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Implementing a Cardiovascular Bundle for Hypertension in Black Adults 18 years and Older

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Abstract

Hypertension (HTN) occurs in all ethnicities in the United States, but the prevalence in Black adults is disproportionate due to unhealthy dietary patterns and physical inactivity lifestyle behavior. This quality improvement strategic effort strived to educate Black adults on HTN to curb the health disparity. The quality improvement project focused on using a Dietary Approaches to Stop Hypertension (DASH) diet and physical exercise to reduce blood pressure in Black adults 18 years and older with hypertension. A one-group pre-test-post-test design was used in this project. The Plan-Do-Study-Act framework was utilized. The program was eight weeks in duration. All the participants from the project site have a diagnosis of hypertension. Participants were selected at their own will at their physicians' office visits. The measurement tools were the project leader's pre-and post-intervention BP measurements, and participants independently answered the Dietary Approaches to Stop Hypertension Questionnaire (DASH-Q) and Godin Shephard Leisure Time Physical Exercise Questionnaire (GSLTPEQ). The intervention comprised education on the DASH diet eating plan/menu and 150 minutes/week of moderate-intensity physical exercise, providing patient handouts, and following up three times weekly with text message reminders. At the end of 8 weeks, the participants received repeated assessments with post-SBP and DBP measurements and post-intervention DASH-Q and GSLTPEQ assessments, respectively. The results showed reduced BP measurements and improved knowledge and utilization of the DASH diet and physical exercise to control BP among Black adults aged 18 and older with HTN.

Keywords: Hypertension in Black adults, Dietary Approaches to Stop Hypertension (DASH) diets, Physical activity.

Health Gap

Hypertension (HTN) is high blood pressure (BP). HTN is termed a 'silent killer' because it has no signs or symptoms until it has caused severe problems (Whelton et al., 2018). HTN develops when blood flows through the arteries at a higher-than-normal pressure as the heart beats to circulate blood (National Heart Lung and Blood Institute [NLBI], 2022). According to the American College of Cardiologists [ACC] /American Heart Association [AHA] 2017 guidelines, normal BP is the systolic BP [SBP] is < 120 mmHg, and diastolic BP [DBP] is < 80 mmHg, elevated BP is SBP 120 - 129 mmHg and < 80 mmHg. Stage 1 HTN is SBP 130 - 139 mmHg, DBP 80 - 89; stage 2 HTN is 140 mmHg or greater, and the DBP 90 mmHg or higher. Additionally, the SBP equal to or >180 and DBP 120 mmHg is a hypertensive crisis requiring emergency medical attention. HTN increases cardiovascular risks, organ damage, and mortality.

The health gap identified was a high prevalence of stage 1 and stage 2 HTN among Black adults 18 years and older. The knowledge deficits and lack of healthy dietary approaches to stop Hypertension (DASH) diet adherence, and physical exercise result in unmet HTN control goals despite using prescribed antihypertensives among Black adults 18 years and older (Howard et al., 2018). The Southern dietary consumption, characterized by fried foods with high saturated fats, high sodium, and low potassium, was a significant risk contributor to the high prevalence and mortality of HTN among the adult Black population 18 years and older (Howard et al., 2018). These health gaps require a quality improvement (QI) project to bridge the gap, improve HTN through screening assessments, and promote education and patient advocacy with evidence-based dietary approaches and physical exercise to control BP.

Although HTN affects people from all ethnicities in the United States (U.S), Black adults 18 years and older are disproportionately affected due to unhealthy dietary patterns influenced by

low socio-economic status, low income, living in a neighborhood of a food desert region, lack of access to quality fresh foods, and high prices of foods (Cook et al., 2022). Also, physical inactivity is another lifestyle behavior contributing to uncontrolled BP among the Black adult population with HTN. Black adults 18 years and older are reported to have a higher physical inactivity rate of 30.0%, compared to Hispanic people at 23%, White people at 23%, and Asians at 20.1% from 2017 to 2020 (Centers for Disease Control and Prevention [CDC], 2022b). The attributes of physical inactivity among adult Blacks 18 years and older are lower social support for regular exercise, lack of recreational gym facilities, financial strain, and lack of access to safe and convenient places in Black communities (Cook et al., 2022).

Locally, in this project site, a private primary care outpatient clinic in a suburban city in Texas, the chart audits electronic health records identified that 75% of Black adult patients 18 years and older have high BP greater than 130/80 mmHg. Also, in this primary care outpatient clinic, when this healthcare personnel enquired from the patients about using the DASH diet and physical exercises to control their HTN, the Black adult patients confirmed that they were not using the DASH diet and physical exercise to manage their HTN, depicting a knowledge deficit of the DASH diet and physical exercise regimen to control their HTN. Locally, the suburban county of North Texas is the second most populous county in Texas and the ninth largest in the U.S. In 2020, this county's HTN population included Blacks 71%, American Natives 70%, Hispanics 53%, Asians 61.0%, and Whites 65% (DFWHC Foundation, 2023). The 2018 -2020 national rate of the ethnicity age-adjusted death rate for stroke due to uncontrolled HTN was 37.6 per 100,000, while the Healthy People 2030 target was 33.4%. In comparison, the suburban county of Texas has a death rate of 45.1 per 100,000, with Blacks having a 60.4% death rate; Whites, 41.2%; Hispanics, 33.8%; and Asians, 35.5% (Dallas Fort Worth Healthy Community

[DFWHC] Foundation, 2023). Similarly, data from 2016 to 2020 in this suburban county of North Texas, the HTN-related heart disease deaths were 167 per 100,000 cases, above the national rate of 165 per 100,000 (Dallas County Health and Human Services [DCHHS], 2023).

In Texas, HTN contributes to 78% of all heart disease and stroke cases and has been the leading cause of death among adults for 11 years (Texas Health and Human Services, 2022). Lou et al. (2022) indicated that one in three adults (33.3%) has a low awareness of DASH diet consumption for BP control. The lack of adherence to the DASH diet in Black adults with HTN heightens their uncontrolled BP and increases the risk of cardiovascular disease complications (Muntner et al., 2020). In the fruit and vegetable healthy eating domain, Texas has a low rate of 8.8% consumption and ranks 14th nationally due to a lack of knowledge and access (United Health Foundation, 2022). Similarly, about 85% of Black adult patients in this primary care clinic do not practice the recommended 150 minutes of physical exercise to control BP per ACC/AHA guidelines. In Texas, the projected healthcare cost for HTN from 2016 to 2030 is $3.5 trillion if preventive and treatment strategies are not improved (DCHHS, 2022). The proportion of Texans who have uncontrolled HTN is greater than the overall US rates, with 15.1% of those aged 18 to 44 years having uncontrolled HTN compared to 14.4 % nationwide; 42.7% of adults aged 45-64 years, compared to 40.2% nationally, and those 65 years and older, 61.2% and 60.6% respectively (United Health Foundation, 2023).

At the state level, physical inactivity is a problem. Texans' participation rate in physical activity was 25.1%, ranking 33rd in the nation (United Health Foundation, 2022). Among the Texas adults with HTN, physical inactivity is the leading cause of 8% of deaths (United Health Foundation, 2022). The lack of engagement in physical exercise was evident when the healthcare professional enquired to ascertain the frequency of the patient's practice of moderate-intensity

physical exercise, such as brisk walking to control their BP; in response, many patients admitted that they have not been participating in any physical exercise to control high BP at all. Physical exercise was recommended as the fundamental treatment for the primary prevention, treatment, and control of BP for all stages of HTN (Leggio et al., 2018). Adults should engage in at least 150 minutes of accumulated moderate-intensity physical activity every week or 75 minutes of vigorous-intensity physical activity per week to control their BP (Arnett et al., 2019). An estimated 24.3 million adults with HTN in the United States (US) were not engaging in the recommended weekly 150 minutes of physical exercise to improve BP (Whelton et al., 2018; CDC, 2022b). Implementing cost-effective, practical, and sustainable quality improvement (QI) programs in primary care settings can help close the health gaps. This QI initiative screened, identified, and intervened with the evidence-based DASH diet and physical exercises to achieve the ACC/AHA 2017 HTN guidelines target of normal BP control < 130/80 mmHg and mitigate cardiovascular risks (Carey & Whelton, 2018; Egan et al., 2018). The recommended HTN guidelines for all adults include lifestyle intervention with a healthy DASH diet intake and physical exercise (Fu et al., 2020; Guo et al., 2020; Lee et al., 2018).

At the national level, the prevalence of HTN varies among ethnicities. The HTN prevalence rate for Black people is 57.1%; for White people, 43.6%; for Asian people, 42%; and the rate for Hispanic people is 43.7% (CDC, 2021). Due to a lack of access to healthy fresh foods, unhealthy eating behaviors, and physical inactivity, BP control remained suboptimal among non-Hispanic Black people, with a 10% lower BP control rate than White people (Hayes et al., 2022). Culturally, the Black population in the U.S. has low adherence to the DASH diet but has a high affinity and adherence to popular traditional southern foods comprised of high-fat meats, deep-fried foods in high saturated fats, added sodium, organ meats, processed meats,

canned foods, and sugar-sweetened beverages, that may contribute to uncontrolled HTN among Blacks 18 years and older (Carnethon et al., 2017; Couch et al., 2021). The social and environmental disparities negatively impact overall health, thus increasing the high prevalence of HTN among Black people more than the other ethnic groups in the U.S. (Cook et al., 2022). The emphasis is the need for nutrition interventions in predominantly Black communities to control the development of chronic diseases such as HTN (Couch et al., 2021).

Literature Review

The comprehensive review of literature validates that adjunct nonpharmacological interventions, DASH diet, and physical exercises are fundamental approaches for the reduction of BP and prevention of cardiovascular diseases and mortality, especially in Black adults 18 years and older with stage 1 with BP > 130/80 mmHg and stage 2 HTN >140/90 mmHg.

The selected databases include Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete, Academic Search Complete, the Cochrane Library, Medline, and PubMed, accessed from the University of Texas at Arlington's library. The academic journal articles were researched from three disciplines: nursing, medicine, and nutrition. The search strategy used the keywords dietary approaches to stop hypertension or DASH diets, physical exercises, hypertension, or high blood pressure in adults. The keyword phrases (dietary approaches to stop hypertension OR DASH diets) AND (physical exercise) AND (hypertension OR high blood pressure) were included, and a total of 1204 articles were identified. The search strategy was refined to limit the results to peer-reviewed academic journals, randomized control trials, systematic reviews of meta-analysis, and adult populations. The analysis of the research articles was arranged in three themes based on their concept similarities related to BP control: DASH diet, physical exercises, and a combination of diet and physical exercise in the literature review.

DASH Diet for BP Control

Howard et al. (2018) examined a cohort study with 6897 Black adult participants to evaluate clinical and social factors potentially associated with a high incidence of HTN among Black compared to White adults. The study variables included Southern diet scores, lower adherence to the DASH diet, a high school education level or less, and an annual income of $35,000. The Southern diet score ranged from -4.5 to 8.2; the higher value indicated higher adherence to the Southern diet and less adherence to the DASH diet. For the Black men, the mean Southern diet score was 0.81, while for the Whites, -0.26; the Black women's diet score was 0.27 compared to the White women with -0.57, indicating that the Southern diet was significantly associated with and accounted for 51.6% incidence of HTN for the Blacks (Howard et al., 2018). Other contributory factors to HTN include a high school level of education or less (12.3%), lower DASH diet adherence (15.2%), and a low-income level of < $35,000 (9.3%).

Balasubramaniam and Hewling (2021), in a systematic review of eight randomized controlled trials (RCTs), evaluated the effects of various dietary approaches for BP control among adults aged 18 years and older with HTN. The reviewers highlighted the influence of different healthy dietary patterns, including DASH, low sodium intake, vegetarian, and Mediterranean-style diets, on BP levels. Compared to the typical American diet, the DASH diet is richer in potassium, calcium, protein, and fiber and lower in sodium, sugar, saturated fats, and cholesterol. DASH emphasizes consuming fruits, vegetables, fat-free or low-fat dairy products, whole grains, fish, poultry, beans, seeds, and nuts (Balasubramaniam & Hewling, 2021; Filippou et al., 2020). The lower sodium content in the DASH diet further enhanced the lowering of BP faster than the American diet. The DASH diet's efficacy was superior and sustainable in BP control (Balasubramaniam & Hewling, 2021; Guo et al., 2021). Besides antihypertensive medications,

Balasubramaniam and Hewling recommended the DASH dietary plan as the first-line supplemental treatment for HTN. The reviewers' analysis indicated that the benefit of BP reduction was more significant with adherence to the DASH diet than any other diet. The result showed a decrease of SBP 7 mmHg in the people with normal BP group and 14 mm Hg in the HTN group. Balasubramaniam and Hewlings affirmed that lowering SBP by at least three mmHg correlates with preventing 6% of cardiovascular diseases and 8% of deaths, and reducing two mmHg in DBP decreases 6% of coronary artery disease.

