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A Lifestyle Modification Program for Adult Patients with Coronary Artery Disease

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A Lifestyle Modification Program for Adult Patients
with Coronary Artery Disease

by

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EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing and Health Professions

of Valparaiso University,
Valparaiso, Indiana

in partial fulfillment of the requirements
For the degree of

DOCTOR OF NURSING PRACTICE

2019
DEDICATION

To all healthcare providers who have dedicated their careers to health promotion and the prevention of disease.

To my sweet Oliver, my fighter, my reminder life is precious and to never take any moment with those you love for granted.
ACKNOWLEDGMENTS

Dr. Lynette Rayman, faculty advisor, who is dedicated to her students and for guidance through this project with her endless support and wisdom.

Community Care Network for allowing me to implement this EBP project within their healthcare organization.
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ABSTRACT

As a leading cause of death worldwide, coronary artery disease affects people of all races and ethnicities. The foundation for the prevention of secondary fatal cardiac events, such as stroke or myocardial infarction, is lifestyle modification to effectively lower cholesterol levels. Lifestyle change impacts diet, physical activity, smoking habits, vital sign measures, and stress management. The purpose of this evidence-based practice project was to reduce implement a lifestyle intervention to lower LDL-C levels and promote healthier lifestyles. This practice change was developed utilizing Stetler’s Research Utilization model to promote evidence-based practice changes in the clinical setting. Nola Pender’s Health Promotion model was applied to facilitate the implementation of the intervention. A systematic literature search revealed 16 pieces of evidence that were used to develop a lifestyle modification program which entailed individualized counseling and a patient-guided booklet to facilitate heart healthy lifestyle changes. The created patient-guided booklet contains material from this literature as well as the American Heart Association and the National Institute of Health. A total of 14 adult participants were recruited from a local cardiology practice and were evaluated at their initial evaluation and then again 6 months later. The primary outcome measurement was the low-density lipoprotein cholesterol (LDL-C) drawn from a fasting lipid panel; secondary outcomes measured were blood pressure, body mass index, dietary habits, and physical activity patterns. Paired t-tests were run with a significance level set at \( p < .05 \). Significant outcomes that were found include dietary habits (\( p = .011 \)) and physical activity patterns (\( p = .031 \)). There was no significant change in LDL-C levels pre- and post-intervention (\( p = .461 \)). The results of this evidence-based practice project will be used to implement a cost-effective, patient-centered strategy in the clinical setting to lower a patient’s risk for a secondary cardiac event by changing lifestyle choices.
CHAPTER 1
INTRODUCTION

Background

Each year cardiovascular disease is the leading cause of mortality in the world with 17.7 million deaths globally and 610,000 deaths in the United States (WHO, 2018; CDC, 2017). Cardiovascular disease encompasses a variety of diseases that affect the heart and peripheral vascular structures, such as hypertension, atrial fibrillation, coronary artery disease, heart failure, and stroke (AHA/ASA, 2017). Coronary artery disease (CAD) is the most prevalent cause of heart disease contributing to 366,000 deaths in 2015 and 28.1 million people diagnosed in 2016 (CDC, 2017); 11.5% of adults in the U. S. live with CAD. Risk factors for developing CAD include lifestyle choices, family history, high cholesterol (hyperlipidemia), high blood pressure (hypertension), and cigarette smoking (CDC, 2015). Other risk factors consist of metabolic syndrome, diabetes mellitus Type II, obesity, dyslipidemia, sedentary lifestyle, and sleep disorders (Roever, Biondi-Zoccai, & Rao, 2017). Hyperlipidemia is the major modifiable risk factor for the development of heart disease that can be managed with lifestyle interventions and medications. Several task forces are working to lower the incidence of cardiovascular disease through primary and secondary prevention. One of the objectives for the Healthy People 2020 initiative is to “improve cardiovascular health and quality of life through prevention, detection, and treatment of risk factors for heart attack and stroke” (Healthy People 2020, 2018).

Statement of the Problem

The American College of Cardiology and the American Heart Association (ACC/AHA) 2018 national guidelines on the treatment of hyperlipidemia incorporate both pharmacological and nonpharmacological approaches to reduce patients’ risk for primary and secondary fatal cardiac events. A fatal cardiac event is the occurrence of stroke, heart attack, or death. These guidelines stress the importance of “lifestyle as the foundation for ASCVD risk-reduction”
Atherosclerotic cardiovascular disease (ASCVD) 10-year risk calculator determines the overall risk of heart disease and stroke over a ten-year period and is used frequently in the primary and specialty office settings to determine a patient’s cardiac risk for those patients who have not had a fatal event or prior diagnosis of CAD (ACC, 2018). Not all providers discuss the important benefits of making healthy lifestyle choices and maintaining that lifestyle. If adult patients with CAD are not only prescribed statin-therapy but also given dietary advice regarding national recommendations for a heart healthy diet and adequate physical activity, there would be decreased hospitalizations and fatal cardiac events, prolonging the longevity and quality of life in this population.

Hyperlipidemia in adult patients with CAD increases the risk for fatal cardiac events which include heart attack, stroke, or death. As a modifiable risk factor, treatment for hyperlipidemia involves pharmacological and nonpharmacological therapies. Pharmacological therapies include statin therapy as first-line treatment options in conjunction with lifestyle modifications such as dietary changes, physical activity, stress management, and weight management (AHA, 2017). The overall aim of these therapies is to decrease the low-density lipoprotein cholesterol (LDL-C). Unfortunately, there is difficulty achieving this treatment goals and lifestyle modifications in the clinical setting. The need for a lifestyle change intervention regarding dietary changes and physical activity is evident throughout the literature.

Data from the Literature Supporting Need for the Project

According to Cardoso, Moraes, Rosa, & Moreira (2015) only 14% of patients actively follow guideline recommendations. As the leading cause of death worldwide and across the nation, the United States Preventive Services Task Force (USPSTF) (2014) encourages providers to prevent the occurrence of hyperlipidemia in overweight or obese patients with “intensive behavioral counseling interventions to promote a healthful diet and physical activity for cardiovascular (CVD) prevention”. This guideline is given a grade B as a recommended practice.
According to Heaton & Frede, 2006, Voogdt-Pruis, Van Ree, Gorgels, & Beusmans, 2011, healthcare providers have fallen short due to time and resource constraints. HealthyPeople 2020 released objectives with solutions to reduce the number of deaths from coronary artery disease (from 129.2 per 100,000 people in 2007 down to 103.4 per 100,000 in 2020) and reduce the overall number of adults with high cholesterol (from 15.0 per 100,000 down to 13.5 per 100,000 in 2020) by adhering to heart healthy diets and incorporating physical activity (HealthyPeople, 2014). In addition to lifestyle factors, patients with established CAD should be prescribed statin therapy for treatment and protection.

As a worldwide epidemic, coronary disease is monitored by global task forces to reduce incidence and monitor prevalence. A cross-sectional study that surveyed twenty-four European countries (EUROASPIRE IV) showed providers are still lacking application of lifestyle modification recommendations for the secondary prevention of cardiac events. Even in those patients taking lipid lowering agents alone, medication needs the support of healthy lifestyle changes (Kotseva et al., 2016). In addition, a retrospective, randomized control trial study analyzed the factors influencing physician counseling on cardiovascular risk. The results revealed, regardless of blood pressure readings and lab results, overt signs of obesity, appearance and weight, were the driving factor for lifestyle counseling (Rakita, Homko, Kashem, Memon, & Bove, 2016). Therefore, not all patients received adequate counseling regarding lifestyle modifications to reduce the risk or burden of coronary disease. With the many tools available from the AHA, providers are not taking advantage of using them during follow up visits (AHA, 2018).

Data from the Clinical Agency Supporting Need for the Project

CAD is not just prevalent world and nationwide, but also significant locally as the CDC reports numbers in comparison to the national average. In Lake County, Indiana, there were 190.4 deaths per 100,000 people ages 35 and older from 2013-2015, which compares to the national average of 194.5 deaths per 100,000 people (CDC, 2018). A local cardiology practice
that serves the population of Lake County, Indiana, and is a part of a larger, non-profit healthcare system sees approximately 78 patients per week with a variety of patients with cardiovascular diseases. The struggle of managing patients with multiple comorbidities has become overwhelming to healthcare providers. Providers focus on emergent issues at follow-up visits, and time is not always spent counseling on preventive care. According to the 2013 ACC/AHA guidelines on the treatment of blood cholesterol and lifestyle counseling, modification should precede and work in conjunction with pharmacological therapies to lower LDL-C levels. Although current recommendations do not set a specific LDL-C target goal, the cardiologist prefers 50% of baseline or less than 70 mg/dL. Patients with CAD are also prescribed statin therapy for treatment, and in some cases, patients are even referred to a dietician. The cardiologist at this clinical site provides usual care in accordance with national guidelines and patient preferences to enforce secondary prevention in CAD. Due to time constraints and lack of meaningful resources, lifestyle counseling is not always provided during local office visits for CAD patients struggling with hyperlipidemia.

The healthcare providers at this site would like to incorporate the patient in shared-decision making and mutual goal setting to promote healthy lifestyle habits. The healthcare providers at this site agree nonpharmacological approaches to meet clinical guidelines need to be a priority in patient care and welcome the opportunity to improve upon their current practice. The application of evidence-based practice (EBP) in this particular clinical setting meets the national recommendation guidelines and priorities of these healthcare providers. Also, there is a lack of resources at this clinical site to discuss these changes with patients, hindering the opportunity to outline major lifestyle contributors and guide the patient to healthier lifestyle behaviors. This project counseled and supplied patients with the necessary materials from the AHA and NIH to promote self-managing behaviors to lower LDL-C levels and the overall risk for a fatal or nonfatal cardiac event.
Purpose of the Evidence-Based Practice Project

The impact of lifestyle behaviors is evident by the lack of lipoprotein control and evidence of fatal or non-fatal CAD events. The purpose of this EBP project is to implement a lifestyle intervention to lower LDL cholesterol and promote healthier lifestyles. Participants were counseled on lifestyle modifications, after assessing their current lifestyle choices, using materials emphasized in the national guidelines. The focus of this counseling was to target lower LDL cholesterol levels below 70mg for high-risk and less than 100 mg for low/moderate risk adult patients with CAD in a way that is effective and time-efficient. Focusing on lowering these cholesterol levels by targeting lifestyle modifications lowered cardiovascular risk, thus reducing patient's risk for a major cardiac event. Secondary outcomes included measuring effects on blood pressure, body mass index (BMI), and dietary and physical activity changes.

Compelling Clinical Question

The compelling question that was answered over the length of this project was focused on the effectiveness of a lifestyle intervention that aids in pharmacological therapy (if applicable) to improve cholesterol levels in adults with coronary heart disease. Although there are various diets available for patients to follow, the ACC/AHA (2013) recommends a “heart healthy diet” for lowering adult LDL-C. A heart healthy diet consists of decreasing dietary fat (especially saturated and trans fat) intake and increasing intake of vegetables, fruits, and whole grains (Eckel et al., 2014). Other important foods to incorporate into a heart healthy diet are low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils, and nuts. Necessary eliminations include refined sugars, which are found in most bakery items and beverages, and red meat, from beef and lamb. These changes will be made through following the DASH dietary plan (Dietary Approach to Stop Hypertension).

In addition to dietary recommendations, physical activity is another crucial component to reaching lower LDL-C levels. Eckel et al. (2014) advises adults to participate in 40-minute moderate-to-high intensity aerobic exercise 3-4 times per week. As a result, Eckel et al. (2014)
estimated that 6% of CAD could be eliminated worldwide with life expectancy to increase by 0.68 years with the incorporation of physical activity. Patients also take lipid-lowering medications which help maintain therapeutic LDL-C levels. Statin therapy, which is a first line therapy for lipid reduction, varies by intensity, based on patient’s cardiovascular risk and medical history; high-intensity statin therapy should be prescribed for patients less than 75 years of age who have CAD (Stone et al., 2014). Lifestyle modifications (diet and physical activity) and lipid-lowering medical therapy complement one another to achieve optimal results. Will there be clinical significance to focus more on health-promoting behaviors as the guidelines and current literatures insists?

**PICOT Question**

The PICOT clinical question that was evaluated is: in adult patients with CAD, does dietary and physical activity counseling with a lifestyle intervention lower cholesterol levels in six months?

**Significance of the EBP Project**

With the projected increase of cardiovascular diseases, the AHA/ASA (2017) predicts by the year 2035, half of the United States population will have some form of cardiovascular disease. This disease costs healthcare systems a significant amount of money and time when caring for these patients. In 2016, cardiovascular disease cost the nation $555 billion and is projected to drastically increase to $1.1 trillion by the year 2035 (ACC/ASA, 2017). More specifically, CAD contributes $89 billion to these medical costs, making it the most expensive of the cardiovascular diseases. Considering the cost of CAD, actions must be taken to reduce the burden through primary and secondary prevention.

The overall significance of this project will be to apply EBP in a meaningful way that impacts local practice to adopt a useful clinical lifestyle intervention. Targeted outcomes included lower LDL-C levels, therapeutic blood pressure, weight loss and maintenance, improvement in dietary choices, and physical activity adherence. These outcomes were
measured with fasting serum lipid panel, blood pressure readings from office
sphygmomanometer, BMI calculations, Rate-Your-Plate for Blood Cholesterol Tool, and The
Rapid Assessment of Physical Activity Tool. After the implementation and evaluation of this EBP
project, patients were empowered to possess better self-management skills over their disease
and implement ways to improve their cardiac health. The providers are able to utilize a
resource, that is time efficient and cost-effective, yet patient-centered, in the clinical setting;
thus, preventing any long-term effects for CAD patients with hyperlipidemia. Ultimately, this
improves quality of services, cost of implementation, and access to a lifestyle intervention.

CHAPTER 2
THEORETICAL FRAMEWORK, EBP MODEL, AND REVIEW OF LITERATURE

Theoretical Framework

Overview of Nola Pender’s Health Promotion Model

As a nursing theory in the context of health promotion, Nola Pender’s Health Promotion
Model (HPM) will be applied to this EBP project. Based on self-regulatory and self-reflective
concepts from Bandura’s Social Cognitive Theory, Pender’s first draft was published in 1982
with several revisions since then (George, 2011; Pender, Murdaugh, & Parsons, 2015). The
nursing metaparadigm consists of the four concepts: the patient, health, environment, and
nurse; this concept is essential and evident in Pender’s work. The definition of health varies per
patient as either absence of disease, optimal functioning, or a more abstract definition that
changes over time. Determinants of health include age, socioeconomic elements, culture, and
environment, which are inseparable from other life situations (Pender et al., 2015).

Three assumptions of the HPM are: the patient seeks help from the healthcare provider
to reach optimal levels of health, has the ability to reflect on past experiences and make rational
decisions regarding future decisions, and patients must have the desire for positive health
experiences that produce healthy outcomes. Patients must possess self-regulation over lifestyle
choices and constantly interact with the environment in a dynamic way that changes over time. Healthcare providers have a significant role in the environment that helps facilitate change, but the patient must initiate health-related changes as a result of interaction with the environment, which is essential to behavior change (George, 2011). The concept of health promotion and behavior change are the overarching concepts of this model, but there are several minor concepts also developed in this framework. These major concepts include: a) individual characteristics and experiences (prior related behavior and personal factors), b) behavior-specific cognitions and affect (perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, situational influences, commitment to a plan of action, and immediate competing demands and preferences), and c) behavioral outcome (health promoting behavior) (Pender et al., 2015).

