The Healthy Hearts Program: a pilot nutritional intervention to reduce cardiovascular risk factors

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1. Project Overview

1.1. Summary of relevant research findings leading to this research proposal

Obesity and high blood pressure are contributing factors to cardiovascular disease (CVD), a clinical condition which causes approximately 18 million deaths in the United States. The Southeastern United States contains four of the top five states with the highest adult obesity rates. Nutrition interventions promoting healthy food habits and choices can manage obesity and cardiovascular disease. However, recent studies have shown 12-week nutritional interventions promoting the dietary patterns of those seen in the Mediterranean, coupled with the supplementation of extra virgin olive oil (EVOO) or mixed nuts, are very effective in reducing the risk of CVD and cardiovascular events (1,2,3)

1.2. Brief description of methodology, including design, population, and variables of interest

This will be a prospective randomized controlled trial of Auburn University (AU) employees or an adult sponsored dependent of an active employee (<18 years old) who was insured by the AU Health and Pharmacy Insurance plan during 2015 and enrolled in the Health Insurance plan for 2016 and/or 2017. Eligible patients are 1) those completing their "Healthy Tigers" biometric screening between 01/01/2015-5/31/16, 2) who had a BMI ≥30 and two or more of the following CVD risk factors: male, age 55-80; female, age 60-80; current smoker; family history of premature coronary heart disease; received a red or yellow zone reading for their blood pressure, blood glucose, total cholesterol; those with a diagnosis of hypertension, pre-diabetes, or hypercholsterolemia; a patient of the AU Employee Pharmacy enrolled in the TigerMeds program with an existing diagnosis of hypertension, pre-diabetes, or hypercholesterolemia. Patients will be randomized into two groups: the AHA vs MD. The study will consist of a 12-week nutrition education program that includes dietary nutrition education sessions (both groups) and extra virgin olive oil and mixed nut supplementation (MD group). We will assess program impact by comparing baseline characteristics including body mass index, blood pressure, blood glucose, and total cholesterol, etc., and reassessing the same measures at week 6 and week 12 of the study.

2. Purpose

2.1. Purpose of this project including research questions and/or aims

The primary objective of this pilot study is to assess the efficacy of a MD intervention (education + EVOO and mixed nut supplementation) versus that of an AHA nutrition intervention (education) on serum blood lipid levels as markers for cardiovascular disease risk. As secondary outcomes we will assess insulin resistance, serum metabolic factors, blood pressure, body mass index, and waist circumference.

Research Question: In the Southeastern United States, is the dietary pattern of the American Heart Association or a Mediterranean style diet more effective in the reduction of CVD risk factors.

Aim 1: To assess whether or not patients have improvements in their CVD risk factors by the end of the 12-week program.
Aim 2: To assess which dietary intervention is most effective in the reduction of CVD risk factors at the end of the 12-week program.

2.2. How results of this project will be used (e.g., Presentation? Publication? Thesis? Dissertation?)

It is currently expected that this work will form the base of Ms. Amy Willis' dissertation. The results from this project will be submitted for publication and an abstract will be submitted for acceptance to a professional conference; however, no specific patient information will be disclosed.

3. Participants

3.1. Inclusion and exclusion criteria

a) Inclusion Criteria:

Auburn University employees or an adult sponsored dependent of an active employee who was insured by the Auburn University Health and Pharmacy Insurance Plan during 2015 and/or 2016 and who are enrolled in the Auburn University Health Plan for the 2017 plan year, who meet the following criteria:

1.) Have completed their "Healthy Tigers" screening for the 2015, 2016, or 2017 plan year (completed by the "Healthy Tigers" staff or through submission of a "Healthy Tigers" healthcare provider form OR is a patient of the AU Employee Pharmacy and is enrolled in the TigerMeds program OR is a participant in the Pharmacy Practice Experience (PPE) who is seen within the AUPCC **AND** has a BMI (kg/m2) screening value >24.9 AND has two or more of the following CVD risk factors:

a) screening values classified in the "yellow" or "red" zone for:
   - Systolic blood pressure (mmHg): Yellow zone: ≥140, Red zone: ≥160;
   - Diastolic Blood pressure (mmHg): Yellow zone: ≥90, Red zone: ≥ 100;
   - Fasting blood glucose (mm/dL): Yellow zone: ≥100, Red zone: ≥ 126
   - Blood glucose(random) (mg/dL): Yellow zone: 140-200, Red zone > 200
   - Total Cholesterol (mg/dL): Yellow zone: ≥200, red zone: ≥250

b) Have a pre-existing diagnosis of hypertension, pre-diabetes, or hypercholesterolemia
c) Current smoker (≥1 cigarette/day)
d) Are: male (age: 55-80) or female (age: 60-80)
e) A family history of premature coronary heart disease
f) High risk ethnicity: Black, African American, American Indians/Alaska Natives, Non-Hispanic blacks, Mexican-Americans, Asian, Hispanic/Latino

b) Exclusion Criteria:
    1. Minors that are less than 19 years of age
    2. Individuals who are not enrolled in the Auburn University health insurance program for the 2016 plan year at baseline and have not yet completed initial visit
    3. Individuals who have not completed their 2015 "Healthy Tigers" biometric screening between January 1st and December 31st, 2015 (these can be completed by the "Healthy Tigers" staff or by submitting a healthcare provider form from the individuals' physician to the "Healthy Tigers" office), unless enrolled in TigerMeds.
    4. Individuals who are pregnant or who intend to become pregnant during the 12-week health and wellness challenge.
    5. Individuals who anticipate absence or travel throughout the study that would interfere with their ability to complete the analysis at the mid-point and end of challenge.
    6. Patients with a peanut, tree nut, or olive oil food allergy or intolerance.
    7. Patients who are unable or unwilling to travel to Auburn University main campus for live health and wellness challenge events, individual assessments, personal appointments, and pre- and post- data collection
    8. Individuals who have NOT been stabilized on medication to treat or manage high blood pressure, high cholesterol, dyslpidiemia, or pre-diabetes for at least 12 weeks prior to the study.
    9. Patients who do not have access to the internet and therefore unable to complete the education portion of the study
    10. Individuals who have a pacemaker
    11. Patients who decline participation during informed consent

3.2. Recruitment methods

1. Recruitment will be expanded to include participants enrolled in the Pharmacy Practice Experience who are seen within the AUPCC
2. Recruitment will take place from November 2016-February 2017 until the project is filled
3. A letter describing the research study including the name of the project, the investigators, the inclusion and exclusion criteria, study description, will be e-mailed to all 2015, 2016, and 2017 "Healthy Tigers" and "TigerMeds" participants.
4. Patients that are screened in the "Healthy Tigers" program OR patients who are a part of the PPE program and seen within the AUPCC during the months of November 2016- February 2017 (until the study is filled) and meet criteria on the "Healthy Hearts Program Eligibility Screener" will receive a promotional flier (see Appendix A) during their screening process. If the patients have questions about the study, they will be directed to Amy Willis or a member of the "Healthy Tigers" staff.
5. Messages about the Healthy Hearts Program will be sent to AU employees via the AU Daily

6. Participants of ScaleBack Alabama who weigh in at the AUPCC during the months of January-February 2017 will receive a promotional flyer
7. Social media announcements on Facebook, Twitter, and Instagram.

4. Project Design and Methods

4.1. Methods for consenting participants

Participants will be seen at the Auburn University Pharmaceutical Care Clinic (AUPCC) for their initial "Healthy Tigers" Healthy Hearts Program consenting visit. During this visit, individuals will be screened for eligibility. Once eligibility is determined, a printed copy of the Informed Consent will be given to and discussed with the eligible individual. If the participant chooses to participate, their signature will be obtained on the consent form. Participants will make an appointment for their Baseline visit.