Additionally, in a meta-analysis of ten RCTs, Guo et al. (2021) examined the effect of the modified DASH diet on BP for 2416 pre-hypertensive and hypertensive participants with a mean age of 53 years compared to the control group. Guo et al. recommended the modified DASH (m-DASH), rich in fruits, vegetables, and low-fat dairy products, with more fish, nuts, and legumes and a moderate sodium limitation intake of 3000 mg/day to reduce BP. The m-DASH diet, compared to the control group, decreased the SBP by 4.9 to 7.6 mmHg and DBP by 2.6 to 4.2 mmHg, 95% CI (Guo et al., 2021). However, Filippou et al. (2020) suggested that a sodium intake of 2400 mg/day may potentiate the DASH diet for more BP reduction. Filippou et al. affirmed that the DASH diet combined with 2400mg of sodium reduced SBP and DBP more in people less than 50 years old. Sukhato et al. (2020) also systematically reviewed RCTs to examine the effectiveness of different diet patterns, including DASH, Mediterranean, Nordic, Paleolithic, vegetarian, low salt, low fat, and low carbohydrates, in lowering BP. According to NutriGrade scoring analysis, the DASH diet scored the highest and was significant in overall reduction with SBP -3.20 to -7.62 mmHg and DBP - 2.50 to - 4.22 mmHg in hypertensive participants (Sukhato et al., 2020).

Similarly, Filippou et al. (2020) conducted a systematic review of meta-analysis of 30 RCTs with a total of 5545 adult hypertensive participants with a mean age of 50 years and a baseline SBP of 140 mmHg. The reviewers evaluated the efficacy of the DASH diet and lifestyle modifications on BP levels. The interventions were a DASH diet combined with lifestyle modifications of sodium intake restriction not exceeding 2400 mg daily and physical exercise or weight loss compared to a control diet for 15 weeks. The intervention results indicated that the DASH diet reduced SBP by -6.7 and DBP by -3.5 mmHg compared with a control diet for SBP 2.0 mmHg and SBP 0.8 mmHg outcomes. Filippou et al. (2020) indicated that integrating DASH diets and physical exercise reduced SBP and DBP baseline levels in hypertensive and non-hypertensive participants. The reviewers suggested that the DASH diet could prevent the onset of hypertension and augment antihypertensive medications. Balasubramaniam and Hewling (2021) found that the DASH diet can lower BP and reduce cardiovascular risk.

Physical Exercises for BP Control

Lee et al. (2021), in a systematic review of 73 RCTs, identified moderate-certainty evidence supporting that walking reduced SBP for all ages. The reviewers found a mean difference of SBP 4.1 mmHg for patients aged 18 to 40 who regularly walked for 30 to 45 minutes. A piece of moderate-certainty evidence indicated that walking reduced mean DBP by 3.01 mmHg for patients aged 41 to 60 years and those aged 60 and older, and low certainty evidence for a reduction of 1.33 mmHg for participants aged 60 years and older. Walking is a low-cost physical activity integral to lifestyle modification that enhances blood pressure control (Lee et al., 2021; Zhou et al., 2022; Zhu et al., 2022). Zhou et al. (2022) have similar conclusions in their systematic review of 12 RCTs that investigated the effects of exercise on BP control of 717 adult patients with HTN. In a follow-up at four weeks of the intervention duration, Zhou et

al. reported that physical exercises significantly reduced the SBP by a mean difference of 4.89 mmHg and DBP by 3.74 mmHg (95% CI). The Zhou et al. review supported that, irrespective of the patient's medication status, baseline SBP, age, and intervention duration, physical exercise's effectiveness in reducing BP was outstanding.

In another systematic review of RCTs, Zhu et al. (2022) explored the effects of six aerobic exercises, including walking, yoga, aquatic sports, football, tai chi, and qigong, on controlling BP. The intervention results indicated that these aerobic exercises reduced SBP from 5.94 mmHg to 8.31 mmHg, and DBP ranges from 1.67 mmHg to 3.05 mmHg at 95% CI. Aerobic exercise significantly reduces BP and is recommended for managing HTN (Zhou et al., 2021; Zhu et al., 2022;). Moderate to high-intensity intermittent aerobic exercise effectively improves SBP and DBP and can be implemented in managing HTN (Lee et al., 2021; Zhou et al., 2022; Zhu et al., 2022).

DASH Diet and Physical Exercises Combination for BP Control

In a single RCT, Lee et al. (2018) examined 72 adults with HTN aged 20 years or older in three randomized groups. The mean age was 45 years. The aim was to investigate the effects of lifestyle interventions, including education on the DASH diet alone and the DASH diet in combination with home-based physical exercise education on BP outcome. Group C, the control group, received advice only, while Group D members received education on the DASH diet alone. Group D plus Exercise participants received DASH diet education and physical exercise. These participants were instructed to perform aerobic exercises for 150 minutes per week, such as brisk walking up to 10,000 steps or biking. The BP reductions were more significant with the DASH and exercise group than among other participants. The control group, the DASH diet alone (Group D), had reduced SBP by 5.6 mmHg and DBP of 2.9 mmHg. Compared to the

control, the DASH and Exercise group (Group D plus Ex) has a reduction of 7.2 mmHg. Filippou et al. (2020), Fu et al. (2020), and Lee et al. (2018) recommended that the DASH diet and physical exercise education are nonpharmacological strategies that optimize BP control.

In a similar study, Nguyen-Huynh et al. (2022) performed a 12-month clustered RCTs to determine whether a lifestyle coaching intervention or an enhanced pharmacotherapy protocol is more effective than the usual care in controlling BP among 1761 Black adults with a baseline BP of 140/90 mmHg from 98 primary care physicians in a large healthcare delivery system. The participants were randomized into treatment groups: the lifestyle coaching (LC) group, the enhanced pharmacotherapy (EP) group, and the usual care control group. The LC group received coaching education emphasizing dietary approaches with sodium reduction and the DASH diet to control BP. The EP group received telephone calls from a clinical pharmacist or research nurse for monitoring sessions on thiazide dose increase or the addition of spironolactone or a calcium channel blocker. The follow-up evaluations were done at 24 and 48 months, respectively. The results showed that the LC group had more BP reduction at 72%, EP at 67%, and the control group at 61.2% at 95% CI. Even at 48 months follow-up, BP reduction remained significant. The LC was at 73.1% versus EP 66.5%, and the control group recorded 64.5%, indicating high superiority of LC over the other groups (Nguyen-Huynh et al., 2022).

The systematic review by Fu et al. (2020) supported the DASH diet plus exercise as the superior. They analyzed 17 RCTs to evaluate the effect of the DASH diet and physical exercises of 30 minutes duration three times a week on controlling BP. The reviewers evaluated the effect of the DASH diet, low sodium diet, and physical exercises of 30 minutes duration three times a week on controlling BP. The 12-week follow-ups showed that the DASH diet lowered SBP with a weighted mean difference (WMD) of 6.97 mmHg and DBP of 3.54 mmHg compared to the

usual care. A low sodium intake pattern with a 5g/day salt substitute diet of low sodium chloride containing 65% and high potassium 35% salt lowers SBP with a WMD of 8.21 mmHg. Physical exercise lowered SBP by WMD of 6.60 mmHg and DBP by 4.44 mmHg. DASH diet plus physical exercise is superior because it lowered SBP with a WMD of 11.20 mmHg at 95% CI. Alnooh et al. (2022) examined a systematic review of five RCT studies comprising 334 Black adult participants aged 18 years and older with prehypertension and hypertension. The authors described smartphone apps as impactful in increasing the DASH diet adherence and consumption in lowering the BP among the Black population. The authors found that a reduction in BP correlated with DASH diet consumption and indicated a decline in mean SBP ranging from 3.20 mmHg to 7.62 mmHg and the DBP 2.50 mmHg to 4.22 mmHg at 95% CI compared to usual care. The intervention showed how mobile phone apps assist in changing dietary behavior to improve the consumption of healthy options of the DASH diet. Smartphone users communicate through text messages, phone calls, or email with the lifestyle coach or research team to improve BP control (Alnooh et al., 2022).

In conclusion, DASH diets and physical exercise are evidence-based nonpharmacological interventions to reduce BP and enhance antihypertensive medications in managing HTN (Filippou et al., 2021; Lee et al., 2021). The evidence was drawn from randomized controlled trials and systematic reviews (See Appendix A). Randomized controlled trials and systematic reviews are level-one evidence and represent the gold standard for determining high-quality and reliable information for evidence-based practice (Melynk & Fineout-Overholt, 2019).

Project Question

The project addressed the question: In the Black adults 18 years and older diagnosed with stage 1 and stage 2 HTN (P), how does implementing a cardiovascular bundle with screening, BP

assessments, education on the DASH diet eating plan, and moderate-intensity physical exercises routines of 30 minutes a day for five times a week (I) compared to the standard practice BP management (C), decrease BP, increase the knowledge of the DASH diet and increase physical activity (O) over eight weeks period (T) in a Suburban city private primary care outpatient clinic in the Texas (S)?

Project Objectives

The project objectives included:

1. To assess BP and identify patients with HTN needing to improve BP control.
2. Create awareness by providing BP information handouts and BP parameters to teach patients about HTN.
3. To use DASH-Q and GSLTPEQ questionnaires to screen, and identify Black patients aged 18 years and older with stage 1 and stage 2 HTN with low adherence to DASH diet and physical exercise needing to improve blood pressure (BP) control.
4. To educate on the DASH diet and physical exercises to improve knowledge, improve BP, and thereby control HTN prevalence among Black adults 18 years and older.
5. To assess and compare pre- and post-implementation data for BP readings, knowledge of the DASH diet, and physical exercises to control HTN.
6. To disseminate project information.

Project Framework

Plan-Do-Study-Act (PDSA) is a scientific method, rapid cycle performance improvement approach to the QI process that focuses on an incremental, small-scale change with the best research evidence in healthcare (Djukic & Gilmartin, 2018; Terhaar, 2021). PDSA supported the application of evidence and was chosen for this project due to its simplicity and logical

refinement cycle in the plan for sustainable change improvement (Terhaar, 2021). The PDSA cycle guided the project leader in implementing the evidence-based cardiovascular bundle care for BP reduction in primary care (Terhaar, 2021). The PDSA cycle has four steps, namely (a) plan, (b) do, (c) study, and (d) act (see Appendix B).

The first step of the PDSA was the plan. This step identified a health gap in patients' knowledge of using the DASH diet and physical exercises to control BP among Black adults 18 years and older in a suburban city private primary care outpatient clinic in Texas. This step clearly outlined the project team leader's tasks for the health gap of Black adults aged 18 and older 1 with HTN. Also outlined in this phase were the measures of implementing the cardiovascular bundle with screening, assessments, and education on the DASH diet eating plan and moderate-intensity physical exercise education during the project timeframe in the designated project site.

Step two of the PDSA cycle was the do phase. This phase synthesized the best evidence from literature reviews and implemented the evidence-based HTN care bundle for the DASH diet and 30 minutes of moderate-intensity physical exercises for BP control. Booklet handouts with DASH diet eating plans, types of moderate-intensity physical exercises, and HTN information using plain language and illustrative pictures were provided for better comprehension and patient empowerment (Nattaphat et al., .2021). Step three was the study phase, which entailed the evaluation of the interventions. Data collection occurred in this phase to ascertain the baseline pre-intervention BP measurement and compare it with the post-intervention BP readings to evaluate intervention adherence and effectiveness (Saunders et al., 2022). Step four was the act phase. In this phase, the team decided whether to adopt and refine or

reject the project concept (Melynk & Fineout-Overholt, 2019). If the intervention were adopted, it would be refined to suit the organization structure.

Methods

In preparing for the QI project with the cardiovascular bundle, the project leader assessed the organization's strengths, weaknesses, opportunities, and threats (Appendix C), and the risk assessment (Appendix D). White et al. (2021) described that strengths refer to the good internal factors considered valuable assets of the organization and crucial to the project's success. The QI project involved the cardiovascular bundle with screening assessments, education on the DASH diet, and physical exercise to decrease BP. The strengths comprised good leadership and a trained multidisciplinary team eager to adopt evidence-based health information into practice. Weaknesses refer to the deficiencies in the organization, such as the potential financial burden incurred from the project. Opportunities refer to external factors that could potentially promote the success of the organization, such as good partnerships with the participants to foster positive engagement in the project (White et al., 2021). Threats were external factors that could prevent the success of a project, such as potential participants' discontinuation with the project.

Population

The target population comprised Black adults aged 18 and older diagnosed with stage 1 and stage 2 HTN per ACC/AHA 2017 guidelines. The target population included participants of Black ethnicity, adults 18 years or older, and both genders who were new and established patients in the primary care outpatient clinic. The participants were accepted regardless of health insurance coverage status. Another inclusion criterion for participants was English speaking and reading comprehension for effective communication. The eligible participants were the patients who scored poorly (< 32 out of 77) on the DASH diet Questionnaire (Warren-Findlow et al.,

2017) and those who had poor scores (< 14 out of 32) on the Godin Leisure Time Physical Exercise Questionnaire (GSLTPEQ) for using physical exercises to control HTN (Godin, 2011).

