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Improving Heart Health in African Americans Using a Cardiovascular Disease Bundle

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Abstract

Cardiovascular disease (CVD) is a significant cause of mortality in the United States of America. Risk factors include abnormal low-density lipoprotein (LDL) cholesterol, physical inactivity, and unhealthy diets. African American (AA) adults have higher mortality rates from CVD than other demographics. In Houston, Texas, age-adjusted death rates for CVD per 100,000 population by race in AAs were 111, 85.0 in Whites, 62.9 in Hispanics, and 49.5 in Asians. This project evaluated the impact of using a CVD bundle over an eight-week period on cholesterol medication adherence, physical activity, and heart disease knowledge and was titled Improving Heart Health in African Americans Using a Cardiovascular Disease Bundle. Forty participants were recruited; 19 completed the project. Medication adherence, weight, LDL, physical activity, and heart disease knowledge measures were taken at baseline and eight weeks. The Medication Adherence Reporting Scale (MARS-5) measured adherence to cholesterol medication. Physical activity levels were measured using the Rapid Assessment of Physical Activity (RAPA) questionnaire, and heart disease knowledge was assessed using a Heart Disease Education Survey. The mean age of participants was 53 years; 58% were female. A paired samples t-test revealed a significant difference between all data pairs: MARS-5, $t(18) = -8.024$, $p<0.001$; RAPA-1, $t(18) = 7.435$, $p<0.00$; RAPA-2 $t(18) = 13.568$, $p<0.001$; weight $t(18) = 2.105$, $p<0.025$; LDL $t(18) = 5.079$, $p<0.001$; total heart education scores, $t(18) = -18.000$, $p<0.001$. This indicates that the CVD bundle effectively improved cholesterol medication adherence, increased physical activity, and increased knowledge of heart disease at eight weeks, providing a basis for long-term evaluation of the CVD bundle.

Introduction

Cardiovascular disease (CVD) or heart disease is a significant cause of mortality in developed countries like the United States of America (USA) and worldwide. 17.5 million people die annually from CVD (World Health Organization, 2022a). According to the Centers for Disease Control and Prevention (CDC), CVD kills 695,000 people annually in the USA, an average of one person every five seconds (CDC, 2020). In addition, African Americans (AA) are at a higher risk for heart disease than other ethnic groups, with AA adults having a higher likelihood of suffering from heart attacks, high blood pressure, and stroke-related deaths than Caucasians (CDC, 2023).

Three main risk factors for CVD are elevated low-density lipoprotein (LDL), obesity, and physical inactivity; other risk factors are unhealthy diet, diabetes mellitus, excessive alcohol use, high blood pressure, and smoking (CDC, 2020). Healthcare interventions to decrease CVD risk factors are essential to promote public health and reduce disease burden.

High cholesterol contributes to CVD by causing a buildup of plaque in the arteries, which can cause heart attack or stroke. LDL is known as bad cholesterol, and normal blood levels of LDL should stay at approximately 100mg/dl (CDC, 2019). Obesity is defined as a body mass index (BMI) of 30 kg/m^2 and above (Mayo Clinic, 2021), with 33.9 percent of the USA population being obese (America's Health Rankings, 2022). Consumption of unhealthy foods, sugars, and processed foods, combined with physical inactivity, contributes to obesity. Per the World Health Organization (WHOa, 2022), less than 30 minutes of moderate-intensity physical exercise for most days of the week constitutes physical inactivity and results in a 20-30 percent higher risk of all-cause mortality (WHOb, 2022). These three risk factors contribute significantly to the development of CVD.

Background

As previously stated, 695,000 people died from heart disease in the USA in 2021 (CDC, 2022). Of this number, the highest percentage of deaths per race at 22.6 percent mortality was of Blacks and non-Hispanics, followed by Asians at 18.6 percent (CDC, 2022). Due to these alarming statistics, when AA patients are diagnosed with high cholesterol, especially as young adults, it is vital to prescribe medication treatment if diet and exercise alone are ineffective.

According to Nanna et al. (2018), AAs are less likely to be treated with statin medications than Caucasians (71% vs. 75%, p=0.02). This data indicates a gap in CVD treatment in AAs, in which poor management of risk factors like high LDL contributes significantly to heart disease prevalence and mortality. In addition, AAs were 20 percent less likely to engage in active physical activity than non-Hispanic Whites in 2018 and 1.3 times more likely to be obese than Caucasians (US Department of Health and Human Services, 2019), placing them at a higher risk for developing CVD. The root of these differences is often challenging to explain and may be linked to genetics or healthcare disparities in access to healthcare, unemployment, and food insecurity. Subsequently, timely and efficient management of CVD risk factors like high LDL, physical inactivity, and obesity is crucial to mitigate the gap in CVD management for AA patients.

The National Vital Statistics System (NVSS) mortality data for the Black non-Hispanic population puts the crude death rate per 100,000 at 213.9 from heart disease and 51.4 from stroke (CDC, 2021; National Center for Health Statistics, 2021). In addition, the National Vital Statistics' 2019 leading causes of death data indicated higher death rates from heart disease in AAs compared to Caucasians beginning around the age of 35, with significant differences evident in age ranges 35 to 64 (Heron et al., 2021). Refer to the heart disease mortality rates per age group for a summary of information on heart disease for Whites and Blacks (Appendix A).

Though there is a national decrease in disparities in cardiovascular (CV) mortality between Whites and Blacks, CV mortality rates are still 21 percent higher in Blacks than Whites (Dyke, 2018). According to USA Health Rankings (2022), heart disease was the leading cause of death per 100,000 in Texas in 2021, with a mortality rate of 180.7 compared to a national average mortality rate of 173.78. AAs tend to have higher LDL levels than Caucasians, with 32.4 percent of AA men having high LDL levels compared to 31.7 percent of Caucasian men (Lee-Frye, 2022). High LDL levels in Texas for AAs are 35.8 percent, higher than the national rate of 35.7 percent (America's Health Rankings, 2022). Although screening and treatment for heart disease have improved, heart disease mortality is still higher in the AA demographic. Per the CDC, decreases in CV mortality rates are less in the AA population compared to other races (Dyke, 2018). This data supports the gap in the treatment of heart disease in the AA demographic at the state level.

Locally, Houston State of Health (2023) reports that the age-adjusted death rate for coronary heart disease per 100,000 population by race in Blacks was 111, 85.0 in Whites, 62.9 in Hispanics, and 49.5 in Asians/Pacific. This indicates higher mortality rates from CVD in AAs in Houston, Texas, compared to other races. CVD remains the leading cause of mortality in Houston at 174.6 per 100,000 people (Houston Health Department, 2019). High cholesterol prevalence in 2019 in Houston was 37.3 percent, with 33.3 percent prevalence for AAs and 33.9 percent for Caucasians (Houston State of Health, 2023). Even though AAs in Houston have slightly lower rates of high cholesterol compared to Caucasians, their mortality rate from CVD is higher than that of Caucasians, further supporting the gap in care for this demographic.

Review of Literature

Selected databases for this review were from three disciplines: nursing, medicine, and education. This included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Joanna Briggs Institute (JBI), the Cochrane Library for Nursing, PubMed for Medicine, and the Education Resources Information Center (ERIC) for Education. Key terms used included “African American”, “hyperlipidemia”, “treatment”, “barriers”, “intervention”, “primary care”, and “education”. Other search terms included “compliance”, “medication”, “diet and exercise”, “lifestyle change”, and “cardiovascular”. The Boolean operators “and” and “or” were used individually or in combination with the keywords to search the sections of the PICOT(S).

The initial search for the nursing discipline resulted in over 111 articles, while that for the medicine discipline yielded over 29 articles, and the education search yielded 24 articles. Inclusion and exclusion criteria were utilized to narrow the articles further and remove duplicate reports. The inclusion criteria included articles published in English in the last five years, peer-reviewed articles on adults over 18 years, and human studies. Exclusion criteria included articles not written in English and non-human studies. Ten pieces were retained. Refer to the evidence table in Appendix B for a summary of the evidence supporting the PICOTS.

Synthesis of Evidence

The literature review aims to identify studies focusing on evidence-based interventions that improve compliance with treatment in AA adults with cardiovascular disease. Maintaining healthy LDL levels is essential to preventing CVD. The literature revealed several disparities in CVD treatment faced by the AA community and highlighted higher risk factors than their Caucasian counterparts (Carnethon et al., 2017; Cunningham et al., 2017), which can be

eliminated by promoting evidence-based treatment interventions that improve compliance within this demographic.

This project is an evidence-based project. Based on the review of the literature, the project will focus on three evidence-based interventions in the CVD bundle that have proven effective in improving cardiovascular health for AA adults. These are medication adherence, physical activity, and eating healthy.

Medication Adherence

A review of the literature examines how interventions in primary care settings, such as health coaching (HC), benefit AAs with multiple chronic health conditions. Bailey et al. (2020) (see Appendix B) studied the effectiveness of low-cost patient-centered interventions, like HC and text messaging (TM), in improving self-care outcomes among AA patients with diabetes mellitus and other chronic illnesses in medically underserved areas. The study was a randomized controlled trial (RCT), and data were collected using questionnaires, interviews, and hemoglobin A1C levels, with a total of 581 AA adult participants. The study by Bailey et al. (2020) clearly shows that although HC and TM are practical and affordable teaching methods, they both need to be enhanced by tailoring them to the target population. In addition, Blalock et al. (2019) (see Appendix B) conducted a cross-sectional study of an RCT to investigate reasons for non-adherence to lipid-lowering medications. They developed profiles or classes of non-adherers based on the grounds for non-adherence to tailor more effective interventions when treating hyperlipidemia in adults. Though the study had a modest sample size of 236 adults and utilized a self-report Likert scale questionnaire and non-fasting serum cholesterol levels, it was limited to Veterans only, and some of the classes for non-adherence were unclear. Understanding the reasons behind medication non-adherence is essential, and patient education can be tailored to

each patient's reasons for better outcomes. The study by Blalock et al. (2019) shows that measuring cholesterol levels effectively monitors cholesterol medication adherence. Both studies by Bailey et al. (2020) and Blalock et al. (2019) are essential, but Bailey et al. (2020) was a more robust study as it was specific to AA adults as opposed to Blalock et al. (2019)'s study, which was limited to Veterans of all races.

Tran et al. (2022) (see Appendix B) adds more significance to using LDL monitoring to assess lipid medication adherence in a retrospective cross-sectional study conducted on 12, 322 adults with high cholesterol. Fifty percent of the participants were AAs. The study highlighted the gap in the treatment of CVD disease as lipid monitoring occurred less frequently in AA individuals in the study (odds ratio 0.78, 95% confidence interval [CI]) 0.69 to 0.89). However, some inconsistencies may have been present in the study due to missing lab orders, but it proved that lipid monitoring is an effective way to monitor lipid medication adherence. This will aid in decreasing the gap in care for the AA demographic with CVD.

Physical Activity and Eating Healthy

Increasing physical activity and eating healthy decreases obesity levels through weight reduction. A review of the literature reveals how diet in the AA culture may affect the risk for CVD. Interventions that exclude the fat-rich, sugar-sweetened drinks and processed foods prevalent in the 'soul food' diet of AA culture aid in reducing the risk for CVD. In a cohort study by Williams et al. (2021) (see Appendix B), 44 AA adults followed a vegetarian diet only. They showed significant improvement in cardio-metabolic risk factors, particularly marked reductions in weight and BMI (−10.2 lbs, 33 to 31 kg/m2, p = 0.000) and LDL (121 to 104 mg/dL, −14%, p = 0.000). Thus, weight reduction will be a valid variable in measuring the success of the project intervention.

