

The Impact of Mediterranean Diet on Adult Obesity: A Quality Improvement

Deste D. Baptiste

University of Missouri-Kansas City

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Abstract

The purpose of this evidence-based project proposal was to determine if Mediterranean dietary counseling in adult obesity could improve body mass index and waist circumference in a primary care clinic. Obesity is a common health condition influenced by genetic and environmental factors. Adults with obesity have a higher risk for developing severe medical, psychosocial, and financial problems. A quasi-experimental, pilot, single cohort design with pre- and post-measures were used to evaluate the impact of the Mediterranean dietary counseling on obesity. Fourteen patients were recruited through convenience sampling at a primary care setting. Baseline body mass index and waist circumference were obtained pre and post nine weeks. The dietary counseling included the Mediterranean food pyramid, self-monitoring of accurate weight and waist circumference and calculation of body mass index. Follow up phone calls were conducted during the nine-week intervention. The results showed that Mediterranean dietary counseling lowered body mass index and waist circumference over a period of nine weeks. These findings support Mediterranean dietary counseling and impact on improved body mass index and waist circumference. In healthcare, Mediterranean dietary counseling may be used to manage obesity in the primary care setting.

Keywords: obesity, Mediterranean dietary counseling, lowered BMI, waist circumference.

The Impact of Mediterranean Diet on Adult Obesity

The implementation of Mediterranean dietary interventions to reduce the prevalence of obesity and its associated health complications has begun since the early 1960s (Lichtenstein, Appel & Brands, 2016). The Mediterranean diet consists of vegetables, fruits, small servings of unsaturated fats, poultry, fish, nuts, legumes, whole grains, olive oil, and moderate intake of red wine (Lichtenstein, Appel & Brands, 2016). The Mediterranean dietary patterns had tremendous influences on significant chronic health conditions associated with obesity (Ahmed, Delgado, & Saxena, 2016). Hence, emphasizing the importance of the Mediterranean dietary pattern to improve health outcomes was far more critical than stressing the devastating effects of obesity and health risk factors (Schroeder, 2017). Validated evidence showed that obesity is a serious public health concern with the potential to fracture health expenditures globally and locally (Schroeder, 2017).

Locally, Missouri and Kansas have seen a constant increase of obesity cases, making both Missouri and Kansas among the top twenty states with the highest reported cases of obesity leading to increased morbidity and mortality in both states (Hossain, Kaware & El Nahas, 2017). Therefore, improving the health outcome of individuals living with obesity through simple noninvasive interventions, such as the Mediterranean dietary pattern will not be just an individual achievement, it will be a societal achievement (Hossain et al., 2017).

It is evident that more health promotion based on the Mediterranean dietary guidelines is needed to promote a healthier lifestyle, nutritional practices, and reduce the rate of obesity across the globe (Hossain, Kaware & El Nahas, 2017). The proposed evidence-based project (EBP) aims to determine if the implementation of Mediterranean dietary counseling can improve health outcomes within a single primary care clinic. Existing evidence showed that

Mediterranean dietary counseling promoted adherence, thus lowering body mass index and waist circumference among adults who are living with obesity (Dauchet & Amouyel, 2014).

Background and Significance

The World Health Organization (WHO) estimates 1.6 billion individuals are either overweight or obese and having too much body fat can lead to a collection of health problems, such as high blood pressure, myocardial infarction, heart failure, diabetes, strokes, osteoporosis, and cancer (Burgess, Hassmen, Welvaert & Pumpa, 2017). Consequently, these health complications can trigger a cascade of lethal medical emergencies, such as pulmonary embolism, ventricular fibrillation, ventricular tachycardia, and asystole (Howard, Van Horn & Hsia, 2006). In turn, if left untreated, these medical conditions can lead to unnecessary hospitalizations, surgical procedures, and ultimately sudden death (Burgess et al., 2017). In addition to medical problems, obesity causes serious psychosocial problems that have some negative impact on obese patients (Howard et al., 2006).

Depression, anxiety, low self-esteem, suicide, eating disorders, and body image problems are among the most common adverse psychosocial issues associated with obesity (Howard et al., 2006). As a result, the Center for Disease Control and Prevention (CDC) identifies obesity as one of the most emerging threats capable of harming the entire global health system (Esposito et al., 2017; CDC, 2018).

Economic

In 2016, the health costs associated with obesity for emergency room expenses have grown to a staggering \$128.7 billion (Grundy et al., 2018). This year alone, the estimated health costs ranges from \$197.6 billion to \$230.5 billion and the annual medical costs for an obese person are about 37.9 percent more, or \$812 higher, than the prices for their counterpart (The

Congressional Budget Office, 2018). In 2017, the Congressional Budget Office (CBO) reported that health care system spent over \$198.3 billion in medical cost and medical spending was higher among uninsured minority groups living with obesity (CBO, 2018).

Local Issue

The National Institute for Health Care Excellence (NICE) reports that one of out every three people in Kansas is obese (NICE, 2018). Financially and statistically, Kansas is under a serious financial burden that has the potential to disrupt the healthcare services (Mente et al., 2015). In response to this imminent economic collapse, The Missouri and Kansas Department of Health and Senior Services (DHSS) in partnership with the University of Missouri Kansas City (UMKC) Institute of Human Development, launched a collaborative effort to assist residents of both states with evidence-based nutrition programs similar to this evidence-based project (CDC, 2018).

Both Missouri and Kansas collaborative and integrative approach to address the significance of obesity can serve as a reminder of the enormity of obesity as a global and local threat (Schroeder, 2017). Assessing the effectiveness of the collaborative programs of Kansas and Missouri Departments of Health and Services has proven to be difficult (Mente et al., 2015). However, evaluating the significance of obesity and the need to implement an evidence-based intervention to reverse the expenses and adverse health outcomes associated with obesity is warranted (Esposito et al., 2017; CDC, 2018).

Diversity, Culture, and Geographic Considerations.

The setting for the project is a rural clinic located in Missouri. The majority of the patients are Caucasians and live within ten miles of the clinic. However, the clinic serves a population of various ethnicities including African Americans, Hispanics, and Asians (Bustle,

2018). Data obtained from this rural clinic showed that 94.2% of residents are Caucasian, 1.9% African American, 0.2% Middle Eastern, 0.7% Asians, and 9.3% Hispanic (Bustle, 2018).

English is main language used at the rural clinic and there are limited resources to provide interpretation services for patients who spoke different languages. Cultural considerations play a significant role in this evidence-based project because many cultures dictate dietary practices and rituals in various part of the world (Dauchet, Amouyel & Dallongeville, 2014). Assessing nutritional methods, such as food selection, preparation, and consumption, of individuals in the project assisted in providing culturally competent nutrition counseling to each participant. Participants in the project were provided the Mediterranean food pyramid to consider any possible dietary restrictions within each participant's cultures.

Many studies have shown that some Western and Eastern religions have strict rules and regulations against a variety of dietary practices such as the consumption of alcohol, red meat, and pork product (Heading, 2015). Some cultures impose sanctions, public shame, and even physical punishments on people who disobey the dietary practices of the culture (Dauchet et al., 2014). Possessing a broad understanding of cultural values and beliefs of the participants facilitates the implementation of the Mediterranean dietary intervention (Dauchet et al., 2014). In addition to dietary practices, religious beliefs and faiths are the cornerstones of most cultures (Ferro-Luzzi & Sette, 2017). Many established patients in the primary care clinic are Christians, Muslims, Hindus, and non-affiliated faith (Ferro-Luzzi & Sette, 2017).

In the current project, each participant was provided with the Mediterranean food guidelines to make sure that there were no religious or cultural contraindications with the component of the Mediterranean dietary patterns. The participants reported that Mediterranean dietary patterns aligned with their religious beliefs and had no further concerns regarding the

Mediterranean dietary patterns. In addition to culinary differences, socioeconomic and ethnic background are essential components to consider during the EBP project (Howard, Van Horn & Hsia, 2006). The association between obesity and socioeconomic level differs by geographical location, race, and ethnicity (CDC, 2018). Overall, men and women who live in affluent communities with higher incomes had lower obesity prevalence compared with those with communities with lesser economic opportunities (CDC, 2018).

Recent studies showed that both ethnicity and socioeconomic disparities are important determinants that contributed to the rapid growth of obesity among African American and Hispanic American with low socioeconomic status (CDC, 2018; Howard et al., 2006). Therefore, providing a list of community gardens and local grocery stores that sold fruits, legumes, and vegetables at lower prices can promote adherence to the Mediterranean diet

Problem and Purpose

The evidence-based project was chosen because evidence shows that more than one-third of adults in the US are obese (Fung et al., 2016). Health complications associated with obesity can lead to life-threatening emergencies (Fung et al., 2016). In addition, there is a lack of public response to address obesity and the negative health consequences (Fung et al., 2016). Evidence shows that Mediterranean dietary patterns can positively influence body mass index and waist circumference in obese patients (Fung et al., 2016). This pilot study aimed to determine if Mediterranean dietary counseling reduces BMI and waist circumference in a rural clinic?

Facilitators and Barriers

The project facilitators were the clinic manager and the preceptor who worked at the project site for more than ten years. All instructions including promotional fliers and brochures, educational materials, and a copy of the IRB letter were submitted to the clinic manager and the

preceptor before the implementation of the project. Access to the electronic charts including mailing addresses, emails, and telephone numbers were obtained from the clinic manager.

The potential barriers to the EBP project were the follow-up phone calls that took place two to three times a week. Most of the participants reported that the follow-up phone calls interfered with their work schedules and family activities. Some participants missed the scheduled follow up phone calls because of a poor telephone signal which negatively impact participation in the dietary counseling sessions.

Another barrier was the nine-week dietary counseling which was not long enough for the participants to experience the full scope of the Mediterranean dietary patterns. They believed that if the project lasted more than six months, they would have achieved a greater benefit from the entire project. Socioeconomic status was a serious barrier because 49.7% of the participants were single parents who made less than twenty-five thousand dollars a year. The participants had very limited income and were not able to buy fresh vegetables, fresh fruits, and olive oil as recommended by the Mediterranean dietary guidelines. The participants substituted canned fruits and vegetables instead of going to the grocery stores to purchase fresh products. As a result, economic status and geographic locations were two serious barriers to consider.

To create sustainability of the intervention during and after the project, education materials that contained information about the Mediterranean dietary patterns were given to the clinic staff. These education materials contained flyers and brochures that disseminated background information on the Mediterranean dietary patterns. They also offered a step by step approach to explain the effectiveness of the Mediterranean dietary patterns to the obese and non-obese patient population who frequently sought care in the clinic.

Furthermore, the project facilitators were encouraged to offer and discuss the Mediterranean dietary patterns to new and existing patients during each encounter. In addition to providing the Mediterranean dietary instructions to the facilitators, written and electronic materials were given to the clinic to promote healthy life changes based on the intervention as a long-term solution to reduce the prevalence of obesity in one primary care clinic.