The major concept of individual characteristics and experiences that influence health behaviors. These minor concepts that stem from individual characteristics and experiences are prior-related behaviors and personal factors. A patient’s prior-related behaviors predict future behaviors and decisions; perceived benefits influence the likelihood of a behavior being repeated, thus being able to predict outcomes while considering barriers of prior-related behaviors (Pender et al., 2015). The nurse’s essential role “helps individuals shape a positive behavioral history for the future by focusing on the benefits of a behavior, teaching how to overcome hurdles to performing the behavior, and building high levels of efficacy and positive affect through successful performance experience and feedback” (Pender et al., 2015, p. 36). Personal factors help predict behavioral actions based on biological factors (age, sex, BMI, and family and medical history), psychological (current self-esteem, motivation, and perception, and socioeconomical (race, culture, education, and socioeconomic status) (Pender et al., 2015). These factors promote the incorporation of the nursing metaparadigm and are individualized per patient that impact current state of health. They need to be analyzed and incorporated into the intervention as means to fulfill patient’s commitment to action plan.
The essential core concept of behavior specific cognitions and affect influences the health-promoting intervention and must be measured to determine if the specific intervention caused the behavioral change. Following the minor concepts include perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, situational influences, commitment to a plan of action, and immediate competing demands and preferences. The perceived benefits of action should focus on the positive aspects of health-promoting behavior, because beliefs in positive outcomes, leads to better outcomes (Pender et al., 2015). If the patient perceives they can perform a health-promoting behavior, they will be motivated toward self-efficacy through intrinsic and extrinsic benefits which creates more awareness.

Perceived barriers to action are “viewed as mental blocks, hurdles, and personal costs of undertaking a given behavior” that need to be addressed as soon as possible to revise the action plan (Pender et al., 2015, p. 37). These barriers may include cost, time, transportation, or stress. It is essential to discuss barriers to form an action plan that accommodates the patient to overcome potential barriers to action. A big component of the HPM is the patient’s ability to comprehend and initiate health-promoting behaviors. Perceived self-efficacy consists of judgement of skill and critical thinking to plan for certain outcomes and can increase patient’s motivation to participate in a particular skill in which they excel (Pender et al., 2015). This concept increases the benefit of the action and is encouraging to the patient, as it increases positive thoughts of confidence and competency. Increased perception of self-efficacy motivates the patient directly by intensifying the affects to pursue a commitment to plan of action.

The activity-related affect consists of the emotional response to a health-promoting intervention, which is dependent upon self-acting and the environment (Pender et al., 2015). How the patient feels after completing a health-promoting behavior determines whether or not the action will be repeated or continued in the future. As previously stated, emotions and
feelings happen prior, during, and following an intervention, and if the response is positive, the behavior will most likely be repeated.

Interpersonal influences consist of the thoughts and actions of others. These influences originate from family, friends, peers, coworkers, and healthcare providers (Pender et al., 2015). Other thoughts about one’s health and opinion over perceived benefits impact patient’s expectations and behaviors; some influences come from social expectations and norms, peer pressure, social support, and modeling behavior from others. These influences may result in either pressure or encouragement to participate in health-promoting behaviors.

Situational influences are factors from the available options, details of the health-promoting intervention, and environmental factors. Patients are more comfortable and competent in environments in which they feel “compatible, related, and safe and reassured” (Pender et al., 2015, p. 38). This concept provides insight to providing patient-centered care.

Situational influences must be re-evaluated throughout the implementation phase for maintenance in each patient’s unique, individual characteristics and experiences.

The commitment to a plan of action is the initiation of the patient to engage in the health-promoting intervention, unless there are competing demands that affect participation (Pender et al., 2015). Patients are more willing to participate in organized rather than unorganized, unplanned lifestyle change behaviors. Two underlying assumptions of cognitive processes are the implementation intention with a given time and place, either alone or with support and defining concrete strategies for initiating and performing health-promoting behaviors. There must be a mutual agreement between the healthcare provider and patient to set a plan of action and strategy to motivate and “reinforce health behaviors according to individual preferences” (Pender et al., 2015, p. 39). This agreement brings the patient to a realization of the critical health behavior change and establishes a commitment to follow through with the behavior due to interpersonal influence.
Immediate competing demands and preferences are types of demands and preferences that distract or take precedent over the initiation or maintenance of health-promoting behavior (Pender et al., 2015). Patient usually have little or no control over these feelings, they are not to be confused with barriers. Competing demands and preferences occur in the moment. This concept is evident by the patient’s behavior changes in relation to the health promoting behavior and desirable health goals. Health promoting behavior is the finish line or end point of the HPM. Ending at this point prepares the patient for continual maintenance of behavior which improves overall health status, quality of life, and functioning (Pender et al., 2015). At this point, the patient has established health-promoting behavior and may even influence others through modeling and feedback to influence them to also achieve this endpoint of self-efficacy over health behaviors. This concept is the overall goal and requires continual maintenance with feedback from the provider.

**Application of Theoretical Framework to EBP Project**

The application of Pender’s HPM is appropriate for the context of this EBP project and measurable outcomes in clinical practice. Since the basis of lowering LDL-C levels is based on the health-promoting behaviors of making heart healthy decision in regards to food consumption and incorporating physical activity into sedentary lifestyle, the concepts of the HPM are applicable to patients seen in this outpatient cardiology clinical office. According to Pender et al. (2015) strategies to impact behavior change would involve raising awareness of CAD and fatal events, re-evaluation of self, setting goals that focus on shared-decision making with patient, promoting self-efficacy to guide the patient toward health promoting behaviors, enhance the benefits of change by achieving baseline LDL-C levels to show the magnitude of progress, recognizing cues to promote change, and managing barriers to change.

Understanding a patient’s perception of self-efficacy influences the patient’s ability to participate in a lifestyle modification treatment plan. If they perceive they cannot do it based on their previous attempts and inept skills, then chances are they have low self-efficacy and may
need reassurance on their current abilities and where to start. Prior poor dietary and physical activity habits lead to undesirable health outcomes and the progressive advancement of CAD. The project manager’s role was to assess previous dietary choices and sedentary lifestyle that contributed to the poor control over LDL-C level to anticipate the patient’s future behaviors.

The participants of this EBP project were encouraged to focus on their positive intrinsic and extrinsic factors to strengthen their self-efficacy. Intrinsic factors will vary per participant and will be highlighted during the counseling portion of the intervention. These factors may include the way the participant feels about making health-conscious decisions regarding diet and physical activity. Extrinsic factors will focus on possible positive rewards or outcomes the patient perceives from participating in this EBP project. This process of evaluating intrinsic and extrinsic factors consider patient’s age, abilities, current mood or thought process, dietary preferences, financial budget, career, and level of education. Patients may have certain preferences based on their daily routine and what they are used to. One of the objectives of this project is to provide patients with opportunities to make shopping decisions based on comfort level, starting one small goal at a time and introducing physical activity into sedentary lifestyles with short intervals at a time.

Competing demands is an important concept to consider when administering the intervention. A patient may be driving home from the grocery store and instead of waiting and cooking a heart healthy meal at home, decides to drive through a fast food chain due to the immediate preference for fast food. These types of demands and preferences impede patient’s ultimate intentions. Some patients may be more distracted than others. The process to overcoming these competing demands and preferences requires training and exercising self-regulating and controlling behaviors. The behavioral outcome consists of the overall health promoting behavior, which is the ultimate purpose of this nursing model.

After evaluating perceived benefits, overcoming barriers, evaluating situational and interpersonal influences, and increasing self-efficacy, the patient will be able to possess better
self-management with CAD. Tailoring individualized health-promoting behaviors through dietary and physical activity counseling emphasizes patient preferences and provides patient-centered care to prolong health maintenance.

**Strengths and Limitations of Theoretical Framework for EBP Project**

Although the HPM is successfully used in the context of health behavior change, it also has theoretical and contextual limitations. One strength of the HPM is the applicability to desired intervention in relation to intended outcomes of this EBP project. Adult patients living with CAD and hyperlipidemia need a health promoting process to describe and explain the variables of their behaviors and how to achieve optimal LDL-C levels. Due to the holistic, individualized treatment plan needed to facilitate change for patients, the HPM provides guidance for healthcare providers to be a change agent and predict behaviors of the individuals. On the other hand, the HPM contains abstract concepts that are individualized to each patient and are hard, if impossible, to measure when evaluating for adherence, perception, or efficacy. Also, the large number of concepts within the model may be time-consuming, as this is a time efficient counseling intervention. Another limitation is the modality of effectively communicating health-promoting behaviors, as some patients may not want to change. The HPM allows the project manager to discuss the various concepts with the patient to set goals and provide guidance for overcoming barriers and competing demands or preferences to maintain a healthy lifestyle and reduce cardiovascular risk.

**Evidence-based Practice Model**

The model used for this EBP process was Stetler’s model for Research Utilization. The core of this model is critical thinking and systematic research utilization into EBP.

**Overview of the Stetler Model**

Nursing theory and nursing models of EBP are essential to achieve supportable outcomes in EBP projects. The Stetler model for Research Utilization (Stetler model) is used to guide the EBP process from establishing the clinical problem to evaluating clinical outcomes.
The Stetler model’s primary focus is to use the synthesized research findings to implement a clinical practice change; this process happens in five phases: the preparation phase (phase I), the validation phase (phase II), the comparative evaluation and decision-making phase (phase III), translation (phase IV), and evaluation (phase V) (Stetler, 2001). These phases are based on the assumptions that each type of evidence is supported for use in the appropriate setting, synthesized, translated, and then, evaluated for use “in a manner that is replicable, observable, credible, verifiable, or basically supportable for safe and effective use” (Dang et al., 2015, p. 279).

It can also be used by novice to expert practitioners in everyday practice to improve upon patient outcomes. Due to the applicability of the model to the clinical problem, this particular EBP model was selected based on the previous revision of the Stetler model that included external and internal bodies of evidence. The use external evidence is crucial due to the emphasis on the ACC/AHA’s clinical guidelines for hyperlipidemia in CAD; this expert consensus is widely used in healthcare settings and is the basis for most clinical decisions (Melynk & Fineout-Overholt, 2015). Internal evidence is the information obtained from the clinical site to establish a clinical problem and use the information from patients and healthcare providers to support the clinical problem during the preparation phase. All the way through the evaluation phase, the Stetler model is a comprehensive and systematic process that is applicable to this EBP project for adult patients with CAD and hyperlipidemia.

**Application of the Stetler Model to EBP Project**

In the preparation phase, the observed clinical problem was that providers were following the ACC/AHA clinical guidelines for hyperlipidemia, but not including all aspects of the guidelines. As current practice outcomes have shown, cholesterol screening results have not been optimal for patients with CAD. This problem is affirmed through actual observation that occurred in the clinical setting and is evidenced by the lack of adherence and less than optimal LDL-C results. Validation (phase II) was achieved after a thorough review of the current
ACC/AHA national guidelines and a literature search through several databases; these searches affirmed the significance of the clinical problem. After validating that hyperlipidemia and poor lifestyle choices are a prevalent clinical problem in patients with CAD, the synthesis of the literature supported the need for a more individualized treatment plan for these patients. The decision to use the findings of the literature search was based on synthesis of the data collected to support the basis of this EBP project. The resources were selected based upon their appraisal, the level and quality. As a result, the next stage of the process was to transition into the translation/application phase to address the need for a lifestyle intervention.

To translate the synthesis of the literature into a relatable practice, a change in current practice involved a shared-decision making and patient-guided tool. A synthesis of the literature summarized the EBP findings and allowed patients to be more self-led through this process by encouraging goal-setting and providing resources that support these changes. This approach was instrumental to the longevity of health-promoting behaviors. Methods to implement this change included formal heart healthy lifestyle counseling and distribution of an interactive patient-guided tool. The application of this type of interaction promotes self-efficacy to manage the disease long-term, which the literature supports as a present problem. The goals of implementing this EBP project were to evaluate a patient-centered, time-efficient, and cost-effective tool to guide patients toward healthier behaviors that can be used in an outpatient cardiology clinical setting. The overall evaluation was the collection of serum LDL-C levels, blood pressures, and calculating BMIs at the conclusion of the implementation period to compare with the pre-intervention values. Therefore, the focus of applying health-promoting behaviors based on EBP was crucial to the success of research utilization within this model.

**Strengths and Limitations of the Stetler Model for EBP Project**

The Stetler Model is widely accepted and used in nursing research as a means to change health practices. Strengths of this model are the applicability to developing a plan of action for EBP projects. Also, the systematic flow of the model allows for a step-by-step
evaluation of the overall plan and goals for an EBP project. It can be used in formal and informal ways, either in direct patient contact through an organization or in everyday clinical practice by a practitioner. The information obtained from an EBP project can improve current practice. The Stetler model is very complex and has several critical assumptions of the model which may or may not be applicable to all users. The use of the model in an informal manner may be too subjective and reduce the credibility to other nurse researchers; the lack of knowledge or novice of one user may be using the model in an inappropriate manner. However, the Stetler model was first published in 1976 and has since upheld its applicability of research findings into EBP (Dang et al., 2015).
Literature Search

To collect the evidence for best practice for CAD patients with hyperlipidemia, a thorough literature search was conducted. Several databases were searched, and keywords were used in the format of the PICOT question and narrowed down based upon MeSH and CINAHL headings. After the best evidence was collected, a level organization and appraisal of the evidence was conducted from Melynk and Fineout-Overholt (2015) for the leveling of evidence and the Johns Hopkins Nursing Research/Non-Research Evidence Appraisal tool for evidence appraisal (Dearholt & Dang, 2014). See Appendix A for complete literary synthesis.

Sources Examined for Relevant Evidence

In a search for the best available resources, the evidence was searched for in the Joanna Briggs Institute (JBI), Cochrane, National Guideline Clearinghouse, Medline, and CINAHL databases. Keywords of the PICOT question were used in the foundation for the initial key searches. In the Medline and CINAHL databases, subject headings were utilized to eliminate all possible variations of keyword usage in each of the two databases. Inclusion criteria for final review was based on targeted population, intervention, outcomes measured, English language, less than five years old, and country (similar to the cultures of the United States). Studies were excluded if they were published in any language other than English, older than five years, or did not fit the targeted population, intervention, or outcomes. The final search resulted in a total of 747 articles from the included databases. Appendix A includes a complete literary search and synthesis. Table 1.1 outlines the final results of the literature search.
### Table 1.1

**Review of the Literature Table**

<table>
<thead>
<tr>
<th>Database</th>
<th>Results</th>
<th>Duplicates</th>
<th>Reviewed</th>
<th>Accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBI</td>
<td>153</td>
<td>2</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Cochrane</td>
<td>125</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>NGCH</td>
<td>173</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Medline</td>
<td>102</td>
<td>2</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>CINAHL</td>
<td>194</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>747</td>
<td>9</td>
<td>41</td>
<td>16</td>
</tr>
</tbody>
</table>
The National Guideline Clearinghouse was searched for widely accepted clinical guidelines. The keyword “cardiovascular disease” was used to find the protocol guidelines for adult patients with CAD. Limiters in this database were U.S.-based organizations and years from 2013-2017. This timeframe was selected to provide the most recent application of EBP. A total of 173 guidelines were found with one duplicate and three were reviewed for consideration. One widely accepted and used guidelines in clinical practice was used for evidentiary support for CAD patients with hyperlipidemia. The other guidelines were based from medical programs that applied this national guideline in their protocols for hyperlipidemia and CAD.

Then, a search was conducted in the JBI database to find evidence summaries consisting of systematic reviews. The best search in the JBI database included of the main concepts from the PICOT question, “cardiovascular disease” OR “coronary artery disease” AND prevention, and the inclusion criteria listed. A total of 153 results, two were duplicates from other databases. Ten results were considered for final review. Two of the three accepted systematic reviews originated from an evidence based summary by Huong Nguyen (2017). The third systematic review was citation chased from a JBI evidence summary from Fong (2016). Furthermore, the Cochrane database of systematic reviews was searched using the keywords “cardiovascular disease” OR “coronary artery disease” AND prevention. Date limiters were applied to years 2013-2018, and reviews were eliminated from consideration if they did not meet the PICOT criteria. The final search yielded 125 systematic reviews, two were duplicates in other databases. A total of 4 reviews were considered for final review and two were accepted into the best practice model.