The exclusion criteria included pregnancy, cognitive impairment, and a history of acute major psychiatric illnesses. Pregnancy was excluded due to the potential high risk for eclampsia and its detrimental effects on maternal and child health; therefore, it was reserved for an obstetrician's expertise. Health conditions such as kidney cancers that can cause high BP from high renin secretion were also excluded. Moreover, primary hyperaldosteronism is caused by a benign adrenal gland tumor causing high aldosterone production in the blood, affecting sodium and potassium electrolytes metabolism, resulting in extremely high BP (Funder, 2022). Patients with impaired cognition and major psychiatric illness were excluded due to potential lapses in memory to recall, adherence to instructions, potential disorientation, and disorganization, which may impede the timely analysis of the project and the efficacy of the project.

Project Setting

The project setting was a suburban city private primary care outpatient clinic in Texas. Still, it also provided services from nearby rural and underserved counties. The outpatient clinic has a nearby small community hospital within two miles distance. The outpatient clinic provided services to only adults aged 18 years and older. The outpatient clinic has an extensive suite comprising a front desk office, a lobby, five examination rooms, an X-ray room, a lab/phlebotomy room, a vital signs/weight room, two executive offices, a staff lunchroom, and two restrooms. The clinic personnel can attend to the healthcare needs of 35 patients daily and more than 8000 office visits annually. The outpatient clinic accepted patients Medicaid, Medicare, and private insurance candidates and uninsured immigrants. The clinic team consists of a physician, the medical director, and the project site owner, whose role was to approve the

use of the clinical site and offer any medical advice. An adult nurse practitioner whose role was the clinical site practice manager oversees the management and had assisted in recruiting potential eligible patients. Also on the team were two medical assistants (MAs) and two front desk clerks whose role was to update records and check-in of patients. The medical assistant's roles were distributing recruitment flyers and brochures and preparing the participants for data collection. The role of the front desk clerk was to register and schedule participants for follow-up office visits.

Measurement and Analysis

Validity refers to the ability of a tool in a study to measure or answer the questions it is scientifically intended to do (White et al., 2021). The content validity determined and reflected the accuracy and clarity of the measuring instrument. Internal validity refers to the extent to which the intervention or the independent variable can affect the outcome of a study and avoid confounding variables (White et al., 2021). A strong internal validity reflects a higher level of confidence. Reliability is the ability of an instrument to measure the concept or variable intended consistently every time the tool is used (Grove & Cipher, 2020). The reliability of an instrument portrayed consistency, dependability, stability, precision, and reproducibility. An instrument with strong reliability and limited potential for error produces consistent data about the concept. Reliability is indicated by a statistic called Cronbach's alpha. Cronbach's alpha is the most used measurement of internal consistency for scales with multiple items at the interval or ratio level of measurement (Grove & Cipher, 2020). Cronbach's alpha coefficient ranges from 0.00 to 1.00, where 1 is perfect reliability, and 0.00 indicates no reliability. A Cronbach's alpha of 0.80 or greater indicates strong reliability of the instrument (Grove & Cipher, 2020). External validity is the degree to which the results of a study can be generalized (Grove & Cipher, 2020). Self-report

questionnaires and self-report logs/diaries largely depended on participants' recall capability, leading to a potentially weakened reliability strength. For this project, the self-report logs/diaries of physical activity performance were used for patients' convenience and cost-effectiveness.

Permission to use the DASH-Q tool was obtained from Dr. Warren-Findlow (Appendix E). The permission to use the DASH eating plan was obtained from the National Heart Lung and Blood Institute (Appendix F). DASH-Q is a multi-item self-report nutrition scale behavioral tool with 11 items to assess the adherence to the nutritional contents of foods of the DASH diet among adults for managing HTN (Warren-Findlow et al., 2017). DASH-Q scores used scales with valid psychometric properties. DASH-Q has robust psychological characteristics that depict strong evidence of internal consistency and validity through Cronbach's alpha (Warren-Findlow et al., 2017). The authors of DASH-Q established that the tool has a Cronbach alpha of 0.83. The DASH-Q scoring ranges from 0 to 77 to stratify diet quality adherence. According to Warren-Findlow et al. (2017), a score of 32 or less indicates low diet quality, scores between 33 and 51 indicate medium diet quality, and scores 52 and greater indicate high diet quality adherence. DASH-Q served as a pre- and post-intervention assessment tool (Appendix G).

The permission to use GSLTPEQ was obtained from Kai Kaufman, the Research Coordinator of the University of British Columbia, Canada (Appendix H). The GSLTPEQ tool was reliable and valid for measuring leisure time exercise behavior. Using a self-reported GSLTPE questionnaire was a practical and simple method that did not need high skill for self-reporting to assess physical activity. The instrument measured and analyzed a seven-day recall self-report of how many times physical activities were done. The physical activities were assessed as strenuous, moderate, or mild physical activity. The simple questions of the GSLTPEQ instrument provided information to evaluate overall indicators of the adult level of

physical activity. Also, GSLTPEQ assessed and served as an assessment tool for the baseline lifestyle activity behavior of the adult population to identify physical activity gaps. The authors reviewed the reliability and concurrent validity of the questionnaire, which were 0.83 and 0.85, respectively (Godin & Shephard, 1986). The GSLTPEQ tool was chosen because of the simplicity of the methodology, which did not require high self-reporting skills from the individual answering the questionnaire.

Moreover, the GSLTPEQ tool helps the primary care healthcare practitioner to measure the participants' physical exercise during leisure time. The GSLTPEQ questions can also assess psychosocial behavior as an overall indicator of the lifestyle assessment for participants. The automated BP measuring device (ABPMD) is the tool for assessing BP. ABPMD had inbuilt software that used an inflation-deflation cycle algorithm to calculate the SBP and DBP values. The algorithm within the Welch Allyn Pro BP 2000 was the same as in many other Welch Allyn professional-grade hospitals and office devices (Alpert, 2019). The validity implied that the healthcare professional could use Welch Allyn ABPMD and obtain data similar to those obtained from traditional sphygmomanometers in office settings. The American Medical Association (AMA) is a renowned organization with respected individuals who have expertise in HTN and BP measurement (Cohen et al., 2019).

AMA had a transparent and accessible registry for identifying rigorous and validated BP devices and was recommended in the Association for the Advancement of Medical Instrumentation/American National Standards Institute/ International Organization for Standardization (ISO) protocol (Cohen et al., 2019). AMA validated Welch Allyn's automated office BP (Cohen et al., 2019). The validity of the ABPMD had been successfully tested and had gained global recommendations for standardized BP assessment for office visits and other

clinical use (Sharman et al., 2023). The traditional manual auscultatory BP measurement with the sphygmomanometer and stethoscope is available in the primary care clinic, but its use has transitioned to an automated version. The automated oscillometer BP measuring device is preferred and popular in primary care settings (American Medical Association [AMA], 2018). The vendor calibrates the device annually. However, for this project, the project leader did the BP measurement in the office using an automated oscillometer BP device (Welch Allyn 2000 series). Also, the automated BP measuring device excluded the subjective bias of listening with a stethoscope for Korotkoff sounds associated with traditional manual BP measurement (AMA, 2018). The automated oscillometer BP device detected the amplitude of BP oscillation on the brachial arterial wall. It used the built-in software in the device to analyze the wave of systolic BP and diastolic BP (AMA, 2018). The education for using an automated BP measuring device involved an individualized selection of the correct cuff based on the mid-arm circumference. The instruction on BP assessment must include choosing the right cuff size for the patient; if a small BP cuff was used, it could erroneously overestimate BP measurement and make readings high (AMA, 2018). Conversely, if the BP cuff is too big, the BP measurement will be erroneously lower than the actual, making an underestimation of the BP value.

Procedure (Intervention or Change or Process)

Before embarking on the project implementation phase, the DNP student obtained an approval letter from the project site medical director (Appendix I). Participant recruitment proceeded when the DNP student received the Graduate Nursing Review Committee (GNRC) approval and was assigned a faculty project advisor (Appendix J). The DNP student displayed posters and flyers with educational messages in public places for community awareness of the project, with education focusing on the DASH diet and physical exercise to control BP and

empower patients about the opportunity to participate in improving their health (Appendix K). The target population was Black adults aged 18 years and older of all genders.

The DNP student was the project leader and implemented the project content. The project leader selected team members and assigned their roles. Project team education was conducted to enhance the successful operation of the project. The project leader educated the team using a PowerPoint-supported presentation (Appendix L). The project leader sought the potential candidates' consent for participation. The project leader screened and selected participants. The team assisted in distributing the brochures on the DASH diet eating plan and moderate-intensity exercises. The project leader implemented education on the DASH diet and physical exercises for BP control throughout the eight weeks of the project time.

Implementation

Participants voluntarily accepted to be in the project and were informed that they may withdraw without retribution. The participants had no name or personal identification collected. The project leader de-identified all the participants' personal information using an alphabetical coding system (Appendix M), which was formulated and assigned by representing numerically the first name initial- last name initial- the project year, 2023, then adding 01 for study participants number one. For example, for a participant with the first name initial C. Last name initial C, the identification would be coded in the dashboard as 7-7-2023-01.

Similarly, the second participant with first name initial D and last name initial E was coded as 8-9-2023-02. Other demographic information, such as gender (1 for male or 2 for female), age, and educational level (3 for some or high school education and 4 for some college education), were included in the descriptive statistics. The serial process of participants' deidentification and allocation continued to assign numerical codes to recruit eligible

participants. The participant identity contains a de-identifier code to make the data anonymous for the participants' privacy. On this basis, the project leader kept the assigned hard copy of the participants in a locker accessible only to the project leader. The information was transcribed into a Microsoft Excel spreadsheet and stored in a locked private laptop computer, secured with encrypted two security passwords. The hard copy data would be kept for two years, then shredded and destroyed permanently, while the digital data would be deleted from the computer. This cardiovascular QI project comprised BP assessments, education with evidence-based information on the consumption of the DASH diet, and moderate-intensity physical exercises to improve BP control for Black adults 18 years and older with stage 1 and stage 2 HTN. The education involved motivational interviews, discussions, and follow-up communication with participants. For each participant, the project leader performed a 15-minute individual educational session on DASH diet food components (Appendix N), a sample menu (Appendix O), and types of moderate-intensity physical exercise (Appendix P).

BP Measurement

The BP measurement screening was done using the calibrated ABPMD to obtain the pre-intervention and post-intervention readings from the participants. The upper arm was used, and the cuff was placed on bare skin for BP measurement. The participants were placed in a relaxed sitting position, with their feet uncrossed and flat on the floor, to ensure accurate BP measurements. Participants were allowed a five-minute rest period before and no talking while measuring BP to prevent false positive elevation of blood pressure (Andreadis et al., 2020). Also, the correct individualized BP cuff was selected based on the mid-arm circumference and placed on bare skin to avoid erroneous BP readings. Two different BP readings at a 2-minute interval from the patient's upper arm in a single assessment visit were collected. The average of the two

readings was recorded as the pre-test BP measurement for the participant. According to ACC/AHA 2017 guidelines, people with stage 1 HTN have SBP 130 to 139 mmHg, DBP 80 - 89 mmHg, and stage 2 SBP >140 mmHg and DBP > 90 mmHg. The participants with stage 1 and stage 2 HTN were included in the project due to their potential risk of preventable cardiovascular disease and mortality (Whelton et al., 2018).

DASH-Q

After selecting the participants, they completed the DASH-Q independently to ascertain their baseline knowledge, use, and adherence to the DASH diet. DASH Questionnaire (DASH-Q) responses were collected, and low adherence to the DASH diet was ascertained among the Black adult participants for lack or not consuming the optimal servings of DASH food components.

Warren-Findlow et al. (2017) formulated an 11-item tool in the DASH-Q as a self-report nutrition scale behavioral assessment to assess adult adherence to the nutritional contents of DASH diet foods for managing BP. The DASH-Q asked the participants:

1) In the seven days, how many days have you eaten nuts or peanut butter?
2) In the past seven days, how many days did you eat eggs?
3) In the past seven days, how many days did you eat beans, peas, or lentils?
4) In the past seven days, how many days did you eat pickles, olives, or other vegetables in brine?
5) In the past seven days, how many days did you eat one serving of fruit (fresh, frozen, canned, or fruit juice)?
6) In the past seven days, how many days did you eat more than one serving of vegetables?

7) In the past seven days, how many days did you eat frozen or canned fruits and vegetables?
8) In the past seven days, how many days did you drink milk (in a glass with cereal or, coffee, tea, or cocoa)?
9) In the past seven days, how many days did you eat apples, bananas, oranges, melons, or raisins?
10) In the past seven days, how many days at broccoli, collard greens, spinach, potatoes, squash, or sweet potatoes?
11) In the past seven days, how many days did you eat whole grain bread, cereals, grits, oatmeal, or brown rice?

The DASH-Q participants' responses are from 0 to 77 were summed (Appendix Q). The interpretation of the DASH-Q tool indicates that a score of 52 or higher is considered adherent (eating a high-quality diet consistent with DASH nutritional recommendations) and is excluded from the project participation. A score of 33 - 51 is moderate adherent and is excluded from this project. A score of 32 or less indicates non-adherent to the DASH diet (Warren-Findlow et al., 2017). This project included participants with DASH scores of 32 or less. DASH-Q was administered to obtain baseline adherence information on the participant's use of the DASH diet to control BP. The project leader initiated the education on the DASH diet and provided the DASH diet brochure to highlight the food components, food lists, and sample menu diets to confer knowledge of its use. The team assisted the project leader in distributing the DASH diet eating plan brochures to the participants.