Review of the Evidence

To bolster the evidence, a wide collection of reliable and validated studies was used as the evidence foundation for the project. The primary goal of the review of literature was to show a clear relationship between Mediterranean dietary patterns and adult obesity.

Inquiry

In adult patients diagnosed with obesity, does adopting the Mediterranean diet lower BMI and waist circumference over a period of nine weeks in a primary care clinic?

Search Strategies

The MEDLINE, Cochrane, the Cumulative Index to Nursing and Allied Health (CINAHL), and PubMed databases were used to gain access to English manuscripts using the keywords of obesity, BMI, MedDiet, cardiovascular disease, metabolic syndrome, behavioral counselling, obese adults, practice guidelines, health care expenditures, DASH diet, and healthcare disparity and barriers. Data were abstracted from studies that focused on the obese population, Mediterranean dietary pattern intervention, large sample sizes, result measures, and appropriate length of time of studies. Inclusion criteria consisted of studies that showed clear benefits of Mediterranean dietary patterns on adult obesity, BMI, and waist circumference. Exclusion criteria were studies funded by special interest groups such as pharmaceutical and diet companies. In order to meet inclusion criteria, the studies needed to be in English; focused on

adults ages 18-50; content on dietary-based and intent to reduce the risks of cardiovascular disease through Mediterranean diet, education, and/or behavioral modifications; conducted in the United States and Europe; issued February 1, 2010 and February 28, 2018; and used a control group for experimental or quasi-experimental study designs. In total, twenty-one studies comprised the synthesis of evidence: eight systematic reviews, four cross-sectional studies, two single experimental studies, one quasi-experimental study, three single quantitative studies, two single qualitative studies, and one qualitative and quantitative study (see Appendix C). There were six level one studies, two level two studies, one level three study, five level four studies, and five level five studies using Melnyk hierarchy (see Appendix M).

Synthesis of Evidence

The Mediterranean dietary pattern has gained recognition for the diet's unique contribution in the reduction of morbidity and mortality worldwide (Melin et al., 2016). Evidence shows that daily consumption of olive oil, whole grains, vegetables, fruits, nuts, moderate intake of wine, and low intake of unsaturated meat has some positive effects on BMI, WC, blood pressure, and lipid profiles (Ahmed, Delgado, & Saxena, 2016; Bonaccio et al., 2013; Trichopoulou, Orfanos, & Norat, 2015). The evidence highlights three key findings: self-monitoring improves adherence, Mediterranean dietary patterns enhance cardiovascular health and lower mortality rates, and Mediterranean diet improves cognitive function and decreases cancer risk.

Self-monitoring in a Mediterranean Dietary

Potvin, Gendron, Bilodeau and Chabot (2015) found that self-monitoring increased adherence to the Mediterranean dietary intervention in a qualitative method design, using semi-structured interviews with participants (N=634). Self-monitoring is an important aspect to

consider in this evidence based-project because it can influence positive behaviors, provide feedback, and enhances motivation in adult living with obesity (Ho et al., 2012). Two randomized controlled Mediterranean dietary intervention trials conducted in Australia, with nine community-based nutrition programs showed that participants (n=322) who practiced self-monitoring after six weeks follow up, reported a significant increase in their adherence ($t=4.42$, $p < .001$) to the Mediterranean diet (Swinburn & Egger, 2017; Wing, Tate, Gorin, Raynor & Fava, 2016; Mahoney, Moura & Wade, 2015).

Heading (2016) found that self-monitoring motivated participants (n=290) who struggle with obesity and weight perception in two rural communities in South Wales ($t=2.73$, $p < .001$) decreased relapse during weight loss programs ($t=4.51$, $p < .001$). Hunter Urban Division of General Practitioners of Newcastle and South Wales conducted seven randomized-controlled trials investigating the effectiveness of self-monitoring in patients with obesity (n=867) receiving the Mediterranean dietary pattern for weight management.

Results from these studies showed that there was increased adherence among self-monitoring group compared to the control group (Zaragoza-Mati, Cabanero-Martinez, Hurtado-Sanchez, Laguna-Perez, & Ferrer-Cascales, 2016; Sofi, Macchi, Abbate, Gensini, & Casini, 2016). Hong, Lusk, Ronis; McDonalds et al. (2014) found that self-monitoring enhanced skill building and improved health and behavioral outcomes. Beck et al. (2016) assessed adherence level on obese individuals (n=89) three years after an extensive prospective study. The result indicated that self-monitoring increased adherence to the diet (74% adherence, $p= 0.026$).

A randomized control trial conducted in three Finnish cities found that intuitive eating based on self-monitoring had a positive impact on eating behavior in adults with psychosocial problems and obesity (integrated self-monitoring, $p= 0.03$, food regulation, $p= 0.23$ (Sairanen,

Tolvanen, Lindroos, et al., 2017; Sofi, Abbate, Gensini, & Casini, 2016). In summary, the concept of self-monitoring for dietary and other behavioral programs show some positive benefits and significantly decreases risk for non-adherence in Mediterranean interventions (McKenzie et al., 2013; Mahoney et al., 2015).

Mediterranean Diet Improves Cardiovascular Disease and Mortality

Fung, Rexrode, Mantzoros, et al (2016) reported that people who adopted the Mediterranean dietary patterns had a combined 29% reduction of mortality, cardiovascular incidence, and reduced waist circumference in postmenopausal women compared to the control groups (Anderson et al., 2015; Martinez-Gonzalez et al., 2015; Hossain, Kavar & Nahas, 2017). Evidence showed that the Mediterranean dietary patterns have more significant therapeutic effects on blood pressure than the DASH diet (Beitz, Mensink, & Fisher, 2014; Ahmed, Delgado, & Saxena, 2016; Bonaccio et al., 2013). In Barcelona, Spain, the Mediterranean diet was implemented in four geriatric hospitals, and after five years follow up, the results showed that the Mediterranean diet lowers mortality rates in obese geriatric patients (Estruch et al., 2013; Trichopoulou et al., 2013; Ahmed, Delgado, & Saxena, 2016; Bonaccio et al., 2013).

A quasi-experimental single cohort study found that the Mediterranean diet interventions lowered total cholesterol level by 32% and risk for coronary syndrome by 17.7% in a group of obese women with a baseline BMI greater than thirty-two (Trichopoulou, Costacou, Barnia & Trichopoulos, 2013; Estruch et al., 2013). Kastorini et al., 2011; Tierney et al., (2016) suggested that providing the Mediterranean diet to obese patients shows greater cardioprotective and cardiometabolic effects than pharmacologic interventions. The Mediterranean dietary patterns have consistently reduced serious health complications associated with cardiovascular

disease compared to other published dietary patterns and pharmacologic management of obesity (Erwin et al., 2018; Trichopoulou et al., 2013; Stefler et al., 2017).

Two studies conducted in Spain, the Prevention with Mediterranean Diet (PREDIMED) and the Inpatient Geriatric Mediterranean Intervention showed that the Mediterranean diet reduced cardiovascular health complications in young adult patient population and mortality rate in geriatric patient population compared to the control groups (Erwin et al., 2018; Trichopoulou et al., 2013; Stefler et al., 2017; Martinez-Gonzales et al., 2016). Two cohort studies showed that patients with higher adherence to the Mediterranean diet had a lower stroke incidence and mortality rate compared to the control groups (Martinez-Gonzales et al., 2016). The Heart Institute of Spokane Diet Intervention and Evaluation Trial showed that the Mediterranean diet lowers the risk for heart attack in newly diagnosed obese patient population (Martinez-Gonzales et al., 2016; CDC, 2018).

Mediterranean Diet on Cognitive Function

The application of the Mediterranean diet is well published for diet effectiveness and benefits on several biological markers (Kwok, Lam, Sea, Goggins & Woo, 2015). Two large randomized clinical trials consisted of dementia and mild cognitive impaired obese populations and showed that the Mediterranean diet improved cognitive functioning after a six-year follow up (Couto, Sandin, Ursin, Adami, & Wederpass, 2017). Gardener, Rainey-Smith, Keogh, Clifton, Mathieson, et al. (2015) conducted a small randomized clinical trial and found that the Mediterranean diet increased cognitive functioning in the patient population experiencing dementia

The Mediterranean Diet on Cancer

Several cohort studies showed that Mediterranean diet reduced mortality rate in cancer patients with the highest adherence to the Mediterranean diet (Couto et al., 2017; Catsburg, Kim, Krish, Soskolne, Kreiger, & Rohan, 2016). A recent PREDIMED randomized clinical trial found a decreased risk for breast cancer in two Mediterranean diet groups compared to the control group (Couto et al., 2017). A recent study showed that the Mediterranean diet reduced the total cancer mortality rate by 4% in individuals who had the highest quantile of adherence (Catsburg et al., 2016; Travier, Cottet, Gonza, Barroso et al., 2013). Two cohort studies with a median follow up of eight to ten years concluded that the Mediterranean diet reduced the occurrence of lung cancer in individuals with the highest adherence to the diet compared to the control group (Couto et al., 2017; Travier et al., 2014).

Theory

The Transtheoretical Model (TTM) was an important aspect of this evidence-based project because it provided an understanding of how people could move toward accepting and supporting a change for the most beneficial health outcome (McKenzie, Neiger, & Thackery, 2013). The adoption of this model to support the implementation of the Mediterranean dietary patterns in the primary care settings is vital (Heading, 2008). The TTM has used in several types of clinical studies that focused on health behavior change, such as substance abuse, mood disorders, exercise, dietary practices, eating disorders, and obesity (McKenzie et al., 2013).

The TTM focuses on overt and covert events that individuals use to advance throughout the stages of change (McKenzie et al., 2013). The Mediterranean dietary interventions are used in multiple settings to target many different biomarkers that lead to chronic illness and increase mortality (Heading, 2008). The Transtheoretical Model guided this project, in which patient

with obesity were motivated while going through the stages of change to adhere to the dietary intervention. (McKenzie et al., 2013).

Methods

IRB

The primary Institutional Review Board (IRB) for the EBP project was the University of Missouri at Kansas-City, Missouri. Approval letters from IRB and the clinic manager who supported the implementation of the project at the clinic site were obtained. The project was approved as Not Human Subjects Research and represented a quality improvement project. In order to prevent any conflict of interest, no family members and friends took part in the project. For the purpose of the project, participant's sensitive and confidential information were accessed via chart reviews and telephone interviews. The process of accessing and obtaining sensitive information about the participants complied with HIPPA regulations.

Setting and Participants

There were 14 participants who took part in the study. Prior to recruitment, inclusion criteria were reviewed with the three medical assistants who aided in the recruitment process. The medical assistants provided the participants with brief information regarding the pilot study. This interaction took place immediately after the medical assistants prepared the patients for the nurse practitioners and medical doctors.