The Medline and CINAHL databases were searched for the best supportive evidence. MeSH headings were used in Medline to include widely used synonyms and eliminate any variations in the keywords. The keywords used were MM “cardiovascular diseases” OR MM “coronary disease” AND diet* OR nutrition OR lifestyle AND cholesterol OR lipid* OR hyperlipidemia AND “physical activity” OR exercise AND MW “risk reduction behavior” OR MW
“secondary prevention”. These keywords were used as a result of analyzing the subject headings for the included evidence to keep the search consistent. Exclusion criteria included date limiters of years 2013-2018 and the English language. This search produced 102 results, two which were duplicates found in the other databases, six were considered for final review. Nine were accepted to support this project. The CINAHL database was searched using subject headings to continue a systematic search. The words MM “cardiovascular diseases” OR MM “coronary disease” AND diet* OR nutrition OR lifestyle OR physical activity OR exercise AND cholesterol OR lipid* OR hyperlipidemia AND “behavior modification” OR prevention, also using subject headings in the final search with English language, years 2013-2018, and scholarly (peer-reviewed) journals as limiters. This search had 194 results with two duplicates included in the other databases; six were included for the final review and one was accepted for synthesis into EBP. This final search concluded all relevant evidence related to the topic of CAD patients with hyperlipidemia and best practice to support a lifestyle intervention in EBP.

A total of 747 results were included and forty-one abstracts were reviewed. Duplicates were excluded from review. During the examination process, each abstract was analyzed to determine if they met criteria for this EBP project. Criteria for this EBP project was based on the targeted population of adults with CAD, struggling with hyperlipidemia; studies were excluded if they targeted CAD patients that had severe chronic disease, i.e. chronic kidney disease, HIV, heart failure, etc., and studies that included pregnant women and children were excluded because of their lack of connection to the targeted population. Due to the widespread prevalence of this disease and its risk factors across the world, patients with diabetes mellitus II were considered due to the heavy correlation between type II diabetes mellitus and CAD. Primary prevention is a crucial component to preventing CAD; these studies were used for application as a protective measure in secondary prevention. Then, studies were reviewed based on their relevance to the intended intervention and measurable outcomes.
Appraisal of Relevant Evidence

A critical appraisal was performed to evaluate the quality of the evidence for validity and reliability. To determine the quality of the evidence used to support this EBP project, the Johns Hopkins Research and Nonresearch Evidence Appraisal Tool was used to guide the appraisal process (Dearholt & Dang, 2014). Studies were appraised not only based on relevancy to the PICOT question, but also based on the quality of the study. The evidence needed to have a clear purpose statement with goals that defined outcomes appropriate to care for patients with CAD and hyperlipidemia. These goals included measurable outcomes or descriptive pertinence to patients with CAD. Also, systematic reviews and RCTs needed to have a current literature reviews. Systematic reviews contained reproducible search strategies that covered more than one database and contained a diagram of eliminated studies but did not appraise the strength of evidence or describe the quality of the studies used. Study details and synthesized findings needed to be clear and relatable to patient population and outcomes measured. Conclusions were gathered based on the results that were applicable to an improvement of health-behavior interventions.

Ratings were given based on the outcomes of the appraisal questions. High quality (A) ratings were given to those reviews and studies that showed purposeful results, sufficient sample sizes, definitive conclusions, and consistent recommendations that related to the outcomes of this project. Good quality ratings (B) were assigned to those with sufficient sample sizes, some control over intervention, and recommendations were based on a mainly comprehensive literature review. Low quality (C) ratings were flawed studies or reviews that had inconsistent and unclear results, small sample sizes. The supportive evidence consisted of 9 As, 5 Bs, and 1 C quality rating, collectively displayed in Table 1.2. After the evidence was collected, organized, and appraised, the data from the included literature search was synthesized and translated into a best practice model to establish the best way to counsel patients with CAD and hyperlipidemia.
### Table 1.2

**Evidence Type and Appraisal**

<table>
<thead>
<tr>
<th>Level</th>
<th>Included</th>
<th>Quality</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>4</td>
<td>A (3)</td>
<td>Systematic Review of randomized controlled trials (4)</td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>A (1)</td>
<td>Randomized Control Trial (1)</td>
</tr>
<tr>
<td>III</td>
<td>2</td>
<td>A (1)</td>
<td>Quasi-Experimental (2)</td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td>A (1)</td>
<td>Prospective Cohort Study (1)</td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td>B (1)</td>
<td>Systematic Review of descriptive studies (2)</td>
</tr>
<tr>
<td>VI</td>
<td>1</td>
<td>A (1)</td>
<td>Cross Sectional Study (1)</td>
</tr>
<tr>
<td>VII</td>
<td>4</td>
<td>A (2)</td>
<td>Expert Panel (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B (2)</td>
<td>Expert Opinion (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Literature Review (1)</td>
</tr>
</tbody>
</table>
Levels of Evidence

To determine the level of evidence, Melynk and Fineout-Overholt's (2015) Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions was used for the literature appraisal. This rating system was used based on the inclusion of keywords from the PICOT question and a broader range of levels of evidence to include well-designed case control and qualitative studies (Melynk & Fineout-Overholt, 2015). This hierarchy determines the ratings from Level I to Level VII. Level I consists of evidence from systematic reviews and meta-analysis of all RCTs. Level II studies consist of well-designed RCTs. Level III is well-designed controlled trials without the randomization of subjects. Level IV is evidence from well-designed case-control and cohort studies. Level V includes evidence from systematic reviews that review descriptive and qualitative studies. Level VI consists of evidence from single descriptive or qualitative studies, and level VII is the expert opinions and/or reports of expert committees. Please see Table 1.2 at the end of this section for a summary of the level and appraisal of evidence.

Level I

The level I evidence was four systematic reviews by Hooper, Martin, Abdelhamid, and Smith (2015), de Waure et al. (2013), Rees et al. (2013), and Cole, Smith, Hart, and Cupples (2011). These articles were given a level I evidence within the hierarchy based on the type of study that was conducted. Four systematic reviews performed meta-analysis and one review consisted of RCTs. The primary and secondary outcomes measured included overall and cardiac mortality, fatal and nonfatal cardiac events, diet intake, blood pressure, lipid measurements, amount of physical activity, BMI, and self-efficacy. The Hooper et al. (2015) systematic reviews consisted of 15 RCTs and 759,000 participants over two years. A significant clinical finding from this review was the 13% reduction of CHD events with the decrease in saturated fat intake (RR 0.87, 95% CI 0.74 to 1.03). There was also a clinical significance to secondary outcomes in LDL-C and systolic and diastolic blood pressure (MD -0.19 mmol/L, 95%
CI -0.33 to -0.05, MD -0.19 mmHg, 95% CI -1.36 to -0.97, and MD -0.36 mmHg, 95% CI -1.03 to 0.32, respectively) with no clear effects on cardiac mortality.

In the systematic review with meta-analysis by de Waure et al. (2013), 14 high-quality RCTs consisting of lifestyle interventions in patients with coronary disease were examined. The trials were evaluated to correlate the impact of lifestyle interventions on the risk for fatal and nonfatal CV events over at least six months. These interventions consisted of multifactorial lifestyle components (measures to reduce LDL-C, blood glucose, smoking, stress, and weight and increase physical activity) and tailored for the individual needs for each patient. This review consisted of 6,657 participants, and it measured the number of fatal and nonfatal events (MI, revascularization, and death), overall mortality (all causes), and hospital readmissions. The authors endorsed the need for secondary prevention programs due to the overall reduction of fatal cardiovascular events and overall mortality. Secondary outcomes that were significant included improvements in systolic blood pressure and total cholesterol, LDL-C was not measured in this review. Fatal CV events were reduced by 18% (RR 0.82, 95% CI 0.69, $P = 0.003$), and overall mortality was reduced (RR 0.94, 95% CI 0.83 to 1.06, $P = 0.32$). A decrease in systolic blood pressure (WMD -4.36 mmHg, 95% CI -6.50 to -2.22) and total cholesterol (WMD -0.33, 95% CI -0.57 to -0.08) was observed. The indications are significant for the big picture in patients with CAD, to reduce the number of fatal and nonfatal cardiac events. The impact of these lifestyle interventions lowers the risk factors and are relevant and reliable to support lifestyle interventions that are tailored to patient preferences and resources.

Dietary advice for reducing CV risk, addressing the effects among healthy people, was reviewed by Rees et al. (2013). Rees et al. (2013) reviewed 44 RCTs and used meta-analysis to determine the significance of the findings of the included studies. The interventions in the RCTs were either verbal or written advice delivered in person by a healthcare professional among 18,175 participants. The primary outcomes of this study included overall CV risk factors, blood pressure, lipids, and biomarkers of dietary intake; secondary outcomes included self-reported
dietary intake. The clinical implications from this systematic review after meta-analysis was the reduction on systolic and diastolic blood pressure and lipids. Blood pressure was reported in 11 studies. Systolic blood pressure was reduced by 2.61 mmHg (DM -2.61, 95% CI -3.91 to -1.31), and diastolic blood pressure was lowered by 1.45 mmHg (MD -1.45, 95% CI -2.22 to -0.68). Lipids were reported in 18 studies with a small, yet significant reduction in total cholesterol of 0.15 mmol/L (MD -0.15 mmol/L, 95% CI -0.23 to -0.06) and in 13 studies LDL-C was reduced by 0.16 mmol/L (MD -0.16 mmol/L, 95% CI -0.24 to -0.08). The DASH diet resulted in the largest reduction of fat intake, 10.9% (MD -2.39 gm, 95% CI -3.37 to -1.4). Therefore, the pertinent outcomes of this review support the need to measure baseline and follow-up serum lab values to measure the consistency of dietary effect and adherence, and support a diet-based intervention. The DASH diet was used in some of the interventions, which showed the largest reduction of saturated fat intake which should be considered when deciding on dietary guidelines for patients to follow.

Cole et al. (2011) proposed to “determine the effectiveness of lifestyle interventions for the secondary prevention of CHD” in their systematic review which included 21 RCTS and 10,799 participants (p. 2). The duration of the studies was from three months to five years with follow up every three months. Primary outcomes measured in the review were all-cause mortality, cardiac mortality, nonfatal cardiac events, and hospital admissions. Secondary outcomes consisted of diet (total intake of fiber, fruits and vegetables), exercise, blood pressure, blood lipid levels, health related quality of life, self- efficacy, and medication adherence. From all of those outcomes, 39 out of 51 participants significantly improved dietary intake of fiber and reduced intake of sugar, fat, and cholesterol. In 20 studies, physical activity had increased, especially in overall workload endurance. Blood pressure was reported in five out of thirteen studies with reported benefits at three and twelve months. Five studies reported significant improvements in LDL-C. Self-efficacy was reported in one study, at 6 months self-management improved. These findings relate to the effectiveness of implementing a lifestyle intervention to
lower the risk of fatal and nonfatal events for patients with CAD. Although self-efficacy was discussed in one of the RCTs, self-management is an important factor in longevity of a behavior change and patients must be willing to continue health-promoting behaviors after the project has ended.

**Level II**

The level II evidence consisted of one well-organized RCT with substantial implications for a lifestyle intervention in CAD patients with hyperlipidemia. Applicable findings from the Stuart et al. (2013) were based on the effects of using a primary care prevention model and telephone-based support. The outcomes measured in this study included LDL-C, waist circumference, blood pressure, physical activity, and motivation. This RCT consisted 49 participants who were at risk for developing CV disease, 26 in the intervention group and 23 in the control group. The intervention included distributing a handbook that provided participants with dietary meal plans, recipes, and physical activity plans, as well as telephone support from a trained healthcare professional. The study lasted twelve weeks. Primary outcomes measured in this study were LDL-C, waist circumference, blood pressure, physical activity, and motivation. There were no changes in the dose of blood pressure or cholesterol medications for those patients prescribed medications during the course of this study.

This stability is an important factor to consider for the implementation process and effects on lifestyle changes. Results were presented as an estimated mean with a set significant \( P \) value of \(< 0.05\). The results of the study showed the intervention group had greater reductions in LDL-C levels with significant main effect for treatment \( (F (1, 43) = 15.50, P = 0.0001) \). Blood pressures remained stable throughout the study and had no significant outcomes on either systolic or diastolic pressures, \( F (1,45) = 15.50, P = 0.60 \) and \( F (1, 43) = 0.52 \text{mmHg}, P = 0.47 \), respectively. Intervention participants experienced weight loss but no significant treatment effect on waist circumference. There was a positive correlation between weight loss and LDL-C \( (r = 0.560, n = 26, P = 0.003) \). These significant outcomes show an effect on dietary and physical
activity counseling on biomarkers that measure hyperlipidemia and CV risk factors. Also, no medication changes were made during this study for those participants on blood pressure or cholesterol lowering medication; this factor is essential to determine whether or not it was the intervention or a potential change in medication dose or frequency that caused the significant effects on the measured outcomes.

Level III

Level III studies are well-controlled trials without randomization (Melynk & Fineout-Overholt, 2015). In Noe et al. (2014), the patients followed a lifestyle modification and nutrition intervention. They were combined into three groups: Group A consisted of aerobic and resistance training sessions four times per week, Group B had two to three times per week, and Group C participants had no regular physical activity. A total of 75 participants with CV risk factors were enrolled in this study for six months. Primary outcomes measured were blood pressure, heart rate, lipid profile, BMI, and exercise tests. BMI significantly decreased, more in Group A than in Group B (8.7% versus 5.0%). There was also a reduction in systolic and diastolic blood pressure in Group A and Group B; Group A had a greater reduction in systolic and diastolic blood pressure than Group B (8.5% and 7.0%; 5.5% and 4.7%). LDL-C had a decrease of 29.8% in Group A and 21.2% in Group B. Implications for clinical practice support the incorporation of physical activity into a lifestyle modification intervention and monitoring for effects on patient’s cholesterol, a major risk factor for a CV event.

In the quasi-experimental study by van den Wijngaart et al. (2015), a nurse-led multidisciplinary intervention was initiated to improve the CV disease profile in patients with CVD. Their purpose was to “evaluate the magnitude of change in various modifiable cardiovascular risk factors, such as body mass index, waist, blood pressure, lipid levels, and lifestyle parameters, during short- and long-term follow-up” (van den Wijngaart et al., 2015, p. 707). This study consisted of 176 participants over a three to fifteen-month period with follows every third and sixth months. The intervention retrospectively evaluated profile risk of participant
and then individualized a treatment plan that involved both medical and lifestyle behavior changes based on that risk profile. These participants were then observed over the length of the study. The descriptive characteristics at baseline chart review that researchers included in the profile consisted of age, gender, blood pressure, BMI, LDL-C, waist circumference, smoking habits, alcohol usage, and eating habits. The tests used to measure the effect in this study included a pair t-test or chi-squared and differences between groups were measured by a univariate ANOVA. At the end of the study, there was a significant reduction in patient’s systolic blood pressure (138.3 ± 20.7 mmHg to 128.7 ± 17.7 mmHg; \( p < 0.01 \)) and LDL-C (2.55 ± 0.87 mmol/L to 2.16 ± 0.73 mmol/L; \( p < 0.01 \)). Unfortunately, BMI increased from 26.6 ± 4.5 kg/m² to 27.5 ± 4.8 kg/m², and patients became less active toward the end of the study. These pertinent outcomes should be considered when developing a project based on tailoring patient interventions and the process in which to apply health-behavior change. This study also contained smoking cessation; there could be a correlation between smoking cessation (-6.7%; \( P < 0.0001 \)) and the increase in BMI.