Godin-Shephard Leisure Time Physical Exercise Questionnaire

The Godin-Shephard Leisure Time Physical Exercise Questionnaire (GSLTPEQ) is a valid simple self-report tool for measuring physical activity among adult participants (Appendix R). The GSLTPEQ tool was used to obtain the participants' baseline engagement in physical exercise (Godin, 2011). The tool assessed the physical exercise practices of the participants. Similarly, the project leader administered the GSLTPEQ. The questionnaire asked participants how many times in seven days have they participated in physical exercises in the following categories: Strenuous exercise that makes the heart beat rapidly, including jogging, running, vigorous swimming, basketball, soccer ball, football, skiing, and so on. Moderate exercise was not very exhausting, and the types of moderate-intensity exercises include brisk walking, easy bicycling, volleyball, folk dancing, stair walking, gardening, and lawn mowing. Lastly, mild/light exercise involved minimal effort. The mild exercises included yoga, easy walking, bowling, golf, and archery (Godin, 2011). Each score of how often one engaged in physical exercise was multiplied by a corresponding metabolic equivalent of task (MET) intensity value. A MET value of three was allocated for mild intensity, five for moderate intensity, and nine for strenuous intensity, respectively. For example, in a week, if a participant had one-time mild exercise, one-time moderate exercise, and one-time strenuous exercise, the calculation is thus (1 x 3) + (1 x 5) + (1 x 9) =17. These values are summed to obtain a leisure score index (LSI) expressed in units (Godin, 2011). The GSLTPEQ dashboard scores are >23 = active, 14 -23 = moderately active, and < 14 units = insufficiently active/sedentary (Appendix S). The participants with an LSI of less than 14 units were included in the project. The tool indicated that a score of less than 14 units as sedentary or inactive, a score of 14 to 23 units as moderately active, and 24 units and over as very active in physical exercise.

In week one, the project leader communicated via email and scheduled a face-to-face meeting with the project site practice manager to discuss the project content and timeline chart. The Gantt chart guided the team in the planning, scheduling, and visualization of project tasks and timelines of start and end dates (Appendix T). The project leader selected team members, assigned roles, and educated the team on project implementation strategies. Recruiting participants during their visits began in week one.

Week two entailed continuing to recruit participants during their visits. The use of demographic tools for recruiting participants for the project initiative. The project leader recruited 29 participants. No personal identifying information of the participants, such as name or date of birth, was collected. However, demographic information related to age, gender, ethnicity, and level of education was obtained. The participants were informed of their right to withdraw from the project at any time.

The implementation phase begins by having a 15-minute educational session with each participant on the components of DASH diets; the DASH diet eating plan outlined foods to eat, such as vegetables, fruits, whole grains, fat-free or low-fat dairy, fish, poultry, beans, nuts, seeds, and vegetable oils. Also, the eating plan lists foods to limit such as fatty red meat, full-fat dairy, sugar-sweetened beverages, sweets, and sodium intake sample menus and the website of the National Heart, Lung, and Blood Institute for more sample menu (ww.nhlbi.nih.gov/DASH). Handouts of the sample DASH diet menu and recommended moderate-intensity physical exercises they prefer to do for 30 minutes five times a week were provided. A food diary and physical exercise log sheet were provided to the participants so that they could record their daily food diaries and exercise performance (Appendix U). Participants were educated on the facts of HTN and the parameters of BP readings per ACC/AHA guidelines (Appendix V). Participants

were educated to use log sheets to record their BP with their home BP monitoring device, but home BP data should not be analyzed in the final data. Only the office BP results are included in the pre- and post-intervention data for analysis to depict consistency in the use of the instrument.

Weeks three, four, five, and six involved continued education on components of the DASH diet and types of moderate-intensity physical activity. The project leader sent reminders for adherence to the regimens via text messages every Monday, Wednesday, and Friday, saying: The project leader reminds you to get 30 minutes of physical exercise daily and choose DASH food components for your menu with the serving of whole grains: 6 - 8 servings, fruits: 4 - 5 servings a day, vegetables: 4 - 5 servings a day, low-fat dairy foods: 2 - 3 servings, fats, and oils: 2 - 3 servings, fish or poultry: 2 servings or fewer, and engage in moderate-intensity physical exercises 30 minutes daily for five times weekly for eight weeks. Sample menus pulled from https://healthyeating.nhlbi.nih.gov/. The text message reminder promoted adherence and education on the DASH diet eating plan, physical exercise, and websites for DASH diet recipes.

From week seven, the project initiatives continued with participant education and reminders. The project leader sent reminders via text messages and reviewed the participants' food diaries and exercise logbooks to check for adherence. The project leader sent a reminder via text messages to notify participants of the post-intervention evaluation on week eight.

Week eight entailed an assessment of the participants' post-intervention SBP and DBP measurement to evaluate the effectiveness of the DASH diet and physical exercise education in reducing BP. The assessment of the post-intervention included DASH-Q and GSLTPEQ scores. The post-intervention DASH-Q results evaluated the benefit of education on the DASH diet for improved knowledge and GSLEPEQ on improved physical exercise knowledge.

Statistical Analysis

This project used a one-group sample pre-test-post-test design. A one-group pre-test-post-test design used a pre-intervention and post-intervention on one sample of participants and no control group for comparison (Grove & Cipher, 2020). The independent variables were the DASH diet meals and moderate-intensity physical exercises, and the dependent variable was a reduction in BP readings. A paired t-test was used for the statistical analysis in the project. A pair t-test is a parametric statistic used to analyze data on ratio or interval scale level of measurement (Grove & Cipher, 2020). The paired t-test compared the means of two repeated assessments of pre-intervention and post-intervention data from one group of participants (Grove & Cipher, 2020). The paired t-test is appropriate for the project because the BP measurement is on a ratio scale. The scale depicts as follows: normal SBP is < 120 mmHg and DBP is < 80 mmHg, elevated BP is SBP 120 - 129 mmHg and < 80 mmHg, stage 1 HTN is SBP 130 - 139 mmHg, and DBP is 80 - 89, and stage 2 HTN is 140 mmHg or greater, and DBP is 90 mmHg or greater. Moreover, the DASH-Q scores depicted an interval level of measurement, with a score of 0 -32 indicating low diet quality, scores between 33 and 51 indicating medium diet quality, and scores 52 and greater indicating high diet quality adherence. GSLTPEQ scores were also measured at the interval level. The GSLTPEQ scale scores >23 = active, 14 -23 = moderately active, and 14-0 units = insufficiently active/sedentary.

In the post-intervention, the project leader analyzed the descriptive data distribution of the mean, median, and mode with a Histogram. Also, the final data was analyzed with the Statistician's input using a paired t-test statistical technique in the Statistical Package for Social Science (SPSS) software. After eight weeks of intervention, SBP, DBP, DASH-Q, and GSLTPEQ data were collected. The data were arranged in a Microsoft Excel Spreadsheet and exported to Statistical Package for Social Sciences (SPSS). The descriptive statistics analyzed the means

standard deviation and computed the p-value. In Nursing, the statistical significance is set at 0.05; therefore, the p-value of alpha = 0.05 indicates that the t-test is statistically significant (Grove & Cipher, 2020). The paired samples t-test determined that the means between all the paired data are statistically significant.

Ethical Considerations

Before starting the data collection, the DNP student completed the human subject ethics training course. The Office of Research provided this training on ethical obligations and regulations at the University of Texas at Arlington, and the Human Subject Training Certificate was received (Appendix W). The training described the ethical principles of the Belmont Report. The ethical principles highlighted include beneficence, nonmaleficence, autonomy, and justice in evidence-based research initiatives for quality improvement (Melynk & Fineout-Overholt, 2019; Terhaar, 2021). Beneficence is the ethical consideration of caring for and doing good for the participants. Also, nonmaleficence is an ethical obligation to avoid harm to participants during the research study for quality improvement and to promote their well-being (Melynk & Fineout-Overholt, 2019; Terhaar, 2021). Autonomy explained that the participants in the project deserved respect and that their privacy was protected and confidential. The autonomy granted the participants the right to volunteer and to be in a sound mind for self-determination in their participation. The principle of justice entailed fair subject selection, which required a thorough review of the inclusion and exclusion criteria for participants to enable a fair and equal sharing of risks and benefits of the scientific project and highlighted that research project activity should not expose the subjects to undue risks. (Melynk & Fineout-Overholt, 2019; Terhaar, 2021). Participation in the project was voluntary, and participants could withdraw from the project without fear of retribution. No personal information from the participants was collected. The

researcher must review and disclose any risks involved in the study to participants and ensure that the participants understand the benefit of the participation information (Melynk & Fineout-Overholt, 2019; Terhaar, 2021).

Results

The mean age of the participants was 62 years. The data analyzed the descriptive statistics means and standard deviation and computed the p-value. The paired samples t-test analyzes the paired data to determine the means. The paired samples statistics showed the pre-intervention Mean SBP= 146.28 mmHg (SD 14.49), post-intervention Mean = SBP 131.66 mmHg, SD (11.4) as depicted (Figure 1). For the pre-intervention, DBP Mean =84.7 mmHg (SD 5.35), and the post-intervention DBP's Mean = 78.1 mmHg, (SD 6.39), indicating a decrease in both SBP and DBP after the intervention (Figure 2). Similarly, in pair 3, the pre-intervention Mean DASH-Q value = 24.28 units, (SD 5.81), and the post-intervention Mean DASH-Q value = 40.07units, (SD 7.77), indicating an increased knowledge and consumption of the DASH diet eating plan after the intervention. Additionally, in pair 4, the pre-intervention GSLTPEQ value Mean = 8.93 (SD 2.82), while the post-GSLTPEQ value Mean = 15.34 LSI units (SD 3.82), indicating an increase in participation in physical exercises, which is associated with reduction of SBP and DBP (Table 1).

Table 1
Statistical Data Analysis

	Pre-Int SBP (mmHg)	Post-Int SBP (mmHg)	Pre-Int DBP	Post-Int DBP	Pre-Int DASH-Q	Post-Int DASH-Q	Pre-Int GSLTPEQ	Post-Int GSLTPEQ
N	29	29	29	29	29	29	29	29
Mean	146.28	131.66	84.79	78.17	24.28	40.07	8.93	15.34
SD	14.49	11.41	5.35	6.39	5.81	7.77	2.82	3.82

Note: *Pre-Int = Pre-Intervention; Post-Int = Post-Intervention; SBP = Systolic Blood Pressure; DBP = Diastolic Blood Pressure; DASH-Q = Dietary to Stop Hypertension Questionnaire;*

GSLTPEQ = Godin-Shephard Leisure Time Physical Exercise Questionnaire, N= sample size, SD= standard deviation.

Pair 1 samples t-test for the pre-SBP and post-SBP intervention, paired Mean difference 14.6 mmHg, t = 4.972; p = < .001. In pair 2 samples t-test, the pre-DBP and post-DBP, the paired Mean difference = 6.62mmHg, t= 5.787; p-value = < .001. Similarly, the pair 3 sample t-test analyzed and compared the difference in the mean of pre-intervention DASH-Q scores value (24.28) and the Mean of the post-intervention DASH-Q score value (40.07) yielding -15.7, which indicated that participants had improved their consumption of DASH diet. In pair 4, the Mean of the pre-intervention GSLTPEQ score (8.93) indicated low adherence to physical exercise, but the post-intervention Mean of the GSLTPEQ score (15.34) indicated improved adherence to physical exercise. All four paired t-tests data analysis indicated statistically significant improvement in BP reduction (Table 2).

Table 2
Paired Sample Differences Test

Data	Mean	Std Dev	95%Confidence Interval Lower	95%Confidence Interval Upper	t-value	df	Significance One-side P
Pair 1 Pre-Int SBP- Post-Int SBP (mmHg)	14.62	15.83	8.59	20.64	4.972	28	< .001
Pair 2 Pre-Int SBP- Post-Int DBP (mmHg)	6.62	6.16	4.27	8.96	5.787	28	< .001
Pair 3 Pre-Int DASH- Post-DASH-Q Values	-15.7	7.12	-18.50	-13.08	-11.93	28	< .001
Pair 4 Pre-Int GSLTPEQ- Post-Int GSLTPEQ	-6.41	4.20	-8.013	-4.81	-8.214	28	< .001

Note: *Pre-Int= Pre-Intervention; Post-Int = Post-Intervention; SBP= Systolic Blood Pressure; DBP= Diastolic Blood Pressure; DASH-Q= Dietary to Stop Hypertension Questionnaire; GSLTPEQ = Godin-Shephard Leisure Time Physical Exercise Questionnaire***.***

The ultimate primary goal of the result was a reduction in the SBP and DBP measurement (Figure 5). The SBP reduction evidence depicts that with a 95% confidence interval [CI], 8.59, 20.64; p= < .001 and DBP at 95% CI; 4.27, 8.96; p= < .001. The result of the quality improvement project buttressed the conclusion that DASH diet and physical exercise promote BP control among Black adults aged 18 years and older with HTN. DASH diet consumption improved 95% CI -18.50, - 13.08; p = .001. The physical exercise participation improved 95% CI, -8.01, -4.81; p = <.001.