Participant selection was based on inclusion criteria: adult male and female patients older than eighteen years who have a body mass index (BMI) greater than thirty-two or a waist circumference greater than forty-two inches. The exclusion criteria included adult male and female patients with known eating disorders, chronic anemia, chemotherapy-induced leukopenia, hypercoagulation disorders, pregnancy, and currently on a pharmacological and non-

pharmacological weight loss regimen. A quasi-experimental, pilot single cohort design with pre- and post-measures was used to establish if Mediterranean dietary counseling lowers BMI and waist circumference in the primary care clinic.

The pilot study was conducted during August 2018 through December 2018. The EBP was conducted at a rural primary care clinic. The primary care clinic offers many services, including geriatric care, pediatric care, educational programs, dietary counselling, and referrals to other specialties. There are limited resources to support obese patients in the clinic, and this project aimed to provide information of evidence to close the gap on adult obesity. Use of convenience sampling was essential for the success of this project which provided information regarding the Mediterranean dietary patterns to adults with obesity.

EBP Intervention

The intervention consisted of two major components of Mediterranean dietary counseling and self-monitoring to promote adherence. The dietary counseling was conducted via follow up phone calls during the nine-week intervention period. Participants were offered other means of communication such as email, mail, and face to face interactions if preferred. However, follow up telephone calls was the most feasible method of communication during and after the intervention.

The protocol entailed a nine-week intervention: During week 1, a face-to-face meeting occurred at the primary care clinic to discuss the objective of the evidence-based project and asked each participant about their desire to participate in the project. Personal information such as telephone numbers and emails were collected, and a package that contained a food diary, two pencils, eight pre-stamped envelopes were provided, and an information packet that included the Mediterranean diet food pyramid and guidelines was given to the individual (see Appendix F).

Participants were required to log their daily Mediterranean food intake and their daily weight. After participant baseline data for BMI and WC was obtained, a brief explanation to the participants on how to take an accurate measurement of weight and waist circumference.

During week 1 through week 3, the participant was advised to initiate tracking of their daily Mediterranean food intake and their daily weight. Also follow up calls were conducted to provide dietary counseling to each participant. The dietary counseling was based on each participant's need. The participants discussed a variety of concerns that included adherence to the Mediterranean dietary patterns during major holidays like Thanksgiving. Each participant was encouraged to follow the food pyramid. All participants turned in their food diaries and weight logs every other week via mail using the provided pre-stamped envelopes. The evidence project included numeric codes to identify each participant during and after the intervention to provide confidentiality. To promote consistency of maintaining confidentiality, all data were collected and stored in a locked box in the primary facilitator's office at the clinic (see Appendix F).

During week 3 through week 6, eight follow-up calls were conducted to encourage the participant to complete the daily food diaries and weight logs. Participants returned the daily food diaries and weight logs every other week as recommended (see Appendix F).

During week 6 through week 8, daily follow-up calls were made to the participants based on their needs. Some participants requested daily dietary counseling and others requested dietary counseling every other day. All seven participants were able to comply fully with the project recommendations. At the end of week 9, the participants mailed the food diaries and weight logs to the student investigator (Appendix F). During week 9, all data including weight log and food diaries were received, and the de-identified data was entered into a spreadsheet (see Appendix F).

Change Process, EBP Model

The Planned Behavior Model of Health Action Process Approach applies to the Mediterranean diet in the primary care clinic. This model implies that people are more likely to engage in a behavior stemming from behavioral, normative and control beliefs (Symons, Downs & Hausenblas, 2015). The ultimate goal of this model is to investigate social and cultural characteristics that may negatively impact the behavior of adult patients during the intervention (Fishbein & Ajzen, 2015). The use of Health Action Process Approach (HAPA) to predict health behavior in the implementations of health promotion intervention regarding a diet is an important factor in the understanding of certain behaviors (Schwarzer, 2015).

The Planned Behavior Model of Health Action Process Approach has two distinct phases: the motivational phase and the assumption phase. The motivational phase results in behavioral intents, and the assumption phase points to the actual health behavior (Schwarzer, 2015). The motivational process mainly influences outcome expectancies (Fishbein & Ajzen, 2015). In the framework of the implementation of the Mediterranean diet, positive outcome expectancies claim that if an individual adheres to the Mediterranean diet, the individual is more likely to believe that they will see a positive change in WC and BMI (Fishbein & Ajzen, 2015). The assumption phase is based on self-efficacy beliefs, which the individual is already intended to change the behavior and should benefit from self-efficacy (Fishbein & Ajzen, 2015).

The ACE Star Model of Knowledge Transformation is very appropriate for this EBP because it highlights numerous barriers that can be accounted for when moving evidence into practice. This model explains various stages of knowledge of methods that can be translated into

critical decisions. The ACE Star Model highlights important steps to adapt one form of information to the next and includes the soundest research evidence with great clinical determinates to achieve evidence-based practice.

Utilizing the format of discovery, evidence summary, translation into action, integration into practice, and evaluation provides a greater clarity in evidence-based practice (Melnik & Fineout-Overholt, 2015). Providing the clinic with easy to understand Mediterranean diet brochures and flyers that can be given to all patients who want to initiate new lifestyle changes, such as the Mediterranean dietary patterns, can foster sustaining the project intervention. To ensure sustainability, written and electronic resources were given to the project facilitators to share with existing and future patients.

Study Design

The EBP project was a pilot, quasi-experimental single cohort design that was conducted at one family clinic in Missouri. A variety of impacting variables, such as demographics, socioeconomic status, geographic location, existing health conditions, and baseline BMI and waist circumference were taken into considerations. The outcome measures of this pilot study included the independent variable of the dietary counseling and dependent outcome variables.

Validity

The participants were recruited through convenience sampling during their office visits with their primary care providers. Evidence shows that convenience sampling has the potential to negatively impact the internal validity. The purpose of the intervention was to show that Mediterranean dietary counseling (independent variable) had a positive influence on BMI or WC (dependent variable). To prevent any threat to internal validity, the student investigator used a series of safeguards such as providing education to participants on how to accurately measure

their waist circumference and encouraging participants to weigh themselves once a week at the same time with the same amount of clothes.

Participants were advised not to use any supplemental diet besides the Mediterranean diet or take any weight loss medications concurrently with the Mediterranean diet. The student investigator checked for inaccuracies during data collection and provided further education if needed to each participant. The evaluation of the impact of the Mediterranean Diet interventions occurred in the primary care settings with all eligible patients at the clinic who had appointments during the first and second week of August. Before accepting any participant's request to take part in the quality improvement project, all participants had to meet the inclusion criteria and consent. Brochures and flyers that contained quick facts about the Mediterranean dietary were given to increase participant engagement in the intervention.

Outcomes and Measures

BMI was the primary outcome measured in this EBP project, and WC was the secondary outcome. Evidence from multiple studies showed that Mediterranean dietary patterns could be implemented in a variety of settings to improve overall health outcomes (Kirby, Liang, Chen, & Wang, 2012). However, the student investigator chooses BMI and WC because they both are well studied and reliable (Kirby et al., 2012). In addition to reliability, BMI can be measured in any setting and yield an accurate result (Kirby, Liang, Chen, & Wang, 2012). Participants weighed themselves and recorded their weekly weight and waist circumference on a log sheet provided to them. The Mediterranean dietary pattern was considered a success if all participants, with an expected number of 14, completed the nine-week intervention and a significant reduction (CI 95%, $p < .05$, WC reduction. CI 95%, $p < .05$) of their BMI and WC occurred from pre to post intervention.

Measurement Instruments

There were two primary outcome variables in this study: BMI and WC. BMI was calculated on weight and height. Participants were identified as obese if BMI is over 30. The findings of this EBP project used self-reports instead of actual measurements. Waist circumference was measured and recorded by each participant, using written instructions that participants received before the intervention. It was imperative that participants follow the instructions to optimize accuracy of measurements of heights and weights for the project. Accurate measurement of BMI and WC are essential for any obesity-based intervention program (Wang & Beydoun, 2017; Stewart, Cutler & Rosen, 2016; Bassett & Perl, 2017).

Quality of Data

A power analysis was not performed because the estimated sample size was small for the pilot project. In discussions with the project facilitator, a sample size of 15-25 was desired at this location for ease of coordination with office staff. In addition to sample size, using a convenience sampling method made the findings of this evidence-based project less. Convenience sampling was more practical at the project. To maintain the quality of data, appropriate measure was taken to reduce the likelihood of falsification, omission, and human error by simplifying the log sheets that were provided to participants to enter their daily intake of the Mediterranean diet from the food pyramid (see Appendix I).

Analysis Plan

Descriptive statistics were used to analyze the data. Mean baseline BMI and waist circumference were compared to the BMI and waist circumference in week 3, 6, and 9. Mean and mode variation of all variables were analyzed at the same time intervals.

Results

Participant and Setting

A total of 14 patients were chosen for the Mediterranean dietary counseling and 7 were disqualified for various reasons in week two of the project intervention. At the beginning of the intervention, baseline variables were measured indicating that all participants met the inclusion criteria to participate in the project. Hence, the final selection was made, and a choice to complete a waiver of informed consent was given to each participant although the participants did not think it was necessary to complete the informed consent. Upon acceptance, the participants were asked to provide their names, addresses, emails, and phone numbers as identifiers. No other identifying personal information was collected. Consequently, all necessary identifiers were confirmed and processed into the project demographic and biometric templates, and all educational materials were mailed accordingly to each participant.

Interventions Course

After enrolling in the project, each participant was given an envelope that contained all the information regarding the Mediterranean diet to follow. The envelopes contained daily log sheets, three paper-based centimeters, and three stamped envelopes with the returning address on those envelopes. The participants were asked to weigh themselves daily and record their weights in the log sheets provided. They were also asked to measure their waist circumference once a week at the same time and recorded in the log sheets provided. Education was given to each participant on how to best measure their waist circumferences and take their daily weights. The participants reported accurate measurement of waist circumferences and used online resources such as interactive tutorials to enhance knowledge on how to best measure their waist circumferences.

During the nine-week intervention, the student investigator provided dietary counseling and reinforced education regarding proper ways to measure waist circumference. In addition to the scheduled 3 times a week of follow-up phone calls for 30 to 40 minutes, further dietary counseling was given at the participant's request to enhance compliance during the holiday seasons. Additional dietary counseling questions, helping with online resources, and assisting in installing MedDiet apps on electronic devices. Those additional phone calls were successful in fostering commitment to the interventions.

Outcome Data by Subtopic

The data included weight and waist circumferences and were collected and entered into SPSS for each week. In addition to data collection, descriptive analysis was used to measure range, mean, and mode for both BMI and waist circumference for each participant. The average weekly weight and waist circumference were expressed in percentage to provide greater meaning to the results.