**Level IV**

The level IV evidence accepted for this literature search was by Al Mheid et al. (2016); a health-partner administered lifestyle intervention was implemented with 711 university employees over 2 years - at baseline, 6-months, 1-year, and 2-years. This prospective cohort study implemented a counseling intervention provided by a trained health professional; the counseling was based on the AHA’s Life’s Simple 7 healthier lifestyle objectives. The outcomes measured in this study include vital signs (heart rate, blood pressure, temperature, respirations, and oxygen saturation), height/weight, and waist to hip ratio, a lipid panel, and metabolic panel. The results of the study showed a decrease in systolic and diastolic blood pressure at 6 months (-3.6 mmHg and -2.2 mmHg, \( p < 0.001 \)) and improvements in LDL-C
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(\(p < 0.001\)). Also, physical activity increased by 6% at 6 months (\(P = 0.04\)) and dietary scores increased by 0.46 for those participants with poor baseline diet scores at 6 months (\(p < 0.001\)). These findings support the need for healthcare professionals to be involved and monitor at risk patients in either the primary or secondary context. This one-on-one counseling intervention, although not within the outpatient clinical setting and pertains to primary prevention, shows efficacy of provider-based counseling for decreasing the risk for CV.

**Level V**

The two level V studies by Salehi-Abargouei et al. (2013) and Tapsell and Neale (2016) were systematic reviews that analyzed descriptive studies. Salehi-Abargouei et al. (2013) analyzed the effects of the DASH diet on CV disease by summarizing information and assessing “the magnitude of the relation between imitating a DASH-style diet and CVDs or its major subclass, like CHD, stroke, and HF in prospective cohorts” (p. 2891). This systematic review consisted of six cohort studies with 260,000 adults with or at risk for CV disease, and the intervention reviewed was imitating a DASH-style diet. The outcomes measured were either incidence of CV disease, CAD, or stroke. Three out of the six studies included data in relation to CHD; in 144,337 adults eating DASH diets lowered the risk for CAD (RR 0.79, 95% CI, 0.71-0.88, \(P < 0.001\)). The DASH diet has shown efficacy in lowering the risk for CV disease and potential fatal outcomes.

Tapsell and Neale (2016) evaluated the effect of interdisciplinary interventions on risk factors for lifestyle disease and its risk factors. These risk factors are weight, lipid levels, glycemic control, and blood pressure. This systematic review and meta-synthesis of sixteen studies (7 RCTs, 3 pseudorandomized, and 6 pre- and post- test results without comparisons to a control group) and 15,890 adults with chronic disease. The outcomes measured in this review were weight, lipid levels, hemoglobin A1c, and blood pressure. The review also synthesized characteristic features of successful interventions for lowering risk factors for chronic disease. As a result, one out of six studies found greater improvements in blood lipids, and in five studies
there were reductions in blood pressures. In addition, exercise and/or behavior modifications to dietary advice resulted in significant reductions in body weight. The synthesized features showed there were greater effects when there was greater amount of contact between health professionals and participants.

**Level VI**

The level VI evidence for this EBP project was a cross sectional study, known as the EUROASPIRE IV study, by Kotseva et al. (2016). The EUROASPIRE IV study was conducted by the European Society of Cardiology to identify patient risk factors, describe management through lifestyle and drug therapies, and provide an objective assessment of clinical implementation of current scientific medical knowledge (Kotseva et al., 2016). It consisted of collecting data from medical records (16,426 records) and post hospitalization interviews (7,998 interviews) at six months. The population of this study included patients less than 80 years old with CAD who had a CABG, PCI, or ACS. Lifestyle factors and targeted anthropometric measures, i.e. physical activity, waist circumference, blood pressure, LCL-C, smoking habits, cardioprotective medications, diabetes, and cardiac rehab attendance. The findings revealed physical activity increased by followed advice from a health or exercise professional (23.5%), participated in gym attendance or an exercise program (52.8%), and increased overall daily physical activity (17.4%). Patients’ knowledge of weight (93.4%) and blood pressure (86.7%) at baseline was sufficient, but most patients were unaware of their current cholesterol level (48.9%) or waist circumference (29.3%).

**Level VII**

The level VII evidence consisted of one expert opinion by Drakopoulou et al. (2016), two expert panels by Eckel et al. (2014) and Stone et al. (2014), and one literature review by Rippe and Angelopoulos (2014). The expert opinion by Drakopoulou et al. (2016) summarized the current recommendations for the lipid profile management of patients with CAD to present behavior modifications and medical treatment, applying the guidelines established by the
ACC/AHA and European Society of Cardiology. These implications are for the lifestyle and
treatment of patients with CAD. The major focuses of this expert opinion included lipid levels,
blood pressure, behavioral and psychosocial risk factors, smoking cessation, and body weight
control. Overall improvements suggested increasing vegetable, fiber, whole grains, low-fat dairy,
poultry, legumes, fish, and nuts for dietary modification. Incorporating daily physical activity was
also advised to reduce LDL-C levels by 3-6 mg/dL when performed for 24 weeks in duration
(greater than three days per week for forty minutes each session). A second lipid panel should
be collected at 4-12 weeks after initiating statin therapy or if there is a change in lifestyle to
further determine patient’s adherence (then performed every 3-12 months). These implications
for practice support the impact of a lifestyle modification intervention on patients with CAD. By
implementing dietary and physical activity changes, the risk for a major CV event can be
significantly reduced by monitoring lipid panels and blood pressures.

In the expert panel by Eckel et al. (2014) from the ACC/AHA consisted of sixteen
members in the Expert Work Group to develop a guideline based on high-level RCTs,
observational studies, systematic reviews with meta-analysis. The purpose of this guideline is to
“prevent CVDs, improve management of people who have these disease through professional
education and research; and develop guidelines and standards and policies that promote
optimal patient care and CV health” (Eckel et al., 2014, p. 2961). These guidelines aim to reflect
outcomes of total cholesterol, LDL-C, blood pressure, levels of physical activity, and dietary
habits and emphasized the focus on low-fat dietary patterns, which includes a decrease in fats
(macronutrient) by following a DASH or Mediterranean diet. The guidelines also list ten lifestyle
recommendations that support the need for tailored interventions as there is an inverse
relationship between levels of physical activity and rates of CVD and beneficial effects on lipids,
cholesterol, and blood pressure.

Another ACC/AHA guideline widely used in the clinical setting is by Stone et al. (2014)
expert panel. This panel consisted of sixteen members that reviewed systematic evidence of
RCTs and systematic reviews with meta-analysis of RCTs. This guideline is intended to guide the treatment of adults, 21 and older, to complement the NHLBI CV health risk reduction guidelines. Thus, the major aim of this guideline on the treatment of blood cholesterol to reduce CV risk in adults is to monitor and treat blood cholesterol. Once again, Stone et al. (2014) emphasized that lifestyle is the foundation for ASCVD risk factors and should be continuously discussed with patients, but moreover, the recommended guideline focuses on four major statin benefit groups and does not recommend any specific LDL-C target goal. In secondary prevention, a high intensity statin medication provides the most benefit for patients less than or equal to 75 years of age. The care for the patient with CAD and hyperlipidemia should be individualized and clinical judgment should be based on experience and health status for target LDL-C goals.

The last piece of evidence is a literature review over the guidelines by Rippe and Angelopoulos (2014). Rippe and Angelopoulos (2014) summarized a recent review on how specific lifestyle strategies could be implemented to lower risk of CV disease based on the AHA Strategic Plan for 2020. This review discussed BMI and weight, amount of physical activity per week, blood pressure, dietary patterns, and smoking habits. Overall, patient counseling contributed a modest or sustained weight loss and should be utilized to achieve meaningful health benefits. In regards to dietary patterns, DASH dietary adherence improves overall CV health and should be recommended in the clinical setting. Patients should participate in moderate to intense aerobic and resistance training physical activity at 3-4 sessions (40 minutes per session). This review also reiterated a discontinuance of targeted treatment for goals for LDL-C therapy and instead reinforces the four major statin benefit groups, which is found in the original 2014 ACC/AHA guidelines by Stone et al. (2014). Rippe and Angelopoulos (2014) also reiterate the Eighth Joint National Committee (JNC 8) recommendations for lifestyle blood pressure regulation. These recommendations include regular aerobic exercise, limiting salt intake, maintain a healthy body weight, and smoking cessation. This article incorporates the ACC/AHA and JNC 8 guideline support to continue reinforcing lifestyle modifications for CAD.
patients ready to make a behavioral change and provides rationale for implementing a lifestyle intervention focusing on improving CAD health.

**Construction of Evidence-based Practice**

The construction of EBP was based on the synthesis of the appraised literature, then developed into a best practice model.

**Synthesis of Critically Appraised Literature**

The literary evidence was synthesized to address the targeted population, emerging implications for practice, measurable outcomes, and duration of interventions. The age of the population in the literature focused on adults over age 18 (Cole et al., 2011; Hooper et al., 2015; Kotseva et al., 2016; Rees et al., 2013; van den Wijngaard et al., 2015). Others focused on adults ages 21 and over, age 28 or older, or age 30 and over (Noe et al., 2014; Stone et al., 2014; Stuart et al., 2013).

Al Mheid et al. (2016), Noe et al. (2014), Rees et al. (2013), Stuart et al. (2013), and Tapsell & Neale (2016) included healthy adult cohorts that were at risk for developing CAD (primary prevention). Cole et al. (2011), de Waure et al. (2013), Hooper et al. (2015), Kotseva et al. (2016), Salehi-Abargouei et al. (2013), and van den Wijngaard et al. (2015) included adults with an established CAD diagnosis (secondary prevention). Primary prevention is applied to the intended population due to the effectiveness of interventions on healthy adults.

Implications for best practice are lifestyle modification programs for a health behavior change. Counseling is a necessary facilitator to include advice giving and providing patients with evidence-based resources, such as handouts, sample menus, and heart healthy recipes (Al Mheid et al., 2016; Cole et al., 2011; de Waure et al., 2013; Eckel et al., 2014; Hooper et al., 2015; Kotseva et al., 2016; Rees et al., 2013; Ripper & Angelopoulos, 2014; Stone et al., 2014; Stuart et al., 2013, Tapsell & Neale, 2015). As a part of this intervention, it is strongly recommended that the counseling intervention and resource handout be individualized to patient preferences with a multifactorial and interdisciplinary approach incorporating dietary...
LIFESTYLE MODIFICATION PROGRAM

changes and physical activity. Physical activity recommendation consists of three to four sessions per week at forty minutes per session, according to the 2014 ACC/AHA national guidelines (Al Mheid et al., 2016; Drakopoulou et al., 2016; Eckel et al., 2014; Noe et al., 2014; Rippe & Angelopoulos, 2014). A DASH-style or modified fat diet must be followed to lower CV risk factors with support from the AHA (Drakopoulou et al., 2016; Eckel et al., 2014; Hooper et al., 2015; Rees et al., 2013; Rippe & Angelopoulos, 2014; Salehi-Abargouei et al., 2013; van den Wijngaart et al., 2015). Self-efficacy and self-management skills were evaluated to observe the impact on long-term behavior changes (Cole et al., 2011; de Waure et al., 2013). To make these lifestyle modifications a success, close engagement with healthcare providers is essential, especially if providers follow the 2014 ACC/AHA guidelines; counseling can be achieved through face-to-face, handouts, and/or telephone support (Al Mheid et al., 2016; Cole et al., 2011; de Waure et al., 2013; Drakopoulou et al., 2016; Eckel et al., 2014; Noe et al., 2014; Rippe & Angelopoulos, 2014; Stone et al., 2014; Stuart et al., 2013; Tapsell & Neale, 2015; van den Wijngaart et al., 2015).

Anthropometric outcomes were used to objectively measure adherence and effects of CV biomarkers. These outcomes consist of measuring weight and height to calculate BMI. The literature measured primary and secondary outcomes at baseline and throughout the duration of the studies. Lipid panel and blood pressure were ordered to evaluate total cholesterol, LDL-C, and/or HDL-C (Al Mheid et al., 2016; Cole et al., 2011; Drakopoulous et al., 2016; Eckel et al., 2014; Hooper et al., 2015; Kotseva et al., 2016; Noe et al., 2014; Rees et al., 2013; Stone et al., 2014; Stuart et al., 2013; Tapsell & Neale, 2016; van den Wijngaart et al., 2015). Other measurements that affect CV risk included in the studies were waist circumference, BMI, dietary habits, and physical activity (Al Mheid et al., 2016; Cole et al., 2011; Eckel et al., 2014; Hooper et al., 2015; Kotseva et al., 2016; Noe et al., 2014; Rees et al., 2013; Rippe & Angelopoulos, 2014; Salehi-Abargouei et al., 2013; Stuart et al., 2013; Tapsell & Neale, 2016; van den Wijngaart et al., 2015). CV events or incidence were also included as primary or secondary
outcomes in which fatal or nonfatal events were considered significant findings (Cole et al., 2011; de Waure et al., 2013; Hooper et al., 2015; Salehi-Abargouei et al., 2013). As a result of a lifestyle counseling and modification program, anthropometric biomarkers, BMI, dietary habits, physical activity, and CV events showed clinically significant improvements.

**Best Practice Model Recommendation**

The best practice model recommendation for this EBP project targets adults ages 18 and older with coronary artery disease and hyperlipidemia to focus on secondary prevention in the clinical setting for optimal risk reduction for a secondary fatal or nonfatal coronary event. A lifestyle modification program, that consists of a brief, yet effective counseling session focusing on multifactorial lifestyle changes for health promotion with a complementary resource tool, was implemented to lower secondary CV event over six months. The intervention was administered by the project manager who will continually monitor patient progress. Face-to-face and telephone modalities was used to deliver the intervention and follow up patients during this project. The participant handout was consisted of expanding on the knowledge and awareness of health; then, a discussion regarding personal risk factors will occur to promote patient-centered care, and a handout will be distributed to promote a heart healthy lifestyle that is supported by the AHA. An introduction regarding the meaning of lipid panel values and effect on health was initiated and what certain foods, low in saturated fat, and exercise can do to promote CV health. Dietary, physical activity guidelines and DASH-style diet will be included, as mentioned in the supportive literature. Participants were also required to complete the Rate-Your-Plate for Blood Cholesterol tool (Gans, Hixson, Eaton, & Lasater, 2000) and the Rapid Assessment of Physical Activity (RAPA) (University of Washington, 2006) evaluate their dietary and physical activity habits. Primary and secondary outcomes were measured at baseline and six months; the primary outcome being measured was a baseline and follow up lipid panel for LDL-C, and the secondary outcomes being measured are blood pressure, BMI, dietary habits,
and physical activity. Findings were then analyzed from the participant’s lab values and changes from dietary and physical activity recommendations.

**How the Best Practice Model Will Answer the Clinical Question**

This best practice model answered the clinical question by addressing the clinical problem of a cost-effective, time-efficient, patient-centered intervention to reduce hyperlipidemia in CAD adult patients. It is recommended in the guidelines that lifestyle changes should be a major focus to changing the status of cardiac risk, however, not all providers have extensive time to do this. If a patient-centered handout was developed to assist the patient toward making these changes, there might be clinical benefit of using it in long-term clinical practice. Therefore, this lifestyle modification program will include a brief counseling session and patient-centered handout. The counseling session will include the meaning and impact of cholesterol on cardiac health and then, dietary and physical activity recommendations will be reviewed in the table of contents of the handout.

**CHAPTER 3**

**IMPLEMENTATION OF PRACTICE CHANGE**

The implemented practice change occurred over six months and was a facilitated health behavior change. By promoting cardiovascular health for adult patients with coronary artery disease, a patient-guided resource, paired with face to face counseling, provided participants with basic yet vital information for improving health practices. The resource also included a patient-specific component at the end of each section to allow participants to reflect on their self-efficacy and status of behavior change. The overall goals of this EBP implementation is to lower secondary risk for nonfatal and fatal cardiac events for adult patients with coronary artery disease.
Participants and Setting

The participants for this EBP project were adult patients with an established coronary artery disease diagnosis. The implementation of this EBP project took place at a local cardiology outpatient practice affiliated with a not-for-profit with a diverse patient population. A manual review of the patients’ electronic health records, determined which patients met the inclusion criteria. Inclusion criteria included the following qualifications: adults ages eighteen and older, previously established CAD diagnosis, hyperlipidemia diagnosis, ability to perform physical activity, and access to a phone and internet resources. Participants were excluded from this study if they are children, under the age of eighteen, pregnant or breastfeeding, living with cognitive impairment or delays, unable to exercise, following strict diets, living with an eating disorder, and/or receiving dialysis treatment. Once patients met the inclusion criteria, either the nurse practitioner or the cardiologist verbally discussed the purpose of the project and eligibility with the patient for recruitment. If the patient was agreeable, then he or she met with the project manager to further discuss the project, sign the informed consent, and receive the lifestyle counseling portion of the intervention. Participants were recruited in September 2018, pre-intervention measurements taken at baseline and at six months.