Project Outcomes

The main objective of the quality improvement project was to ascertain whether the DASH diet and physical exercise could decrease BP among Black adults with stage 1 and 2 HTN. The data results were statistically significant that the project intervention reduced BP, as depicted in Table 2. It is intriguing to know that if the DASH eating plan and physical exercise were adopted by patients and patient education implemented by clinicians, BP could effectively decrease, and HTN prevalence may decrease. This project content initiative of DASH- eating plan and moderate-intensity physical exercise can serve as the first line of a non-pharmacological regimen or in conjunction with the pharmacotherapeutics in the practice setting to assist the clinicians in objectively managing HTN. The clinicians should review each patient's dietary regimen and physical exercise engagement during visits and reinforce teaching to promote sustainability.

Discussion

The project implementation period was eight weeks. The project leader administered the pre- and post-intervention assessments, including BP measurements, DASH-Q scores, and GSLTPEQ scores, to recruited participants. The reason was to validate their knowledge and adherence to the DASH diet and physical exercise to control BP. In the pre-intervention phase, knowledge deficits and low adherence were observed, and the intervention with educational sessions with DASH diet eating plan and patient engagement in 150 minutes/week moderate intensity physical exercise were implemented. The post-intervention data showed a substantial improvement in the consumption of the DASH diet and participation in physical exercises, which correlated with the reduction of BP for managing their HTN.

Summary

Key Findings

This QI project has demonstrated in attestation that there is a positive benefit association between the use of the DASH diet and physical exercise in the reduction of BP to control HTN. The implications include the need for clinicians to educate patients to adopt the DASH diet eating plan and physical exercise to control HTN. Adopting the project intervention will elevate the standard of quality care at the project site. Similarly, the adoption and incorporation of education on DASH diet and physical exercise can be used in other outpatient clinics, hospitals, and rehabilitative hospitals. It is imperative to advocate and apply the knowledge of healthy DASH diet eating and moderate-intensity physical exercise to optimize the cardiovascular health of our patients. Physical exercise has been proven to be associated with reducing BP. All healthcare professionals and health government entities recommend inexpensive moderate-intensity exercise such as brisk walking. Regular physical exercise could be recommended for everybody with normal BP, pre-hypertensives, and hypertensives (Alpsoy, 2020). New nurses

need to receive orientation education to incorporate the DASH diet and physical exercise teaching as lifestyle modification elements for managing HTN.

Limitations

The time frame was eight weeks. The duration was not long enough to process the intervention impact of the QI project extensively. The sample size is small and may not be appropriate for population generalization. The convenience of recruiting participants was used due to easier accessibility. Convenient sampling can constitute sampling bias, impacting project findings from being generalized to the general population. The design used in the project was one group of participants, with no control group and no randomization, constituting a weak type of quasi-experimental design, thus limiting generalizability. Self-reporting of the questionnaires is a potential bias. To mitigate this pitfall, the project leader reviewed the questionnaire to ensure all questions were answered and no omissions were recorded. An attrition of one participant from the project. The project leader conveniently recruited 30 voluntary participants for the project. However, one participant missed the post-intervention assessment, and 29 participants remained. The project was done exclusively on Black adults aged 18 and older with HTN; it will be prudent to carry out similar projects on other ethnic groups to curb the prevalence of HTN nationally and globally.

Conclusions

HTN is a chronic illness requiring health maintenance by individuals, families, communities, and the nation (Tajeu et al., 2022). In 2020, HTN was the leading primary cause of 670,000 deaths and 691,095 deaths in 2021, respectively, among adults 18 years and older in the U. S. The national annual cost of HTN is $131.6 billion, but the projected annual cost will increase to $154 billion by 2025 due to increased prevalence (AHA, 2022; CDC, 2022; United Health Foundation,

2023). The ACC/AHA 2017 guidelines reported that the high prevalence of HTN among adults 18 years and older is estimated at 119.9 million, representing 48.1% of the US population (Whelton et al., 2018). Of these individuals, about three out of four people (77.5%; 92.9 million) have uncontrolled HTN status (CDC, 2022a; Whelton et al., 2018). Annually, HTN is the primary diagnosis recorded for 33.6 million adult visits to the physicians' offices and one million emergency department visits (Cairns & Kang, 2022). The social significance of uncontrolled HTN includes the social burden and high risk of complications such as stroke, renal failure, heart failure, headaches, decreased productivity, disability, and loss of income, which can affect people's quality of life (Tajeu et al., 2022). Jeong et al. (2023) emphasized that the DASH diet reduced SBP and DBP remarkably and decreased high-density lipoprotein and cholesterol levels among Black adults, reducing the 10-year Atherosclerotic Cardiovascular Disease risk scores by 10% over 8 weeks. DASH diet and physical exercise effectively lower BP among adults, thus preventing HTN and its complications (Blumenthal et al., 2021; Leggio et al., 2018).

This quality improvement project demonstrated that with adherence to the DASH diet eating plan and moderate-intensity physical exercise, there is an optimal BP control, which can subsequently decrease the prevalence of HTN among Black adults 18 years and older. The relevance of stratifying the prevalence and mortality rate of HTN in the country is to enable governmental officials, health professionals, and health policy makers to advocate for policy to influence public health policies and allocate funds to correct health inequities for improving social determinants of health in their jurisdictions to promote control of HTN (DCHHS, 2022). Moreover, the prevalence and risk of the burden of cardiovascular disease associated with HTN can be reduced by increased usage of healthcare providers and community engagement to

disseminate patient education on healthy lifestyle modification awareness with DASH and physical exercise.

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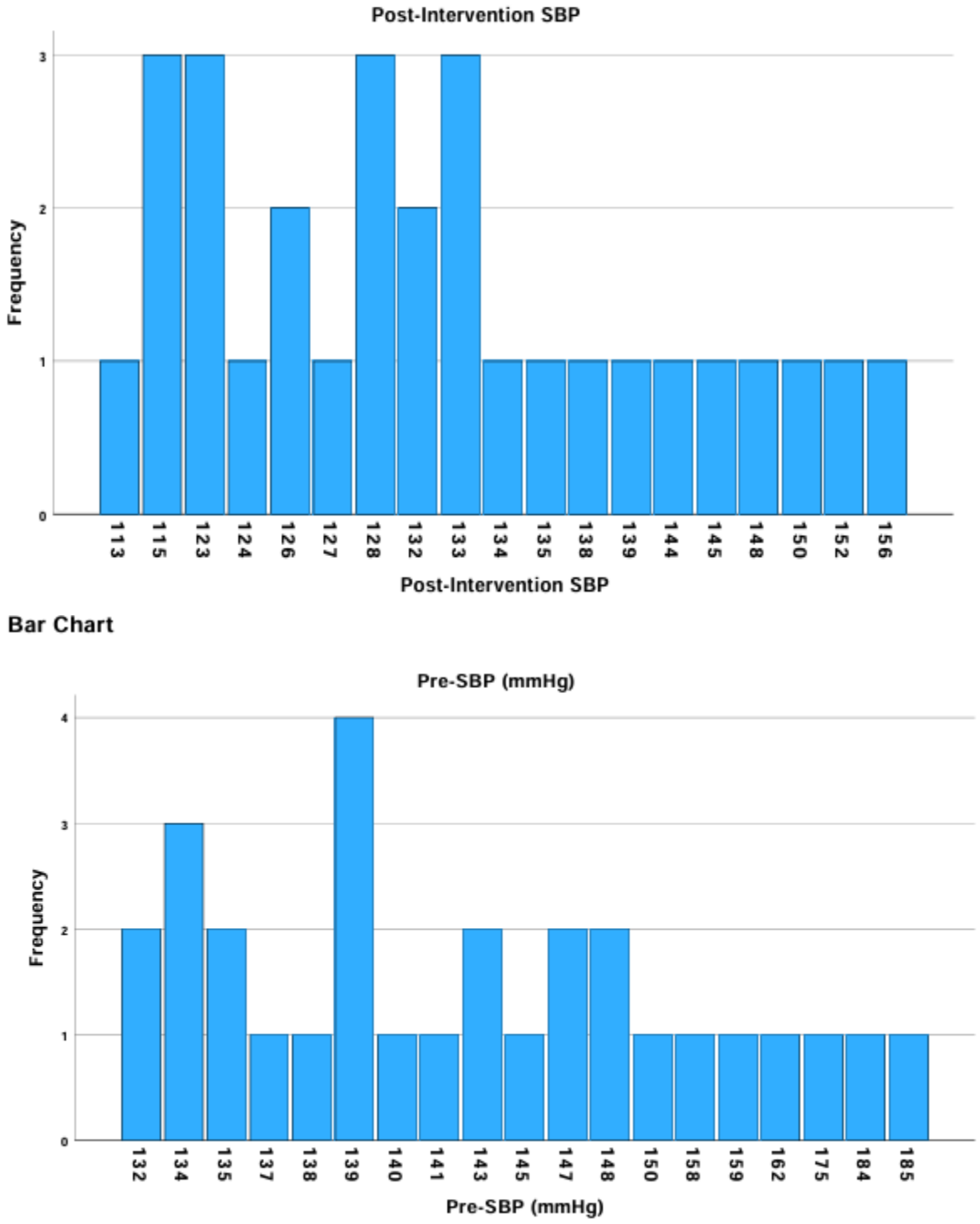

Post-Intervention SBP
Frequency
0
1
2
3
113
115
123
124
126
127
128
132
133
134
135
138
139
144
145
148
150
152
156
Post-Intervention SBP
Bar Chart
Pre-SBP (mmHg)
Frequency
0
1
2
3
4
132
134
135
137
138
139
140
141
143
145
147
148
150
158
159
162
175
184
185
Pre-SBP (mmHg)