Discussion

Successes

Success of this project included a reduction on both BMI and waist circumference in the participant which is consistent with many well published studies that support the need to recognize the Mediterranean diet as the most effective dietary pattern to reduce BMI and waist circumference in adults with obesity. In the literature, the predicting factors that showed a great association with obesity are poor dietary practices and rituals. The project demonstrated that providing adequate dietary counseling over the nine-week interventions had a positive impact on the seven participants with obesity.

Through dietary counseling sessions, each participant was able to learn the importance of diet through the guidance of the Mediterranean food pyramid. They learned about the health benefits offered by each ingredient of the Mediterranean diet offers. Each participant expressed confidence in ability to adhere to the Mediterranean dietary practices because of the positive results of the diet. They also verbalized that they have mastered great skills in developing their own daily weight log sheets, navigating through online resources, and measuring their waist circumference accurately.

Study Strength

The implementation of the Mediterranean diet aimed at decreasing BMI and waist circumference in participants who were obese and exhibited at least some health complication risk factor associated with obesity which made them ideal candidates for the project. Some of the participants had attempted dietary means to manage their obesity without positive benefits. The participant desire and commitment to improve their obesity augmented the strength of the outcome in this study. In addition, the project site, a rural clinic that provided care to a wide variety of patients with obesity and health complications associated with obesity, was an appropriate setting. With the support of the clinic staff and project facilitators, recruiting the participants was convenient.

The clinic staff assisted in collecting updated data on each participant. One characteristic of the strength of the project was the exceptional adherence such as participant recording of their daily food intake, weight, and waist circumferences in the log sheets. Participants who missed a scheduled dietary counseling rescheduled an appointment with the student investigator in that same week. The participants were able to develop a respectful relationship with the student investigator.

The dietary counseling phone calls were always related to the project, and great rapport and trust were consolidated. The most anxious participants called the student investigator for additional counseling sessions and Mediterranean dietary resources via emails or mails. Overall, each participant was able to see the trend of their BMI and waist circumference over the nine-week Mediterranean diet intervention. All participants were involved and stated honest in completion of the log sheet contents.

Results Compared to Literature

The Mediterranean diet is suggested to offer a positive effect on cardiovascular health, particularly in relation to the prevalence of obesity (Bos, Vries, Feskens, Dijk, Hoelen, Siebelink & Heiligenberg, 2018). The results from published studies are consistent with the results of this project because they both showed association between the Mediterranean diet and improvement of obesity. Most recent evidence showed that patients who consumed the Mediterranean diet were more likely to see a reduction in their BMI when compared to other dietary practices (Buckland, Gonzalez, Argudo et al., 2018; Hoevenaar-Blom, Noovens, Kromhout, 2018). The results of the project are congruent with the evidence that shows that adherence to the Mediterranean diet is more beneficial, compared to other diets, in primary prevention of obesity.

Extensively adopting the Mediterranean was shown to be beneficial in reducing BMI and waist circumference in adults with obesity; therefore, health care providers should consider discussing the benefits of an effective diet with obese patients at every office visit. If patients agree with a new dietary change, appropriate dietary counseling should be given to patients to help them receive the most effective diet that has been scientifically shown to improve BMI and waist circumference.

It is published that the increasing prevalence of obesity is a serious public concern of this modern era; therefore, the need for sustainable solutions are needed to slow prevalence of obesity. The Mediterranean diet offers a solution in changing the rapid growth of obesity, and this claim is supported by evidence from research studies and the results of the current project. When analyzing the baseline data of the individuals who participated in the nine-week intervention project, it is easy to conclude that the Mediterranean diet had a positive impact on BMI and waist circumference.

Limitations

Internal and External Validity

There were several limitations in the project during the nine-week intervention that could affect internal validity. First, the project had a short intervention time. Initially, the proposed project timeline was twelve weeks. However, obtaining approval to conduct the project along with processes for participant recruitment led to a nine-week intervention. Second, the proposed sample was thirty participants, and sample size was seven participants. Third, each participant used different scales to weigh themselves at home. Fourth, degree of compliance to the diet was not measured, and data collection might be skewed although, there was no indication that there was intentional manipulation of the data. Participants were cooperative and complied with every instruction given to them during dietary counseling and follow up calls.

In addition to internal validity, there were some factors that could have influenced external validity. First, all the participants were women between the ages of 30-50 years. However, all of the women were obese with a BMI ranging from 32-36. Second, all the participants had their own scales and tape measurement at home to collect their own data. However, participants were advised to come by the clinic if they wanted to check their weights

and waist circumferences. They were also encouraged to bring their scales to the clinic for the student investigator to calibrate all the scales and ultimately to compare their scales with the ones used at the clinic. Three of the participants came to the clinic to have their scales calibrated correctly.

Sustainability of Effects

Encouraging each participant to record their daily food intake, weight, and waist circumference was a challenge during the first week of the project. The participants reported that recording every single food they ate was too cumbersome and asked the student investigator to create a different log sheet. During every dietary counseling session, the student investigator provided coping support to those who felt overwhelmed with recording every single food they ate from the Mediterranean diet food pyramid. The participants were able to find that entering their numbers became less cumbersome by the third week of the intervention. One of the goals of the dietary counseling sessions was to provide each participant with the proper coping mechanisms and tools to help them achieve confidence that they could continue adopting the Mediterranean diet throughout their lives.

Efforts to Minimize Study Limitations

Providing evidence to support the effectiveness of the Mediterranean dietary patterns is crucial. Participants were given many options to access online resources to gain more knowledge about the Mediterranean dietary patterns. Printed copies of the Mediterranean food pyramid were given to each participant. All participants who had electronic devices downloaded Mediterranean diet apps and gained access to interactive online resources to maximize the validity of the project. Participants had options to have daily dietary counseling via telephones

and text messages if needed. Often text messages were sent to remind participants to continue their good work and offer positive reinforcement.

Whenever a participant failed to attend the scheduled dietary counseling, text messages were sent to keep participant engaged in the project. These options minimized some limitations of the project in achieving success. There were limitations throughout the project and the most significant one was Thanksgivings day where most people held family functions that contained unhealthy food, but the participants remained dedicated to the project intervention because of the results they had noticed in their weights.

Interpretation

Expected Actual Outcomes

There is a large body of scientific evidence supporting the beneficial effects of the Mediterranean diet on both BMI and WC. As a result, the student investigator expected to see a decreased BMI or WC in all the participants by offering dietary counseling via telephone for nine weeks. The results showed that the Mediterranean diet had a positive impact on 57% of the participants. The results also showed that 28.6% of participant had an increased BMI. Moreover, the results showed that the Mediterranean diet had no effects on 14% of the participants. These findings corroborated results from previous studies in adult obesity, in which the Mediterranean diet showed a positive impact on BMI and WC. The results of this evidence based suggest that implementing the Mediterranean dietary model in primary may result in reducing the prevalence of obesity as indicated by reduced BMI and waist circumference.

Intervention Effectiveness and Revision

The nine-week intervention was effective because the Mediterranean diet improved BMI and waist circumference. Data and results from the project showed that participants who

consumed food from the Mediterranean food pyramid every day over the course of nine weeks had a reduction of both BMI and waist circumference. Dietary counseling and follow up phone calls improve adherence to the Mediterranean diet, thus, reducing both BMI and waist circumference. Many participants attempted to manage their obesity with no positive results. Once they adopted the Mediterranean diet, they could see some improvement in their diet as evidence by a reduction of BMI and waist circumference.

Health care providers should implement the use of the Mediterranean diet in the primary care setting to manage obesity. Health care providers should also create a pathway for patients with obesity who seek care in the primary care clinic to have dietary counseling during each visit to enhance adherence and improve health outcomes. Offering Mediterranean dietary counseling was an important aspect of the project because it allowed participants to choose food they preferred from the Mediterranean food pyramid and recorded their daily weights and waist circumferences. Utilizing Mediterranean diet-based counseling improves BMI and waist circumference in adults with obesity.

Expected and Actual Impact to Health System and Policy

The project validated findings from previous studies that suggested that the Mediterranean diet reduced BMI and waist circumference, thus improving health outcomes of patients with obesity in the United States. This project was successful at addressing the prevalence of obesity and the effectiveness of the Mediterranean diet in population with obesity. The project also aimed to encourage public health officials on a local and national level, educators, and community leaders to implement new health policies that would provide monetary reimbursement for health providers who provide dietary counseling via telephone to patients with a clinical diagnosis of obesity as well as a Mediterranean diet food assistance

program. The proposed project cost was estimated at \$634.73. However, only \$212.17 were spent on education materials and equipment needed for the project intervention.

Conclusion

The results of the nine-week project intervention showed that Mediterranean diet reduced BMI and waist circumference. The benefits of the Mediterranean diet in this project are relevant because BMI and waist circumference are two important factors in many cardiovascular risks. A reduction in BMI and waist circumference after a nine-week intervention supports that the Mediterranean diet is an effective dietary intervention in the primary care setting.

Implementation of Mediterranean diet counseling in adults with obesity may promote clinical confidence in the use of the Mediterranean diet in the primary care clinic as a mean to manage obesity. Optimistically, the results of this project may serve as a template to increase awareness and education among health care providers and patients when attempting to elicit a healthy dietary change in the primary care settings.

The dissemination of evidence was conducted via a poster presentation at the annual conference of the Advanced Practice Nurses of the Ozarks last November 2018. The beneficial effects of the Mediterranean diet have been shown in adults with obesity. In this project, the Mediterranean diet had a positive impact on adults with obesity, thus reducing their BMI and waist circumferences over a nine-week dietary counseling intervention.