Culturally sensitive interventions that examine attitudes and barriers to a healthy diet and physical activity in underserved or understudied populations produce positive change and reduce mortality rates from CVD. In a quasi-experimental study of 982 adults in two mainly AA neighborhoods in Pittsburgh, Pennsylvania, Vaughan et al. (2018) (see Appendix B) utilized self-reported minutes of walking measured by a physical activity questionnaire. This concept will be applied using the Rapid Assessment of Physical Activity (RAPA) questionnaire. Though the study yielded promising results on attitudes and barriers to a healthy diet and physical activity, it needed more generalizability because most of their sample were single AA women with no children. Thus, the study by Vaughan et al. (2018) did not yield helpful information compared to the study by Williams et al. (2021). This, however, should not negate the significance of examining barriers to diet and exercise.

Moore & Mary (2020) and Stormacq et al. (2020) both highlight the significance of incorporating intervention components that include cultural appropriateness, tailoring, skills building, goal setting, and active discussions to improve health-related outcomes (see Appendix B). These concepts are significant when tailoring interventions promoting physical activity and healthy eating. However, Moore & Mary's (2020) literature review study was limited to AA women and focused on holistic health therapies. Additionally, though Stormacq et al. (2020)'s systematic review of 21 studies focused on the effectiveness of health literacy interventions in increasing positive health outcomes for underserved populations, it was difficult to conclude the efficacy of the interventions due to the large number of studies involved. We can conclude that educating on diet and exercise goals will help build habits to promote healthy eating and increase physical activity levels, ultimately decreasing CVD risk factors.

Enrolling in health improvement studies promotes healthy behaviors, as evidenced by Duren-Winfield et al. (2021) (see Appendix B), who conducted a 15-week cohort study on a CVD risk-prevention and intervention course for 124 AA college students. There was an increased intake of fruits and vegetables and increased knowledge of CVD risk factors after the study, with 86 percent of the students passing the course. This is significant because educating the subjects on their risk factors and interventions to decrease CVD risk cultivates better diet and exercise practices. Halbert et al. (2017) (see Appendix B) further proved this in an RCT utilizing a comparative effectiveness education trial for lifestyle health behavior change among 530 AA adults in a metropolitan area in Philadelphia. The study concluded that education about risk factors for chronic disease and evidence-based strategies for health behavior change may help address obesity-related behaviors among AAs. Participants who completed the intervention had a 1.78 odds of meeting physical activity guidelines (95% CI= 1.02, 3.10, p = 0.04), evidence that the study yields beneficial information for reducing CVD risk factors. Though both studies produced good evidence in reviewing the literature, they also needed to be improved. Duren-Winfield et al. (2021)'s study included subjects in the age range of 17 to 26 who are relatively young and may have lower risk factors for CVD because of age; Halbert et al. (2017) study used subjective methods to measure physical activity levels and fruit and vegetable consumption versus objective approaches that are more sensitive to behavior change.

In conclusion, primary care providers should strive to include evidence-based practices incorporating health coaching, methods to increase physical activity, and healthy eating to decrease the risk for CVD in at-risk populations such as AA adults.

Project Framework

This is an evidence-based practice project. The framework used to guide this project is the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model (Appendix D). According to Reavy (2016), it is a framework built on three cornerstones of nursing: practice, education, and research, with three steps guiding the evidence-based process: practice question, evidence, and translation, collectively called the PET process.

In the first step, the problem is identified, and an answerable practice question is developed. A systematic review and synthesis of research and non-research evidence is conducted in the second or evidence step. The third step, translation, is where an evidence-based practice team constructs a plan to implement feasible and appropriate recommendations (Dang et al., 2019).

The practice or intervention question in step one states, “In AA adults with elevated LDL levels and BMI equal to or greater than 30 kg/m^2, how does the use of a CVD bundle compared to standard of care improve cardiovascular health within eight weeks in a primary care clinic in Southeast Texas?” This identified the gap or problem forming the basis of the project.

The evidence in step two has been gathered through a review of the literature and synthesis of existing evidence in studies about LDL treatment in AA adults, with particular attention given to compliance with cholesterol medication treatment, physical activity and diet, and effective patient education methods tailored to this demographic. The Johns Hopkins Nursing Evidence-Based Practice Appraisal Tool was used to analyze the evidence, and best practice techniques were synthesized for this project.

The third step, or translation phase, is where the intervention is planned, constructed, and implemented utilizing appropriate recommendations to treat high LDL cholesterol in the adult

AA demographic. The project spanned eight weeks, data was collected, and the outcomes will be discussed below.

Project Question

The problem being addressed is the higher mortality rates from CVD in AA adults compared to other demographics. The project is designed to answer the following PICOTS question: In AA adults with elevated LDL levels and BMI equal to or greater than 30 kg/m^2, how does the use of a CVD bundle, which includes implementing cholesterol medication adherence, physical activity levels evaluations, and patient education with the use of handouts and verbal education on the effects of hearts disease, compared to standard of care, improve cardiovascular health within eight weeks in a primary care clinic in Southeast Texas? The desired outcome is a reduction in weight and LDL cholesterol measurements, improved adherence to cholesterol medication, increased physical activity levels, and increased knowledge of the effects of heart disease.

Methods

Setting

The Doctor of Nursing (DNP) project was conducted in a primary care clinic in Southeast Texas. The clinic operates six days a week and is staffed with one physician, three nurse practitioners, two clerical staff, and three medical assistants. It is centrally located in a commercial space with easy accessibility and adequate patient parking spaces. The clinic has in-house laboratory testing, four patient examination rooms, and enough space for expansion. Their mission is to provide accessible, high-quality care and promote the health and well-being of the community.

The providers see approximately 35-45 patients daily, with 40 percent of the patients being of AA heritage. The clinic provides primary care services such as annual physicals, sick visits, minor emergency visits, urgent care, weight loss, intravenous hydration therapy, sports physicals, and immunizations. Primary care providers had the tools to screen patients for diseases and conditions that increased the risk for comorbidities and severe illnesses like CVD and stroke. Phlebotomy services were provided in the clinic for bloodwork for this project. If the clinic could not perform on-site lab draws, a paper lab order was provided to the patient for bloodwork at an outpatient LabCorp site. Effective management of CVD risk factors such as obesity and high cholesterol decreases the risk of developing CVD, an essential element for AAs who have higher overall CVD mortality and premature death rates than Caucasians (Bacon, 2020). This setting served as an excellent data source and allowed for the application of the project to mitigate this gap in care.

Population

Heart disease is the number one cause of adult mortality in the USA (CDC, 2022). It affects men and women of all races, but different mortality rates exist for various demographic groups. The target population in focus was non-Hispanic African American (AA) adults, male and female, with a BMI of 30 kg/m^2 and over and LDL levels above 100 mg/dl.

Participants included established and new patients who met the inclusion and exclusion criteria. The anticipated sample size for the project was 40 patients. The patients were recruited when they came in for a clinic visit. The inclusion criteria were that the patients' abnormal LDL levels should have been collected in the last 12 months in an outpatient or acute care setting. They should have already been prescribed a cholesterol-lowering medication. The patients were able to speak, read, and comprehend the English language. Exclusion criteria for the population

include pregnancy, incarceration, mental illness, cognitive dysfunction, major CVD events such as myocardial infarction and stroke in the last three months, and cardiac stent placement in the previous three months. Weight was measured at the beginning and end of the project using a digital standing scale in the clinic. At the end of the project, LDL levels were rechecked through laboratory testing in the primary care clinic. Racial and ethnic data were collected through a questionnaire on demographics.

Team Role

The clinic operates six days a week and is staffed with one physician, three nurse practitioners (NP), two clerical staff (clerks), and three medical assistants (MA). The NP conducting the project is the Project Lead. The physician was the administrator. The team was comprised of the project lead NP, NP1, NP2, MA1, MA2, Clerk 1(C1), and Clerk 2 (C2). The project lead guided the project and delegated data collection portions to the other team members. The project lead and NPs invited patients into the project and explained the purpose, steps, and duration. The project lead and the NPs also ensured the participants completed the MARS-5 and RAPA questionnaires and a Heart Disease Knowledge Survey. Each participant received a patient education pamphlet to guide them as they followed the diet and exercise recommendations at home for the duration of the project. Weight measurements were collected at the beginning and end of the project and documented in the electronic medical record (EMR).

MA1 and MA2 made initial contact with the patient in the exam room. They collected weight measurements and placed the questionnaire forms and education pamphlets in the exam room. The NPs and project lead invited the patients to participate by reading a project invitation script (Appendix E). MA1 and MA2 assisted with collecting the completed questionnaires at the

end of the visit. In addition, the MAs were also educated on the importance of the project to answer questions from patients interested in participating.

NP1 and NP2 invited patients to participate in the project when they determined they met the criteria. Suppose the project lead could not see the participant during the visit, NP1 and NP2 followed the project invitation script included in the DNP Project Team Education PowerPoint handout in Appendix F. If the patient agreed to participate, the NP ensured the participants completed the questionnaires. They gave each participant the patient education pamphlet. They documented the weight and LDL values in the database dashboard. After the visit, C1 and C2 scheduled the participants' 8-week follow-up appointments for the project-end visit. The administrator served as a resource to the project lead. He assisted by clarifying aspects of the project where needed and reviewed the participants' health records to ensure the accuracy of inclusion and exclusion criteria, data collection, completeness of forms, and prevention of Health Insurance Portability and Accountability Act (HIPPA) violations in the data collection process.

Education of the Team

It was essential to educate the team members on their roles in making this project run smoothly. The team needed to understand the basis of the project to help implement it effortlessly. The MAs who usually made initial contact with the patient in the exam room were educated on correctly measuring and documenting the weight and on the overall importance of the project. The MAs and NPs were provided with a project invitation script to follow that included general information about the project to be used to invite patients to participate. The NPs ensured each participant met the inclusion criteria to qualify as a participant. The team was educated on the importance and significance of all project components. The project lead educated the team using the PowerPoint presentation (Appendix F) handout. The patients

completed the patient questionnaires, and each participant received the patient education pamphlet. Copies of all the documents used in the project were available for the team to provide to the participants. Each participant received a call from the project lead every two weeks to ensure they stayed on track, answered any questions about their progress, and reminded them of their post-project visit. The Lead, C1, and C2 facilitated this part of the project. The project lead met with the team every two weeks to ensure the project went as planned and answered questions the team had concerning the project. A GANTT chart was created to illustrate the implementation of the project over the 8-week project duration (Appendix G).

Implementation

Two days before the implementation process, the team was educated on the project purpose, data collection, and their roles in the implementation process. The project lead conducted a 30-minute education session during the team lunch break using the Project Team Education PowerPoint (Appendix F). The lead answered questions from the team and offered clarification where needed. Printed copies of the PowerPoint slides were provided to the team for reference.

The project commenced on day three of the first week. Patients who met the criteria for participation met with the project lead and other NPs for a 20-minute pre-survey data collection and educational session. Participants completed the MARS-5 questionnaire (Appendix H), the RAPA questionnaire (Appendix I), and the Heart Disease Knowledge Survey (Appendix J). The MA or NP weighed each participant. After completing the pre-test surveys, each participant received the Heart Disease Educational Pamphlet (see Appendix K). The NP educated the patient on LDL medication adherence, physical activity, and diet recommendations to reduce their risk for heart disease. These recommendations were to be followed for the project duration and were

included in the education pamphlet. The session concluded with the project lead, or NP, confirming LDL values and weight measurements and ensuring they were documented in the electronic health record (EHR). This data was manually inputted into the dashboard spreadsheet by the NPs. After the session, the Clerk scheduled a 20-minute post-project visit during weeks 6 to 8 of the project. Completed forms were placed in a secure drawer and locked by the project lead.