4.2. Research design and methods

1) Participants will be seen at the Auburn University Pharmaceutical Care Clinic (AUPCC) for their initial "Healthy Tigers" Healthy Hearts Program consenting visit. The assessment will include a health and wellness interview, International Physical Activity Questionnaire, Diet History Questionnaire II, a Mediterranean diet knowledge/adherence survey, and the completion of the eligibility form. During this visit, the letter of consent will be given to and discussed with the participant. If the participant chooses to participate, their signature will be obtained on the consent form.
2) a) Participants will then return to the Auburn University Pharmaceutical Care Clinic (AUPCC) for their baseline "Healthy Tigers" Healthy Hearts Program visit. Pharmacists and pharmacy residents, employed by the AUPCC will obtain the following: height measurement (inches), weight measurement (pounds), Calculated BMI (kg/m2) measurement of body composition (using bioelectrical impedance analysis) (% body fat, pounds of fat, pounds of lean mass, pounds of total body water), waist measurement (inches), hip measurement (inches), Waist to Hip Ratio, Waist to Height Ratio, Systolic blood pressure (mmHg), Diastolic blood pressure (mmHg), resting pulse (bpm), fasting blood glucose (mg/dL), fasting total cholesterol (mg/dL), fasting LDL-cholesterol (mg/dL), fasting HDL-cholesterol (mg/dL), fasting Triglycerides (mg/dL), total Cholesterol to HDL ratio, Atherosclerotic cardiovascular disease risk (ASCVD) Score (%), fasting insulin mI/L, fasting leptin ng/mL, IL-6 (pg/mL), tumor necrosis factor-α (pg/mL), urinary tyrosol and hydroxytyrosol. These measurements will be repeated at week 6 and week 12 of the trial.

   b) At this baseline appointment, the patient will also receive a baseline medication therapy management (MTM) assessment by a pharmacist in order to identify any potential or actual drug-related problem (DRPs), and to monitor for efficacy and safety of all medications, make recommendations for vitamins, minerals, and supplements, and provide preventative care recommendations (such as immunizations, osteoporosis screenings, colonoscopy, mammograms, and other recommended medical screenings that are recommended for the patient's age, gender, and concomitant disease states and medications).

c) All subjective and objective medical information collected during this appointment will be recorded in the CompuGroup Medical (CGM) electronic medical record (EMR) that is used in the Auburn University Pharmaceutical Care Center (AUPCC) and the "Healthy Tigers" programs. This EMR is a secure medical record that meets all HIPAA requirements and has been reviewed by the Harrison School of Pharmacy (HSOP) HIPAA officer, the Auburn University HIPAA officer, and the AU HIPAA consultant, and meets all legal and security requirements. These data will be perpetually stored in this EMR as required of medical data. Access to this EMR is restricted to authorized personnel only.

3) Baseline, 6 week and 12 week Appointments

a) Participants will then return to the Auburn University Pharmaceutical Care Clinic (AUPCC) for their baseline "Healthy Tigers" Healthy Hearts Program visit. Pharmacists and pharmacy residents, employed by the AUPCC will obtain the following: height measurement (inches), weight measurement (pounds), Calculated BMI (kg/m2) measurement of body composition (using bioelectrical impedance analysis) (% body fat, pounds of fat, pounds of lean mass, pounds of total body water), waist measurement (inches), hip measurement (inches), Waist to Hip Ratio, Waist to Height Ratio, Systolic blood pressure (mmHg), Diastolic blood pressure (mmHg), resting pulse (bpm), fasting blood glucose (mg/dL), fasting total cholesterol (mg/dL), fasting LDL-cholesterol (mg/dL), fasting HDL-cholesterol (mg/dL), fasting Triglycerides (mg/dL), total Cholesterol to HDL ratio, Atherosclerotic cardiovascular disease risk (ASCVD) Score (%), fasting insulin mI/L, fasting leptin ng/mL, IL-6 (pg/mL), tumor necrosis factor-α (pg/mL), plasma α linolenic acid, urinary tyrosol and hydroxytyrosol. These measurements will be repeated at week 6 and week 12 of the trial.