References

- Adherence. (n.d.). In Collins Dictionary Online, Retrieved December 6, 2016, from <https://www.collinsdictionary.com/dictionary/english/adhere>
- American Nursing Association. (2018). Nursing Research Grants. Retrieved from <https://www.nursingworld.org/foundation/programs/nursing-research-grants/>
- Anderson, L.H., Martinson, B.C., Crain, A.L., Pronk, N.P., Whitebird, R.R., Fine, L.J. & O'Connor, P.J. (2015). Health care charges associated with physical inactivity, overweight, and obesity. *Preventive Chronic Disease, 2*, 1-12.
- Bach, A., Serra-Majem, L., Carrasco, J.L., Roman, B., Ngo, J., Bertomeu, I., et al. (2016). The use of indexes evaluating the adherence to the Mediterranean diet in epidemiological studies: a review. *Public Health Nutrition, 9*, 132-146.
- Bassett, M.T. & Perl, S. (2017). Obesity: the public health challenge of our time. *American Journal of Public Health, 94(9)*, 1477.
- Bosire, C., Stampfer, M.J., Subar, A.F., Park, Y., Kirkpatrick, S.I. & Chiuve, S.E. (2017). Index-based dietary patterns and the risk for prostate cancer in the NIH-AARP diet and health study. *American Journal of Epidemiology, 177*, 504-513.
- Buckland, G., Travier, N., Cottet, V., Gonzalez, C.A., Luja'n-Barroso, L. & Agudo, A. (2014). Adherence to the Mediterranean diet and risk for breast cancer in the European Prospective Investigation into Cancer and Nutrition cohort study. *International Journal of Cancer, 132*, 2918-2927.
- Burgess, E., Hassmen, P., Welvaert, M. & Pumpa, K.L. (2017). Behavioural treatment

- strategies improve adherence to lifestyle intervention programs in adults with obesity: a systematic review and meta-analysis. *Clinical Obesity*, 7(2), 105-114.
- Carroll, D. & Roth, M.T. (2002). Evidence for the cardioprotective effects of omega-3 FattyAcids. *Annual Pharmacotherapy*, 36(12), 1950-1956.
- Catsburg, C., Kim, R.S., Kirsh, V.A., Soskolne, C.L., Kreiger, N. & Rohan, T.E. (2016). Dietary patterns and breast cancer risk: a study in 2 cohorts. *American Journal of Clinical Nutrition*, 101, 817-823.
- Centers for Disease Control and Prevention. (2018). Obesity at a Glance 2011 – Halting the Epidemic by Making Health Easier At A Glance. Retrieved from <http://www.cdc.gov/chronicdisease/resources/publications/aag/obesit.htm>
- Celis-Morales, C., Livingstone, K.M., Marsaux, C.F.M., Macready, A.L., Fallaize, R., O'Donovan, C.B., Woolhead, C., Forster, H., Walsh, M.C., & Navas-Carretero, S. (2017). Effect of personalized nutrition on health-related behaviour change: Evidence from the Food4me European randomized controlled trial. *Internal Journal of Epidemiology*, 186, 1-12.
- Congressional Budget Office. (2017). CBO's Record of Projecting Subsidies for Health Insurance Under the Affordable Care Act: 2014 to 2016. Retrieved from <https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53094-acapr-objections.pdf>
- Couto, E., Boffetta, P., Lagiou, P., Ferrari, P., Buckland, G. & Overvad, K. (2017). Mediterranean dietary pattern and cancer risk in the EPIC cohort. *British Journal of Cancer*, 104, 1493-1499.
- Dauchet, L., Amouyel, P. & Dallongeville, J. (2014). Fruits, vegetables and coronary heart

- disease. *National Review of Cardiology*, 6(9), 599-608.
- Erwin, C.M., McEvoy, C.T., Moore, S.E., Prior, L., Lawton, J., Kee, F., Cupples, M.E., Young, I.S., Appleton, K., McKinley, M.C. & Woodside, J.V. (2018). A qualitative analysis exploring preferred methods of peer support to encourage adherence to a Mediterranean diet in a Northern European population at high risk of cardiovascular disease. *British Medical Journal of Public Health*, 18, 1-13.
- Esposito, K., Chiodini, P., Maiorino, M.I., Bellastella, G., Panagiotakos, D. & Giugliano, D. (2015). Which diet for prevention of type 2 diabetes? A meta-analysis of prospective studies. *Endocrine*, 47, 107-116.
- Esposito, K., Kastorini, C.M., Panagiotakos, D.B. & Giugliano, D. (2017). Mediterranean diet and weight loss: meta-analysis of randomized controlled trials. *Metabolic Syndrome Related Disorders*, 9, 1-12.
- Ferro-Luzzi, A. & Sette, S. (2013). The Mediterranean diet: an attempt to define its present and past composition. *European Journal of Clinical Nutrition*, 43(2), 13–29.
- Fishbein, M. & Ajzen, I. (2015). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Flegal, K.M., Carroll, M.D., Kit, B.K. & Ogden, C.L. (2015). Prevalence of Obesity and Trends in the Distribution of Body Mass Index Among US Adults, 1999-2010. *JAMA*, 307(5), 491-497.
- Fung, T., Rexrode, K.M., Mantzoros, C.S., Manson, J.E., Willett, W.C. & Hu, F.B. (2016). Mediterranean diet and incidence of and mortality from coronary heart disease and stroke in women. *Circulation*, 119(8), 1093-1100.
- Grundy, S.M., Cleeman, J.I., Daniels, S.R., Donato, K.A., Eckel, R.H. & Franklin, B.A. (2015).

- Diagnosis and management of the metabolic syndrome. *Cardiology Review*, 13(6), 322-327.
- Heading, G. (2008). Rural obesity, healthy weight and perceptions of risk: Struggles, strategies and motivation for change. *Australian Journal of Rural Health*, 16, 86-91.
- Heading, G. (2015). Rural obesity, healthy weight and perceptions of risk: Struggles, strategies and motivation for change. *Australian Journal of Rural Health*, 16, 86-91.
- Ho, A.Y., Berggren, I. & Dahlborg-Lyckhage, E. (2012). Diabetes empowerment related to Pender's Health Promotion Model: a meta-synthesis. *Nursing of Health Science*, 12, 259-267.
- Hong, O., Lusk, S.L. & Ronis, D.L. (2016). Ethnic differences in predictors of hearing protection behaviour between Black and White workers. *Residency of Theory Nursing Practice*, 19, 63-76.
- Hossain, P., Kaware, B. & El Nahas, M. (2017). Obesity and diabetes in the developing world-a growing challenge. *New England Journal of Medicine*, 356, 213-215.
- Howard, B., Van Horn, L. & Hsia, J. (2006). Low-fat dietary pattern and risk of cardiovascular disease: the Women's Health Initiative Randomized Controlled Dietary Modification Trial. *JAMA*, 295(6), 655-666.
- Jantz, C., Anderson, J. & Gould, S.M. (2012). Using computer-based assessments to evaluate interactive multimedia nutrition education among low-income predominantly Hispanic participants. *Journal of Nutritional Education Behaviors*, 34(5), 252-260.
- Kim, M.K., Han, K., Kwon, H.S., Song, K.H., Yim, H.W., Lee, W.C., et al. (2014). Normal weight obesity in Korean adults. *Clinical of Endocrinology*, 80, 214-220.
- Kirby, J.B., Liang, L., Chen, H.J. & Wang, Y. (2012). Race, Place, and Obesity: The Complex

- Relationship Among Community Racial/Ethnic Composition, Individual Race/Ethnicity, and Obesity in the United States. *American Journal of Public Health, 102(8)*, 1572-1578.
- Kwok, T.C., Lam, L.C., Sea, M.M., Goggins, W. & Woo, J. (2015). A randomized, controlled trial of dietetic interventions to prevent cognitive decline in old age hostel residents. *European Journal of Clinical Nutrition, 66*, 1135-1140.
- Lichtenstein, A., Appel, L.J. & Brands, M. (2006). American Heart Association Nutrition Committee. Diet and lifestyle recommendations revision 2006: a scientific statement from the American Heart Association Nutrition Committee. *Circulation, 114(1)*, 82-96.
- Mahoney, M.J., Moura, N.G. & Wade, T.C. (2015). Relative efficacy of self-reward, self-punishment, and self-monitoring techniques for weight loss. *Journal of Consulting and Clinical Psychology, 40(3)*, 404-407.
- Manasse, S.M., Schumacher, L.M., Goldstein, S.P., Martin, G.J., Crosby, R.D., Juarascio, A.S., Butryn, M.L. & Forman, E.M. (2017). Are individuals with loss-of-control eating more prone to dietary lapse in behavioural weight loss treatment? An ecological momentary assessment study. *European Eating Disorders Review, 1-15*.
- Martinez-Gonzalez, M.A., Salas-Salvado, J., Estruch, R., Corella D., Fito, M. & Ros, E. (2015). Benefits of the Mediterranean Diet: Insights From the PREDIMED Study. *Progressive Cardiovascular Disorder, 58*, 50-60.
- McDonald, P.E., Brennan, P.F. & Wykle, M.L. (2014). Perceived health status and health-promoting behaviours of African-American and White informal caregivers of impaired elders. *Journal of National Black Nurses Association, 16*, 8-17.
- McKenzie, J.F., Neiger, B.L. & Thackeray, R. (2013). *Planning, Implementing & Evaluating*

- Health Promotion Programs: a primer* (6th ed.). Glenview, IL: Pearson Education, Inc.
- Mediterranean Diet. (n.d.). In Merriam-Webster Online, Retrieved December 6, 2016, from <https://www.merriam-webster.com/dictionary/Mediterranean%20diet>
- Melin, I., Karlström, B. & Lappalainen, R. (2003). A programme of behaviour modification and nutrition counselling in the treatment of obesity: a randomized 2-y clinical trial. *International Journal of Obesity*, 27, 1127–1135.
- Mente, A., de Koning, L., Shannon, H.S. & Anand S.S. (2015). A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. *Archives of Internal Medicine*, 169(7), 659-669.
- Monitoring. (n.d.). In Merriam-Webster Online, Retrieved December 6, 2016, from <https://www.merriamwebster.com/dictionary/monitors>
- National Institute for Health and Care Excellence. (2018). Obesity: identification, assessment and management of overweight and obesity in children, young people and adults. Retrieved from www.nice.org.uk/guidance/cg189
- Nicholas, I., Pond, D. & Roberts, D.C.K. (2005). The effectiveness of nutrition counselling by Australian General Practitioners. *European Journal of Clinical Nutrition*, 59(1), S140-S146.
- Nordmann, A., Suter-Zimmermann, K. & Bucher, H.C. (2011). Meta-analysis comparing Mediterranean to low-fat diets for modification of cardiovascular risk factors. *American Journal of Medicine*, 124(9), 841-851.
- Outcomes. (n.d.). In Merriam-Webster Online, Retrieved December 6, 2016, from <https://www.merriam-webster.com/dictionary/outcomes>
- Pender, N.J. (2006). Health Promotion Model Manual. Retrieved from:

[www.https://deepblue.lib.umich.edu/bitstream/handle/2027.42/85350/HEALTH_PROMOTION_MANUAL_Rev_5-2011.pdf](https://deepblue.lib.umich.edu/bitstream/handle/2027.42/85350/HEALTH_PROMOTION_MANUAL_Rev_5-2011.pdf)

- Polit, D.F. & Beck, C.T. (2012). *Resource Manual for Nursing Research: Generating and Assessing Evidence for Nursing Practice* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
- Schroeder, S. (2007). Shattuck Lecture. We can do better-improving the health of the American people. *New England Journal of Medicine*, 357(12), 1221-1228.
- Schwarzer, R. (2008). Health Action Process Approach. Retrieved March 10, 2017, from <http://www.hapamodel.de/>
- Sofi, F., Macchi, C., Abbate, R., Gensini, G.F. & Casini, A. (2016). Mediterranean diet and health status: an updated meta-analysis and a proposal for a literature-based adherence score. *Public Health Nutrition*, 17, 2769-2782.
- Stewart, S.T., Cutler, D.M. & Rosen, A.B. (2016). Forecasting the effects of overweight and smoking on U.S. life expectancy. *New England Journal of Medicine*, 361(23), 2252-2260.
- Symons Downs, D. & Hausenblas, H. (2005). Elicitation studies and the Theory of Planned Behavior: A systematic review of exercise beliefs. *Psychology of Sport and Exercise*, 6, 1-31.
- Trichopoulou, A., Costacou, T., Barnia, C. & Trichopoulos, D. (2015). Adherence to a Mediterranean diet and survival in a Greek population. *New England Journal of Medicine*, 348, 2599-2608.
- Wang, Y. & Beydoun, M. (2017). The obesity epidemic in the United States-gender, age,

socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta regression analysis. *Epidemiology Review*, 29, 6-28.