Figure 1

Figure 3

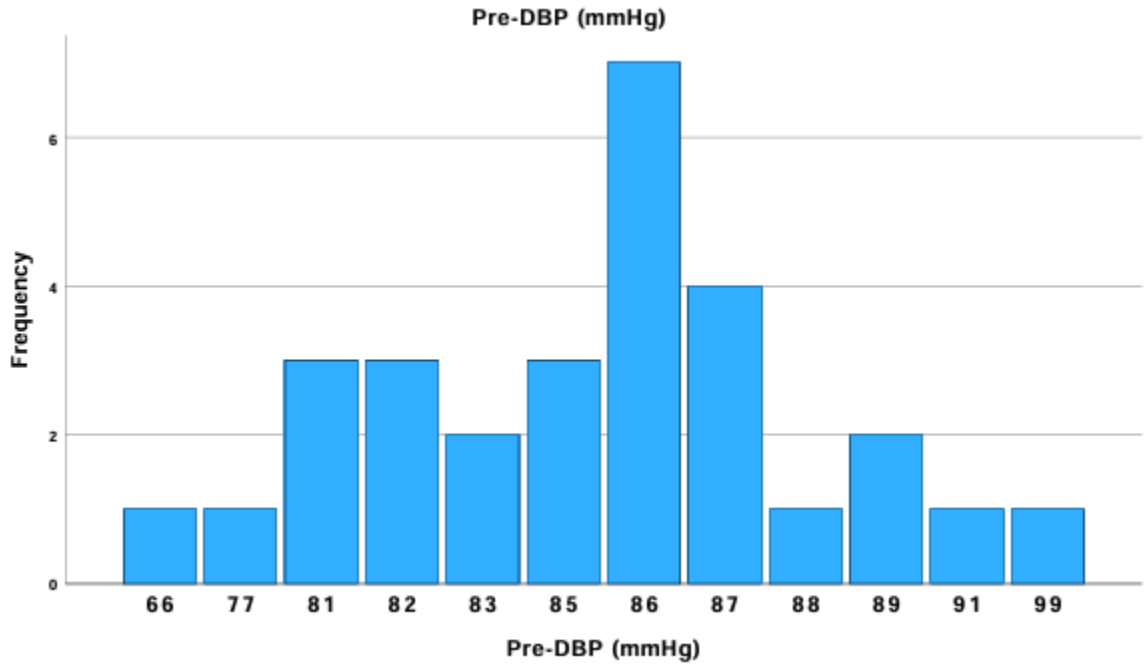


Figure 4

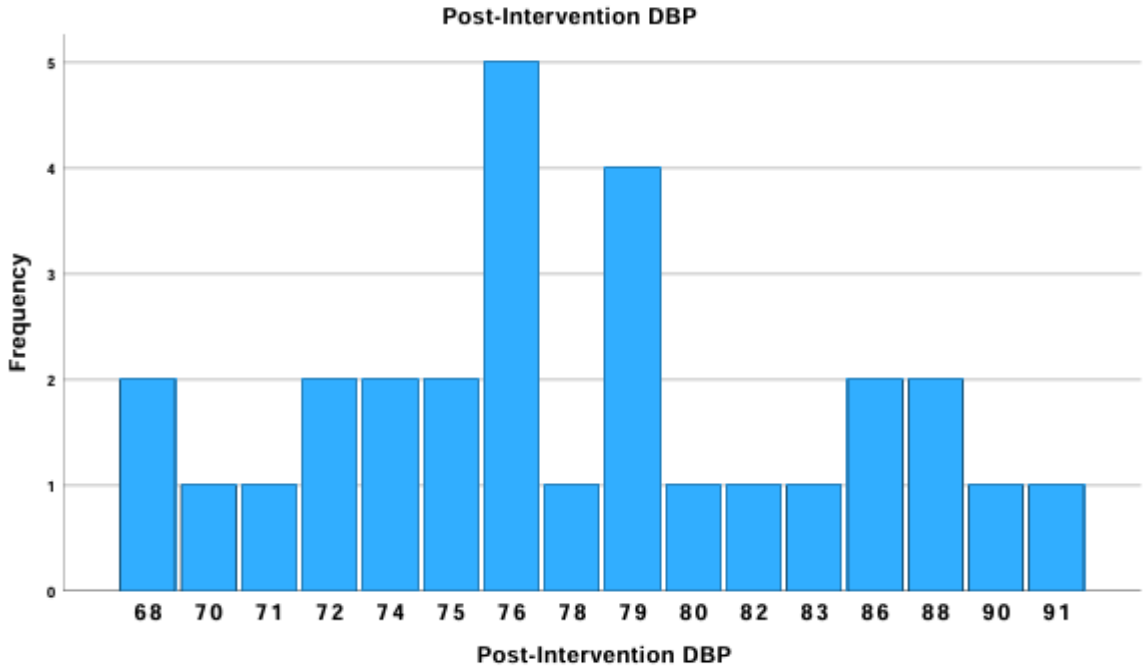
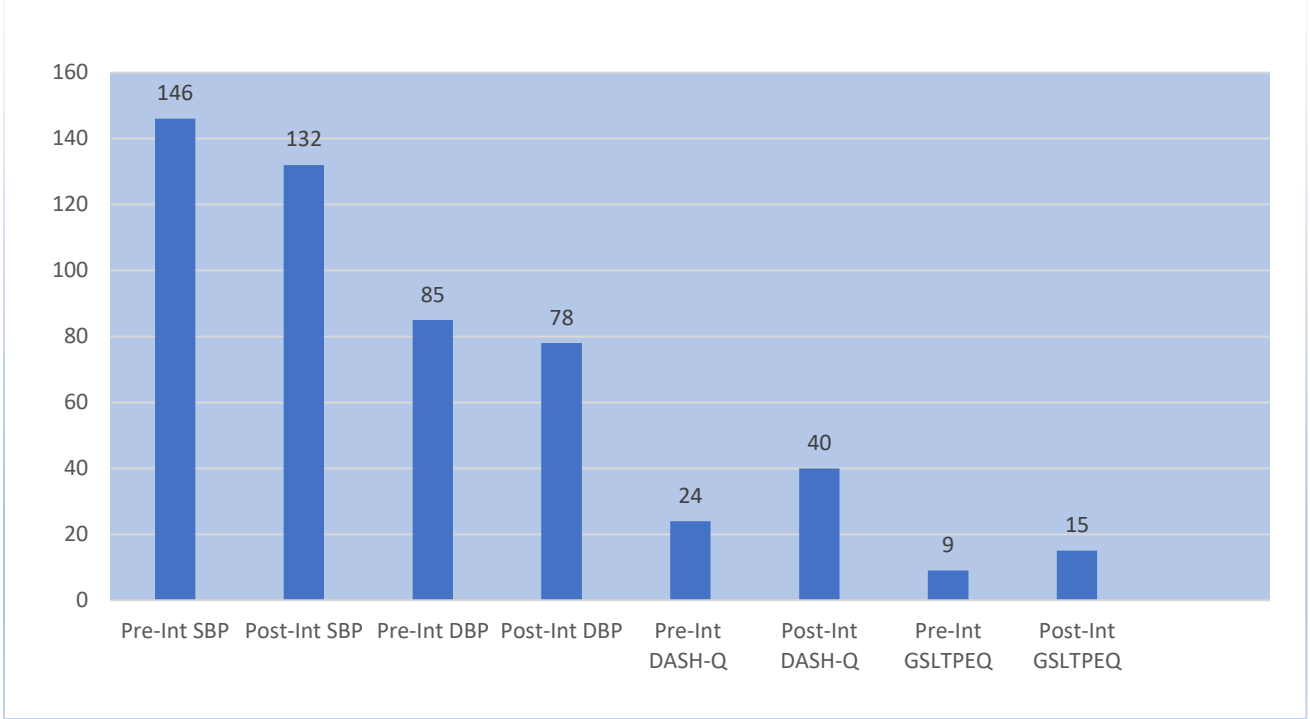


Figure 5

Data Analysis: Descriptive Statistics of Paired Samples Means Bar Graph

N= 29 (Male= 14; Female= 15); Mean Age= 62



Note. Means rounded to the nearest whole numbers.
Pre-Int SBP = Pre-intervention systolic blood pressure. Post- Int SBP = Post-intervention systolic blood pressure.
Pre-Int DBP = Pre-intervention diastolic blood pressure. Post-Int DBP = Post-intervention diastolic blood pressure.
Pre-Int DASH-Q = Pre-intervention DASH Questionnaire. Post-Int DASH-Q Post-intervention DASH Questionnaire.
Pre-Int GSLTPEQ = Pre-intervention Godin Shephard leisure time physical exercise questionnaire.
Post-Int GSLTPEQ = Post-intervention Godin Shephard leisure time physical exercise questionnaire

Appendix A

Evidence Review Table for Quality Improvement HTN Bundle

#	**Author Citation**	**Design and Aim and** Major **Variables**	**Population, Setting, and Sample Size**	**Intervention**	**Measurements (tool to assess outcome)**	**Results or Recommendations**	**Strengths and Limitations**	**Evidence Level Quality Rating**
1	Balasubramaniam & Hewling (2021)	Design: A systemic review of RCTs evaluates the effect of various DASH diets on BP for patients with HTN. The Independent variable is the DASH diet. Dependent variable: Outcome effect on both SBP and DBP.	Population: *N* =1051 adult males and females. Mean age 52 years. All the participants have been diagnosed with HTN, have no antihypertensive medications, and the baseline SBP was < 160 mmHg. Pregnant	The DASH diet's main contents are fruits, vegetables, fat-free or low-fat milk and dairy products, whole grains, fish, poultry, beans, seeds, and nuts, such as the Mediterranean diet. The DASH diet contains less sodium, added sugars, fats,	The baseline and post-intervention measurements of SBP and DBP using Oscillometer BP apparatus to assess and record BP.	The DASH diet produces an effect equal to that of a single antihypertensive medication. The DASH diet has three different sodium levels (high level is 3450 mg/day, intermediate is 2300 mg/day, and low is 1150 mg/day). The results indicated a significant reduction in BP using only the	Strengths: Randomization of the study groups to minimize bias, and there was intervention fidelity, credibility, and rigor. Limitations: The study has a small sample size.	Evidence Level: 1A Quality Rating: High (A).

			females were excluded from the study. Setting: The participants were evaluated in the medical centers and clinics in the United States.	and red meats than the typical regular American diet. The DASH diet is also low in saturated fat, trans fat, and cholesterol.		DASH diet compared to the regular American diet. The DASH diet lowers BP irrespective of sodium content. The reduced sodium consumption and the DASH diet lowered SBP and DBP, with more decrease evident at higher baseline BP levels. For example, in participants with baseline SBP >150 mm Hg, the mean SBP decrease was >20 mm Hg. The study affirmed that a reduction of 3 mmHg average in SBP potentially results in an 8% and 5% reduction in stroke and heart	The study duration of eight weeks was brief and may affect the reliability.	

						diseases, respectively. Also, a two-mmHg reduction in DBP may lead to a 6% reduction in coronary heart disease.		
2	Fu et al. (2020)	Design: Network of meta-analyses of RCTs. The aim is to investigate the comparative effect of the DASH diet, low sodium diet, and physical exercises of 30 minutes duration three times a week on lowering BP. Independent variable: DASH diet, low sodium,	Population: *N* = 14923 adults. A total of 8530 participants were randomized to 17 intervention groups, and 6393 were assigned to usual care in 22 control groups. The mean age was 52 years. Duration is 12 weeks. Setting: In communities and clinics in	The participants strictly followed 22 various non-pharmacological interventions. The categories of the interventions were alone or combined with the DASH diets, sodium restriction, and several types of physical exercises.	In the meta-analyses of systematic reviews, the PRISMA reporting tool selects the largest, most informative, complete data. An additional evidence quality analysis was conducted using the Grading of Recommendations Assessment, Developme	The 12-week follow-up showed that DASH diets lowered SBP with a weighted mean difference (WMD) of 6.97 mmHg and DBP of 3.54 mmHg compared to the usual care. A 5g/day salt substitute diet of low sodium chloride containing 65% and high potassium 35% salt lowered SBP with a WMD of 8.21 mmHg. Physical exercise	Strengths: Randomization to eliminate section bias. The study has credibility and rigor. Limitation includes a large sample size which may be challenging and very expensive.	Evidence level: 1A Quality Rating: High quality (A).

		and physical exercise. Dependent variable: Reduction in BP measurements.	the U.S., Europe, Africa, and Asia.		nt, and Evaluation (GRADE) framework.	lowered SBP by WMD of 6.60 mmHg and DBP by 4.44 mmHg. The superior intervention is the DASH diet plus physical exercise lowered SBP with a WMD of 11.20 mmHg at 95% CI.		
3	Lee et al. (2021)	Design: RCT Aim: Investigate the effect of walking - a physical activity, on BP reduction. Independent variable: Walking activity. Dependent variable: Outcome reduction of BP.	Population: Adults from 18 to 84 years with and without HTN. *N* = 5060. The 73 RCTs studies, *n*= 5060). Setting: General population.	Intervention: Walking is a cost-effective, typical physical exercise for blood pressure control. Duration: 20 to 40 minutes, three to five times a week for three months. The control group has no walking activity.	Walking reduced the SBP by an average of 4.11mmHg. Without walking, SBP decreased by 1.30 mmHg (95% CI, *P* = < 0.02). Walking reduces the mean difference (MD) of SBP by 4.41	The effect of no walking on SBP and DBP was minimal, while the effects of walking reduced SBP and DBP in adults.	Strengths include Randomized sampling to minimize bias and intervention fidelity delivered to obtain a good, effective outcome. A large sample size effect enables	Evidence Level: 1B Quality Rating: Good (B).

					mmHg (95% CI -6.17 to 2.65 mmHg: 14 studies (*n* = 491) for ages less than 40 years. Walking for ages 41 to 60 years MD of SBP was 3.79 mmHg, 95% CI 5.64 to 1.94 mmHg, P < 0.005; 35 studies, n =1959). For ages 60 years and older, MD of SBP reduced by 4.30 mmHg, 95% CI, 6.17 to 2.44mm Hg, 24 studies, n = 2610).		generalization. Limitations: The sample may be too large and expensive to process. A self-report record of walking may be unreliable.	

					The effect of no walking on diastolic blood pressure (DBP) is 0.73mmHg compared to the effects of walking on DBP, indicating MD 1.79 lower (2.51 lower to 1.07 lower 95% CI).			
4	Filippou et al. (2020)	Design: Systematic review of meta-analysis of RCTs in the Cochrane databases. Aim: Evaluate the effects of DASH diets and lifestyle modifications on BP levels.	Population: N = 5545 adult participants. The mean age for the participants is less than 50 years. The baseline SBP is 140 mmHg. Setting: In clinical trials,	DASH diets combined with lifestyle modifications of sodium intake restriction not exceeding 2400 mg per day, physical exercise, or weight loss compared to a control diet for	The PRISMA guideline is the tool that ensures the use of a quality assessment of the measurements and eliminates bias. The outcome	DASH diet combined with sodium intake restriction reduced SBP by 6.7, 4.9, 5.2, and 7.6 mmHg DBP was reduced by the mean difference of 3.5, 3.6, 2.6, and 4.2 mmHg compared to the control	Strengths: Diverse population and randomization to reduce bias. The large sample size may enable the generalization of the	Evidence Level: 1A Quality Rating: High

		Control is the usual diet. Independent variables: The DASH diet is rich in fruits, vegetables, and low-fat dairy foods with low saturated fat, low cholesterol, and sodium restriction. Dependent variable: Reduction in SBP and DBP.	RCTs (*n* =30) with 5545 participants.	a mean duration of 15 weeks.	assessment evaluates the reliability and validity of data. The mean difference between the baseline pre-intervention SBP and DBP results and the post-intervention mean SBP and DBP results are valid.	diet (CI 95%; $p < 0.05$). The DASH diet alone reduced the mean difference SBP to 3.2, 4.2, and 3 mmHg (CI 95%, $p < 0.001$), and DBP difference in means include 2.5, 3.5, and 1.5 mmHg (95% CI): $p < 0.001$). Grading of recommendations, assessment, development, and evaluation (GRADE) approach indicates the moderate quality of evidence supporting the adoption and incorporation of DASH diets and lifestyle changes demonstrated a reduction of both SBP and DBP baseline levels in	study. The study quality has rigor, clarity, and intervention fidelity. Limitations: Hawthorne effects on participants can have outcome bias.	