All data will be collected at:

Auburn University Main Campus
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record that meets all HIPAA requirements and has been reviewed by the Harrison School of Pharmacy (HSOP) HIPAA officer, the Auburn University HIPAA officer, and the AU HIPAA consultant, and meets all legal and security requirements. These data will be perpetually stored in this EMR as required of medical data. Access to this EMR is restricted to authorized personnel only. Participants will also have a paper research chart. No identifying data identifying information will be kept in the research chart. Participants will be assigned a personal, unique, and confidential study code at this visit. This study code will be placed at the top of all data sheets that are placed in the research chart. Identifying information will be stored electronically as part of the electronic medical records of the AUPCC for the individual patients. The code list linking the study code to the EMR will be stored in the medical records room the AUPCC (2155C) which has controlled access. The specific cabinet in which it will be stored has a key lock and the key is stored in a password-protected lockbox.

d) At the end of the baseline and 6 week appointments, participants in The Mediterranean Diet (MD) group will receive 3L of olive oil and 3 pounds of mixed nuts. Participants in the MD group will be educated by oral and written means, on consumption goals. Participants will be asked to return any unused supplements at the midpoint (week 6) and 12-week appointment. Information will be provided to the participant on how to access nutritional information used within this study and how to access the educational programming. Written instructions will also be provided.

e) Participants will complete 3 surveys/questionnaires at their baseline visit, 6 week, and 12 week appointments. The Mediterranean diet screener and the International Physical Activity questionnaire will be completed in person. Participants will complete the web-based version of the Diet History Questionnaire II.

4) Participant Involvement Time

Participant Task		**Total Involvement Time**
In-Person Visits to the AUPCC	**Estimated Time**	
Consenting visit	45 minutes	
Baseline visit	45 minutes	
6 week visit	45 minutes	
12 week visit	45 minutes	
Total In-Person Involvement Time		**180 Minutes**
Web-Based Tasks		
Diet History Questionnaire (x3)	30 minutes each	90 minutes
Nutrition Education Modules (x7)	10 minutes each	70 minutes
Total Web-Based Involvement		**160 minutes**

Time		
Total Participant Involvement Time		**340 minutes**

5) STUDY REQUIREMENTS
   a) The participants will be asked to follow a dietary pattern that is associated with their assigned intervention group. The Mediterranean Diet (MD) group will be given supplements of extra virgin olive oil (EVOO) and mixed nuts. Participants in this group will be asked use these supplements as a part of their daily intake. A total of 6 L of EVOO and 6 pounds of mixed nuts (3 pounds raw walnuts and 3 pounds raw almonds) will be administered throughout the study. Participants in the MD group will be given 3 L of EVOO and 3 pounds of mixed nuts at the baseline appointment asked to return unused portions of at their 6-week appointment. At that time they will be given a new supplementation of 3 L or EVOO and 3 pounds of mixed nuts. Participants will be given the same instructions for use and asked to return unused portions at the end of the study (week 12).

   b) The participants might have follow-up appointments scheduled with the pharmacist within the AUPCC depending on the patient's personal care plan that is developed at baseline. For instance, if a patient has potential or actual drug-related problems that are identified on their baseline MTM appointment, then the pharmacist will schedule follow-up appointments that are appropriate for the problem and the plan of care that is developed to address these problems. This will be done consistently between all patients in the study, regardless of the randomization (the pharmacist and the will be blinded concerning which group the patient is randomized to concerning dietary intervention).

   c) Narrated nutrition education presentations will be developed by a registered dietitians, dietetic interns, graduate students, and faculty. These presentations will be loaded on the "Healthy Hearts Program" website. The participants will be asked one presentation weekly for the first 6 weeks of the study and then one additional education module at week 9. A post-presentation assessments will load after the presentation is completed, and completion of the assessment will be used as verification that the participant watched the presentation.