Wing, R.R., Tate, D.F., Gorin, A.A., Raynor, H.A. & Fava, J.L. (2016). STOP Regain: Are There Negative Effects of Daily Weighing? *Journal of Consulting and Clinical Psychology*, 75(5), 715.

Zaragoza-Marti, A., Cabanero-Martinez, M.J., Hurtado-Sanchez, J.A., Laguna-Perez, A. & Ferrer-Cascales, R. (2018). Evaluation of Mediterranean diet adherence scores: a systematic review. *British Medical Journal*, 8, 1-8.

Appendix A

Project Cost Center Table

MedDiet Cost		
Projected started date 9/20/18		
Item	Cost	Notes
Deste Baptiste DNP UMKC graduate student		Was not compensated for data collection and providing education
Office manager and NPs		Was not compensated for recruitment and data collection
Educational Pamphlets	\$3.75 per paper ream x 5 \$25.00 per ink cartridge x 3	Mediterranean food pyramid
Digital Weight Scale	\$47.90 for 2 scales	Provided for 2 participants who did not have weight scales
Food Diary	\$5 per item. 7 items =\$ 35	Food & drink log, weight log
Supplies	\$60	Paper, Ink, Stamps, Survey. Additional material may be needed.
1 Medical Assistant	\$14/hour/ 3 x weekly	Uncompensated
RN	\$26/hour/ 3 x weekly	Uncompensated
Total	\$ 236.65	This sum includes \$ 23.25 for additional supplies

Appendix B

Definition of Terms

Adherence: The ability to commit to an intervention

Health Outcome: Result of a certain health determinants or variables

Mediterranean Diet: A mixture of fruits, nuts, fine grains, vegetables and olive

Self-monitoring: The ability to both observe and measure one's ability

Appendix C

PICOTS: In adult patients 18 to 50 years of age, diagnosed with obesity, does adopting the Mediterranean diet lower BMI and waist circumference, over a period of three months in the primary care clinic?

First author, Year, Title, Journal	Purpose	Research Design, Evidence Level & Variables	Sample & Sampling, Setting	Measures & Reliability (if reported)	Results & Analysis Used	Limitations & Usefulness
Burgess. (2017). Behavioural treatment strategies improve adherence to lifestyle intervention programs in adults with obesity: a systematic review and meta-analysis. Clinical Obesity	To determine if motivational counseling improve adherence to lifestyle intervention programs in adults with obesity	Systematic review Meta-analysis RCTs Level V	30 randomized studies in primary care setting	mean (M) and standard deviation (SD) are as follows	The average effect size for session attendance expressed in Percentage	Weakness: heterogeneity level Publication bias Small number of studies available for inclusion. of adherence
Bonaccio. (2013). Nutrition knowledge is associated with higher adherence to Mediterranean diet and lower	To assess nutrition knowledge and observance	Cross-Sectional Study Level IV	Population-based cohort study on	Data analysis was generated using SAS/STAT software, Version validity, test-retest	Nutrition knowledge improve dietary habits and promote healthier choices	Weakness: selection biases Strength: data support the issue of participants knowledge

<p>prevalence of obesity. Results from the Moli-sani study. Appetite 68</p>						<p>on health-related issues as a possible tool for promoting healthier choices also in terms of dietary habits</p>
<p>Martinez-Gonzalez. (2015). Adherence to Mediterranean diet and risk of developing diabetes: prospective cohort study. British Medical Journal</p>	<p>To assess the relation between adherence to a Mediterranean diet and the incidence of diabetes</p>	<p>Case control- Single experimental study RTC Level II</p>	<p>Spanish University Department 13380 Spanish university graduates without diabetes</p>	<p>95% confidence intervals. Poisson regression models</p>	<p>Participants who adhere closely to a Mediterranean diet had a lower risk of diabetes.</p>	<p>Weakness: small number of new cases of diabetes Strength: participants had high level of engagement</p>
<p>Kesse-Guyot. (2013). Adherence to Mediterranean diet reduces the risk of metabolic syndrome: A 6-year prospective study. Nutrition, Metabolism & Cardiovascular Diseases</p>	<p>To evaluate effect evidence of Mediterranean diet</p>	<p>Quasi-experimental study with intervention and control group- non-randomized Level III</p>	<p>1,281 participants with diabetes at Paris-Cochin Hospital</p>	<p>Logistic regression model Linear. Statistical tests</p>	<p>Reduced risk of metabolic syndrome</p>	<p>None</p>

<p>Nissensohn. (2015). The Effect of the Mediterranean Diet on Hypertension: A Systematic Review and Meta-Analysis. Journal of Nutrition Education and Behavior</p>	<p>To analyze the effect of MedDiet interventions on blood pressure</p>	<p>A Systematic Review and Meta-Analysis and Randomized Control Level V</p>	<p>7,000 individuals 3 primary care clinics</p>	<p>Interviews and article reviews</p>	<p>The pooled estimation effect (95% CI</p>	<p>Weakness: Limited the statistical power analyses The pooled effect. high evidence of heterogeneity Strength: Effective sampling and no coercion in data analysis.</p>
<p>Lasa. (2014). Comparative effect of two Mediterranean diets versus a low-fat diet on glycaemic control in individuals with type 2 diabetes. European Journal of Clinical Nutrition</p>	<p>Was to compare the effect of two Mediterranean diets versus a low-fat diet on several</p>	<p>Single Quantitative Study Level IV</p>	<p>Participants with type II diabetes were community dwellers in Barcelona, men aged 55-80 years old and women 60-80 years old Barcelona Hospital Clinic</p>	<p>SPSS Statistics 19.0</p>	<p>Increased values of adiponectin ratio (p=0.043) and low-fat diet (p<0.001)</p>	<p>Weakness: Study was carried out in type II diabetes patients Strength: Good sampling method</p>
<p>Park. (2016). Mediterranean diet and mortality risk in metabolically</p>	<p>Was to investigate the association between Mediterranean</p>	<p>A quantitative study; a cross-sectional & descriptive; Level V</p>	<p>1,739 adults age 20-80 years old from the National Health and Nutrition</p>	<p>Cox Proportional hazard regression</p>	<p>Adherence to Mediterranean diet reduced mortality</p>	<p>Unable to confirm whether individuals had the same</p>

<p>healthy obese and metabolically unhealthy obese phenotypes. International Journal of Obesity</p>	<p>diet, metabolic phenotypes and mortality risk</p>		<p>Examination Survey III</p>			<p>benefits from CVD risk reduction because hypothesis were focused on short term effects. More evidence would be necessary based on long term follow-up studies.</p>
<p>Huo. (2015). Effects of Mediterranean-style diet on glycemic control, weight loss and cardiovascular risk factors among type 2 diabetes individuals: a meta-analysis. European Journal of Clinical Nutrition</p>	<p>To explore the effects of Mediterranean diet on glycemic control, weight loss and cardiovascular risk factors in diabetes patients</p>	<p>Cross-sectional study Convenience Sample Level IV</p>	<p>N=1,178 adult patients with all ready diagnosed diabetes</p>	<p>Estimated effect size 95% CI by utilizing random effect models.</p>	<p>Mediterranean style diet provides greater glycemic management</p>	<p>None</p>

<p>Ruiz-Cabello. (2017). Influence of the degree of adherence to the Mediterranean diet on the cardiometabolic risk in peri and menopausal women. The Flamenco Project. Nutrition, Metabolism & Cardiovascular Diseases</p>	<p>To assess whether different degrees of adherence to the MD were associated with the cardiometabolic risk in peri and menopausal women.</p>	<p>Qualitative study and literature review Level IV</p>	<p>N= 128 perimenopause women</p>	<p>Descriptive statistics</p>	<p>Adherence to the MD was found to be associated with resting heart rate (p Z 0.026), total cholesterol (p Z 0.028), LDL-C (p Z 0.027), total cholesterol/HD L-C ratio (p Z 0.030), and C-reactive protein levels (p Z 0.011). Mediterranean diet promotes a reduced cardiometabolic risk among peri and menopausal women.</p>	<p>None</p>
<p>Erwin. (2018). A qualitative and quantitative analysis exploring preferred methods of peer support to encourage</p>	<p>To determine the preferred peer support approach to encourage adherence to Mediterranean diet.</p>	<p>Qualitative and Quantitative Level VI and IV, respectively</p>	<p>A dozen focus groups (60% female, mean age 64 years)</p>	<p>Information from questionnaires were entered in IBM SPSS.</p>	<p>Group peer support approach is most likely to encourage adherence to a Mediterranean diet.</p>	<p>Weakness: Preference scoring method and discussion bias. participants visualize the different</p>

<p>adherence to a Mediterranean diet in Northern European population at high risk of cardiovascular disease. British Medical Journal of Public Health</p>						<p>support peer approach</p>
<p>Manasse. (2017). Are individuals with loss-of-control eating more prone to dietary lapse in behavioural weight loss treatment? An ecological momentary assessment study. European Eating Disorders Review</p>	<p>To examine whether the presence of loss-of-control associated with non-adherence</p>	<p>Cross-sectional study convenience sample Level IV</p>	<p>N = 189 overweight and obese adults with a BMI 27-50</p>	<p>Descriptive analysis u impact of dietary lapses with a CI 95%</p>	<p>Loss of control was positively associated with dietary lapse.</p>	<p>Weakness: Relatively small subsample who endorse LOC and bias of subjectivity reporting on own lapses.</p> <p>Strength: Use of EMA to analyze prospective relationships between internal experiences and lapse occurrence</p>

<p>Zaragoza-Marti. (2018). Evaluation of Mediterranean diet adherence scores: a systematic review. British Medical Journal</p>	<p>To assess whether different degrees of adherence to the MD were associated with decreased cardiometabolic and healthy men</p>	<p>Quantitative study and literature review Level IV</p>	<p>N= 136 perimenopause women</p>	<p>Descriptive statistics</p>	<p>Adherence to the MD was found to be associated with decreased glycemic level</p>	<p>None</p>
<p>Dansinger. (2016). Meta-analysis: The Effect of Dietary Counseling for Weight Loss. Annals of Internal Medicine</p>	<p>To evaluate the effect of dietary counseling compared with usual care on body mass index (BMI) over time in adults.</p>	<p>Systematic Review Meta-analysis Level 1</p>	<p>Overweight adults aged 18 and older. Randomized sampling</p>	<p>Descriptive statistics and power analysis</p>	<p>Dietary counseling Enhanced compliance</p>	<p>None</p>
<p>Dinu. (2018). Mediterranean diet and multiple health outcomes: an umbrella review of meta-analyses of observational studies and randomized trials. European</p>	<p>To explore if greater adherence to the Mediterranean diet is associated with a reduced risk of major chronic disease.</p>	<p>Systematic Review of RCTs. Level I Evidence</p>	<p>25 articles reported data from 140 different meta-analyses</p>	<p>Effect size and CI by 95%</p>	<p>Adherence to Mediterranean diet decreases the overall risk of cardiovascular diseases, metabolic syndrome, and mortality rate.</p>	<p>None</p>