Outcomes

The primary outcome of the project was the LDL-C (mg/dL) drawn from a fasting lipid panel. Secondary outcomes that were measured include blood pressure (mmHg), BMI (kg/m²), dietary habits, and physical activity assessment. Dietary habits were assessed by instructing the participant in how to fill out the patient-focused pre- and post- intervention tool. The RYP for Blood Cholesterol scores was based on dietary choices ranging from 23 to 69. Scores were tallied by patient’s selection of dietary choices. Ranges 23-38 indicate there were many ways to make healthier dietary choices, a score within the range of 39-54 mean there were a few ways to make healthier dietary choices, and a score of 55-69 verified healthy dietary choices are being made.
The RAPA tool is a quick assessment in which providers can quickly assess physical activity and has two categories, aerobic activity and strength and flexibility. A score of 1 refers a sedentary lifestyle, score of 2 is an under-active patient, score of 3 is being under-active to lightly active, scores 4 and 5 regularly exercises but is underactive, and scores of 6 and 7 are active. For strength and flexibility, participants who perform activities to increase muscle strength receive a score of 1, and if a participant does regular stretching and/or yoga activities, they receive a score of 2. A score of 3 is given if a participant both performs strength and stretching activities. Outcome data was compared to each other at baseline and 6 months post intervention. These outcomes were helpful to determine the indications to continue this practice.

**Intervention**

The intervention for this EBP project was a multifactorial strategy to promote lifestyle management in coronary artery disease patients with CAD. The intervention included measuring participant’s LDL-C, blood pressure, BMI, RYP for Blood Cholesterol Tool score (Appendix B), and RAPA (Appendix C) score significance at baseline and 6 months. Clinical significance was important to determine if this practice helped lower LDL-C levels and encouraged patients to maintain a heart healthy lifestyle. The intervention also included an individualized counseling session, following the guidelines set forth by the ACC/AHA. In this counseling session, the project manager and participant reviewed the benefits and risk of participation, expected follow-up, follow-up appointment, and review of baseline LDL-C, blood pressure, and BMI. Participants also completed the Rate-Your-Plate Tool for Blood Cholesterol (Gans et al., 2000) questionnaire for dietary habit assessment and the RAPA (Topolski et al., 2006) for physical activity pattern.

The participants then received a self-guided patient booklet that contains a health profile record, dietary and physical activity guidance, and stress management relief techniques, used with permission from the AHA and NIH. Participants were instructed to complete each section every week and complete the self-guided patient component. The self-guided component was intended to increase patient knowledge and self-efficacy to build lifelong learning and disease
management skills. A telephone call follow-up was initiated the first week post intervention, and monthly, thereafter. The telephone follow-up was intended to assess participant perspective on the current status of the intervention and remind patient to stay on track with the sections of the booklet. Participants were expected to obtain their follow-up LDL-C sample prior to their 6-month follow-up office appointments. The 6-month follow-up appointments involved meeting with the healthcare provider to review lab work and then meeting with the project manager to review completed portions of the patient booklet, answer any questions, and complete the Rate-Your-Plate Tool for Blood Cholesterol (Gans et al., 2000) for dietary assessment and the RAPA tool for the level of physical activity completed (Topolski et al., 2006). Data was updated as received by participants and analyzed after the 6-month follow-up.

**Planning**

This EBP project was a result of a clinical problem discovered during clinical rotations. The clinical problem was the observation of patient disconnect from their LDL-C levels and knowledge of a heart healthy lifestyle. A literature search was performed to determine a best practice strategy to improve the health of patients with CAD and hyperlipidemia. The Health Promotion model was used to guide best practice for a lifestyle modification intervention. Project site was selected based on the patient population and need for advanced practice nursing intervention. Permission was obtained from facilitators at the project site to conduct the project and collect data. Site facilitators were kept updated during this process.

Once IRB approval was received, patients were recruited based on the inclusion and exclusion criteria. The electronic medical records of patients with upcoming appoints during the recruitment period were reviewed. Site facilitators were notified ahead of time who qualified for the project, so they could verbally convey project details to the convenience sample of potential participants. Once the patient agrees to participate in the EBP project was initiated based on strategies listed as the intervention. The implementation involved all aspects of the clinical site including the health care providers and the office medical assistant, who obtained vital
measurements. Intervention was directly implemented by the project manager who will also perform follow-up telephone calls and the 6-month follow-up assessments.

**Data**

**Measures**

The data measured in this EBP project will be a LDL-C, blood pressure, BMI, dietary, and physical activity patterns. A 12-hour lipid panel was drawn. To ensure blood pressure, weight, and height is valid, project manager ensured medical assistant took patient measurements with the appropriate technique each time. Blood pressure were measured with the patient in the sitting position, legs uncrossed, feet planted on the floor, arm upward in pronation resting at chest level on a solid surface, and with the same blood pressure machine each time (standard technique). Height was measured with the device, and weight was taken on the same scale, zeroed for weight accuracy. The tools used to collect these measurements were the same during each collection for each participant.

Dietary and physical activity assessment tools were used to evaluate dietary patterns and physical activity levels. The dietary assessment tool utilized in this EBP project was the Rate-Your-Plate Tool for Blood Cholesterol (Gans et al., 2000). This tool was studied and shown to be both valid and reliable. Physical activity assessment was evaluated using the RAPA tool (Topolski et al., 2006). This tool is easily accessible for healthcare providers and patients and is a valid form of measuring physical activity in the clinical setting.

**Collection**

To collect data, participant privacy was a priority objective. Data was coded by using a random assignment of numbers. Data was collected by venous sampling for fasting lipid profile to read LDL-C levels. Anthropometric data was collected by office personnel and data typed into electronic record for project manager viewing and use. The Rate-Your-Plate Tool for Blood Cholesterol (Gans et al., 2000) and RAPA survey were collected by project manager in paper and pencil format that will contain the patient’s randomly assigned number on the upper right-
hand corner to correlate with patient identification that was followed throughout the duration of the project. During the duration of the project, data was recorded in a flowsheet and kept secure in a password protected computer. The data was inserted into a statistics software program (SPSS) for statistical analysis.

**Management and Analysis**

The management of patient data was in the form of paper and online data recording. Data collected from participants were kept on site unless needed for input analysis; data was inserted into the latest version of SPSS software to determine the significance of the intervention. Participant data was protected in a lockbox in which the project manager was the only one who has the code and key. Information was stored at project site in a locked filing system behind locked doors after hours unless needed for input into SPSS version 25 software or further analysis. The participant data was analyzed by collecting final results of participant LDL-C, blood pressure, and BMI. Pre- and post-intervention results will be compared using paired $t$-tests to determine clinical significance. Dietary scores results will be compared pre- and post-intervention using paired $t$-tests, as well. Physical activity assessment will be assessed using the scores from the RAPA tool (Topolski et al., 2006). Data will be analyzed by comparing pre- and post-intervention scores using paired $t$-test.

Descriptive statistics were used for demographic data collected during this EBP project. Chi-Square test will be used to analyze differences between groups. Demographics collected were gender, marital status, identifiable race/ethnicity, income, highest level of education medication use, and years diagnosed with CAD. This data was used to display differences among demographic groups.

**Protection of Human Subjects**

To protect participants from unethical behavior and unnecessary harm, IRB approval was obtained from both the educational and professional institutions where the project took
place. Prior to IRB approval, project manager was able to gain clinical site permission and a
documentation of approval for EBP project. This project contained a level of risk that is minimal
and provided full disclosure of project intent to IRB and future participants, falling under an
expedited review from both IRBs.

CHAPTER 4

FINDINGS

This evidence-based practice project focused on the reduction of lipid levels in adult
patients with CAD. These patients were counseled regarding lifestyle changes according to the
ACC/AHA guidelines. A lifestyle modification intervention was designed based on best practice
found in an extensive literature search. After completion of the implementation phase, the
findings were analyzed. The following analysis describes the demographics and outcomes of
the intervention.

Participants

The participants were recruited from September 2018 and were followed up in January
and February 2019 at a local northwest Indiana cardiology practice. A total of 14 patients
participated for the full six months. There was no attrition throughout the duration of the project.
The purpose of this project was to determine the impact of a patient-led lifestyle modification
intervention for adult patients with CAD.

The 14 participants were followed over a 6-month time period, after the initial counseling
session, with monthly phone call follow-ups to monitor for adherence to the lifestyle modification
intervention. Primary and secondary outcomes were measured pre-intervention and six months
post-intervention. There was no attrition; all fourteen participants completed the study as
instructed, possibly due to the close follow-ups and ease of contacting the project manager.

Characteristics
The participant demographic characteristics were gender, marital status, race/ethnicity, annual household income, highest level of education completed, taking a medication to lower cholesterol/lipids, years diagnosed with CAD, and range of ages. Based on the demographic data form completed by the participant, the information was placed into SPSS version 25 for frequency and mean analysis. Of the recruited participants (N = 14), 85.7% (n = 12) were male, and 78.6% (n = 11) were married (see Figure 4.1). The rest of the participants (n = 3) were either single (n = 1) or widowed (n = 2); no one selected divorced. In regards to race ethnicity, 92.9% (n = 13) of participants identified as white or Caucasian, and the remaining participant (n = 1) identified as black or African American. Household income was placed into range groups that varied from less than $50,000, $51,000 - $75,999, $76,000 - $100,999, $101,000 - $150,999, greater than $151,00, or preferred not to answer. Figure 4.2 depicts the ranges of household income. A cumulative 57.1% (n = 8) made either less than $50,999 (n = 4) or $51,000 - $75,999 (n = 4).

The highest level of education completed was high school diploma or equivalent, which consisted of 42.9% (n = 6) of participants. 21.4% (n = 3) had a technical or vocational degree, 14.3% (n = 2) had associate’s degrees, and 21.4% (n = 3) has a master’s degree. TAIl (n = 14) participants were prescribed statin-lowering pharmacological therapy. The length of CAD diagnosis was listed in year range groups; 71.4 % (n = 10) of the participants have been diagnosed for greater than 10 years. The other participants (n = 4) have been living with CAD for 5 – 10 years (n = 3) or less than 6 months (n = 1). The participants then selected their age range on the demographic questionnaire. Age ranges included 18 – 29 years, 30 – 40 years, 41- 50 years, 51- 60 years, 61 – 70 years, 71-80 years, 81- 90 years, and 91 years and older. Figure 4.3 displays the frequency of the age distribution; the majority, 42.9% (n = 6), of participants were between ages 61 – 70 years. Table 4.1 and 4.2 demonstrate the overall participant demographic characteristics and pre-intervention means for primary and secondary outcomes.
Figure 4.1

MARITAL STATUS

- Single
- Married
- Widowed
Figure 4.2

HOUSEHOLD INCOME

- Less than $50,999
- $51,000–$75,999
- $76,000–$100,999
- $101,000–$150,999
- Greater than $151,000
- Prefer not to answer
Figure 4.3

AGE RANGE

- 51–60 years
- 61–70 years
- 71–80 years
- 81–90 years
Table 4.1

*Participant Characteristics*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12 (85.7)</td>
</tr>
<tr>
<td>Female</td>
<td>2 (14.3)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>Married</td>
<td>11 (78.6)</td>
</tr>
<tr>
<td>Widowed</td>
<td>2 (14.3)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>13 (92.9)</td>
</tr>
<tr>
<td>Black</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td><strong>Annual household income</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; $50,999</td>
<td>4 (28.6)</td>
</tr>
<tr>
<td>$51,000 - 75,999</td>
<td>4 (28.6)</td>
</tr>
<tr>
<td>$76,000 – 100,999</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>$101,000- 150,999</td>
<td>2 (14.3)</td>
</tr>
<tr>
<td>$151,000 &gt;</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>2 (14.3)</td>
</tr>
<tr>
<td><strong>Highest level of education completed</strong></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>6 (42.9)</td>
</tr>
<tr>
<td>Technical/Vocational</td>
<td>3 (21.4)</td>
</tr>
</tbody>
</table>
| Associate’s degree              | 2 (14.3)  | (continued)
Table 4.1  
*Participant Characteristics* (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest level of education completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>6</td>
<td>(42.9)</td>
</tr>
<tr>
<td>Technical/Vocational</td>
<td>3</td>
<td>(21.4)</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>2</td>
<td>(14.3)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>3</td>
<td>(21.4)</td>
</tr>
<tr>
<td>Years with CAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6 months</td>
<td>1</td>
<td>(7.1)</td>
</tr>
<tr>
<td>5-10 years</td>
<td>3</td>
<td>(21.4)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>10</td>
<td>(71.4)</td>
</tr>
</tbody>
</table>
Table 4.2
*Primary and Secondary Outcomes*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre-Intervention $M (SD)$</th>
<th>Post-Intervention $M (SD)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL-C</td>
<td>67 (20.78)</td>
<td>62 (16.11)</td>
</tr>
<tr>
<td>BMI</td>
<td>33.33 (5.74)</td>
<td>29.74 (4.06)</td>
</tr>
<tr>
<td>BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>133 (15.21)</td>
<td>132 (22.21)</td>
</tr>
<tr>
<td>Diastolic</td>
<td>78 (9.50)</td>
<td>76 (8.75)</td>
</tr>
<tr>
<td>RAPA 1</td>
<td>4 (1.83)</td>
<td>5 (0.94)</td>
</tr>
<tr>
<td>RAPA 2</td>
<td>0.5 (1.09)</td>
<td>2 (0.92)</td>
</tr>
<tr>
<td>RYP for Blood Cholesterol</td>
<td>48 (6.8)</td>
<td>58 (4.58)</td>
</tr>
</tbody>
</table>
Changes in Outcomes

The primary outcome analyzed was the pre- and post-intervention LDL-C levels. Secondary outcomes examined were: BMI, BP, RYP for Blood Cholesterol scores, and RAPA scores. The data were analyzed to identify any relationship between the demographic characteristics on primary and secondary outcomes using a Chi Square with a statistical significance level of \( p < .05 \).

Statistical Testing

The statistical method used for identifying possible correlations on LDL-C levels, BP, BMI, dietary choices, and physical activity was the paired samples. For the pre- and post-intervention data, a paired-samples \( t \)-test was performed to analyze for clinical significance. Demographic characteristics were measured on either a nominal or ordinal level, based on the type of data collected. LDL-C was measured based on interval-level data, as well as the mean score for secondary outcomes, BMI, BP, RYP for Blood Cholesterol score, and RAPA score. Table 4.2 displays data for pre- and post-intervention outcomes. Figure 4.4 compare pre-intervention and post-intervention LDL-C levels, and Figure 4.5 and 4.6, respectively, compare pre-intervention and post-intervention RYP for Blood Cholesterol and RAPA scores.