   d) The participant will complete the following at baseline, week-6 and week 12 of the study: Diet History Questionnaire II, International Physical Activity Questionnaire, and a Mediterranean diet knowledge and adherence questionnaire.

   e) For patients with a diagnosis of Hypertension or an elevated blood pressure reading during a "Healthy Tigers" screening that is in the yellow or red zone, home blood pressure monitoring might be integrated into the medication therapy management plan of care.

f) For patients with a diagnosis of pre-diabetes, or who have an elevated blood glucose reading during a "Healthy Tigers" screening that is in the yellow or red zones, home blood glucose monitoring might be integrated into the medication therapy management plan of care.

g) All participants will be asked to return to the AUPCC at weeks 6 and 12 for a repeat "Healthy Tigers" analysis and MTM consultation.

4.3. Measurement Procedures

Questionnaires

1) A registered dietitian or trained nutrition student will administer the following:
   a) International Physical Activity Questionnaire
   b) Mediterranean Diet Knowledge and Adherence Questionnaire
2) Participants will be instructed on how to complete the following questionnaire from home computer
   a) Food Frequency Questionnaire- Diet History Questionnaire II (DHQII)

Blood pressure (BP)

1) Blood Pressure (4): Blood pressure will be taken with a mercury sphygmomanometer with the Korotkoff's sound technique
   a) Patient will be seating comfortably, with back supported, legs uncrossed, and upper arm bare.
   b) Patient's arm should be supported at approximately heart level
   c) Cuff bladder should encircle 80% or more of the patient's arm circumference
   d) Mercury column should be deflated at 2-3 mm per second
   e) The first and last audible sounds should be recorded as systolic and diastolic pressure, respectively. Measurements should be given to the nearest 2 mm Hg.
   f) Neither the participant nor the person taking the measurement should talk during the procedure

Anthropometric measurements: *Anthropometric measurement procedures taken from the National Health and Nutrition Survey (NHANES) Anthropometry Procedures Manual. (5)*

1) Height: Participant's height will be measured via standing height.
   a) Height will be measured using a wall-mounted calibrated stadiometer
   b) Prior to measurement, participant will be asked to remove hair ornaments, jewelry, buns.
   c) Participant is to stand up straight against the backboard with the body weight evenly distributed with both feet flat with heels together and toes apart
      i) Depending on the overall body configuration of the participant, the following four points must make contact with the stadiometer backboard– head, shoulders, buttocks, and heels, examples of possible exceptions:
         1. Some overweight individuals cannot stand straight while all four points touch the backboard

2. Participants with kyphosis – a forward curvature of the spine that appears as a hump at the upper back may make contact not possible

d) Align the head in the Frankfort horizontal plane (See Figure 1)
   i) In the Frankfort horizontal plane the horizontal line from the ear canal to the lower border of the orbit of the eye is parallel to the floor and perpendicular to the vertical backboard
e) Lower the stadiometer head piece so that it rests firmly on the top of the participant's head
f) Instruct participant to stand as tall as possible and take a deep breath, and hold this position.
g) Record result in inches.

2) Weight: Participants will be weighed on a calibrated scale at the AUPCC
   a) Ask participants to remove shoes, purses/bags, jackets or bulky outerwear prior to stepping on the scale
   b) Record weight in pounds provide weight to patient.
3) Waist Circumference:
   a) Ask participant to remove any jackets or bulky outerwear. If participant feels comfortable, ask to gather his/her shirt above the waist.
   b) Ask participant to place hands on opposite shoulders.
   c) Stand on participant's right side. Palpate the hip area to locate the right ilium of the pelvis. With a cosmetic pencil draw a horizontal line just above the uppermost lateral border of the right ilium. Cross this mark at the midaxillary line, which extends down from the armpit down the side of the torso.
   d) Extend the measuring tape around the waist. Position the tape in a horizontal plane at the level of the measurement mark. Check that the tape is parallel to the floor and lies snug but does not compress the skin.
   e) Always position the zero end of the tape below the section containing the measurement value.
   f) Take and record the measurement to the nearest 0.1 cm.