Every two weeks after a participant enrolled in the project, the project lead placed a follow-up call to check on their progress, reminded them of their post-project visit, and answered any questions the participants had about the project. An appointment reminder was sent to participants who were unreachable by phone, and the project lead placed another reminder phone call a week before their post-project visit. At the post-project visit, each participant had their LDL values measured by blood draw in the clinic laboratory and had their post-project weight measurements obtained by the MAs. The participants completed the MARS-5 and RAPA questionnaires and the Heart Disease Knowledge Survey for post-project data collection. Finally, the project lead collected the data from the pre/post-test questionnaires and pre/post-LDL and weight measurements for analysis.

Data Collection and Dashboard

Data collection began when a patient agreed to participate in the project. The data collection process involved collecting basic demographic information about the participants, including age, gender, employment status, marital status, and education level (Appendix L). Pre-intervention and post-intervention test results of LDL values, weight, MARS-5 questionnaire responses, and RAPA questionnaire responses were also collected. Pre-intervention test results were collected at the beginning of the project, and post-intervention test results were collected

during week eight. Each participant was assigned a patient identification code (28-19-006, 10-15-007, etc.) corresponding with their pre-and post-test questionnaires, LDL, and weight measurements. The last three digits of the code assigned to each participant corresponded with the order in which they were recruited by the project lead or the NP who explained the project to them. The project lead added five points to the three-digit number to mask the patient's identity; thus, the first patient's three-digit code was 006. The project lead assigned the patient code to a master-participant list. Only the project lead had access to the master participant list, which was kept in a locked cabinet in the project lead's office, which was also kept locked. Since the questionnaires were in paper format, the project lead collected and secured all surveys in the locked drawer until all the data was entered on the dashboard, after which the project lead shredded them. The database dashboard (Tables Q1 and Q2, and Q3 in Appendix M) contained the coding categories and the aggregated data from the outcome variables collected during the project. Refer to Appendix N for the participant identification master coding system and Appendix O for the database coding legend for data analysis. Data was stored in an Excel File, as reflected in Appendix O, which was stored on the University of Texas Arlington (UTA) OneDrive on a password-protected laptop computer in the project lead's home office kept behind locked doors.

The administrator, clerks, MAs, and NPs were educated on all project steps before initiation. The MAs assisted with data collection by ensuring participants were weighed correctly and measurements were documented in the patients' charts. The MAs also collected the completed questionnaire forms. The NPs aided in data collection by documenting weight and LDL values in the database dashboard and collected completed forms for storage in the locked drawer. The project lead and NPs explained the intervention to the participants and reviewed the

patient education pamphlet with each participant, who retained a copy. The MAs were educated in obtaining and documenting accurate weight measurements. The NPs were educated on the content of the questionnaires using the dashboard and education pamphlets, and they assisted with data collection and documentation on the dashboard.

Data Analysis

Data analysis for the project utilized descriptive statistics, which revealed specific characteristics within a sample data set and illustrated project variables (Grove & Cipher, 2020). Data analysis involved processing pre-test and post-test variables of LDL, weight, MARS-5, RAPA, and the Heart Disease Knowledge survey questionnaire responses of one group of participants. The data was inputted into the Statistical Software for the Social Sciences (SPSS) software for calculation and analysis. SPSS analyzed the demographic data collected to gain additional information that added significance to the project results. The participant demographic data included age, gender, marital status, employment status, and educational level. They were analyzed for frequencies, frequency distributions, and percentages using SPSS. All demographic variables except age were examined using the nominal scale. Age was recorded as a ratio value with frequencies such as the average age of participants at enrollment calculated.

LDL and weight outcome variables were analyzed in SPSS using the Paired Samples T-test or repeated measures test. LDL and weight measurement data, both ratio levels of measurement, were processed for the mean differences using the paired samples t-test. The Wilcoxon Signed-Rank test, a non-parametric data analysis method, was used instead of the repeated measures test to analyze the MARS-5 and RAPA questionnaire responses since this data was ordinal and paired from the same sample. The MARS-5 assessed the participants' adherence to cholesterol medications, while the RAPA questionnaire assessed their physical

activity levels. The pre-test and post-test questionnaire outcomes were examined using percentages, frequencies, and means (Grove & Cipher, 2020). The project lead collaborated with a statistician for assistance in analyzing the results.

Results

Participant Description

When the project implementation phase began, 40 participants completed the pre-intervention data collection; 19 returned to the clinic and completed the post-intervention data collection process. 57.9 percent of the 19 retained participants were female, with 42.1 percent male. 42.1 percent were married, and 21.6 percent of the participants were either divorced or widowed. 52.6 percent were unemployed, 36.8 percent had a high school degree or less, and 26.3 percent had an Associate degree or were Masters level educated.

Outcome Results

Analysis of the results indicated the effects of the CVD bundle produced statistically significant scores in five of the six data pairs, which were cholesterol medication adherence, LDL levels, physical activity, and heart disease education, with $p<0.001$ in these areas. The intervention was not statistically significant in weight measures with $p<0.025$.

Adherence to cholesterol medication was assessed using the MARS-5 questionnaire composed of Likert-type items, with responses ranging from 1 to 5, with 1=always to 5=never, as shown in (Appendix H). The average score or mean (M) of medication adherence before the intervention was 14.26 and 19.11 after the intervention. This represented an increase in cholesterol medication adherence post-intervention.

The level of physical activity was assessed using the RAPA questionnaire, which has two sections, as shown in (Appendix I). For the RAPA-1 questionnaire, before the intervention,

participants had a mean score of 2.79 and 4.21 after the intervention. For the RAPA-2 questionnaire, participants had a mean score of 0.53 before the intervention and 1.05 afterward. This indicates that participants' physical activity levels increased after the intervention.

Knowledge about cardiovascular disease was assessed using the Heart Disease Education survey, as shown in (Appendix J). Before the intervention, participants had a total pre-education mean score of 8.58 and 14.26 after. This indicates an increase in participant knowledge of heart disease after the intervention.

Participants' weights in pounds and LDL cholesterol levels in mg/dl were also assessed pre-and post-intervention. Before the intervention, participants had an average weight of 202.442 pounds and 197.311 pounds post-intervention. Finally, before the intervention, participants had a mean LDL level of 139.21 mg/dl and 130.84 mg/dl post-intervention. This indicates participants had an overall reduction in weight and LDL levels because of the intervention (Appendix P).

A paired samples t-test and Wilcoxon Signed-Rank test revealed significant differences between all six data pairs pre-intervention and post-intervention scores. For the medication adherence using MARS-5, $t(18) = -8.024$, $p < 0.001$. For physical activity level measures, RAPA-1, $t(18) = 7.435$, $p < 0.00$, with RAPA-2, $t(18) = 13.568$, $p < 0.001$. For the weight measurements, $t(18) = 2.105$, $p < 0.025$. For the LDL values, $t(18) = 5.079$, $p < 0.001$. And finally, for the total heart disease education scores, $t(18) = -18.000$, $p < 0.001$. Thus, the intervention had a statistically significant impact on the participants in all data pairs except for weight, where $p < 0.025$ was above the statistically significant value of 0.01. This indicates the CVD bundle intervention successfully improved cardiovascular health in the participants compared to standard care.

Unexpected problems included several canceled post-intervention data collection clinic visits that reduced the sample size by over 50%. The final 19 participants completed all aspects of the project with no missing data.

Discussion

Statistically reliable improvements in cholesterol medication adherence, LDL levels, physical activity, and heart disease education were noted in the post-intervention data. This is significant for the primary care clinic as it indicates that using the CVD bundle improved heart health in the participants compared to standard care. For the AA adult population, this indicates that tailored interventions beyond standard care can reduce their risk for heart disease, and therefore prolong their lives. Consequently, the use of the CVD bundle will be continued in the clinic. Improving heart health in this demographic decreases the national mortality rate from CVD, thus improving the health of the nation, decreasing healthcare costs, and improving the quality of life for AA individuals and their families and communities. Similarly, Bailey et al.'s 2020 study indicated that targeting a specific demographic allowed for the results to be generalizable to similar underserved populations where they applied the use of questionnaires and biological measurements to determine the effectiveness of their intervention.

The strengths of the study included exclusion criteria that participants from volunteering in the study would not be able to complete the questionnaires independently or follow all requirements to participate in the project successfully. Additionally, the project included the participants not incurring extra costs for participation, and all resources required were present in the clinic. Some modifications that will be made to the intervention include placing the questionnaires in electronic form for patient preference, which may reduce the time spent filling out the paperwork.

Study weaknesses include the threat to the internal validity of maturation. It allowed the participants to predict that better responses would indicate better outcomes since the same questionnaires were utilized in the pre-and post-intervention phases. In addition, outside interference or histories, like weight loss medications or natural supplements to reduce cholesterol, may have contributed to weight loss and reduced LDL measures outside the intervention alone. Efforts made to reduce these limitations included participants returning completed questionnaires to staff and not retaining copies for review prior to the post-intervention data collection appointment. Participants were also encouraged to give truthful responses to the questions.

The limitations of the project include sampling of adults from one demographic, which was AA adults, thus reducing its generalizability to other demographics. Also, the sample size 19 was small and may not necessarily be generalizable to a bigger group of participants. The Hawthorne effect also reduces the generalization of results as the participants were aware of being studied with an expectation of better responses and measurements in the post-intervention phase for the success of the intervention. Another limitation is the length of the study; eight weeks may not be sufficient to determine if the medication adherence, increase in physical activity, decrease in LDL cholesterol, and decrease in weight measurements would be sustained over a more extended period. Future nurse scientists looking to close these gaps in the project may look to have a larger sample size and collect measurements over a more extended period.

In conclusion, cumulative evidence supports the significant impact the CVD bundle had on the participants' heart disease risk. The CVD bundle was found to reduce the overall weight of the participants and clinically significantly increased their adherence to cholesterol medication, increased their heart disease knowledge, decreased their LDL measurements, and increased their

physical activity levels. This implies embedding the CVD bundle into practice in primary care settings will decrease morbidity and mortality from heart disease in AA adults. Further research is warranted with a larger sample size over a subsequently more extended period to investigate if the short-term improvements are sustainable for AA adults.