Journal of Clinical Nutrition						
Ahmed. (2016). Trends and disparities in the prevalence of physicians' counseling on diet and nutrition among the U.S. adult population, 2000-2011. Preventive Medicine	To recognize the impact of physicians' Counseling on their patients	A quantitative study; a cross-sectional & descriptive; Level IV	A convenience sample of non institutionalized population of the U.S. aged 18 and above	Physician-delivered counseling has shown to be effective	One way ANOVA	
Flegal. (2012). Prevalence of Obesity and Trends in the Distribution of Body Mass Index Among US Adults, 1999-2010. JAMA	To estimate the prevalence of adult obesity from the 2009-2010 National Health and Nutrition Examination Survey	Systematic Review of RCTs. Level I Evidence	Randomized controlled trial A total of 277 men and women were recruited through the Danish recruitment website	Descriptive statistics Paired t-test	Prevalence of obesity is higher among women than men	International comparisons of BMI
Stefler. (2017). Mediterranean diet score and total and cardiovascular	To examine whether Mediterranean diet	Systematic Review. Level I	A prospective of 12 cohort studies	Participants' adherence to the Mediterranean diet was classified	adherence to Mediterranean diet was low (25 %). One	Over the median follow-up time of 7 years

mortality in Eastern Europe: the HAPIEE study. European Journal of Nutrition	score (MDS) is associated with CVD			as low	standard deviation (SD)	The moderate response rates selection bias
Martínez-González. (2016). Mediterranean diet and reduction in the risk of a first acute myocardial infarction: an operational healthy dietary score. European Journal of Nutrition	To study the risk reduction of incident myocardial infarction provided by a Mediterranean dietary pattern	Case control-Single experimental study RTC. Level II	171 cases all male or female subjects, aged under 80, with their first definite AMI in tertiary hospitals of Pamplona (Spain)	the observed values for the a priori defined pattern ranged between 9 and 38.	reductions in relative risks associated with a high consumption MedDiet	hospitalized patients small sample size
Storniolo. (2017). A Mediterranean diet supplemented with extra virgin olive oil or nuts improves endothelial markers involved in blood pressure	To evaluate if serum nitric oxide (NO) reduction and increased on endothelin-1 (ET-1) play a pivotal role in endothelial dysfunction and hypertension	Systematic Review. Level I	Ninety non-smoker women (aged 60–80 years)	Positive correlation	probability plots were expressed as mean ± SEM General linear	Lack of research on nitric oxide influence on blood pressure and cardiovascular benefits, since this meta-

control in hypertensive women. European Journal of Nutrition						
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Appendix D

Rating System for the Hierarchy of Evidence For an Interventional Inquiry (Modification by Dr. Lindholm for course N5613)	
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs. <i>Evidence-based clinical practice guidelines based on systematic reviews of RCTs</i> .*
Level II	Evidence obtained from well-designed RCT. <i>Quantitative systematic review of well-designed controlled trial without randomization.</i>
Level III	Evidence obtained from well-designed controlled trial without randomization (<i>quasi-experimental</i>). <i>Quantitative systematic review of case-control, cohort, or correlational studies.</i>
Level IV	Evidence from well-designed case-control or cohort study (<i>or cross-sectional study</i>)
Level V	Evidence from systematic review of <i>quantitative</i> descriptive (<i>no relationships to examine</i>) or qualitative studies.
Level VI	Evidence from a single <i>quantitative</i> descriptive (<i>no relationships to examine in the study</i>) or qualitative study
Level VII	Evidence from the opinion of authorities and/or reports of expert committees

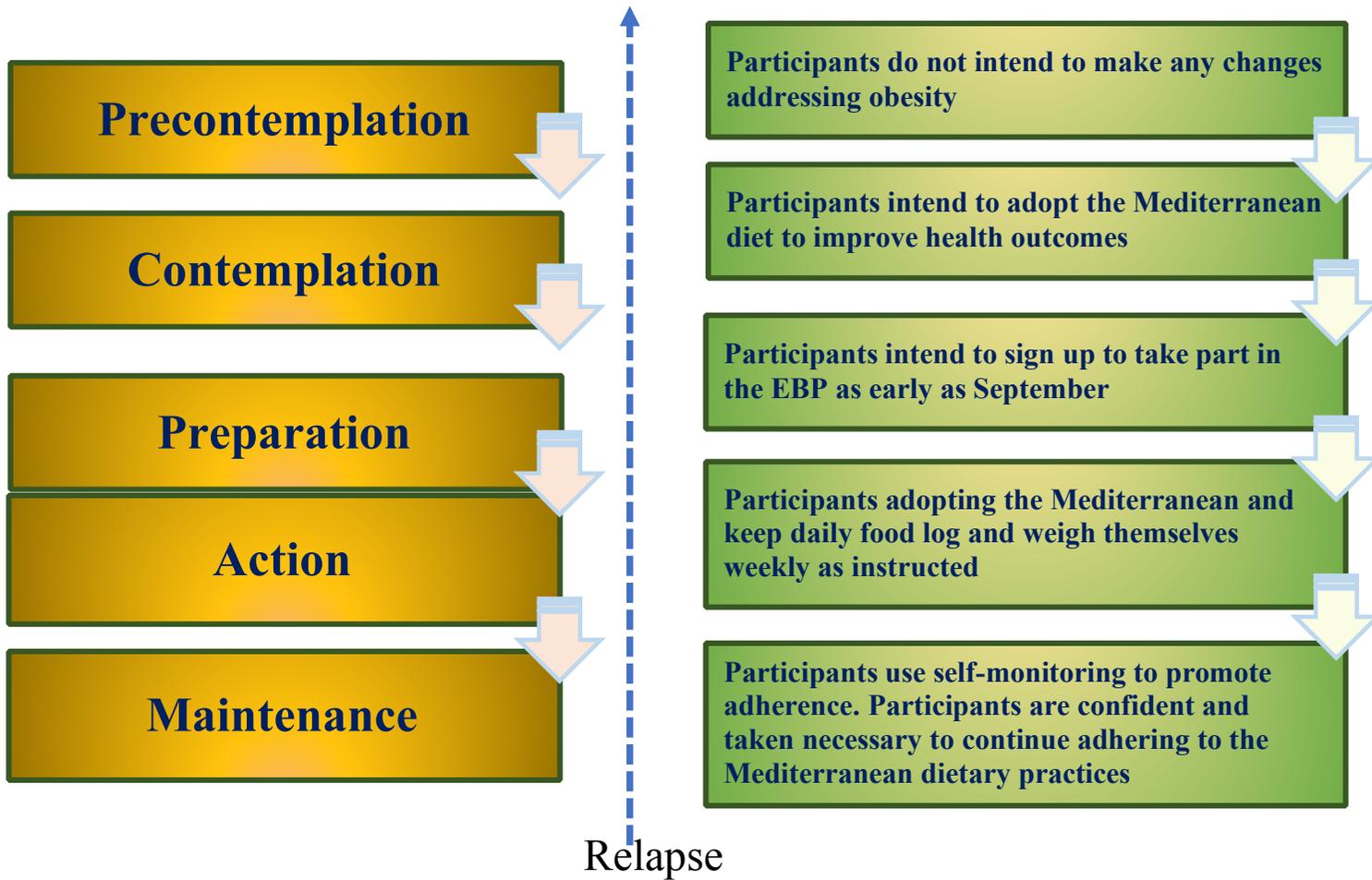
Appendix E

Logic Model for DNP Project					
Student: Deste D. Baptiste					
Inquiry, PICOTS: In adult patients 18 to 50 years of age, diagnosed with obesity, does adopting the Mediterranean diet lower BMI and waist circumference, over a period of three months in the primary care clinic?					
Inputs	Intervention(s) <i>Activities</i>	Outputs <i>Participation</i>	Outcomes – Impact		
			<i>Short</i>	<i>Medium</i>	<i>Long</i>
<p>Evidence, sub-topics</p> <ol style="list-style-type: none"> 1. Self-Monitoring and Self-Efficacy 2. Self-Reinforcement 3. Goal Setting and Perceived Barriers 4. Behavioral Contract <p>Major Facilitators or Contributors</p> <ol style="list-style-type: none"> 1. Front Desk 2. Office Manager 3. 2 Healthcare Providers 4. Grant Funding <p>Major Barriers or Challenges</p> <ol style="list-style-type: none"> 1. Patient adherence 2. Attrition 3. Patient relapse 4. Clinic staff adherence 	<p>Providing an educational pamphlet regarding the Mediterranean Diet</p> <p>Major steps of the intervention (brief phrases)</p> <ol style="list-style-type: none"> 1. Creating food log 2. Creating PowerPoint presentation 3. Purchase scale 4. Transportation fund 	<p>The participants (subjects)</p> <p>N=100, 18-50 years</p> <p>Site</p> <p>To be determined</p> <p>Time Frame</p> <p>11/2018-01/2019</p> <p>Consent or assent Needed</p> <p>Yes</p> <p>Other person(s) collecting data (yes/no)</p> <p>No</p> <p>Others directly involved in consent or data collection (yes/no)</p> <p>No</p>	<p>(Completed during DNP Project)</p> <p>Outcome(s) to be measured</p> <p>Primary: Reduce BMI in adults of suspected BMI > 25</p> <p>Secondary: Reduce waist circumference in adults with WC > 40</p> <p>Measurement tool(s)</p> <ol style="list-style-type: none"> 1. 14-Item Questionnaire of Mediterranean diet adherence <p>Statistical analysis to be used</p> <ol style="list-style-type: none"> 1. T-test 2. Regression Analysis 	<p>(after student DNP)</p> <p>Outcomes to be measured</p> <p>Increased dietary prevention in patients who are at risk for developing obesity and make referral to dietician.</p> <p>Improve nutrition counseling using Mediterranean diet guidelines.</p> <p>Increase awareness about unhealthy dietary practices and encourage both patients and care providers to discuss weight management program to improve health outcome.</p>	<p>(after student DNP)</p> <p>Outcomes that are potentials</p> <p>Potential long-term outcomes including adopting the Mediterranean diet in the primary care clinics. Provide education to health providers to introduce the Mediterranean diet to every patient.</p>

Appendix F

Transtheoretical Model of Behavioural Change

(Prochaska, 1979)



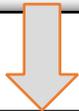
Appendix G

Intervention Participant Flow Diagram**Step 1: Recruitment**

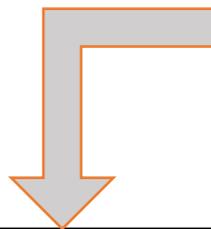
Seeking adult patients between the age 18-50 years old who currently diagnosed with obesity. Registered nurses, nurse practitioners, and medical assistants will select participants, using a convenience sampling method over a period of 8 weeks in the primary care clinic.