Venipuncture blood draw- *Phlebotomy procedures will follow the World Health Organization's Guidelines on drawing blood: Best practices (6)*

1) **Overview**: Participant will be instructed not to eat or drink anything, other than water, after midnight the day of their baseline, 6-week, and 12-week visits. Phlebotomy of a peripheral arm vein will be performed by AUPCC clinicians (pharmacists and pharmacy residents) who have been phlebotomy trained, using sterile procedures and seated position. A sterile bandage will cover the phlebotomy site after the procedure and arm will be elevated to ensure that bleeding has stopped. The participant will be observed for any lightheadedness, bruising or bleeding during and after the procedure.
   a) If the participant is lightheaded, he/she will be reclined until symptoms resolve

b) If the participant is asymptomatic after the phlebotomy procedure, he/she will be released
c) A maximum of 3 attempts to access a vein will be allowed at each visit, for each participant. If 3 unsuccessful attempts to access a vein are made, the participant will be excused from this portion of the study.

2) **Materials**
   a) Safety Needles, 22g or less; Butterfly needles, 21g or less
   b) Vacuum tube
   c) Tourniquets
   d) Antiseptic. Individually packaged 70% isopropyl alcohol wipes
   e) 2x2 gauze or cotton balls
   f) Sharps disposal container. An OSHA acceptable, puncture proof container marked "Biohazardous"
   g) Bandages or tape
3) **Safety**
   a) Observe universal (standard) safety precautions.
   b) Wash hands in warm, running water with approved handwashing product. Hands are to be washed before and after each phlebotomy is performed.
   c) Gloves are to be worn during all phlebotomies, and changed between patient collections. Palpation of phlebotomy site may be performed without gloves providing the skin is not broken.
4) **Procedure**
   a) Identify participant.
   b) Select the site (preferably at the bend of the elbow). Palpate the area; locate a vein of good size that is visible, straight, and clear. The vein should be visible without applying the tourniquet.
   c) Apply a tourniquet, 4-5 finger widths above the selected site.
   d) Ask the patient to forma fist so that the veins are more prominent
   e) Put on well-fitting, gloves.
   f) Disinfect the site using 70% isopropyl alcohol and allow to dry. DO NOT touch the site once disinfected.
   g) Anchor the vein by hold the patient's arm and placing a thumb BELOW the venipuncture site. **DO NOT touch the cleaned site; in particular, DO NOT place a finger over the vein to guide the needle.**
   h) Perform venipuncture. Enter the vein swiftly at a 30 degree angle.
   i) Once sufficient blood has been collected, release the tourniquet BEFORE withdrawing the needle
   j) Withdraw the needle gently and give the patient a clean gauze or dry cotton-wool ball to press gently on the site. Ask the patient NOT to bend the arm.
   k) Discard the used needle and syringe or blood sampling device immediately into the sharps container
   l) Check the label and forms on vacuum tube for accuracy

m) Place items that can drip blood or body fluids into the "Biohazardous" waste container
n) Remove gloves and place them in the general waste.
o) Perform hand hygiene

Urine collection *A clean catch urine sample will be obtained from the participant. Procedures are derived from the U.S. National Library of Medicine. (7)*

1) Participant will be instructed not to void immediately prior to baseline, 6-week, and 12- week appointments.
2) Participants will be given verbal and written instructions on how to provide a clean catch urine sample. Instructions will include:
   a) You will use a special kit to collect the urine, it will include a cup and two wipes.
   b) Wash your hand with soap and warm water
   c) *Females*
      i) Sit on the toilet with legs spread apart. Use two fingers to spread open the labia.
      ii) Use a wipe to clean the inner folds of the labia. Wipe front to back.
      iii) Use a second wipe to clean over the opening where urine comes out (urethra), just above the opening of the vagina.
      iv) Keeping your labia open, urinate a small amount into the toilet bowl, then stop the flow of urine
      v) Hold the urine cup a few inches from the urethra and urinate until the cup is about half full.
      vi) You may finish urinating in the toilet bowl.
   d) *Males*
      i) Clean the head of the penis with a sterile wipe. If you are not circumcised, you will need to pull back (retract) the foreskin first.
      ii) Urinate a small amount into the toilet bowl, and then stop the flow of urine.
      iii) Then collect a sample of urine into the clean or sterile cup, until it is half full.
      iv) You may finish urinating in the toilet bowl.