References

America's Health Rankings. (2022). Annual report. https://www.americashealthrankings.org/explore/measures

Bacon, E. (2020). Racial/ethnic differences in treatment recommendations: Lifestyle changes and medication prescriptions for high cholesterol. *Ethnicity & Health*, *25*(2), 273–288. https://doi.org/10.1080/13557858.2017.1398315

Bailey, J. E., Surbhi, S., Gatwood, J., Butterworth, S., Coday, M., Shuvo, S. A., Dashputre, A. A., Brooks, I. M., Binkley, B. L., Riordan, C. J., Steinberg, H. O., Gutierrez, M. L., Haley, L. E., Leak, C. L., & Tolley, E. A. (2020). The management of diabetes in everyday life study: Design and methods for a pragmatic randomized controlled trial comparing the effectiveness of text messaging versus health coaching. *Contemporary Clinical Trials*, *96*, 106080. https://doi.org/10.1016/j.cct.2020.106080

Blalock, D. V., Bosworth, H. B., Reeve, B. B., & Voils, C. I. (2019). Co-occurring reasons for medication nonadherence within subgroups of patients with hyperlipidemia. *Journal of Behavioral Medicine*, *42*(2), 291–299. https://doi-org.ezproxy.uta.edu/10.1007/s10865-018-9954-3

Carnethon, M. R., Pu, J., Howard, G., Albert, M. A., Anderson, C. A. M., Bertoni, A. G., Mujahid, M. S., Palaniappan, L., Taylor, H. A., Willis, M., & Yancy, C. W. (2017). Cardiovascular health in African Americans: A scientific statement from the American Heart Association. *Circulation*, *136*(21), e393–e423. https://doi.org/10.1161/CIR.0000000000000534

Centers for Disease Control and Prevention. (2019). *About high blood cholesterol*. https://www.cdc.gov/cholesterol/about.htm

Centers for Disease Control and Prevention. (2020). *Heart Disease and stroke*.

https://www.cdc.gov/chronicdisease/resources/publications/factsheets/heart-disease-stroke.htm#:~:text=Leading%20risk%20factors%20for%20heart

Centers for Disease Control and Prevention., & National Center for Health Statistics. (2021). National vital statistics system, mortality 1999-2020 on CDC WONDER online database. https://wonder.cdc.gov/controller/saved/D76/D266F218

Centers for Disease Control and Prevention. (2022). *Heart disease facts*. https://www.cdc.gov/heartdisease/facts.htm

Centers for Disease Control and Prevention. (2023). *Celebrate African American history month!* https://www.cdc.gov/healthequity/features/african-american-history/index.html#:~:text=However%2C%20certain%20groups%E2%80%94including%20African

Chan, A. H. Y., Horne, R., Hankins, M., & Chisari, C. (2020). The medication adherence report scale: A measurement tool for eliciting patients' reports of nonadherence. *British Journal of Clinical Pharmacology*, *86*(7), 1281–1288. https://doi.org/10.1111/bcp.14193

Cunningham, T. J., Croft, J. B., Liu, Y., Lu, H., Eke, P. I., & Giles, W. H. (2017). Vital signs: Racial disparities in age-specific mortality among Blacks or African Americans — United States, 1999–2015. *MMWR. Morbidity and mortality weekly report*, *66*(17), 444–456. https://doi.org/10.15585/mmwr.mm6617e1

Duren-Winfield, V., Carr, L. T. B., McCauley, G. A., Onsomu, E. O., Roberson, K., Williams, J., Kizakevich, P. N., Krzyzanowski, M., & Price, A. A. (2021). The development and pilot testing of an evidence-based cardiovascular disease risk-prevention program to promote healthy lifestyle behaviors among African-American college students – Rams Have

HEART. *Journal of Best Practices in Health Professions Diversity: Research, Education and Policy, 14*(1), 44–62.

Dyke, M. V. (2018). Heart disease death rates among Blacks and Whites aged ≥35 Years — United States, 1968–2015. *MMWR. Surveillance summaries, 67*. https://doi.org/10.15585/mmwr.ss6705a1

Grove, S., & Cipher, D. (2020). *Statistics for nursing research: A workbook for evidence-based practice.* Elsevier - Health Science.

Halbert, C. H., Bellamy, S., Briggs, V., Delmoor, E., Purnell, J., Rogers, R., Weathers, B., & Johnson, J. C. (2017). A comparative effectiveness education trial for lifestyle health behavior change in African Americans. *Health Education Research, 32*(3), 207–218.

Heron, M. (2021). *National vital statistics reports deaths: Leading causes for 2019.* https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-09-508.pdf

Houston Health Department. (2019). *Health disparity and health inequity 2019 trends and data report Houston/Harris county*. https://www.houstontx.gov/health/chs/documents/Health-Disparities-Summary-2019.pdf

Houston State of Health. (2023). *Disparities dashboard*. https://www.houstonstateofhealth.com/indicators/index/dashboard?alias=disparities

Lee-Frye, B. (2022). *Cholesterol, heart disease, and African Americans*. Verywellhealth. https://www.verywellhealth.com/cholesterol-heart-disease-and-african-americans-3571756#:~:text=The%20association%20reports%20that%2032.4,high%20or%20high%20LDL%20levels

Magriplis, E., Sialvera, T. E., Papadopoulou, A., Efstathiou, S. P., Trautwein, E. A., Goumas, G.,

Dimakopoulos, I., Papavasiliou, K., Koutsouri, A., & Zampelas, A. (2019). Effectiveness and easiness of adherence to behavioural guidelines for diet and lifestyle changes for cholesterol-lowering: The Increasing Adherence of Consumers to Diet & Lifestyle Changes to Lower (LDL) Cholesterol (ACT) randomised controlled trial. *Journal of Human Nutrition and Dietetics: The Official Journal of the British Dietetic Association*, *32*(5), 607–618. https://doi-org.ezproxy.uta.edu/10.1111/jhn.12667

Mayo Clinic. (2021). *Obesity*. https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc-20375742

Miszory, E. V., Makai, A., Pakai, A., & Járomi, M. (2022). Cross-cultural adaptation and validation of the rapid assessment of physical activity questionnaire (RAPA) in Hungarian elderly over 50 years. *BMC Sports Science, Medicine & Rehabilitation*, *14*(1), 131. https://doi.org/10.1186/s13102-022-00512-3

Moore, T. L., & Mary, A. (2020). Medication compliance and holistic complementary alternative therapies among African American women with chronic conditions: A literature review. *ABNF Journal*, *31*(2), 54–60.

Nanna, M. G., Navar, A. M., Zakroysky, P., Xiang, Q., Goldberg, A. C., Robinson, J., Roger, V. L., Virani, S. S., Wilson, P. W. F., Elassal, J., Lee, L. V., Wang, T. Y., & Peterson, E. D. (2018). Association of patient perceptions of cardiovascular risk and beliefs on statin drugs with racial differences in statin use. *JAMA Cardiology*, *3*(8), 739–748. https://doi.org/10.1001/jamacardio.2018.1511

Reavy, K. (2016). Evidence-based practice: Background and models. In Reavy, K. (Ed.), *Inquiry and leadership: A resource for the DNP project.* (Pp. 43–57). Philadelphia, PA: F.A. Davis Company.

Stormacq, C., Wosinski, J., Boillat, E., & Van den Broucke, S. (2020). Effects of health literacy interventions on health-related outcomes in socioeconomically disadvantaged adults living in the community: A systematic review. *JBI Evidence Synthesis*, *18*(7), 1389–1469. https://doi.org/10.11124/JBISRIR-D-18-00023

Tran, C., Vo, V., Taylor, P., Koehn, D. A., Virani, S. S., & Dixon, D. L. (2022). Adherence to lipid monitoring and its impact on treat intensification of LDL-C lowering therapies at an urban academic medical center. *Journal of Clinical Lipidology*, *16*(4), 491–497. https://doi-org.ezproxy.uta.edu/10.1016/j.jacl.2022.05.003

USA Health Rankings (2022). *USA coronary heart disease death rate by state*. https://www.worldlifeexpectancy.com/usa/heart-disease

US Department of Health and Human Services. (2019). *Obesity - the office of minority health*. Hhs.gov. https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=25

Vaughan, C. A., Ghosh-Dastidar, M., & Dubowitz, T. (2018). Attitudes and barriers to healthy diet and physical activity: A latent profile analysis. *Health Education & Behavior*, *45*(3), 381–393.

Williams, K. A., Fughhi, I., Fugar, S., Mazur, M., Gates, S., Sawyer, S., Patel, H., Chambers, D., McDaniel, R., Reiser, J. R., & Mason, T. (2021). Nutrition intervention for reduction of cardiovascular risk in African Americans using the 2019 American College of Cardiology/American Heart Association primary prevention guidelines. *Nutrients*, *13*(10), 3422. https://doi.org/10.3390/nu13103422

World Health Organization. (2022a). *Cardiovascular diseases*. https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1

World Health Organization. (2022b). *Indicator metadata registry details*.

https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3416

Appendix A

Heart Disease Mortality Rates Per Age Group Table

Whites 35-44	**Blacks 35-44**	**Whites 45-54**	**Blacks 45-54**	**Whites 55-64**	**Blacks 55-64**
23.8	56.8	76.7	143.3	187.1	330.7

Note. Summary of heart disease death rates in 2019 from Heron et al. (2021).

Appendix B

Evidence Table

#	Author Citation	Design & aim or hypothesis & Major Variables	Population & Setting & Sample Size	Intervention	Measurements (e.g., tool to assess outcome)	Results &/OR Recommendations	Strengths & Limitations	Evidence Level & Quality Rating
1	Bailey et al. (2020)	Randomized Control Trial (RCT) Hypothesis-subgroup analyses for heterogeneity of treatment effects will show that HC is superior to TM for higher-risk subgroups with low health literacy, high medical or social complexity, non-smart cell phone ownership, older age, and suburban/rural	AA adults aged 18 years and over with uncontrolled diabetes living in medically underserved areas of the Mid-South N= 581	TM and HC	- SDSCA questionnaire - Treatment Self-Regulation Questionnaire (TSRQ) - Diabetes-39 quality of life instrument - Perceived Competency Scale - Adherence to Refills and Medications Scale - A1c obtained from medical records and	Recommendations: - assist health systems in understanding the contextual factors of underserved populations that drive intervention effectiveness - to tailor and replicate findings to similar populations.	Strength: Using AA patients with uncontrolled diabetes will allow for the generalization of the results to similar underserved populations, such as AAs with CVD and hyperlipidemia. - examining HC (low-cost) to TM (higher cost) will enable healthcare providers to assess the utilization of combinations of	Level II Quality Rating: B

	residence (Bailey et al., 2020). Major variables - general diet, exercise, medication adherence, primary care engagement, average blood sugar (A1c).	reported in the DWPC Registry (Bailey et al., 2020).	interventions for AAs. Limitations: - the model only tests two primary care interventions. - Other AA patients in underserved areas may not have similar healthcare experiences in other parts of the country, reducing the possibility of generalization of the results. - recruitment was limited to AAs in outpatient populations, a missed opportunity to involve medically underserved inpatients

2	Blalock et al. (2019).	Design: Cross-sectional study of an RCT Aim: to inform patient care by providing a mechanism to identify profiles of nonadherence behaviors and target interventions to improve adherence in individual patients. Major variables: occasional forgetful adherers, side effect non-adherers, and out-of-routine non-adherers	Population: adults with hyperlipidemia Setting- three primary care clinics affiliated with the Durham Veterans Affairs Health Care System N= 236	- A multi-component, tailored behavioral intervention	- Self-report Likert scale on non-adherence - Non-fasting serum cholesterol laboratory values were measured.	- Non-fasting serum total cholesterol was positively correlated with the endorsement of non-adherence (Blalock et al., 2019, p. 293). - endorsed reasons for non-adherence were forgetting (58%, n = 63), worried about taking medications for the rest of one's life (30%, n = 33), busy (26%, n = 28), side effects (25%, n = 27), coming home late (25%, n = 27), and traveling (23%, n = 25) (Blalock et al., 2019, p. 293). - the two least reported reasons for non-adherence were	Strength: - four distinct classes of medication non-adherers were identified. - Interventions can be tailored using these classes to improve medication adherence when treating hyperlipidemia. -examination of the classes supported the validity and generalization of the findings Limitations: - modest sample size - the categorization for the side-effect non-adherence class is unclear; it may be due to patients	Level III Quality Rating: B

						cholesterol being too low (5%, n = 5) and costing much money (7%, n = 8) (Blalock et al., 2019, p. 293) - multimodal interventions that involve patient education and collaborative planning should be tailored to the patient's reason for noncompliance.	stopping the medication on their own or following the doctor's orders to stop the medicine. - single time items were used in the latent analysis of the classes, but medication non-adherence may be a time-varying phenomenon; thus, results may not be accurate.	
3	Duren-Winfield et al. (2021)	Design: Cohort study Aim: - assess CVD risk factors among AA college students by examining blood markers. - to pilot test the effects of a 15-week CVD risk-prevention	Population & setting: AA college students at a Southeastern HBCU N= 124	An evidence-based, 15-week CVD risk-prevention and intervention program/course.	- The Queen's College Step Test was used to assess cardiovascular fitness. - Personal Health Intervention Tool (PHIT)- used to record daily recall of food and drink	Results: - mean blood lipid panel and glucose results were within the optimal range for the study. - Intake of fruits and vegetables increased - knowledge of CVD risk factors increased - 86% of the	Strengths: - applicable translation to other settings with populations at high risk for CVD - high potential for generalizability and impact - The study provided tools for students to	Level IV Quality Rating: B

	intervention administered as a 3-credit hour course versus a control course on two cohorts of AA college students (Duren-Winfield et al. (2021). Hypothesis: students enrolled in the evidence-based CVD health curriculum will adopt better health behaviors and improve their anthropometric measurements (BMI) and waist circumference) and blood markers (total cholesterol, triglycerides, high-density lipoprotein [HDL], low-density	consumption, mainly fruits and vegetables, and document physical activity. Other questionnaires administered: - Pittsburgh Sleep Quality Index (PSQI), - Perceived Stress Scale (PSS-10) - International Physical Activity Questionnaire (IPAQ) - Rams Have Heart App Evaluation Questionnaire	students enrolled in the intervention group passed the course. Recommendation - Developing and offering a healthy lifestyle-behavior CVD intervention course to AA college students effectively maximizes their awareness of chronic disease risk factors and prompts behavior change (Duren-Winfield et al., 2021).	monitor their health behaviors and continue to improve their health over time, reducing risk factors for chronic diseases. Weaknesses: - Limited retention of college students in the post-assessment phase. - loss of follow-up data on students who did not return to school after winter or summer breaks (Duren-Winfield et al., 2021).