Primary outcome

The primary outcome of this EBP project was a comparison of participant's LDL-C pre- and post-intervention, and a side by-side histogram (Figure 4.4) demonstrates the comparison between pre- and post-intervention information. The mean pre-intervention data was 67 mg/dL (\( SD = 20.78 \)), and the post-intervention mean was 62 mg (\( SD = 16.11 \)). The significance of the intervention was determined by running a paired \( t \)-test. The paired \( t \)-test revealed \( t (13) = .759, p < .05 \) 95% CI [-8.97, 18.68] and significance level of .461, which is not clinically significant (see Table 4.3).
Figure 4.4

PRE- AND POST-INTERVENTION LDL-C LEVELS

Pre-intervention LDL-C

Post-intervention LDL-C

Secondary outcomes
The secondary outcomes measured in this EBP project were BP, BMI, dietary habits, and amount of physical activity. The means for these secondary outcomes are listed above in Table 4.3. Results for significance were based on the collected post-intervention significance of the paired t-tests. SBP (t(13)= .056, p<.05 95% CI [-13.33, 14.05]) and DBP (t(13)= .886, p<.05 95% CI [-3.39, 8.11]) with clinical significance levels of .956 and .392, respectively, which is not considered to be clinically significant. For BMI, the results of the paired t-test were t(13)= 1.655, p<.05 95% CI [-1.00, 8.30] and significance level of .122 and is not clinically significant.

Dietary habits were measured by having participants fill out the RYP for Blood Cholesterol questionnaire. These scores were based on eating habits consistent with the ACC/AHA recommendations for heart healthy living. The pre-intervention mean score was 48 (SD = 6.8), and the post-intervention score was 58 (SD = 4.58), also displayed in Figure 4.5. After running a paired samples t-test, the results concluded t(13)= -4.237, p<.05 95% CI [-15.10, -4.90] with a significance level of .001, which is considered clinically significant. For physical activity, participants were asked to complete the RAPA questionnaire, which has two sections. The first part of the RAPA questionnaire contained amount and type of physical activity, and the second part contained questions regarding strength training and flexibility. The mean pre-intervention score for the first part was 4 (SD = 1.83) and a post-intervention mean was 5 (SD = 0.94). A paired samples t-test was conducted which resulted a t(13)= 2.421, p<.05 95% CI [-2.57, -1.15] and a significance level of .031, which is significant. The second part of the RAPA tool pre-intervention mean was 0.5 (SD = 1.09) and a post-intervention mean of 2 (SD = 0.92). A paired t-test was showed significance, t(13)= -4.583, p<.05 95% CI [-2.21, -.79] with a significance level of .001. Participant results were significant for dietary and physical activity habits.
Figure 4.5

DISTRIBUTION OF RYP FOR BLOOD CHOLESTEROL TOOL SCORES

Pre-Intervention RYP scores

Post-Intervention RYP scores
Figure 4.6

DISTRIBUTION OF RAPA 1 AND 2 SCORES

Pre-Intervention RAPA 1 Scores  Post-Intervention RAPA 2 Scores

Pre-Intervention RAPA 2 Scores  Post-Intervention RAPA 2 Scores
Significance

Table 4.3 contains the complete display of the significance of primary and secondary outcomes.
Table 4.3

*Paired-Samples t-test Comparison for Primary and Secondary Outcomes*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>M (SD)</th>
<th>N</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL</td>
<td>66.57(20.78)</td>
<td>14</td>
<td>13</td>
<td>.461</td>
<td>5.55</td>
</tr>
<tr>
<td></td>
<td>Pre 61.71(16.11)</td>
<td>Post</td>
<td>61.71(16.11)</td>
<td>.461</td>
<td>4.31</td>
</tr>
<tr>
<td>SBP</td>
<td>132(15.21)</td>
<td>14</td>
<td>13</td>
<td>.956</td>
<td>4.07</td>
</tr>
<tr>
<td></td>
<td>Pre 132(22.21)</td>
<td>Post</td>
<td>132(22.21)</td>
<td>.956</td>
<td>5.94</td>
</tr>
<tr>
<td>DBP</td>
<td>77(9.50)</td>
<td>14</td>
<td>13</td>
<td>.392</td>
<td>2.54</td>
</tr>
<tr>
<td></td>
<td>Pre 75(8.75)</td>
<td>Post</td>
<td>75(8.75)</td>
<td>.392</td>
<td>2.33</td>
</tr>
<tr>
<td>BMI</td>
<td>33.33(5.74)</td>
<td>14</td>
<td>13</td>
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<tr>
<td></td>
<td>Pre 29.74(4.06)</td>
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<tr>
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<td>RAPA1</td>
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<td>Post</td>
<td>2 (.92)</td>
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CHAPTER 5
DISCUSSION

The purpose of this EBP project focused on the effectiveness of a lifestyle modification intervention that aids in pharmacological therapy (if applicable) to improve cholesterol levels in adults with coronary heart disease. The primary outcome of lowering LDL-C levels by a targeted lifestyle modification counseling session has been shown to lower cardiovascular risk, thus reducing patient’s risk for a major cardiac event. Secondary outcomes included measuring effects on blood pressure, body mass index (BMI), and dietary and physical activity changes.

The results from the data were interpreted to explain and address the PICOT question and purpose of this EBP and relate findings to future implications in advanced nursing practice, theory, research, and education.

Explanation of Findings

Primary and Secondary Outcomes

The overall impact of the lifestyle intervention and counseling on LDL-C levels was insignificant \( (p=.461) \), as there was no significant difference in LDL-C pre- and post-intervention. This insignificant clinical finding may have been due to the fact that participants had a therapeutic LDL-C level prior to implementation and were prescribed a cholesterol-lowering medication before the course of the implementation period. However, therapeutic LDL-C levels were maintained throughout the duration and no cardiac events or deaths occurred. The majority of participants were between the ages of 61-70 (42.9%), all taking cholesterol lowering medications (100%), and were diagnosed with CAD and hyperlipidemia for ten years or more (71.4%). Inferences can be made that there is longevity with CAD and increased education exposure in correlation with medications, and interactions with health providers.
The secondary outcomes measured were SBP, DBP, BMI, dietary habits, and physical activity. SBP and DBP were not clinically significant in pre- and post- intervention blood pressure readings. \((p = .956, p = .392)\), which remained consistent and unchanged. Although there appeared to be a decrease in overall BMI means pre- and post- intervention, there was no significance for clinical implications in the reduction of BMI. RYP for Blood Cholesterol tool results showed significance. There was an improvement in dietary choice scores after six months \((M = 58, 4.58)\), suggesting lifestyle modification intervention impacted participants dietary choices. The RAPA tool, that assessed for physical activity levels, had a significant increase in the type and amount of both physical activity and strength and flexibility. The data did answer the PICOT question of lowering blood cholesterol in six months; it maintained levels, but pre-intervention levels were therapeutic. There was a reduction in risk factors associated with secondary cardiac events, as supported by the significance found in measuring secondary outcomes.

In the review of literature, the DASH diet or “heart healthy” diet lifestyles reported in Rees et al. (2013) which included a reduction of fat intake and healthy eating habits were consistent with the findings from this EBP project. Cole et al. (2011) systematic review, reported that an increase in physical activity would be observed post-lifestyle modification intervention. Self-efficacy and management of disease was mentioned in several studies and was one of the primary foci when developing this intervention. Participants cholesterol, blood pressure, and BMI remained stable, which reduces risk factors for secondary fatal cardiac events. Provider involvement with valid dietary and physical activity measurement tools improved participant self-management outside the clinical setting. There were no major deviations of LDL-C levels in this project. There were updates for blood cholesterol management guidelines in 2018. Overall, the results from this EBP project was consistent with the current literature search using key search terms.
Evaluation of Applicability of Theoretical and EBP Frameworks

Theoretical Framework

Pender’s Health Promotion model consists of four major interacting concepts which influence patient’s health promotion. Individual counseling sessions were implemented as part of the intervention to focus on patient dietary and physical activity preferences. Participants consented based on their desire to reach optimal cardiac health with the hope of improving current lifestyle choices for their future health. The APN role as leader, consultant, clinician, and educator were emphasized to improve access to care for patients, meeting healthcare and personal goals. Leader role was fulfilled through leading the EBP project, and researching and planning the intervention, and conducting counseling sessions and follow-up. Health was optimized by utilizing the best appraised literature to connect relationship between patient and APN. A behavioral intervention was created based on interacting participant’s current state of health with self-efficacy perception. Compliance and effectiveness was determined by maintenance or improvement in LDL-C measurements.

Environment impacts participant healthcare decisions based on culture, socioeconomics, preferences, and access. The context affects the overall schema of participants view of health and feelings regarding a self-led. During each counseling session, the concept of environment was discussed to promote interest and personal impact of a heart healthy lifestyle and access to preferences for resources, such as grocery store locations, restaurant menus, physical activities, recipes, online support, and smartphone applications. The APN role promotes overall national healthcare goals consistent with guidelines recommendations by implementing this type of intervention.
This health promotion theory was appropriate for this EBP project based on the incorporation of the nursing metaparadigm with the main goals of improving health outcomes and quality of life by decreasing the incidence of secondary cardiac death. Barriers to success were addressed early in the implementation phase to create a plan of action when participants discussed their vulnerabilities and lack of knowledge. A plan of action was prepared during the counseling sessions for grocery shopping and eating out. This concept incorporated Pender’s self-efficacy and health promotion initiation to overcome perceived barriers to action. Interpersonal influences played an important role in the implementation and evaluation phase due to the impact participant’s spouses, children, and friends. They encouraged health promotion for participants and held participants accountable for committing to the plan of action, as Pender suggested participants are more willing to follow through with the intervention with the influence of a support system.

Strengths of Pender’s Health Promotion model are the concepts and application of health promoting behavior within the nursing metaparadigm. The lifestyle modification program was created within the context of nursing. The theory supports the purpose of this EBP project to assist APNs with introducing and influencing health promoting behaviors based on literary evidence. Preparation for working with participants with little or no self-efficacy skills and understanding how to approach these patients with a treatment plan was guided by the Health Promotion model. The main objectives focused on goal-setting; the project was six months in duration in which small goals were implemented in the patient-guided booklet to meet the larger overall goal of lowering or maintaining a therapeutic LDL-C level and healthy lifestyle choices.

Weaknesses of Pender’s Health Promotion model include the efforts of individualizing treatment plans and how to guide patients of different cultural and socioeconomic backgrounds. The majority of participants in this project were white, older adult males. Also, the complexity of increasing participant access to resources and maintaining healthy lifestyles was difficult to individualize based on participant’s geographical location. Participants may grow weary or
complacent once they obtain a therapeutic LDL-C level and may not notice a difference in pre-
and post- intervention behaviors. Bias occurs when an APN has personal choices that differ
from participants and may lead to a barrier. The Health Promotion model is patient-focused. For
example, choosing to participate in certain types of diets, fitness programs, and social media
sites is a personal preference and APNs must recognize their own preferences may differ from
patient preferences. The intervention was individualized, and therefore, time consuming due to
the complexity of considering participant appointment times, journaling during personal time,
and discussing status on the telephone. Overall, the Health Promotion model is an appropriate
nursing theory for this health-promoting nursing intervention.

**EBP Framework**

Stetler’s model for Research Utilization help guided the EBP process. The five phases of
this model include preparation, validation, decision-making, translation, and evaluation. This
model was an adequate fit for this EBP project based on the clinical need for lifestyle
modification guidance and motivation, which is first-line treatment, according to the ACC/AHA
guidelines. The literature search validated the need and effectiveness of lifestyle and healthcare
support. Also, relaying the information to participants in a relatable format appealed to their level
of knowledge and understanding, considering environmental factors. Goals were set based on
participant response to best practice recommendations. A final evaluation collectively assessed
objective and subjective findings from data collection for future practice.

The strengths and limitations of this EBP model included incorporating all five stages
from research utilization as a result of the literature review to an EBP intervention. The plan of
action was as step-by-step process that needed constant decision-making and translating into
nursing implications. Limitations included the inability to apply every assumption to the
participant’s situation. This project was the initial application of this EBP model by the project
manager and appropriate use could be a limitation. Modifications were made to simplify the
process to ease into the application of EBP. Although there were no major modifications, they
involved taking a more subjective approach to relate the context of the material to achieve targeted outcomes. The translation of research was based on a review of the literature and implementing applicable interventions to patient population that included a validation of the problem, after synthesizing the appraised literature.

**Strengths and Limitations of the EBP Project**

The strengths and weaknesses of this EBP project include what the outcomes implied, such as medications are effective, and there is clinical significance for behavior changes toward a heart healthy lifestyle, as validated through the initial literature search. Clinical use is practical, increasing participant access to resources, cost-effective, and time efficient. This EBP project applied national recommended guidelines as part of the literary synthesis into a translatable intervention. The counseling portion took ten minutes to complete with the participant and included focusing on each participant’s current lifestyle and preferences. Telephone calls monitored participant progress and adherence to the lifestyle modification booklet. This booklet was reviewed at the six-month follow-up. Participant’s growth of knowledge was evident through verbalizing understanding of the material and applying the principles in their self-guided booklet. By applying principles learned through the self-guided booklet, participants can be self-efficacious. Participants had completed the intervention which is supported by the significance of the RYP for Blood Cholesterol tool and RAPA tool post-intervention scores. Overall, this EBP project is patient-focused and provide means for lifestyle improvements without spending an entire healthcare visit discussing lifestyle. This EBP project also supports self-learning and self-efficacy, based on the absence of attrition and completion of the self-guided booklet. Progress can be measured through validated tools and evidence-based research that utilize nursing theories and goals.

Weaknesses include: the overall sample size was small, which may influence the effect size and applicability in larger samples, the participant population lacked diversity, so it is unclear whether or not this intervention would be appropriate for various races/ethnicities,
socioeconomic, marital, and/or gender groups. Participants had therapeutic LDL-C levels prior to intervention, and there were no major changes in this post-intervention, so there was no clinical significance regarding the reduction of LDL-C levels. This lifestyle modification intervention may be more effective on patients who are at higher ASCVD risk and uncontrolled cholesterol levels. The paper booklet may also be burdensome to some patients. Application of this EBP project may vary in the future based on technological advances through smartphone and computer usage.

**Implications for the Future**

**Practice**

Implications for advanced nursing practice are for the role of the family nurse practitioner as clinician and consultant. By enforcing EBP and national guideline recommendations, conclusions can be made to tailor a patient-centered counseling session and intervention to improve clinical outcomes. The family nurse practitioner must consider the patient’s environmental context in which health is maintained to assist in locating resources and support. These environmental factors include patient’s culture, society, economics, and technology. The FNP should act as change agents to modify current lifestyles. These environmental factors impact patients in regard to their incomes, dietary budgets, physical limitations, access to resources, computer and internet familiarity. The family nurse practitioner is a leader in regard to change by initiating new ideas that are relevant in literature. Taking time to discuss patient’s environment and self-efficacy toward health maintenance fulfills organizational goals to reduce health disparities and costs of secondary cardiac events. These implications are applicable to all three levels of prevention.

The lifestyle modification program can be applied to primary, secondary, and tertiary levels of prevention for cardiac health. Primary prevention starts with preventing primary cardiac events and promoting healthy lifestyles starting in adolescence and young adulthood through education curriculums and well child visits. Secondary prevention occurs in patient follow-ups
involving both the family nurse practitioner and the patient. The family nurse practitioner’s role as clinician is to screen those with pertinent cardiac family history or ASCVD risk factors. Tertiary prevention was implemented through this EBP project for those who had an initial cardiac event and needed guidance to prevent a secondary cardiac event.

Theory

Pender’s Health Promotion model was an applicable nursing theory to assist the APN to promote cardiac health in patients with established CAD. There is also a self-care deficit in those patients who do not practice healthy lifestyles. Dorothy Orem’s Self-Care Deficit theory which assesses a patient’s ability to care for self, and when there is a self-care deficit or patients are “incapable of or limited in their ability to provide continuous effective care”, nurses need to intervene (George, 2011, p. 117). Her theory could also be applied to this EBP project. Orem explains five methods of helping that are relevant in health promoting interventions. They are acting and doing for another, guiding and directing, providing physical or psychological support, environmental support, and teaching. Educating patients must be relatable to their level of knowledge and comprehension. This EBP project focused on patients with established CAD, and the age group of the participant population consisted of mostly older adults, who preferred writing on paper over typing on a computer. The learning material was taken from professional literature, but created into a context that was understandable and relatable to the intended population. Guiding and directing patients should be based on setting mutual goals, such as reaching targeted LDL-C levels, making healthier dietary choices, and incorporating a physical activity into their day, even small ones. This guidance should be focused on moving the patient toward maintaining wellness on the healthcare continuum.