4.4. Data collection instruments

1) Clinical Data Recording Form (height measurement (inches), change in baseline body weight (%), change in total body weight (kg), Calculated BMI (kg/m2) measurement of body composition (using bioelectrical impedance analysis) (% body fat, pounds of fat, pounds of lean mass, pounds of total body water), waist measurement (inches), hip measurement (inches), Waist to Hip Ratio, Systolic blood pressure (mmHg), Diastolic blood pressure (mmHg), resting pulse (bpm), fasting blood glucose (mg/dL), fasting total cholesterol (mg/dL), fasting LDL-cholesterol (mg/dL), fasting HDL-cholesterol (mg/dL), fasting Triglycerides (mg/dL), total Cholesterol to HDL

ratio, and ASCVD Score (%)), fasting insulin mI/L, fasting leptin ng/mL, IL-6 (pg/mL), tumor necrosis factor-α (pg/mL), urinary tyrosol and hydroxytyrosol.
2) International Physical Activity Questionnaire
3) Mediterranean Diet Nutrition Adherence and Knowledge Questionnaire
4) Diet History Questionnaire II (DHQ II)

4.5. Data analysis

Descriptive statistics will be conducted and presented for the population. Baseline demographics will be compared between the 2 groups and compared using the appropriate test for each data point. Continuous variables will be compared using student t-tests, categorical variables will be compared using chi-square tests, etc. Age will be collected as a continuous variable (years). Ethnicity will be collected as a categorical variable (Caucasian, Asian, African-American, Hispanic, Other, Not Reported). Level of education will be collected as a categorical variable (high school, some college, college degree, graduate degree, professional degree, etc.), smoking status will be collected as a categorical variable (never smoked, past smoker, current smoker), baseline ASCVD risk score (collected as a continuous variable), obesity (dichotomous), HTN (dichotomous), hypercholesterolemia (dichotomous), Number of patients with 1 disease state (continuous), number of patients with 2 disease states (continuous), number of patients with 3 disease states (continuous), number of patients with 4 disease states (continuous), number of yellow values (continuous), number of red zone values (continuous).

Baseline data on change in baseline body weight (%), change in total body weight (kg), calculated BMI (kg/m2) measurement of body composition (using bioelectrical impedance analysis) (% body fat, pounds of fat, pounds of lean mass, pounds of total body water), waist measurement (inches), hip measurement (inches), Waist to Hip Ratio, Waist to Height Ratio, Systolic blood pressure (mmHg), Diastolic blood pressure (mmHg), resting pulse (bpm), fasting blood glucose (mg/dL), fasting total cholesterol (mg/dL), fasting LDL-cholesterol (mg/dL), fasting HDL-cholesterol (mg/dL), fasting Triglycerides (mg/dL), total Cholesterol to HDL ratio, and ASCVD Score (%)) fasting insulin mI/L, fasting leptin ng/mL, IL-6 (pg/mL), tumor necrosis factor-α (pg/mL), urinary tyrosol and hydroxytyrosol, will be compared to data at week-6 and the end of the 12 weeks

• Student's T test will be used to compare the continuous data collected in the study
• Chi Square test will be used to compare the categorical data collected in the study

The Diet History Questionnaire II, International Physical Activity Questionnaire, and the Mediterranean Knowledge/Adherence questionnaire will be collected at the beginning, mid-point and the end of the study. The number of drug-related problems identified through Medication therapy management will be collected at the beginning and end of the study

5. Risks and Discomforts

5.1. Description of potential risks that participants may encounter

Physical Risk: Blood draw (venipuncture phlebotomy)- Patients will have approximately 10 mL of blood taken a total of three times (total 30 mL or 2 tablespoons over 12 weeks) throughout this study (baseline, week 6, and week 12). The blood will be taken via venipuncture phlebotomy of the arm. Risks include: pain or discomfort at the site of puncture; bruising at point of blood draw; redness and swelling for the vein; rarely an infection; and, uncommonly, faintness from the procedure. See Appendix G "Measurement Procedures."