		lipoprotein [LDL], and glucose, compared to the control group not enrolled in the course. Major variables: IV- the CVD risk-prevention intervention course. DV1- anthropometric measurements DV2- blood makers						
4	Halbert et al. (2017)	RCT Aim: To compare the effects of integrated (INT) versus disease-specific education (DSE) on changes in obesity-related behaviors in a comparative effectiveness education randomized trial	Population & setting: AA adults aged 18-75 residing in the Philadelphia, PA, metropolitan area. N= 530	A comparative effectiveness education trial for lifestyle health behavior change (Halbert et al., 2017).	Health Information National Trends Survey (HINTS) to evaluate FV intake and PA	- Significant increases were found in the proportion of participants who met PA guidelines from baseline (47.4%) to follow-up (52.4%) (p= 0.005). - Participants who completed the intervention had a 1.78 odds of meeting PA	Strengths: - using a CBPR approach to develop, implement, and evaluate intervention protocol - most participants completed the interventions (389 participants). Weakness:	Level II Quality Rating: A

		among African Americans Halbert et al. (2017). Major variables: PA and FV				guidelines (95% CI= 1.02, 3.10, p = 0.04). - Education about risk factors for chronic disease and evidence-based strategies for health behavior change may help address obesity-related behaviors among African Americans.	- Completion of the study may be affected by the financial incentive at completion and may not be replicable in future studies - no objective methods were used to measure PA or FV, just subjective reports, which may not be sensitive to behavior change. - follow-up retention rates could have been higher, possibly due to no financial incentive to complete follow-ups.	
5	Magriplis et al. (2019)	RCT Aim: to assess the effectiveness and easiness of	Adults aged 45 to 75 years old with hyperlipidemia who were	Randomized 6-week study with behavioral therapy	- The International Activity Questionnaire – Short Form to	Results: DG group showed higher adherence scores to diet, lifestyle change,	Strength: Using evidence-based behavioral change strategies could	Level II Quality Rating: A

	behavioral, diet, and lifestyle changes related to hyperlipidemia given by physicians or dieticians where those changes have been previously difficult to sustain. Major variables: perception of easiness, effectiveness, and future adherence, BMI, BP, and cholesterol values.	inhabitants of Athens and its surroundings. Setting- professional primary care setting N= 100	sessions administered by a physician group (PG) or a dietitian group (DG).	assess PA - Weight and height measurements to calculate the BMI - The 'forecasted adherence' questionnaire - A basic cholesterol knowledge questionnaire - IPAQ questionnaire - BP measurement and blood sample collection to measure cholesterol values - Questionnaire for perceived effectiveness of adhering to guidelines - Questionnaire for perceived easiness with respect to	and perception of cholesterol-lowering and easiness of following than the PG group. Recommendations: - Lifestyle and dietary changes related to HLD can be achieved with monitoring and continuous education. - a multidisciplinary approach involving dietitians for follow-up will enhance the lifestyle and dietary changes for adults with dyslipidemia.	increase the effectiveness of treating HLD and incorporate technological interventions. - The study indicates that a multidisciplinary approach to treating HLD by including dietitians is optimal. Weakness: short duration of the study may limit the time to develop multiple behavior change techniques or provide long-term efficacy of diet and behavioral changes for HLD patients whose condition involves lifelong change.

					adhering to guidelines - Questionnaire for effectiveness with respect to adhering to guidelines - Questionnaire for easiness with respect to adhering to guidelines - Questionnaire for reported forecasted adherence			
6	Moore & Mary (2020)	Literature Review Aim: "to examine the inclusion of holistic health therapies for AA women with chronic conditions" (Moore & Mary, 2020, p. 54) Major variables:	AA women aged 18-99 years old with any chronic conditions. N= 10 articles	- Holistic nurse coaching sessions - one-on-one interviews - focus groups - questionnaires	- Symptom Status Questionnaire - Heart Failure, Minnesota Living with Heart Failure Questionnaire, - Patient Health Questionnaire - 9, - Control Attitudes Scale - Revised, -	-The review indicated an openness of AA women to include CAT in their medical treatment plans. - Non-compliance may result from including some aspects of religion or spirituality. - AA women use	Strengths - a focus on studies about AA women examined data often overlooked, where men are usually the majority in most studies. - it revealed factors AA women value in treatment that	Level VII Quality Rating: B

	Medication compliance and Holistic complementary alternative therapies.		Multidimensional Scale of Perceived Social Support - Short Blessed Test - Brown Bag Medication Assessment - Medication Regimen Complexity Index (MRCI) -Beer's Criteria, - Audio recordings.	multiple home remedies and alternative, complementary therapies as part of their treatment plans for chronic disease management. -AA women often incorporate faith-based interventions in their treatment plan - Healthcare provider cultural competency is essential for successful medication compliance of the patients. - cultural considerations, fear of medication side effects, regimens, and perception of the cause of illness affect medication compliance.	will enable providers to include those values in treatment plans. Limitations - possible bias as men are excluded from the studies. - some studies had monetary incentives that could indicate bias. - results are not generalizable to most other populations due to limitations to AA women.

7	Stormacq et al. (2020).	Systematic Review (SR) Aim: to identify the best available information on effective HL interventions that increase health-related outcomes for socioeconomically disadvantaged people (Stormacq et al., 2020). Major variables: health literacy interventions, health-related outcomes	Adults 18 years and over of any ethnicity and cultural group worldwide who are socially or socioeconomically disadvantaged in their communities. N= 21 articles	Critical appraisal of studies with HL interventions	-Short-Form-36 Health Survey - EuroQol - Satisfaction with Life Scale, - Self-Efficacy Scale - OECD Long-Term Disability Questionnaire - Promoting Lifestyle Profile - Unmet Health Care Needs indicators.	Results: - incorporating intervention components that include cultural appropriateness, tailoring, skills building, goal setting, active discussions, and theory-based improve health-related outcomes. - Multi-faceted interventions, combining information facilitation and contact with an interventionist, are more effective than single-modality interventions.	Strengths: Extensive evidence was gathered on the effectiveness of HL interventions specifically addressed to socioeconomically disadvantaged people worldwide. Limitations: - difficulty concluding the effectiveness of HL interventions due to the large number of studies examined. - the author's limitation on access to studies - inability to contact the authors of two eligible studies with potentially good data, thus,	Level I Quality Rating: A

							were excluded from the review.	
8	Tran et al. (2022).	Retrospective cross-sectional study. Aim: To determine the number of patients that completed appropriate lipid monitoring at an urban academic medical center and investigate if an association exists between lipid monitoring and treatment intensification. Major variables: lipid monitoring, treatment intensification, statin use	Population: adults with HLD and prescribed ≥1 LDL-C lowering therapy and with more than one outpatient encounter during 2018 and 2019 (Tran et al., 2022) Setting: An urban academic medical center located in Richmond, Virginia N=12, 332	Lipid monitoring and subsequent HLD treatment intensification (higher statin dose or addition of another lipid-lowering drug) in the 12-month study period.	- Chi-square test and odds ratios on treatment intensification and lipid values - Lipid monitoring was defined as at least one lipid panel during the 12-month follow-up period. - Statin use and intensity were classified according to current practice. - "Treatment intensification was defined as a dose increase, change to a higher intensity statin, or addition of a new lipid-lowering therapy" (Tran	- Treatment intensification increased when lipid levels were monitored closely compared to no monitoring. - Lipid monitoring occurred less frequently in black or African American individuals (odds ratio 0.78, 95% confidence interval [CI]) 0.69 to 0.89)	Strength: Significant representation of the AA population (50% of participants), mostly AA females. Limitations: not generalizable due to subjects recruited from the medical center's outpatient clinics only. -possible biased interpretation of sample demographics due to the exclusion of 6,520 subjects who did not meet the criteria for the study. - some subject lab panels were incomplete, but	Level III Quality Rating: B

					et al., 2022, p.492).		the authors were unsure if it was due to non-adherence or incomplete lab orders. - additional factors, such as education, income, and marital status, were unavailable but may have provided more insight for the study.	
9	Vaughan et al. (2018)	Quasi-experimental Aim- to identify profiles of attitudes and barriers to diet and PA that distinguish subgroups of individuals and determine whether these profiles demonstrate associations	Population & setting - two low-income, predominantly AA neighborhoods in the same city N= 982	The Pittsburgh Hill/ Homewood Research on Eating, Shopping, and Health (PHRESH) and PHRESH Plus questionnaires	- Automated Self-Administered 24-hour recall for food - self-reported minutes of walking measured by the International Physical Activity Questionnaire - average daily minutes of	Four classes of attitudes were identified that can inform efforts to tailor individual-level interventions for diet and PA for people at high risk of chronic diseases. These classes are: (a) a moderate diet and negative exercise attitudes	Strengths: - the use of accelerometers, the gold-standard method of measuring PA - Examining attitudes and barriers to a healthy diet and PA in an underserved, understudied population.	Level II Quality Rating: B

		with diet and PA (Vaughan et al., 2018) Major variables IV-a latent profile analysis of attitudes and barriers to diet and PA DV1- Social cognitive constructs, including (self-efficacy, social norms, and internal and external barriers to diet and exercise) DV2- PA and diet			moderate to vigorous PA (MVPA) using data collected with a tri-axial accelerometer worn by participants for seven consecutive days.	(b) few barriers and benefits of a healthy diet and exercise (c) moderate overall attitudes (d) positive overall attitudes.	Limitations: - low generalizability of findings to other populations as most participants were single, AA women without children. - a lack of correspondence during a 2-year gap between assessments of diet and PA and the use of self-report measures of diet and walking, resulting in a high risk of social desirability bias.	
10	Williams et al. (2021)	Cohort study Aim: Evaluate the impact of a nutrition intervention in AAs on risk factors and	Population-African American (AA) adults aged 18 and over. Setting-an urban,	5-week non-dairy vegetarian nutrition intervention.	- ACC/AHA atherosclerotic cardiovascular disease (ASCVD) risk scores - A self-reported	Significant improvement in cardio-metabolic risk factors, particularly marked reductions in serum insulin	Strengths: - A majority female sample (83%), who are generally under-represented in cardiovascular research studies.	Level IV Quality Rating: B