Furthermore, providing physical and psychological support was an essential component for the desired outcomes and purpose of this EBP project. Connection should be kept open between healthcare provider/project manager. This connection was achieved by reaching out to participants during the implementation and monitoring phases through telephone calls, online
LIFESTYLE MODIFICATION PROGRAM

support, and follow-up; resources from the AHA and NIH were also helpful to keep participants on track. Teaching was applied during the initial counseling session with teachback methods. Topics of discussion were the physiology of cholesterol, blood pressure, genetics, and weight to correlate how each affects the role of health in the body. Nursing intervention depends on patient preferences and response to their environment. Discharge or follow up to care happens when participants are able to make lifestyle choices that impact longevity and quality of cardiovascular health. Nursing actions should be based on patient response, to adapt and assist patient where they’re at on the health continuum and move them toward wellness and evidence-based research that utilize nursing theories and goals, which is essential for Orem’s theory.

Research

Although this project was evidence-based, there are gaps in the literature regarding further clinical investigation for adult patients with established CAD. New guidelines were published from the ACC/AHA during the implementation process regarding the management of blood cholesterol. With these new guidelines in place, further research should investigate the percentage of LDL-C reduction in patients who are at higher risk for developing CAD or experiencing a secondary cardiac event. A multidisciplinary, multifactorial intervention that utilizes telehealth or electronic technology, such as smart phone applications may be beneficial for those patients at risk for developing CAD or high ASCVD risk percentages. The use of electronic technology and resources may provide better accountability due to programming reminders and ease of downloading applications and typing into one central location to access a variety of resources. Future research should be developed on the use of a multidisciplinary team and relevant environmental resources to assist patients with healthier lifestyle choices on a primary prevention level.

Education

Education impacts both the advanced practice and professional nurse. The family nurse practitioner can further explore patient’s risk factors, current lifestyle choices, family history, and
available options to discuss with patients during annual wellness or follow-up visits. Family nurse practitioners are first line agents to advocate for lifestyle interventions at the organizational level. This process calls for the practitioner to be a lifelong learner by constantly reviewing newly released research and EBP and presenting the information to patients and obtaining feedback to present to organizational administration for implementation. For the professional nurse, the findings from this EBP project could be used to educate patients in the clinical setting- either in a practice office or acute care setting. The significant role EBP plays in the development of patient resources that promote cardiac care and how to access these resources through a hospital organization. The professional nurse can also address the immediate needs of the patient and modify the intervention based on the context of the patient’s environment and access to resources. With education playing a role in EBP, nursing educators can emphasize and teach the importance of professional nurses to educate patients and what impacts their healthcare decisions. As well as the APN, who is the patient’s biggest advocate and access to resources. Resources consist of providing local dieticians, lifestyle programs, fitness activities, grocery store selection, and restaurants, as well as online support and groups.

**Conclusion**

In conclusion, the lifestyle prevention of secondary cardiac events would not only decrease mortality worldwide, but also improve cardiac disparities and disease progression. This EBP project addressed the clinical problem by lowering or maintaining therapeutic LDL-C levels. The literary synthesize was supported by 16 pieces that emphasized a focus on altering lifestyles; these literary pieces included systematic reviews, randomized control trials, literature reviews, and clinical guidelines. Melynk and Fineout-Overholt (2015) was used to evaluate the hierarchy of evidence, and the Johns Hopkins Nursing Research/Non-Research Evidence Appraisal tool (2014) was used to appraise the evidence with guidance of the Stetler model for EBP process and Nola Pender’s Health Promotion model. The overall best practice recommendation was a multifactorial lifestyle modification program. An intervention was created
from the literature which included counseling, education, LDL-C levels, BP, and BMI monitoring, and dietary and physical activity assessment over six months. The clinical question was answered and compelling findings included the significance of behavioral changes associated with advocating and educating patients on a heart healthy lifestyle. Self-efficacy was apparent through all the participants who completed the intervention. It was apparent through compliance of completing the self-guided booklet, maintaining therapeutic LDL-C levels, and improvement in dietary and physical activity scores. These inferences can be used as support for future implications for nursing practice changes in the clinical setting, theory development, further research, and education. This intervention can be used in clinical practice to prevent the incidence of secondary and possibly primary cardiac events, reducing overall mortality of one of the most fatal diseases.
REFERENCES


Fong, E. (2016, July 31). *Cardiovascular Diseases (Primary and Secondary Prevention): Dietary Approaches to Stop Hypertension (DASH)-Style Diet.* Retrieved from Joanna Briggs Institute database. (Accession No. JBI11546)


Amanda M. Yarbrough graduated from Valparaiso University’s accelerated baccalaureate nursing program in 2010 with her Bachelor of Science in Nursing. Prior to attending Valparaiso University, she studied business at Loyola University Chicago. Amanda is currently practicing on a telemetry unit at St. Mary Medical Center in Hobart, Indiana. She serves as a charge nurse and nurse preceptor for new employees. She is also an undergraduate nursing clinical instructor for the Valparaiso University School of Nursing and Healthcare Professions. Scholarly interests include preventative healthcare and wellness promotion with a holistic, patient-centered approach to family practice. Amanda is also interested in nursing education and pursuing a CNE certification. Her doctoral project was presented at the 2018 Northwest Indiana Nursing Research Consortium and will be presented at the annual CAPNI conference March 2019. She is planning to submit her doctoral project manuscript for publication in the Journal of Cardiovascular Nursing. She has been a member of Sigma Theta Tau International since 2016. In the future, she will practice in the family practice setting and establish a holistic health center for prevention and wellness.
ACRONYM LIST

ACC: American College of Cardiology
ACC/AHA: American College of Cardiology/American Heart Association
AHA: American Heart Association
AHA/ASA: American Heart Association/American Stroke Association
ASCVD: Atherosclerotic Cardiovascular Disease
BMI: Body Mass Index
CAD: Coronary Artery Disease
CDC: Centers for Disease Control and Prevention
DNP: Doctor of Nursing Practice
EBP: Evidence-based Practice
NIH: National Institute of Health
RAPA: Rapid Assessment of Physical Activity
RYP: Rate-Your-Plate
SPSS: Statistical Package for the Social Sciences
WHO: World Health Organization
## Synthesis of Evidence

<table>
<thead>
<tr>
<th>Citation (APA)</th>
<th>Purpose</th>
<th>Design</th>
<th>Sample</th>
<th>Measurement/Outcomes</th>
<th>Results/Findings</th>
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<tbody>
<tr>
<td>Al Mheid et al. (2016)</td>
<td>Health-partner administered lifestyle intervention on CV risk profile</td>
<td>Prospective cohort study</td>
<td>n = 711 University employees</td>
<td>Physical measurements: vital signs,</td>
<td>Decrease in SBP and DBP at 6 months (-3.6 mmHg and -2.2 mmHg, <em>p</em>&lt;0.0001) Improvement in LDL-C (<em>p</em>&lt;0.001) Physical activity increased by 6% at 6 months (<em>P</em>=0.04) Dietary changes improved, scores increased by 0.46 with baseline poor diet scores at 6 months (<em>P</em>&lt;0.001)</td>
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<td></td>
<td></td>
<td>Intervention: counseling given by a health-partner on healthier lifestyles on CV risk factors (AHA Life’s Simple 7)</td>
<td>Duration: over 2 years-baseline, 6-months, 1-year, and 2-years</td>
<td>height/weight, and waist hip ratio Lipid panel Metabolic panel</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Participants given questionnaires regarding diet and physical activity</td>
<td>n = 10,799 Adults ages 18 years or older</td>
<td>Primary outcomes: All-cause mortality, cardiac mortality, nonfatal cardiac events,</td>
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<td>Cole, Smith, Heart, &amp; Cupples (2011)</td>
<td>&quot;to determine the effectiveness of lifestyle interventions for the secondary&quot;</td>
<td>Systematic review of 21 RCTs; meta-analysis with 95% CI</td>
<td>n = 10,799 Adults ages 18 years or older</td>
<td>Diet: 39 out of 51 outcomes were significant in dietary improvement to include improvement for intake of fiber, fat, sugar, and cholesterol</td>
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<tr>
<td>Study</td>
<td>Setting</td>
<td>Interventions</td>
<td>Duration</td>
<td>Outcomes</td>
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<tr>
<td>Cole et al., 2011</td>
<td>Outpatient clinical setting or home-based interventions</td>
<td>Dietary, exercise, psychological, educational, multifactorial, organizational</td>
<td>3 months to 5 years with follow-up every 3 months</td>
<td>Hospital admissions, Secondary outcomes: Diet, exercise, blood pressure, blood lipid levels, health related quality of life, self-efficacy, and medication adherence</td>
<td>Physical Activity: 20 studies showed significant improvements in workload, Blood pressure: 5 out of 13 studies reported benefits at 3 months and 12 months, LDL-C: 5 studies reported significant improvements, Self-efficacy: reported in 1 study, significant improvement in self-management at 6-month follow-up</td>
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<td>de Waure et al., 2013</td>
<td>Telephone-based, outpatient setting, or home</td>
<td>Multifactorial lifestyle components</td>
<td>n = 6,657, Patients with established CHD</td>
<td>Primary outcomes: fatal and nonfatal CV events (MI, revascularization, and death), Secondary outcomes: overall mortality and hospital readmissions</td>
<td>Multifactorial lifestyle interventions should be considered in secondary prevention programs, Reduced fatal CV events with estimated RR 18%: (RR= 0.82, 95% CI = 0.69, p = 0.003), Reduced overall mortality: RR 0.94, 95% CI = 0.83, 1.06; p = 0.32, Improvement in risk factors for home-based interventions: Decrease in SBP WMD (-4.36 mmHg, 95% CI = -6.50, -2.22)</td>
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<td>Drakopoulou et al. (2016)</td>
<td>Managing lipid profile of coronary heart disease patients</td>
<td>“summary of current recommendations for lipid profile management in patient with CHD, with view to present lifestyle modification and novel treatment strategies indicating also the areas of dispute between recent guidelines” (Drakopoulou Expert opinion on the guidelines established by the ACC/AHA and European Society)</td>
<td>Lifestyle and treatment therapies for patients with coronary heart disease</td>
<td>Focus on lipid levels, blood pressure, European Society recommends adding behavioral and psychosocial risk factors, smoking cessation, and body weight control</td>
<td>Increase vegetable, fiber, whole grains, low-fat dairy, poultry, legumes, fish, and nuts for dietary improvements Stress the importance of daily exercise (reduces LDL-C by 3-6 mg/dL when performed for 24 weeks in duration, greater than 3 days per week for 40 minutes) Obtain secondary lipid panel at 4-12 weeks after initiation of statin therapy or change in therapy to further determine patient’s adherence (then perform every 3-12 months) No emphasized LDL-C target goals</td>
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<td>Eckel et al. (2014) 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk</td>
<td>Expert Work Group with 16 members (expert panel) Guideline developed that includes data from RCTs, observational studies, systematic reviews with meta-analysis</td>
<td>For patients who are at risk or have CVD</td>
<td>Effects on total cholesterol, LDL-C, blood pressure, levels of aerobic activity, and dietary habits Emphasized focus on low fat dietary patterns (decrease in fats- as a macronutrient, i.e. DASH diet, Mediterranean diet) Dose dependent inverse relationship between levels of physical activity and rates of CVD and beneficial effects on lipids, cholesterol, and blood pressure 10 Lifestyle recommendations (p. 2968- 2970)</td>
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<td>Hooper, Martin, Abdelhamid, &amp; Smith (2015) Reduction in saturated fat intake</td>
<td>Systematic review; meta-analysis with RR for dichotomous data and MD for continuous data 15 RCTS n = 759,000 Adults with or at risk for CVD</td>
<td>Primary outcomes: All-cause mortality, CVD mortality, CVD events</td>
<td>No clear effects on all cause or CVD mortality 13% reduction in CHD events (RR 0.87, 95% CI 0.74 to 1.03)</td>
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<tr>
<td>Study</td>
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<td>Secondary Outcomes</td>
<td>Findings</td>
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<td>[81]</td>
<td>Intervention: modified fat diets compared with usual diets</td>
<td>Duration: at least 2 years</td>
<td>Secondary outcomes: Fatal and non-fatal cardiac events, blood lipids, cancer, blood pressure, BMI, body weight, and quality of life</td>
<td>LDL-C sig. reduction (MD -0.19 mmol/L, 95% CI -0.33 to -0.05)</td>
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<td>Kotseva et al. (2016)</td>
<td>Cross-sectional study</td>
<td>n = 16,426 patients reviewed</td>
<td>Knowledge of weight (93.4%) and blood pressure (86.7%)</td>
<td>Physical activity increased by followed advice from a health professional (23.5%), attended a gym or exercise program (52.8%)</td>
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<td>References</td>
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<td>Cardiac rehab attendance</td>
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<td>Noe, Dosa, Ranky, &amp; Pavlik (2014)</td>
<td>Cardiopulmonary results of an individually controlled complex prevention</td>
<td>Acta Physiologica Hungarica</td>
<td>“To study the effect of a six-month regular training program of two different intensities on patients with previously existing risk factors (Noe et al., 2014, p. 2)</td>
<td>n = 75 patients with risk factors</td>
<td>Blood pressure</td>
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<td>C n = 25</td>
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<td>Rees et al. (2013)</td>
<td>Dietary advice for reducing cardiovascular risk (review)</td>
<td></td>
<td>Systematic review of 44 RCTs; meta-analysis with 95% CI</td>
<td>n = 18,175 Healthy adults with cardiovascular risk factors</td>
<td>Primary outcomes: CV risk factors, blood pressure, lipids, and biomarkers of dietary intake</td>
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<tr>
<td><strong>Cochrane Database of Systematic Reviews</strong></td>
<td>establish relevance in clinical practice</td>
<td>Setting: Clinical healthcare</td>
<td>Interventions: verbal or written advice delivered in person</td>
<td>Duration: 3 months to 12 months</td>
<td>Secondary outcomes: self-reported dietary intake</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Rippe &amp; Angelopoulous (2014)</td>
<td>Summarize recent literature review to how specific lifestyles strategies may be employed to lower risk of CV disease</td>
<td>Literature review on the AHA Strategic Plan for 2020</td>
<td>Patients who have or at risk for CVDs</td>
<td>Discuss BMI (weight), amount of physical activity per week, blood pressure, dietary type/patterns, and smoking habits</td>
<td>Overall, counseling patients that lifestyle changes can produce modest to sustained weight loss and achieve meaningful health benefits, thus reducing CV risk</td>
</tr>
</tbody>
</table>

**Current Atherosclerotic Report**
<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>n</th>
<th>Incidence of CVDs, CHD, or stroke</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salehi-Abargouei et al. (2013)</td>
<td>Imitating DASH style diet</td>
<td>260,011 adults with or at risk for CVD</td>
<td>CHD, stroke</td>
<td>V, B</td>
</tr>
<tr>
<td>Stone et al. (2014)</td>
<td>“define practices that meet the needs of patients in most circumstance s . . .” (Stone et al., 2014, p. 2891)</td>
<td>Expert panel (16 members) NHLBI systematic evidence review which consists of RCTs, systematic reviews with meta-analysis of RCTs</td>
<td>Intended for the treatment of adults ages 21 years or older to complement the NHLBI CV health risk-reduction guidelines</td>
<td>Blood cholesterol panel</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2013 ACC/AHA guidelines on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal of the American College of Cardiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stuart et al. (2013)</td>
<td>“. . . evaluate a primary prevention care model using telephone support” (Stuart et al., 2013, p. 641)</td>
<td>RCT pilot trial Intervention: handbook with dietary meal plans, recipes, and physical activity plans and telephone based coaching sessions</td>
<td>Intervention (CLIP) n = 26 Control n = 23 Duration: 12 weeks</td>
<td>LDL-C Waist circumference Blood pressure Physical activity Motivation</td>
</tr>
<tr>
<td>A telephone-supported cardiovascular lifestyle programme (CLIP) for lipid reduction and weight loss in general practice patients: A randomised controlled pilot trial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**LIFESTYLE MODIFICATION PROGRAM**