Breach of confidentiality: Investigators will be accessing confidential or identifiable data of participants. Precautions described below.

5.2. Description of precautions taken to eliminate or reduce potential risks

Venipuncture phlebotomy precautions: Verbal and written consent will be received from each patient. Patient will receive verbal and written risks of procedure. All venipuncture guidelines will be followed as outlined in protocol.

Patient data is stored securely in the electronic medical record (EMR). Access to the EMR is restricted to individual account holders assigned by the clinic in a password-protected program. When recorded into the clinical data recording form, data will be recorded confidentially with a numbered linkage back to the patient. No personally identifiable information will be recorded with the associated patient data. All information linking patients and data will be stored in a locked cabinet in a controlled access medical records room.

All surveys and questionnaires will remain anonymous and have no identifiable patient information. Patients' data from survey collection will remain confidential through the use of Qualtrics for delivery of the surveys.

6. Benefits

6.1. Description of direct benefits to participants by participating in this study

This study should have benefits on participants' CVD risk. They should see decreases in their blood pressure, blood glucose, total cholesterol, and blood pressure after completion.

All participants will receive free nutrition education and access to a registered dietitian throughout the study. Both groups will receive nutrition education on dietary interventions that studies have shown decrease the risk of CVD. Therefore, benefits include, obtaining the nutritional knowledge to change dietary patterns for the reduction of CVD risk factors.

6.2. Description of benefits for the general population that may be generated from this study

This study should have benefits on participants' CVD risk. They should see decreases in their blood pressure, blood glucose, total cholesterol, and blood pressure after

completion. Participants will also gain insight into proper dietary patterns for the reduction of CVD risk factors.

7. References

1. Estruch R, Martinez-Gonzalez MA, Corella D, Salas-Salvado J, Ruiz-Gutierrez V, Covas MI, Gomez-Gracia E, Lopez-Sabater MC, Vinyoles E, Aros F, Conde M, Lahoz C, Lapetra J, Saez G, Ros E. Effects of a Mediterranean-style diet on cardiovascular risk factors: a randomized trial. Annals of internal medicine. 2006:145:1-11.
2. Estruch R, Ros E, Salas-Savado J, Covas MI, Corella D, Aros F, Gomez-Gracia E, Ruiz-Gutierrez V, Fiol M, Lapetra J, Lamuela-Raventos ML, Serra-Majem L, Pinto X, Barosa J, Munoz MA, Sorli JV, Martinez JA, Marinez-Gonalez MA. Primary prevention of cardiovascular disease with a Mediterranean diet. N Engl Journal of Medicine. 2013;368:1279-90.
3. Guasch-Ferre M, Hruby A, Salas-Salvado J, Martinez-Gonzalez MA, Sun Q, Willett WC, Hu FB. Olive oil consumption and risk of type 2 diabetes in US women. Am Journal Clin Nutr. 2015;102:479-86.
4. Pickering TG, Hall JE, Appel LJ, Falkner BE, Graves J, Hill MN, et al.; Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. Recommendations for blood pressure measurement in humans and experimental animals. Part 1: blood pressure measurement in humans. Hypertension 2005;45:142–61.
5. CDC. National Health and Nutrition Examination Survey (NHANES) Anthropometry Procedures Manual. Available online: http://www.cdc.gov/nchs/data/nhanes/nhanes_07_08/manual_an.pdf (accessed April 15, 2016).
6. WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy. Geneva: World Health Organization; 2010.