	biomarkers associated with CVD. Major variables: - IV- a low-sodium, low-calorie, zero cholesterol, non-dairy vegetarian diet - DV1- serum metabolic biomarkers - DV2- 10-year ASCVD risk	predominantly AA community church. N=44	questionnaire to collect participants' baseline dietary patterns and lifestyle variables.	(−43%, p = 0.000), hemoglobin A1c (6.2% to 6.0%, p = 0.000), weight and BMI (−10.2 lbs, 33 to 31 kg/m2, p = 0.000), trimethylamine-N-oxide (5.1 to 2.9 μmol/L, −43%, p = 0.001), small dense low-density lipoprotein cholesterol (LDL) (24.2 to 19.1 mg/dL, −21%, p = 0.000), LDL (121 to 104 mg/dL, −14%, p = 0.000), total cholesterol (TC) (190 to 168 mg/dL, −12%, p = 0.000). Recommendation: Adherence to this vegetarian	- ‘Soul food,’ a Southern dietary pattern among AAs, was identified as substantially increasing health risks for CVD up to 56% and a 30% higher risk of stroke. This will help tailor dietary interventions to include fewer fat-rich, sugar-sweetened drinks and processed foods. Limitations: - Limited follow-up as only 75% of participants returned the surveys. - Short study duration (5 weeks) insufficient to address the

		diet low in sodium, cholesterol, refined carbohydrates, saturated fats, and sweetened beverages “will dramatically reduce and possibly eradicate the racial disparity in ASCVD events and mortality rates if 19% of the 21% increase is eliminated by this lifestyle change” Williams et al. (2021, p. 2).	long-term reduction in risk or accurately measure accumulated health events. - Lack of a control group does not account for non-dietary factors, such as improved medication adherence, that may have affected the results but were not reported by the participants. - Underestimation in the 10-year risk score due to the removal of 8 subjects from the ASCVD pooled cohort equation/ calculation due to successfully lowered lipid

					levels below 130. - Most participants were female (83%). Thus, males were under-represented though they have higher CV mortality rates than women.

Note: This table summarizes the evidence supporting the intervention for the PICOT. **AA= African American,** ACC= **American College of Cardiology**, AHA= American Heart Association, ASCVD= atherosclerotic cardiovascular disease, **A1C= average blood sugar**, BMI= body mass index, BP= blood pressure**, CBPR= c**ommunity-based participatory research, CI= confidence interval**, CAT= Complimentary alternative therapies,** CVD= cardiovascular disease, dL= deciliter, DWPC= Diabetes Wellness and Prevention Coalition, DG= dietitian group, DV= dependent variable, FV= fruit and vegetable**,** GP=general practitioner, **HBCU= Historically Black Colleges and Universities,** HC=health coaching, HL= health literacy, HDL= high-density lipoprotein**, HLD= hyperlipidemia**, IPAQ= International Physical Activity (PA) Questionnaire, IV= independent variable, lbs= pounds, LDL= low-density lipoprotein**,** mg= milligram**, n= number**, N= sample size, OECD= Organization **for Economic** Cooperation **and Development**, PA= physical activity, PG= physician group, p= probability, **RCT= randomized control trial**, SDSCA= Summary of Diabetes Self-Care Activities Questionnaire, TC= total cholesterol, TM= text messaging, umol= micromole.

Appendix C

Organization Approval Letter

Aicon Family Clinic

16261 FM 529 Rd, STE. A. Houston TX 77095
Tel: 282-550-5388; Fax: 281-550-5325

The University of Texas at Arlington,

701 S. Nedderman Drive

Arlington, TX 76019

Good day Sir/Madam,

To Whom It May Concern

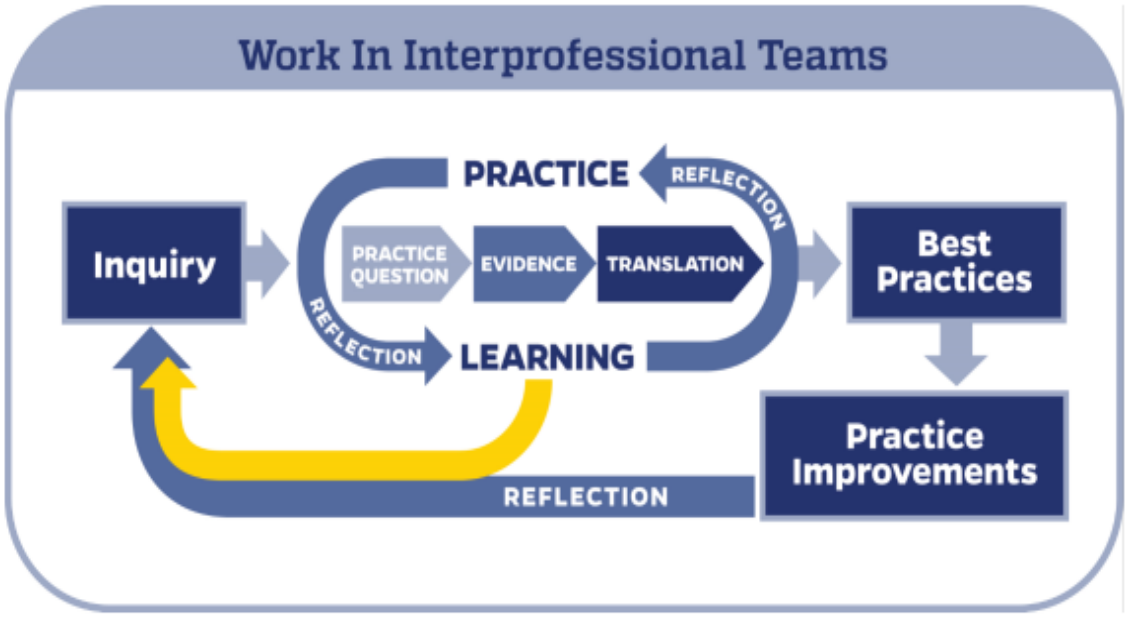
This is to confirm with the University of Texas at Arlington School of Nursing that DNP student Loretta Bennam will be conducting her clinical/DNP Capstone project at Aicon Family Clinic.

Sincerely,

Kindness Chukwukere FNP-BC
Aicon Family Clinic
16261 FM 529 Rd, Ste A,
Houston Texas 77095
PH: 281-550-5388

Appendix D

Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Model



Appendix E

Project Invitation Script for Nurse Practitioners

“Good morning, Mr./Mrs. X,

The clinic is conducting a project to improve the heart health of African American patients in our community. The project focuses on treating high cholesterol, promoting healthy diets, and increasing physical activity. To qualify as a participant, you must meet specific criteria. It uses evidence-based guidelines, and your participation comes at no extra cost to you. Will you be interested in hearing more about the project?”

Appendix F

DNP Project Team Education PowerPoint

Improving Heart Health in African American Adults Using a Cardiovascular Disease Bundle

DNP Project Team Education
Loretta Bennam
College of Nursing and Health Innovation, The University of Texas Arlington
6/10/2023

Slide D1

Heart Disease

- Heart disease is a significant cause of mortality in the United States of America (USA) and worldwide.
- 17.5 million people die annually from cardiovascular disease (CVD) worldwide (WHO, 2022)
- CVD kills 695,000 people annually in the USA
- one person dies every five seconds from heart disease in the USA (CDC, 2020).
- The leading cause of death in Texas in 2017 was heart disease (CDC, 2018)

Slide D2

Heart Disease in African Americans

Black, non-Hispanic African Americans (AAs) have the highest percentage of deaths per race due to heart disease (CDC, 2022).

less likely to be treated with statin medications than Caucasians (71% vs. 75%, p=0.02) (Nanna et al., 2018)

20% less likely to engage in active physical activity than non-Hispanic Whites in 2018;

1.3 times more likely to be obese than Caucasians (US Department of Health and Human Services, 2019)

AAs have the highest death rate in Houston, Texas, from coronary artery disease (Houston State of Health, 2023)

Slide D3

Risk Factors for Heart Disease

- Elevated Low-density Lipoprotein (LDL) Or "Bad Cholesterol"
- Obesity
- Physical Inactivity
- Unhealthy Diet,
- Diabetes Mellitus,
- Excessive Alcohol Use,
- High Blood Pressure, And
- Smoking

(CDC, 2020).

For the project, we will focus on three risk factors

- Obesity,
- High LDL Cholesterol
- Physical Inactivity

Slide D4

The DNP Capstone Project

The project is implementing a CVD bundle to decrease heart disease in African American adults

3 main sections:

- assessing cholesterol medication adherence
- identifying profiles of attitudes and barriers to physical activity
- patient education (pamphlet will be provided)

Goal: Improve heart health by promoting cholesterol medication adherence, weight reduction, and improving physical activity.

Subjects:
- Non-Hispanic African American adults
- BMI of 30 kg/m^2 and over (obese)
- LDL cholesterol levels above 100 mg/dl

Slide D5

Data Collection

- Weight measurements
- Medication Adherence Report Scale (MARS-5) questionnaire

  - assesses the patient's medication adherence or compliance
- Rapid Assessment of Physical Activity (RAPA) questionnaire

  – to measure physical activity by the patient's report
- Measure LDL cholesterol levels at the end of the project

Slide D6

Weight Measurements

- Weight measurements should be done on a standing scale
- Zero the scale before obtaining the weight
- Have the subject remove shoes and any heavy clothing like jackets or sweaters
- Record the weight to one decimal fraction, e.g., 200.2 lbs

(CDC, 2021)

Slide D7

Team Members

- Administrator
- Project Lead
- Nurse Practitioners (NPs)
- Medical Assistants (MAs)
- Clerks/ Front Desk Staff

Slide D8

Record Keeping

Accurate weight measurements should be recorded in the patient's chart

Completed consent forms and questionnaires must be scanned into patient charts in the electronic health record (EHR)

All forms must have subject MRN number as patient identifier

LDL cholesterol levels will be drawn at the end of the 10-week project

Sign-in Sheet with subject MRN numbers

Slide D9

Project Invitation Script

"Good morning, Mr./Mrs. X,

The clinic is conducting a project to improve the heart health of African American patients in our community. The project focuses on treating high cholesterol, promoting healthy diets, and increasing physical activity. To qualify as a participant, you must meet specific criteria. It uses evidence-based guidelines, and your participation comes at no extra cost to you. Will you be interested in hearing more about the project?"

Slide D10

Forms

When the subject agrees to participate, ensure they receive these forms:

- Sign-in Sheet
- Demographics question sheet
- The project consent form
- MARS-5 questionnaire
- RAPA questionnaire
- Patient education pamphlet

The project lead and NPs will give more details and complete data collection with the patient.