CLIP participants experienced weight loss but not significant, no significant treatment effect on waist circumference; however, positive correlation between weight loss and LDL-C ($r = 0.560$, $n = 26$, $P = 0.003$)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Examine evidence of interdisciplinary interventions on lifestyle disease risk factors including weight, lipid level, glycemic control, and blood pressure to summarize the characteristic features of successful interventions” (Tapsell &amp; Neale, 2016, p. 272)</td>
<td>Systematic review; meta-synthesis</td>
<td>n = 15,890 adults with chronic disease</td>
</tr>
<tr>
<td>16 studies RCTs= 7 Pseudorandomized(not truly)= 3 Pre &amp;Post test results without comparisons to a control group</td>
<td>Weight Lipid levels Hemoglobin A1c Blood pressure</td>
<td>1 of 6 studies found greater improvements in blood lipids</td>
</tr>
<tr>
<td>Characteristic features of successful interventions</td>
<td>Greater effects seen where there was a greater amount of contact between health professionals and participants</td>
<td>5 studies found reductions in blood pressure</td>
</tr>
<tr>
<td>The addition of exercise and/or behavior modifications to dietary advice resulted in significant reductions in body weight and improvements in blood pressure</td>
<td>Weekly contact produced positive outcomes- ongoing</td>
<td>V, C</td>
</tr>
</tbody>
</table>
van den Wijngaart, Sieben, van der Vlugt, de Leeuw, & Bredie (2015)

A nurse-led multidisciplinary intervention to improve cardiovascular disease profile of patients

*Western Journal of Nursing Research*

<table>
<thead>
<tr>
<th>“... evaluate the magnitude of change in various modifiable cardiovascular risk factors, such as body mass index, waist, blood pressure, lipid levels, and lifestyle parameters, during short- and long-term follow-up” (van den Wijngaart, 2015, p. 707)</th>
<th>Quasi-experimental - one treatment group</th>
<th>n = 176 Patients with CVD</th>
<th>Baseline characteristics: age, gender, BP, BMI, LDL-C, waist circumference, smoking habits, alcohol usage, and eating habits</th>
<th>Significant reduction in SBP (138.3 ± 20.7 mmHg to 128.7 ± 17.7 mmHg; <em>p</em> &lt; 0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention: Evaluation of risk profile and individualized treatment plan was implemented, including both pharmacological and lifestyle behavior change</td>
<td>Setting: outpatient clinical setting</td>
<td>Duration: 3 - 15 months; LDL-C, BMI, and BP were monitored at 3 and 6 months</td>
<td>Differences measured by univariate ANOVA</td>
<td>Significant reduction in LDL-C (2.55 ± 0.87 mmol/L to 2.16 ± 0.73 mmol/L; <em>p</em> &lt; 0.01)</td>
</tr>
<tr>
<td>BMI increased from 26.6 ± 4.5 to 27.5 ± 4.8 kg/m²</td>
<td>Effect of intervention measured by paired <em>t</em>-test or chi-squared</td>
<td></td>
<td>Less patients became physical activity toward end of study</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Rate-Your-Plate for Blood Cholesterol (RYP) tool

❤ RATE YOUR PLATE ❤

Think about the way you usually eat. For each food topic, put a check mark in column A, B, or C.

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RED MEAT* beef, hamburger, pork, lamb, veal</td>
<td>☐ Usually eat: three times a week or more</td>
<td>☐ Usually eat: twice a week</td>
<td>☐ Usually eat: once a week or less</td>
</tr>
<tr>
<td>2. RED MEAT CHOICES* beef, pork, lamb, veal</td>
<td>☐ Usually eat: high-fat cuts, such as ribs, brisket, T-bone steak, prime rib, sausage</td>
<td>☐ Sometimes eat: high-fat cuts, such as ribs, brisket, T-bone steak, prime rib, sausage</td>
<td>☐ Usually eat: lean beef cuts such as round, loin, flank; lean pork and lamb cuts such as loin and leg; and veal Or, I rarely eat meat</td>
</tr>
<tr>
<td>3. GROUND MEAT, BURGERS*</td>
<td>☐ Usually eat: regular, chuck or lean ground beef with more than 15% fat</td>
<td>☐ Usually eat: ground sirloin, round, ground turkey, or ground beef with 10-15% fat.</td>
<td>☐ Usually eat: ground turkey breast or vegetable patties like Boca™ or Garden burgers™ Or, I rarely eat ground meat or burgers</td>
</tr>
<tr>
<td>4. CHICKEN, TURKEY, ETC.*</td>
<td>☐ Usually eat: chicken, turkey, and other poultry with skin</td>
<td>☐ Sometimes eat: chicken, turkey, and other poultry with skin</td>
<td>☐ Usually eat: chicken, turkey, and other poultry without skin</td>
</tr>
<tr>
<td>5. FISH*</td>
<td>☐ Usually eat: fish less than once a week</td>
<td>☐ Usually eat: fish once a week</td>
<td>☐ Usually eat: fish twice a week or more</td>
</tr>
<tr>
<td>6. CHICKEN AND FISH CHOICES*</td>
<td>☐ Usually eat: fried chicken and/or fried fish and shellfish</td>
<td>☐ Sometimes eat: fried chicken and/or fried fish and shellfish</td>
<td>☐ Usually eat: chicken and fish that is baked, broiled, grilled, poached, roasted, etc.</td>
</tr>
<tr>
<td>7. COLD CUTS, HOT DOGS, BREAKFAST MEATS*</td>
<td>☐ Usually/often eat: salami, bologna, other cold cuts, hot dogs, bacon, breakfast sausage</td>
<td>☐ Sometimes eat: salami, bologna, other cold cuts, hot dogs, bacon, breakfast sausage</td>
<td>☐ Usually eat: roast beef, turkey breast, ham, or low-fat cold cuts, low-fat hot dogs, low-fat bacon/sausage Or, I rarely eat processed meats</td>
</tr>
<tr>
<td>8. SERVING SIZES OF MEATS (COOKED)*</td>
<td>☐ Usually eat: large portions (7 oz. or more)</td>
<td>☐ Usually eat: medium portions (4-6 oz.)</td>
<td>☐ Usually eat: small portions (3 oz. or less)</td>
</tr>
<tr>
<td>9. MEATLESS MAIN DISHES like all-bean chili, bean burrito, lentil soup, meatless spaghetti sauce</td>
<td>☐ Rarely eat: meatless main dishes</td>
<td>☐ Usually eat: meatless main dishes once a week</td>
<td>☐ Usually eat: meatless main dishes twice a week or more</td>
</tr>
<tr>
<td>10. EATING OUT in restaurants or getting take-out food</td>
<td>☐ Usually eat out or get take-out food twice a week or more</td>
<td>☐ Usually eat out or get take-out food once a week</td>
<td>☐ Usually eat out or get take-out food less than once a week OR Usually eat low-fat restaurant meals</td>
</tr>
<tr>
<td>11. EGG YOLKS*</td>
<td>☐ Usually eat: 6 or more egg yolks a week</td>
<td>☐ Usually eat: 4-5 egg yolks a week</td>
<td>☐ Usually eat: 3 egg yolks or less a week Or, I usually eat cholesterol-free egg substitutes</td>
</tr>
<tr>
<td>12. MILK*</td>
<td>☐ Usually eat: whole milk or cream</td>
<td>☐ Usually eat: 2% reduced-fat milk</td>
<td>☐ Usually eat: 1% low-fat or skim milk</td>
</tr>
</tbody>
</table>

*If you are a vegan or vegetarian and do not eat this food, choose choice "C."
### Appendix B (continued)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **13. CHEESE**  
*Include cheese on pizza, sandwiches, snacks & in mixed dishes* |   |   |
|   | **Usually eat:** regular cheese, such as cheddar, Swiss, and American | **Sometimes eat:** regular cheese, such as cheddar, Swiss, and American | **Usually eat:** reduced-fat or part-skim cheese  
Or, I rarely eat cheese |
| **14. FROZEN DESSERTS**  
*Ice cream, etc.* |   |   |
|   | **Usually eat:** regular ice cream, ice cream bars/sandwiches | **Sometimes eat:** regular ice cream, ice cream bars/sandwiches | **Usually eat:** sherbet, sorbet, low-fat frozen yogurt or ice cream  
Or, I rarely eat frozen desserts |
| **15. COOKING METHOD** |   |   |
|   | **Usually add:** oil, butter, or margarine to the pan | **Sometimes add:** oil, butter, or margarine to the pan | **Usually:** broil, bake, or steam without fats or oils or use cooking sprays (Pam®) |
| **16. COOKING FATS & OILS**  
*Choices for cooking and baking* |   |   |
|   | **Usually use:** butter, bacon drippings, stick margarine and/or lard for cooking or baking | **Usually use:** liquid or tub margarine, or shortening (i.e. Crisco™) for cooking or baking | **Usually use:** oils such as olive, corn, and Canola for cooking  
Or, cook without fats/oils |
| **17. FRIED FOODS**  
*Like French fries, egg rolls, etc.* |   |   |
|   | **Often eat:** fried foods | **Sometimes eat:** fried foods | **Rarely eat:** fried foods |
| **18. SPREADS**  
*Added at the table* |   |   |
|   | **Usually put:** butter or stick margarine on breads, potatoes, vegetables, etc. | **Usually put:** liquid or regular tub margarine on breads, potatoes, vegetables, etc. | **Usually put:** “light” tub margarine on breads, potatoes, vegetables  
Or, I eat them plain |
| **19. SALAD DRESSING & MAYONNAISE** |   |   |
|   | **Usually use:** regular salad dressing or mayonnaise | **Sometimes use:** regular salad dressing or mayonnaise | **Usually use:** light or fat-free salad dressing and mayonnaise  
Or, I eat them plain |
| **20. SNACKS** |   |   |
|   | **Usually/often eat:** regular chips, crackers, and nuts | **Sometimes eat:** regular chips, crackers, and nuts | **Usually eat:** fruit, pretzels, low-fat crackers and baked chips |
| **21. DESSERTS & SWEETS** |   |   |
|   | **Usually/often eat:** donuts, cookies, cake, pie, pastry or chocolate | **Sometimes eat:** donuts, cookies, cake, pie, pastry, or chocolate | **Usually eat:** fruit, angel food cake, low-fat or fat-free desserts and sweets |
| **22. GRAINS**  
*breads, cereal, rice, pasta* |   |   |
|   | **Usually eat:** white breads; white rice; low fiber cereals like corn flakes, Rice Krispies™, etc. | **Sometimes eat:** white breads; white rice; low fiber cereals like corn flakes, Rice Krispies™, etc. | **Usually eat:** whole grain breads; brown rice; whole grain cereals like oatmeal, bran cereals, Wheaties™, etc. |
| **23. FRUITS & VEGETABLES**  
*(1 serving = 1/2 cup or 1 piece of fruit)* |   |   |
|   | **Usually eat:** 1 serving or less a day | **Usually eat:** 2-4 servings a day | **Usually eat:** 5 or more servings a day |

*If you are a vegan or vegetarian and do not eat this food, choose choice “C”.*

**FIND YOUR RATE YOUR PLATE SCORE:**

Total checks in column A = [Number]  
[Number] x 1 = [Number]

Total checks in column B = [Number]  
[Number] x 2 = [Number]

Total checks in column C = [Number]  
[Number] x 3 = [Number]

TOTAL = [Number]
Appendix B (Continued)

WHAT DOES YOUR SCORE MEAN?

If your score is:
23-38 There are many ways you can make your eating habits healthier.
39-54 There are some ways you can make your eating habits healthier.
55-69 You are making many healthy choices.

WHAT'S NEXT?

Look back at your Rate Your Plate. Do you have any answers in Column C? If you do, great! You are already making some heart healthy choices.

Can you improve? Look at your answers in Columns A and B. Where you checked Column A, can you start eating more like Column B? Over time, move toward Column C.

Set goals. Write down eating changes you are ready to make now.

Goal 1: ____________________________
Goal 2: ____________________________
Goal 3: ____________________________

Begin today. Make changes a little at a time. Let your new way of eating become a healthy habit.

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Appendix C

Rapid Assessment of Physical Activity (RAPA) tool

How Physically Active Are You?

An assessment of level and intensity of physical activity

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Do not reproduce without permission, which may be obtained via the Web site:
[http://depts.washington.edu/hprc/rapa](http://depts.washington.edu/hprc/rapa)
Rapid Assessment of Physical Activity

**Physical Activities** are activities where you move and increase your heart rate above its resting rate, whether you do them for pleasure, work, or transportation.

The following questions ask about the amount and intensity of physical activity you usually do. The intensity of the activity is related to the amount of energy you use to do these activities.

**Examples of physical activity intensity levels:**

<table>
<thead>
<tr>
<th>Light activities</th>
<th>Walking Leisurely</th>
<th>Stretching</th>
<th>Vacuuming or Light Yard Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>• your heart beats slightly faster than normal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• you can talk and sing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moderate activities</th>
<th>Fast Walking</th>
<th>Aerobics Class</th>
<th>Strength Training</th>
<th>Swimming Gently</th>
</tr>
</thead>
<tbody>
<tr>
<td>• your heart beats faster than normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• you can talk but not sing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vigorous activities</th>
<th>Stair Machine</th>
<th>Jogging or Running</th>
<th>Tennis, Racquetball, Pickleball or Badminton</th>
</tr>
</thead>
<tbody>
<tr>
<td>• your heart rate increases a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• you can’t talk or your talking is broken up by large breaths</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### How physically active are you? (Check one answer on each line)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Does this accurately describe you?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I rarely or never do any physical activities.</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>I do some <strong>light</strong> or <strong>moderate</strong> physical activities, but not every week.</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>I do some <strong>light</strong> physical activity every week.</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>I do <strong>moderate</strong> physical activities every week, but less than 30 minutes a day or 5 days a week.</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>I do <strong>vigorous</strong> physical activities every week, but less than 20 minutes a day or 3 days a week.</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>I do 30 minutes or more a day of <strong>moderate</strong> physical activities, 5 or more days a week.</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>I do 20 minutes or more a day of <strong>vigorous</strong> physical activities, 3 or more days a week.</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>I do activities to increase muscle <strong>strength</strong>, such as lifting weights or calisthenics, once a week or more.</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>I do activities to improve <strong>flexibility</strong>, such as stretching or yoga, once a week or more.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

ID # ____________________________
Today’s Date ____________________________
Scoring Instructions

RAPA 1: Aerobic

To score, choose the question with the highest score with an affirmative response. Any number less than 6 is suboptimal.

For scoring or summarizing categorically:

Score as sedentary:

1. I rarely or never do any physical activities.

Score as under-active:

2. I do some light or moderate physical activities, but not every week.

Score as under-active regular – light activities:

3. I do some light physical activity every week.

Score as under-active regular:

4. I do moderate physical activities every week, but less than 30 minutes a day or 5 days a week.

5. I do vigorous physical activities every week, but less than 20 minutes a day or 3 days a week.

Score as active:

6. I do 30 minutes or more a day of moderate physical activities, 5 or more days a week.

7. I do 20 minutes or more a day of vigorous physical activities, 3 or more days a week.

RAPA 2: Strength & Flexibility

I do activities to increase muscle strength, such as lifting weights or calisthenics, once a week or more. (1)

I do activities to improve flexibility, such as stretching or yoga, once a week or more. (2)

Both. (3)

None (0)