**Step 2: Eligible for Intervention?**

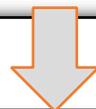
Student researcher will review eligibility for inclusion criteria by analyzing data gathered during the recruitment. Inclusion criteria: Adults 18 -50 years of age with a BMI > 25 and Waist Circumference >40.

**Step 3:**
Informed Consent**Step 4:**

Baseline data collection:
Mediterranean daily food log and weekly weight log will be collected. Student researcher will input data from the logs in to a generated data tracker twice a week (Monday, Wednesday, Saturday)

**Step 5:**

Nutrition counseling will be provided to patients via telephone or face to face in the primary clinic.

**Step 6:**

Post data collection

Student researcher will use a t-test for data analysis. Participant's weekly weight and daily food logs will be analyzed, further nutrition counseling, education, and encouragement will be provided to participants if needed to promote adherence to the Mediterranean dietary patterns.

Appendix H



July 25, 2018

UMKC Institutional Review Board
Primary Project Site IRB
UMKC DNP Student

UMKC IRB, Primary Project Site IRB, and DNP Student

This letter serves to provide documentation regarding Deste Baptiste's Doctor of Nursing Practice (DNP) Project proposal. Mr. Baptiste obtained approval for his project proposal, *The Impact of Mediterranean Diet on Adult Obesity*, from the School of Nursing and Health Studies DNP faculty on July 25, 2018.

If we can provide further information, please feel free to contact us.

Sincerely,

A handwritten signature in black ink that reads "Dr. Cheri Barber". The signature is written in a cursive style.

Cheri Barber, DNP, RN, PPCNP-BC, FAANP
Clinical Assistant Professor
DNP Program Director
UMKC School of Nursing and Health Studies
barberch@umkc.edu

Lyla Lindholm, DNP, ACNS-BC
Clinical Assistant Professor
DNP Faculty

Appendix I



Mediterranean Diet Pyramid

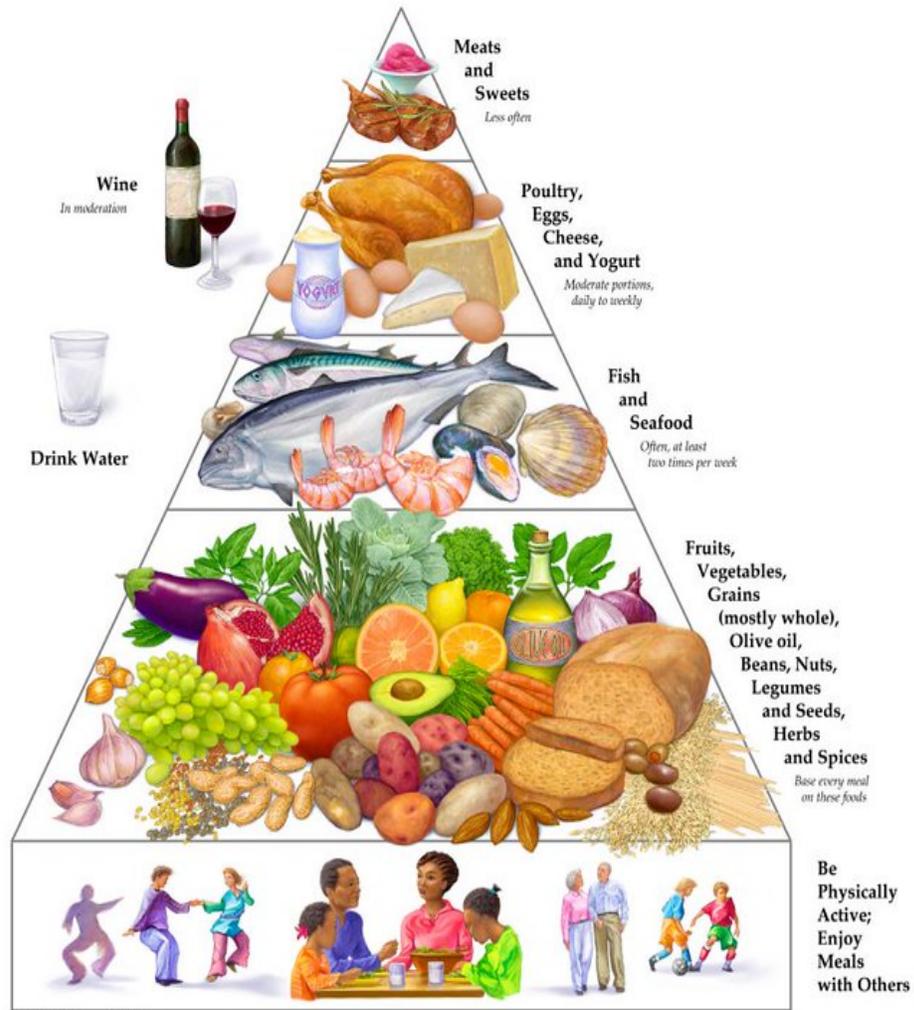


Illustration by George Middleton

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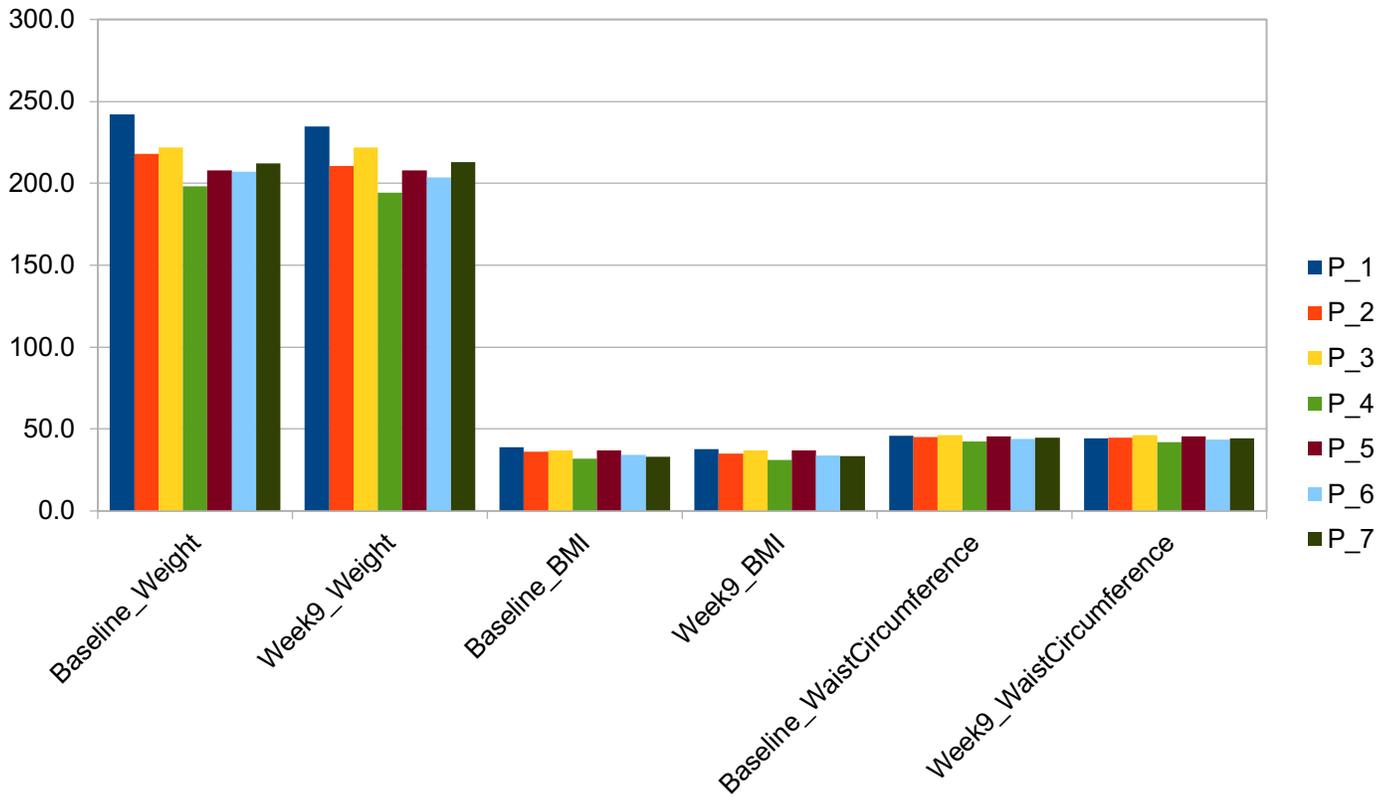
Appendix J

Statistics

		Pre_Interventi on_Weight	Post_Interven tion_Weight	Pre_Inteventi on_BMI	Post_Interven tion_BMI	Pre_Interventi on_WaistCirc umference	Post_Interven tion_WaistCir cumference
N	Valid	7	7	7	7	7	7
	Missing	0	0	0	0	0	0
Mean		215.286	212.214	35.529	35.014	44.914	44.357
Median		212.000	210.400	36.300	35.000	45.300	44.300
Mode		198.0 ^a	194.1 ^a	32.0 ^a	31.3 ^a	42.4 ^a	41.9 ^a
Range		44.0	40.4	7.1	6.5	3.8	4.2

Appendix K

Mediterranean Diet



Appendix L



July 25, 2018

UMKC Institutional Review Board
Primary Project Site IRB
UMKC DNP Student

UMKC IRB, Primary Project Site IRB, and DNP Student

This letter serves to provide documentation regarding Deste Baptiste's Doctor of Nursing Practice (DNP) Project proposal. Mr. Baptiste obtained approval for his project proposal, *The Impact of Mediterranean Diet on Adult Obesity*, from the School of Nursing and Health Studies DNP faculty on July 25, 2018.

If we can provide further information, please feel free to contact us.

Sincerely,

A handwritten signature in black ink that reads "Cheri Barber".

Cheri Barber, DNP, RN, PPCNP-BC, FAANP
Clinical Assistant Professor
DNP Program Director
UMKC School of Nursing and Health Studies
barberch@umkc.edu

Lyla Lindholm, DNP, ACNS-BC
Clinical Assistant Professor
DNP Faculty

UNIVERSITY OF MISSOURI-KANSAS CITY

2464 Charlotte • Kansas City, MO 64108-2718 • p 816 235-1700 • f 816 235-1701
www.umkc.edu/nursing • nurses@umkc.edu
an equal opportunity/affirmative action institution