Slide D11

References

Centers for Disease Control and Prevention. (2018). *Stats of the state of Texas*. National centers for health statistics. https://www.cdc.gov/nchs/pressroom/states/texas/texas.htm

Centers for Disease Control and Prevention. (2020). *Heart Disease and stroke*. https://www.cdc.gov/chronicdisease/resources/publications/factsheets/heart-disease-stroke.htm#:~:text=Leading%20risk%20factors%20for%20heart

Centers for Disease Control and Prevention. (2021). *Measuring children's height and weight accurately at home*. https://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/measuring_children.html/#weight

Centers for Disease Control and Prevention. (2022). *Heart disease facts*. https://www.cdc.gov/heartdisease/facts.htm

Houston State of Health. (2023). *Disparities dashboard*. https://www.houstonstateofhealth.com/indicators/index/dashboard?alias=disparities

Slide D12

References

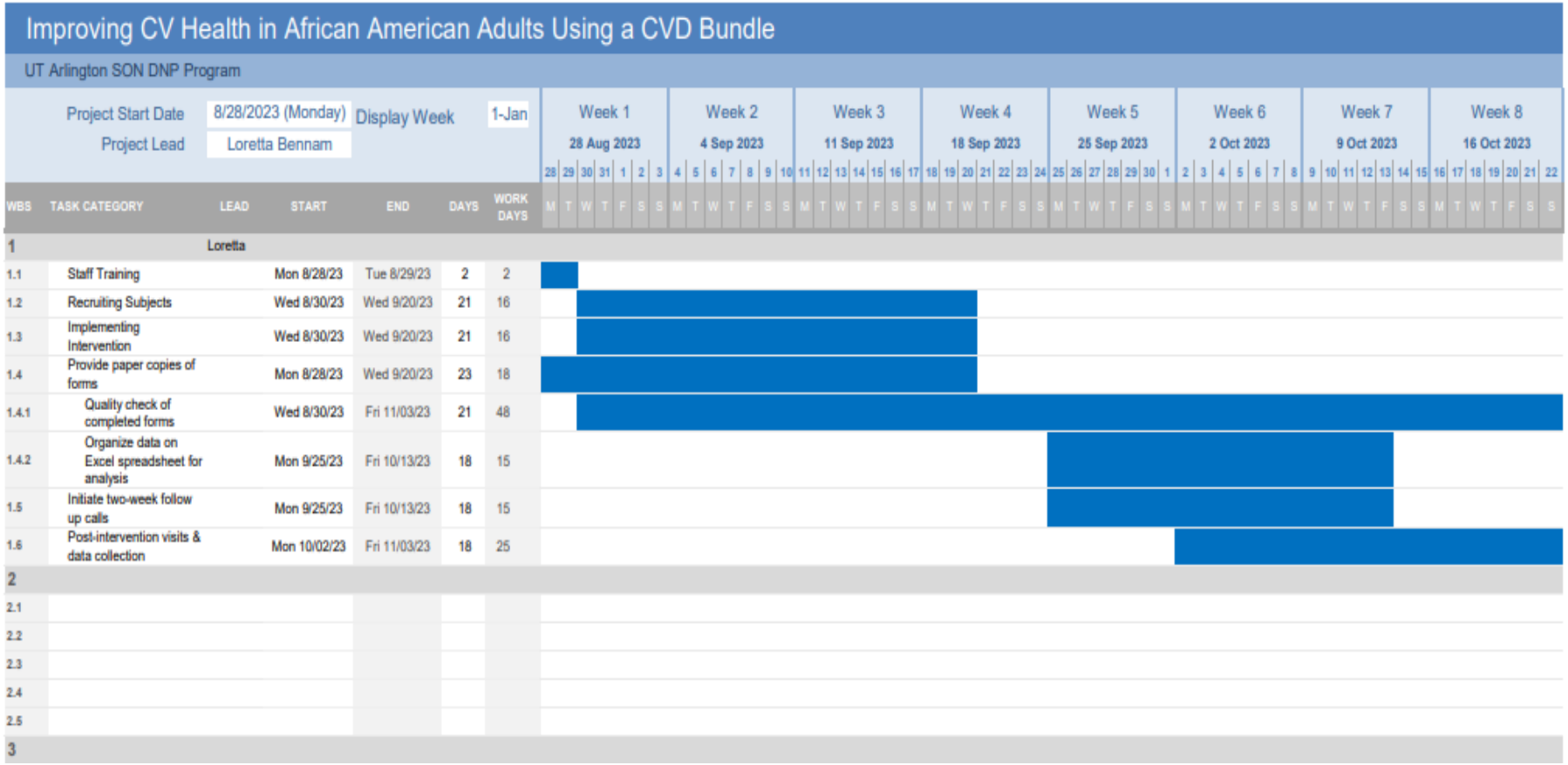
Nanna, M. G., Navar, A. M., Zakroysky, P., Xiang, Q., Goldberg, A. C., Robinson, J., Roger, V. L., Virani, S. S., Wilson, P. W. F., Elassal, J., Lee, L. V., Wang, T. Y., & Peterson, E. D. (2018). Association of patient perceptions of cardiovascular risk and beliefs on statin drugs with racial differences in statin use. *JAMA Cardiology*, *3*(8), 739–748. https://doi.org/10.1001/jamacardio.2018.1511

US Department of Health and Human Services. (2019). *Obesity - the office of minority health*. Hhs.gov. https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=25

World Health Organization. (2022). *Cardiovascular diseases*. https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1

Appendix G

GANNT Chart for DNP Project Weeks 1-8



Appendix H

MARS-5 Questionnaire

MARS_5

QUESTIONS ABOUT USING YOUR MEDICINES

- **Many people find a way of using their medicines which suits them.**
- **This may differ from the instructions on the label or from what their doctor has said.**
- **We would like to ask you a few questions about how you use your medicines**

Here are some ways in which people have said that they use their medicines

For each of the statements, please tick the box which best applies to you

	Your own way of using your medicines	Always	Often	Sometimes	Rarely	Never
M1	I forget to take them					
M2	I alter the dose					
M3	I stop taking them for a while					
M4	I decide to miss out a dose					
M5	I take less than instructed					

Appendix I

Rapid Assessment of Physical Activity (RAPA) Questionnaire

Rapid Assessment of Physical Activity

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

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

Examples of physical activity intensity levels:

Light activities • your heart beats slightly faster than normal • you can talk and sing	 Walking Leisurely  Stretching  Vacuuming or Light Yard Work
Moderate activities • your heart beats faster than normal • you can talk but not sing	 Fast Walking  Aerobics Class  Strength Training  Swimming Gently
Vigorous activities • your heart rate increases a lot • you can't talk or your talking is broken up by large breaths	 Stair Machine  Jogging or Running  Tennis, Racquetball, Pickleball or Badminton

How physically active are you? *(Check one answer on each line)*

		Does this accurately describe you?	
RAPA 1 1	I rarely or never do any physical activities.	Yes ☐	No ☐
RAPA 1 2	I do some **light** or **moderate** physical activities, but not every week.	Yes ☐	No ☐
RAPA 1 3	I do some **light** physical activity every week.	Yes ☐	No ☐
RAPA 1 4	I do **moderate** physical activities every week, but less than 30 minutes a day or 5 days a week.	Yes ☐	No ☐
RAPA 1 5	I do **vigorous** physical activities every week, but less than 20 minutes a day or 3 days a week.	Yes ☐	No ☐
RAPA 1 6	I do 30 minutes or more a day of **moderate** physical activities, 5 or more days a week.	Yes ☐	No ☐
RAPA 1 7	I do 20 minutes or more a day of **vigorous** physical activities, 3 or more days a week.	Yes ☐	No ☐
RAPA 2 (3 = Both 1 & 2) 1	I do activities to increase muscle **strength**, such as lifting weights or calisthenics, once a week or more.	Yes ☐	No ☐
RAPA 2 (3 = Both 1 & 2) 2	I do activities to improve **flexibility**, such as stretching or yoga, once a week or more.	Yes ☐	No ☐

ID # _____

Today's Date _____

Appendix J

Heart Disease Knowledge Survey

Question	Poor	Fair	Good	Very Good	Excellent
1. How would you rate your knowledge about high cholesterol?					
2. How would you rate your knowledge about physical activity and exercise?					
3. How would you rate your knowledge about the risk factors for heart disease?					
4. How would you rate your knowledge about eating healthy to prevent heart disease?					

Rating Scale (score range 4-20)
1= Poor
2= Fair
3= Good
4= Very good
5= Excellent

Appendix K

Heart Disease Patient Education Pamphlet

Increase Your Physical Activity

-AHA recommends 150 minutes per week of moderate-intensity aerobic activity or 75 minutes of vigorous aerobic activity weekly or a combination of both

-Take brisk walks in your neighborhood park

-Jog or walk on the treadmill three days a week as tolerated or for 30 minutes per session

-Park further from the entrance at work to include more physical activity

-Use stairs instead of the elevator as tolerated

-Aim to be more physically active than you currently are (AHA, 2018)

Obesity

Defined as BMI greater than 30 kg/m2

Eating healthy, exercising, and avoiding excess calories help prevent obesity (CDC, 2019b)

References

American Heart Association. (2018). American heart association recommendations for physical activity in adults and kids. Www.heart.org.https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults

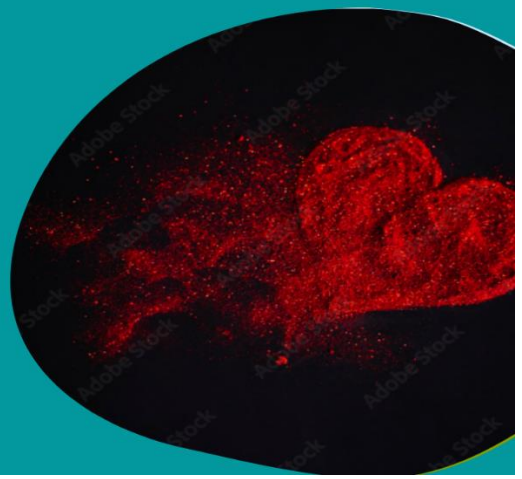
American Heart Association. (2019). Healthy eating. Www.heart.org. https://www.heart.org/en/healthy-living/healthy-eating

Centers for Disease Control and Prevention. (2019a). About high blood cholesterol. https://www.cdc.gov/cholesterol/about.htm

Centers for Disease Control and Prevention. (2019b). Knowing your risk: High cholesterol. Centers for Disease Control and Prevention. https://www.cdc.gov/cholesterol/risk_factors.htm

National Heart Lung and Blood Institute (2021). On the move to better heart health for African Americans. https://www.nhlbi.nih.gov/resources/move-better-heart-health-african-americans

Reduce Your Risk for Heart Disease



Risk Factors

High cholesterol*
Obesity*
Physical Inactivity*

Also.....
Smoking
Excessive alcohol use
High blood pressure
Unhealthy diet
(CDC, 2019b)

Goals

1. Eat healthy.
2. Take your cholesterol medication.
3. Increase your physical activity.

Eating Healthy

- Choose minimally processed food or avoid them altogether
- Eat a variety of fruit and vegetables
- Have healthy protein from plant sources and seafood
- Choose whole-grain foods
- Use liquid non-tropical plant oils, e.g., olive oil
- Reduce salt intake
- Limit alcohol consumption

(AHA, 2019; NHLBI, 2019)

High Cholesterol

- LDL or low-density lipoprotein is referred to as 'bad cholesterol"
- Normal values of LDL in less than 100 mg/dl
- Decreasing LDL numbers reduces the risk of heart disease.
- Taking your cholesterol medication daily or as prescribed is very important.
- Set a reminder to take your medication
- Taking medications at the same time every day improves compliance

(CDC, 2019a)

Appendix L

Demographic Data Questionnaire

1. Are you African American?
   Yes_____ No____

2. Are you of Latino origin?
   Yes_____ No____ (If yes, you do not qualify for this project)

3. Please indicate your birth gender.
   Male_____ Female_____

4. Please indicate your highest level of education
   High school degree or less___ Associate's degree___Bachelor's degree____
   Master's degree or higher_____

5. What is your marital status?
   Single____ Married_____ Divorced or separated_____ Widowed_____

6. What is your employment status?
   Employed_____ Unemployed_____

Appendix M
Database Dashboard for Data Collection

Table Q1

Participant Code	Weight (lbs)		LDL (mg/dl)		MARS-5 Score (Range 5-25)		RAPA-1 Score (Range 0-7)		RAPA-2 Score (Range 0-3)	
	Pre	Post	Pre	Post	Pre	Post	RAPA-1 Pre	RAPA-1 Post	RAPA-2 Pre	RAPA-2 Post
28-19-006 See Appendix Q for code	250	230	189	150	9	19	7	7	1	3

Table Q2

MARS-5										
Participant Code	Q#1 Pre	Q#2 Pre	Q#3 Pre	Q#4 Pre	Q#5 Pre	Q#1 Post	Q#2 Post	Q#3 Post	Q#4 Post	Q#5 Post
28-19-006 See Appendix Q for code	1	2	2	1	3	3	4	4	3	5