						both hypertensive and non-hypertensive participants.		
5	Lee et al. (2018)	Design: Randomized controlled trial (RCT). Aim: Investigate the effects of lifestyle interventions, including education on the DASH diet alone and the combination of home-based exercise education on BP outcome. Independent variable: DASH diet and physical exercise. Dependent variable: BP changes.	Population: N = 72 adults with hypertension aged 20 years and older. Mean age: 45 years. Setting: Clinical trials in Korea.	The participants were randomized into three groups. Group C, the control group, received advice only. Group D, DASH diet education alone. Group D + Exercise (Group D +Ex) participants received the DASH diet education and physical exercise. Participants were instructed to perform aerobic exercises for 150 minutes per week, such	An automated sphygmomanometer manufactured by Omron Healthcare Japan was used for the BP measurement to assess baseline BP pre-intervention and post-intervention readings. Two office BP measurements were recorded five minutes apart at one-week, four weeks, and eight weeks	BP reductions indicated that the DASH and exercise group was the most significant among the participants. Control group shows a mean SBP difference of -2.0 and DBP -3 mmHg, Group D has reduced SBP 5.6 of mmHg, and DBP of 2.9 mmHg (p = 0.009). Compared to the control, Group D + Ex has reduced 7.2 mmHg (p-value = 0.005).	Limitations: Small sample size to determine the effects of generalization The intervention duration is only eight weeks, which may be short to fully evaluate the study of the DASH diet and physical exercise, education, and blood pressure control.	Evidence Level I B Quality Rating: Good.

				as walking more than 10,000 steps, swimming, or biking. The duration of the intervention was eight weeks.	on all participants during visits. Physical activity was assessed using the self-report Godin Leisure-Time Exercise Questionnaire and a 7-day physical activity recall for one week, four weeks, and eight weeks, respectively.	Recommendations: The DASH diet and physical exercise education effectively reduce BP.		
6	Zhou et al. (2022)	Design: Systematic review of RCTs. Aim: Evaluate the effect of exercise on HTN.	Population: *N* = 717 participants in 12 RCTs of patients with HTN or prehypertension.	Exercise is a non-pharmacological therapy. The study is to investigate the effectiveness of exercise in decreasing BP.	The measurement tool includes Preferred reporting items for systematic reviews and	The meta-analysis showed that in patients with hypertension, physical exercise could significantly reduce SBP (MD	Strengths include: Randomizing the participants into the experimental and	Evidence Level: 1B. Quality Rating: Good.

		Independent variable: Physical exercises. Dependent variable: Effect of exercise on BP.		The experimental group exercised 30 to 45 minutes three to five times daily. The exercise duration for the experimental group was four weeks, while the control group did not exercise.	meta-analyses (PRISMA) guidelines.	= 4.89; 95% CI, 7.05 to 2.73; *P* < 0.0001) and DBP (MD = 3.74; 95% CI, 5.18 to 2.29; *P* < 0.0001).	control groups. Randomization decreases the risk of selection bias. Limitations: Unequal intervention duration ranging from 6 weeks to 24 weeks	
7	Nguyen-Huynh et al. (2022)	Study: Cluster randomized clinical trial. Aim 1: Determine whether a lifestyle coaching intervention or an enhanced pharmacotherapy protocol is more effective than usual care	Population: 1761 Black adults with HTN under the care of primary care providers with at least 140/90 mmHg. Mean age: 61 years. Setting: An integrated healthcare	The participants were randomly assigned to the treatment and control groups. The control group received the usual care (UC) protocol. The EP group received 16 telephone calls from a clinical	Each patient had free walk-in visits for BP checks every two weeks. Review of dietary self-monitoring records. Staff review of the electronic medical	A 12-month post-intervention showed no significant difference in BP control among the study and control groups. SBP was <140 and DBP was < 90 mmHg. At 24 months: Significant difference in BP	The study is rigorous. Strengths: randomizing the participants into control and treatment groups, thereby decreasing selection bias. The	Evidence Level: 1B. Quality Rating: Good

		in improving BP control rates in Black adults. Aim 2: Investigate BP control at two to three years post-enrollment. Independent variables: Lifestyle coaching and enhanced pharmacotherapy Dependent variable: Effect on BP.	delivery system using a standard BP protocol from Kaiser Permanente of North Carolina (KPNC). Sample selection and registration of participants were completed in 12 months. The usual care (UC), *n* = 1129 participants; the lifestyle coaching (LC) group, n = 286; the enhanced pharmacotherapy monitoring (EP) group, n = 346.	pharmacist or a research nurse to monitor drug treatment and provide education sessions on thiazide dose intensification or the addition of spironolactone or calcium channel blocker per the KPNC protocol. The treatment group received a lifestyle coaching (LC) intervention focusing on dietary approaches to stop hypertension with sodium reduction and the DASH diet. An initial individual session lasts 30	record was used to gather information on filling antihypertensive prescriptions.	control as follows, the LC group versus UC (UC, 61.2% [95% CI, 57.3% -64.7%]; EP, 67.6% [95% CI, 61.9% -72.8%]; LC, 72.4% [95% CI, 66.9% - 78.1%]; LC versus UC, P =.001), and at 48 months (UC, 64.5% [95% CI, 61.6% - 67.2%]; EP, 66.5% [95% CI, 61.3% - 71.3%]; LC, 73.1% [95% CI, 67.6% -77.9%]; LC versus UC, P =.006) Recommendation: The LC intervention was more effective at controlling BP than the UC at 12 months, 24 months, and 48	use of trained staff on standardized BP measurement to minimize errors. Limitations include: Lengthy study duration of 12 months and another 48 months of follow-ups, which may cause attrition as some participants may die or drop out of the study. The cost of the study could be expensive.	

				minutes, then 15 minutes weekly for four sessions in a week for 12 months of intervention. Follow-up: 48 months.		months respectively. DASH diet: Rich in fruits, vegetables, fiber, and low-fat dairy but with reduced saturated and total fats. DASH is diet effective. Moreover, sodium restriction and the DASH diet provide additional lowering of BP in adults.		
8	Zhu et al. (2022)	Design: Systematic review of RCTs of 46 studies. Aim: Explore the effects of aerobic exercises such as walking, yoga, aquatic sports, football, and Tai Chi on blood pressure	Population: 3058 adult hypertensive patients Mean age: 53 years. Setting: Includes the United Kingdom, Denmark, and Sweden.	The intervention demonstrated six types of aerobic exercises, including walking, yoga, aquatic sports, football, Tai Chi, and Qigong, and the effect on BP on	Analysis and measurement of BP readings for exercise patterns were assessed and compared with their corresponding control groups.	Results in the experimental groups indicated that walking reduced SBP by 5.94 mmHg, DBP reduced by 2.66 mmHg compared to the control group SBP reduced by 3.66 mmHg, and DBP by 1.67 mmHg.	The study is robust. The research design is RCT, in which the participants were randomized into experimental and control	Evidence Level: 1 B. Quality Rating: Good.

		in patients with HTN. Independent variables: Aerobic exercises. Dependent variable: Outcome effect on the BP reduction.		hypertensive patients from 2 weeks to 15 weeks. Walking exercise is a low-cost and flexible physical activity. Recommendations: Moderate to high-intensity aerobic exercise improves heart function for hypertension and has been used to supplement antihypertensive drugs.		Yoga reduced SBP by 5.09 mmHg, and DBP decreased by 3 mmHg. Aquatic Sports reduced SBP by 7.53 mmHg and DBP by 5.35 mmHg. Football and soccer training exercises reduced SBP by 6.06 mmHg and DBP by 5.55 mmHg. Tai Chi and Qigong reduced SBP by 8.31 mmHg and DBP by 3.05 mmHg, 95% CI, respectively. Recommendations: Walking, yoga, aquatic sports, and football are effective	groups, thereby eliminating selection bias. The study has a large number of participants, which increased the accuracy of generalization. Limitations include a lack of detailed descriptions of the exercise intensities and frequencies. The evidence quality was not evaluated using the GRADE approach,	

						interventions for controlling HTN.	and this may affect the strength of the results.	
9	Guo et al. (2021)	Meta-analysis of RCTs. The aim is to analyze the modified Dash diet (m-DASH) on SBP and DBP. The independent variable is the modified Dash diets. Dependent variable: The effect on BP.	Population, N= 2416 hypertensive and pre-hypertensive adult participants. BP range from 127/81 to 165/85 Mean age: 53 years. A total of ten studies were selected. The setting for four studies was the United States of America, and the other six were from China, South Korea, Canada, Pakistan, and Brazil.	The study compared the m-DASH diet with the control diet. The m-DASH is rich in fruits, vegetables, and low-fat dairy products, with more fish, nuts, and legumes and a moderate sodium restriction. Control: Usual unrestricted diet.	The tool used was the preferred reporting items for systematic reviews (PRISMA) for reports, appraisal, and evaluation of the systematic reviews of interventions. The study protocol was not registered per the author's assertion, thereby impeding the integrity	The m-DASH diet reduced the SBP by 4.9 to 7.6 mmHg and DBP by 2.6 to 4.2 mmHg. The mean BP reduction in the subgroups (SBP 7.59 mmHg; DBP 4.47 mmHg) in patients with a baseline BP > 140/90 mmHg. A higher baseline BP is associated with more significant SBP and DBP reduction. Data showed that 30% of HTN is associated with excessive salt intake. However, a decreased sodium intake of	Strengths: The study is rigorous RCTs. One of the strengths includes randomizing the treatment group with their corresponding control groups to avoid selection bias. Limitations: A small sample size of 10 studies may interfere with generalizati	Evidence Level: 1 B Quality rating: Good.

					of the evaluation with the GRADE approach.	3000mg/day reduced BP. Recommendation: The modified DASH diet is an effective treatment modality for HTN. From the studies, the DASH dietary pattern scored highest using NutriGrade.	on. There was heterogeneity in the studies, which downgraded the analysis.	
10	Sukhato et al. (2020)	Design: Systemic review and meta-analysis of RCTs. Aim: Provide umbrella reviews to provide evidence on the effectiveness of different dietary patterns in lowering BP for HTN control.	Population: N = 5050 hypertensive and pre-hypertensive adult participants in 7 to 89 studies. Mean age: 48 years. Setting: Europe, North America, South America,	There are 12 dietary patterns listed in the umbrella review of the study. The diets are DASH, Mediterranean, Nordic, vegetarian, low-salt, low-carbohydrate, low-fat, high-protein, and paleolithic.	The NutriGrade scoring system assesses the quality level and rates results as low, moderate, and high on each diet.	DASH dietary scored the highest in the NutriGrade scoring system. DASH is the most significant overall in reducing SBP and DBP in hypertensive and normotensive participants, with mean differences ranging from −3.20 to −7.62 mmHg for SBP	Strengths include the collection of data and meta-analysis from the RCTs articles. Limitations include: The diet categories' characteristics are different and can	Evidence Level: 1 B. Quality Rating: Good.

		Independent variable: 12 various dietary patterns. Dependent variable: Effect on BP.	Asia, Australia, and New Zealand.			and from −2.50 to −4.22 mmHg for DBP. Low salt intake also significantly decreased the SBP – 4.14 to -7.04 mmHg; DBP was reduced by 1.17 to 3.22 mmHg (95% CI).	create high heterogeneity and outcomes.	
11	Howard et al. (2018)	Design: A longitudinal cohort study. Independent variables High Southern diet score and Low DASH diet score, Level of education, Level of income Dependent variable: Incidence of HTN	Population N= 30,239 participants (both Black and white). Black adult men and women were 6897. Mean age 62years Setting: In the United States.	A social statistical risk assessment scores to evaluate sources of racial disparities in HTN incidence, including Southern diet, level of education, and annual income < $35,000.	High Southern diet score of 0.81 for the Black men, -0.26 for the White men; Low DASH diet score of Black men 14.9, versus White men 13.4; Black women 14.5 and White women 12.9 (95% CI).	The Southern dietary pattern was the most significant mediating factor for differences in the incidence of hypertension, accounting for 51.6% (95% CI, 18.8% to 84.4%) heightened risk among black men and 29.2% (95% CI, 13.4% to 44.9%). The high school or less level education had12.3% and <	Strengths: The study has a large sample size to effectuate generalization. Limitation: The attrition rate was high: 40% of the participants either withdrew from the study or died.	Evidence level: III B Quality rating B

						$35,000 had 11.2% heightens the risk of HTN incidence among Black people.		
12	Alnooh et al. (2022)	Design: Systematic reviews. 3 RCTs and 2 pre-post pilot studies.	Population N= 334 participants. Mean age: 47years Setting: In the United States.	The intervention target was mobile phone apps for dietary and behavioral use and adopting the DASH diet to reduce BP.	Effect of the DASH mobile app of smartphones on the health outcome of BP	All studies supported self-management of the DASH diet and hypertension with increased patient awareness through educational information. All studies reported the apps' effectiveness in dietary and behavioral changes and controlling BP.	Strengths: Randomization in the studies decreased selection bias. Limitation: The sample size is small for generalization.	Evidence Level II B. Quality rating B

Note. BP = Blood pressure; DASH = Dietary Approaches to Stop Hypertension diet: sodium restriction, rich in fruits & vegetables, low-fat dairy foods, & low saturated fat and low cholesterol; DBP = diastolic blood pressure; GRADE = Grading of Recommendations Assessment, Development, and Evaluation; MD = mean difference; RCT = randomized control trial; SBP = systolic blood pressure; U.S. = United States

[1] Adapted from "A systematic review of the efficacy of the DASH diet in lowering blood pressure among hypertensive adults" by J. Balasubramaniam & S. J. Hewlings, 2021, *Topics in Clinical Nutrition, 36*(2), 158–176 (https://doi-org/10.1097/TIN.0000000000000238). Copyright 2021 by Wolters Kluwer Health, Inc.