Table Q3

RAPA																		
Participant Code	Q#1 Pre	Q#2 Pre	Q#3 Pre	Q#4 Pre	Q#5 Pre	Q#6 Pre	Q#7 Pre	Q#8 Pre	Q#9 Pre	Q#1 Post	Q#2 Post	Q#3 Post	Q#4 Post	Q#5 Post	Q#6 Post	Q#7 Post	Q#8 Post	Q#9 Post
28-19-006 See Appendix Q for code	0	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	2

See Appendix N for coding explanation

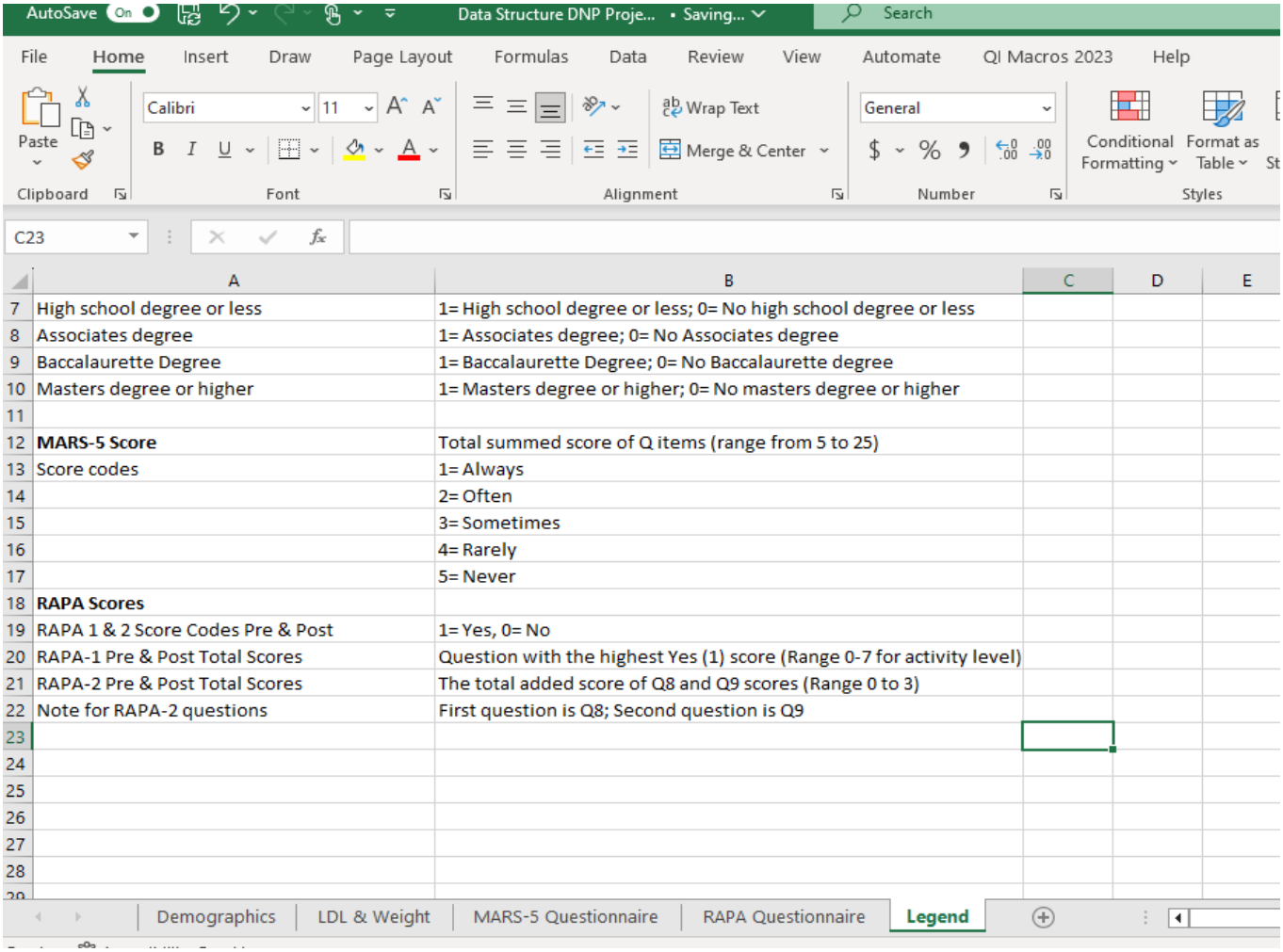
Appendix N
Participant ID Master Coding System

A= 10	B= 11
C= 12	D= 13
E= 14	F= 15
G = 16	H= 17
I= 18	J= 19
K= 20	L= 21
M= 22	N= 23
O= 24	P= 25
Q= 26	R= 27
S= 28	T= 29
U= 30	V= 31
W= 32	X= 33
Y= 34	Z= 35

Participant ID Code = Initial First Name – Initial Last Name—Participant number; If the first participant's name were Sarah Jones, her code would be 28-19-006.

Appendix O

Database Coding Legend for Data Analysis



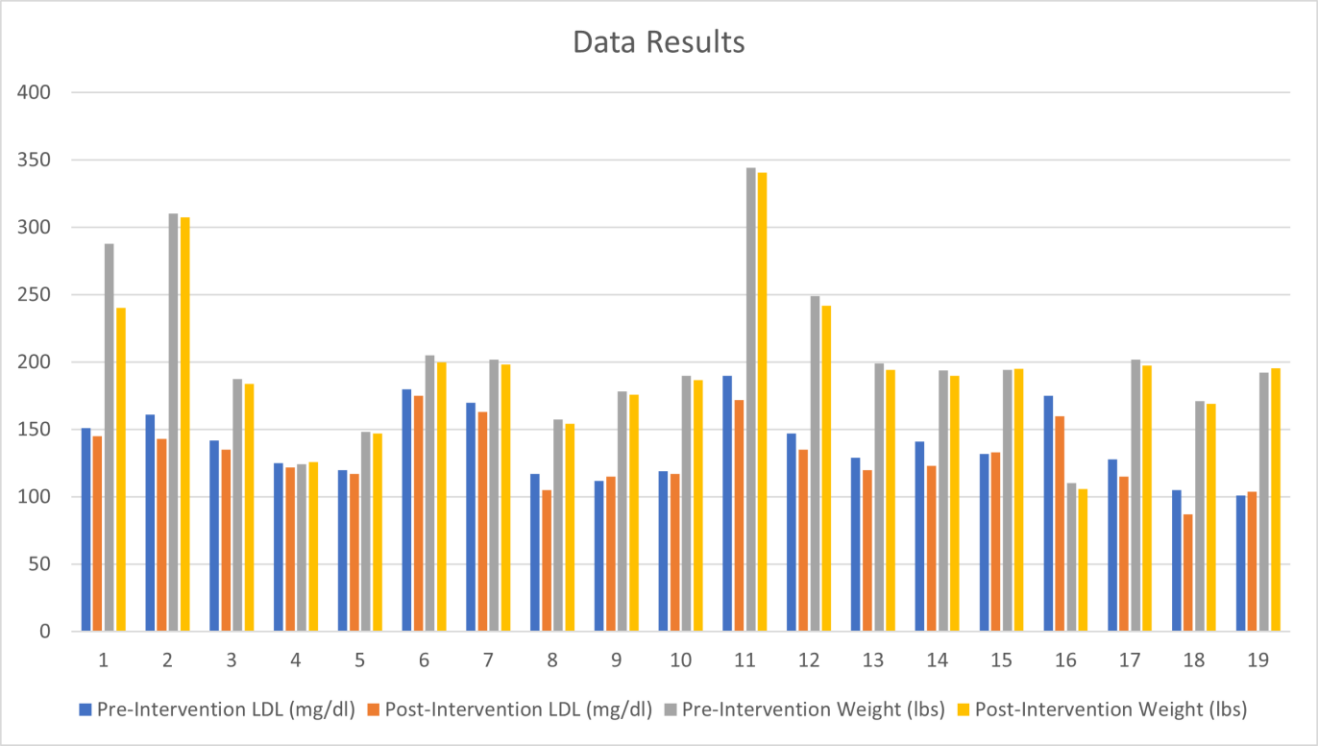
	A	B	C	D	E
7	High school degree or less	1= High school degree or less; 0= No high school degree or less			
8	Associates degree	1= Associates degree; 0= No Associates degree			
9	Baccalaurette Degree	1= Baccalaurette Degree; 0= No Baccalaurette degree			
10	Masters degree or higher	1= Masters degree or higher; 0= No masters degree or higher			
11					
12	**MARS-5 Score**	Total summed score of Q items (range from 5 to 25)			
13	Score codes	1= Always			
14		2= Often			
15		3= Sometimes			
16		4= Rarely			
17		5= Never			
18	**RAPA Scores**				
19	RAPA 1 & 2 Score Codes Pre & Post	1= Yes, 0= No			
20	RAPA-1 Pre & Post Total Scores	Question with the highest Yes (1) score (Range 0-7 for activity level)			
21	RAPA-2 Pre & Post Total Scores	The total added score of Q8 and Q9 scores (Range 0 to 3)			
22	Note for RAPA-2 questions	First question is Q8; Second question is Q9			
23					
24					
25					
26					
27					
28					

Demographics | LDL & Weight | MARS-5 Questionnaire | RAPA Questionnaire | Legend

Heart Disease Education Survey	Total summed score of Q items (range from 4 to 20)
Score codes	1= Poor
	2= Fair
	3= Good
	4= Very good
	5= Excellent

Appendix P

Participant LDL and Weight Pre- and Post-Data Results



Appendix Q

Permission to Use MARS-5 Questionnaire

Permission to use the MARS-5 Questionnaire Inbox ×

Loretta Bennam <lorybennam@gmail.com> Jul 19, 2023, 1:21 PM (17 hours ago)
to r.horne

Good day Dr. Rob Horne,

My name is Loretta Bennam. I am a Doctor in Nursing Practice (DNP) student at the University of Texas in Arlington. I'm am seeking permission to use The Medication Adherence Report Scale (MARS-5) questionnaire for my capstone project to commense in August 2023. The project is on Improving Heart Health in African American Adults using a Cardiovascular Disease Bundle. I plan to use the questionnaire to assess cholesterol medication adherence in the subjects.

I will greatly appreciate your approval and permission to utilize the MARS-5 questionnaire for my project.

Thank you in advance.

Sincerely,

Loretta Bennam.

Taylor, Lauren <lauren.taylor@ucl.ac.uk> 3:58 AM (2 hours ago)
to Zoe, Robert, me

Dear Loretta,

I hope this email finds you well. Thank you for your interest in the MARS questionnaire (please see attached, which should provide answers to your questions including scoring etc).

We are very interested in hearing more about your findings. We ask all potential users to sign up to our standard conditions/ copyright for use of the MARS questionnaire here: https://forms.office.com/r/gYSHWRsPtd

If you are happy with the conditions, please complete the form using the link. Permissions are automatic on receipt of returned form.

If you have any questions, please do not hesitate to ask.

Best wishes

Lauren Taylor

Research Fellow
UCL School of Pharmacy
Department of Practice and Policy | Centre for Behavioural Medicine
BMA House, Tavistock Square
London, WC1H 9JP

Loretta Bennam <lorybennam@gmail.com> 6:14 AM (32 minutes ago)
to Lauren, Zoe, Robert

Dear Lauren

Thank you for your response. I agree to the standard conditions and copyright presented. I have filled out the form as requested. I will certainly keep you updated on the findings of the study. Thank you again for your time and consideration.

Kind regards.

Loretta Bennam
DNP Student
University of Texas in Arlington

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