[2] Adapted from "Nonpharmacologic interventions for reducing blood pressure in adults with prehypertension to established hypertension" by J. Fu., Y, Liu., L. Zhang., L. Zhou., D. Li., H. Quan., L. Zhu., F. Hu., X. Li., S. Meng., R. Yan., S. Zhao., J. U. Onwuka., B. Yang., D. Sun., & Y. Zhao, 2020, *Journal of the American Heart Association*, *9*(19), 1–138. (https://doi.org/10.1161/JAHA.120.016804). Copyright 2020 by the Authors, Open access.

[3] Adapted from "Walking for hypertension" by L. L. Lee, C. A., Mulvaney, Y. K. Wong, E. S. Y. Chan, M. C. Watson, H. H. Lin. *Cochrane Database of Systematic Reviews, 2,* Article CD008823. (https://doi.org/10.1002/14651858.CD008823.pub2). Copyright 2021 by Cochrane Library.

[4]Adapted from "Dietary approaches to stop hypertension (DASH) diet and blood pressure reduction in adults with and without hypertension: A systematic review and meta-analysis of randomized controlled trials" by C. D. Filippou, C. P. Tsioufis, C. G. Thomopoulos, C. C. Mihas, K. S. Dimitriadis, L. I. Sotiropoulou, C. A. Chrysochoou, P. I. Nihoyannopoulos D. M.Tousoulis, *Advances in Nutrition, 11(*5), 1150–1160 (https://doi.org/10.1093/advances/nmaa041). Copyright *2020 by the American Society of Nutrition.*

[5] Adapted from "The Effects of diet alone or in combination with exercise in patients with prehypertension and hypertension: A randomized controlled trial by C. J. Lee., J. Y. Kim., E. Shim., S. H. Hong., M. Lee., J. Y. Jeon., & S. Park. (2018). *Korean Circulation Journal, 48*(7), 637–651 (https://doi.org/10.4070/kcj.2017.0349). Copyright 2018 by The Korean Society of Cardiology.

[6] Adapted from "Effect of exercise on vascular function in hypertension patients: A meta-analysis of randomized controlled trials" by H. Zhou., S. Wang., C. Zhao, & H. He, (2022) *Frontiers in Cardiovascular Medicine, 9*, Article 1013490 (https://doi.org/10.3389/fcvm.2022.1013490). Copyright 2022 by Zhou, Wang, Zhao, and He by Creative Commons Attribution License (CC BY).

[7] Adapted from "Effect of lifestyle coaching or enhanced pharmacotherapy on blood pressure control among Black adults with persistent uncontrolled hypertension: A cluster randomized clinical trial" by Nguyen-Huynh, M. N., Young, J. D., Ovbiagele, B., Alexander, J., Alexeeff, S., Lee, C., Blick, N., Caan, B.J., Go, A., & Sidney, S. (2022). *JAMA Network Open*, 5(5): Article e2212397 (http://doi.org/10.1001/jamanetworkopen.2022.12397). Copyright 2022 by Nguyen-Huynh MN et al., Creative Commons Attribution License (CC-BY).

[8] Adapted from "Association between Exercise and blood pressure in hypertensive residents: A Meta-analysis. Evidence-based complementary and alternative medicine by Z. Zhu, W. Yan, Q. Yu, P. Wu, F. M. Bigambo, and J. Chen, (2022), Evidence-Based Complementary and Alternative Medicine, 2022, Article 2453805 (https://doi.org/10.1155/2022/2453805). Copyright 2022 by Zhu Zhu et al., Creative Commons Attribution License (CC-BY).

[9]Adapted from "Effects of the Modified DASH Diet on Adults with elevated blood pressure or hypertension: A systematic review and meta-analysis by Guo, R., Li, N., Yang, R., Liao, X. Y., Zhang, Y., Zhu, B. F., Zhao, Q., Chen, L., Zhang, Y. G., & Lei, Y. (2021). *Frontiers In Nutrition, 8*, Article 725020 (https://doi.org/10.3389/fnut.2021.725020). Copyright 2021 by Guo, Li, Yang, Liao, Zhang, Zhu, Zhao, Chen, Zhang, and Lei, Creative Commons Attribution License (CC-BY).

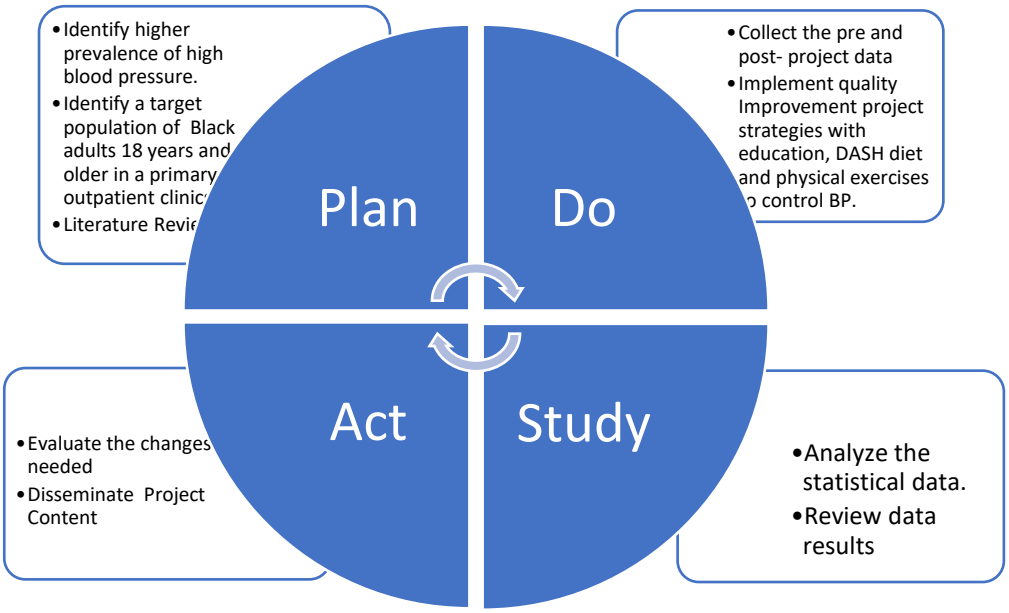
[10] Adapted from "Efficacy of different dietary patterns on lowering of blood pressure level: An umbrella review" by Sukhato, K., Akksilp, K., Dellow, A., Vathesatogkit, P., & Anothaisintawee, T. (2020). *The American Journal of Clinical Nutrition, 112*(6), 1584–1598 (https://doi.org/10.1093/ajcn/nqaa252). Copyright 2020 by the American Society for Nutrition.

[11] Adapted from "Association of clinical and social factors with excess hypertension risk in Black compared with White US adults: Howard, G., Cushman, M., Moy, C.S., Oparil, S., Muntner, P., Lackland, D.T., Manly, J.J., Flaherty, M.L., Judd, S.E., Wadley, V.G., Long, D. L., & Howard, V.J. (2018) https://doi.org/10.1001/jama.2018.13467

[12] Adapted from "The use of dietary approaches to stop hypertension (DASH) mobile apps for supporting a healthy diet and controlling hypertension in adults: Systematic review" by Alnooh, G., Toukiah, A., Hawley, M., & de Witte, L. (2022). https://cardio.jmir.org/2022/2/e35876

Appendix B

Plan -Do- Study- Act



Note. Adapted from "Methods of translation" by M. F. Terhaar, 2021, in K. M. White, S. Dudley-Brown, & M. F. Terhaar. (Eds.). *Translation of evidence into nursing and healthcare* (3rd ed., pp. 173-197). Springer Publishing.

Appendix C

SWOT Analysis Table

Strengths	**Weaknesses**
- Transformational leadership in the organization is a change agent that fosters quality improvement solutions. - Good communication channels in the organization are available to disseminate health information through verbal discussions, flyers, telephone calls, and text messages. - A cooperative multidisciplinary team. - Trained staff with knowledge of BP measurement skills. - Knowledge of BP parameters to detect clinical diagnosis of HTN per ACC/AHA guidelines. - Knowledge of the DASH diet's evidence-based (EB) health benefits to control BP. - Knowledge of EB benefits of Physical exercises to control BP. -High ownership of smartphones among patients to provide digital health tools.	- Participants' unawareness, lack of knowledge, and use of DASH diets to improve BP control. - Participants lack knowledge of and use of physical exercise regimens for HTN. - A financial need for printing educational materials such as posters, flyers, pamphlets, notebooks, and pens.
Opportunities	**Threats**
-The project leader will implement health education on HTN, the DASH diet, and Physical exercises to control BP. - Participants will receive pamphlets on HTN, DASH diets, and various physical exercises. - The organization may use the educational project as a quality improvement tool to improve BP. Partner with participants for patient engagement to improve adherence to BP management.	- Insufficient funding for the increased financial burden. -Non-compliant with the DASH diet and physical exercise. - Participants may decline to continue with the project.

Appendix D

Risk Management Plan Table for Quality Improvement Cardiovascular Bundle Project

Risk	Probability	Impact	Mitigation of Risk	Contingency Plan
Participants' non-compliance with consumption and components of the DASH diet to control BP to less than 130/80 mmHg.	Likely	Critical	-Educating the participants on various DASH diet eating plan food selections. -Encourage adherence to DASH diet components via text messages or phone calls for reminders (Filippou et al., 2020).	- Using the National Heart Lung and Blood Institute website for dietary teaching (National Heart Lung and Blood Institute, 2023).
Participants' non-compliance with physical exercise to control BP.	Likely	Critical	- Use preferred individualized moderate-intensity or vigorous-intensity physical exercise for 150 minutes weekly to control BP (Lee et al., 2020).	-Daily reminders via text messages championed by the project leader.
Potential for insufficient funds.	Likely	Critical	-Prepare a sustainable budget plan to delineate the total funds/income and the expenditure for the project. Proper lower cost allocations to avoid budget deficits.	-Solicit financial support from another source.
Potential for participants' attrition or discontinuation with the project.	Likely	Critical	-Schedule follow-up appointments at the patient's convenience. -Follow up with phone calls and text messages. Offer free walk-in BP checks at any time.	-A convenient sampling method to recruit participants who are less likely to drop out of the project.

Appendix E

DASH-Q Permission Letter from Jan Warren-Findlow, PhD

[External]

Dear Florence,

I am excited to hear about your interest in using DASH-Q. I'm happy to chat about its development at any time. You have my permission to use the scale in your research if you wish with the following caveat: under no circumstances may you embed the survey questions and the scoring into any kind of mobile app or mHealth application without my prior permission in writing. The DASH-Q and the H-SCALE are copyrighted material. The DASH-Q and the H-SCALE are not available for commercial use. Please let me know if you need the Spanish version of the DASH-Q.

The self-administered form of the DASH-Q is attached as a Word document along with the scoring instructions. Please read the attached scoring instructions carefully so that you understand how to score the scales and their limitations.

The *Journal of Nutrition Education and Behavior* article (Warren-Findlow, Reeve & Racine) describes the revision and validation of the DASH-Q. The most recent publication (2019) in the *Western Journal of Nursing Research* presents the current subscales and their correlations with blood pressure, as well as adherence to the subscales and their association with the control of blood pressure. Please make sure to cite this publication (with the correct spelling of my name "Warren-Findlow") in any publications or presentations. I understand that in some areas of the world, this is not common practice to reference other works, but this is a condition of your being able to use the DASH-Q. Also please indicate that you have the researcher's permission to use the scale.

Keep me informed of how your work progresses. I am always interested in hearing what others are doing in relation to hypertension self-care, nutrition, and blood pressure. Let me know if you have any questions.

Please confirm that you understand and agree to the above restrictions in an email response. Let me know if you have any questions.
Sincerely, Jan Warren-Findlow

Jan Warren-Findlow, PhD @DrJanWF
Pronouns: she/her/herself
Dept. of Public Health Sciences | UNC Charlotte
Professor and Chair
voice: 704/687-7908 | fax: 704/687-1644
jwarren1@uncc.edu | https://publichealth.uncc.edu/
Join us on Twitter - @CLTPublicHealth
Jan's Zoom Room

On Wed, Apr 5, 2023, at 12:01 AM, Chinwuba, Florence Ifeyinwa

<florence.chinwuba@mavs.uta.edu> wrote:

Hi Dr. Warren,

Greetings! My name is Florence Chinwuba. I am a Doctor of Nursing Practice (DNP) student at the University of Texas at Arlington. I am completing my DNP project on Hypertension Management with a DASH diet, physical exercises, and education to control blood pressure among adults 18 years and older with hypertension. The setting is a primary care outpatient clinic in Texas. I saw your article: Psychometric Validation of a Brief Self-report Measure of Diet Quality: The DASH-Q. I request your permission to use the DASH- Q questionnaire in your study for my project to assess the knowledge and adherence to the DASH diet in adults 18 years and older. If my request for permission is approved, I will use DASH-Q for the survey

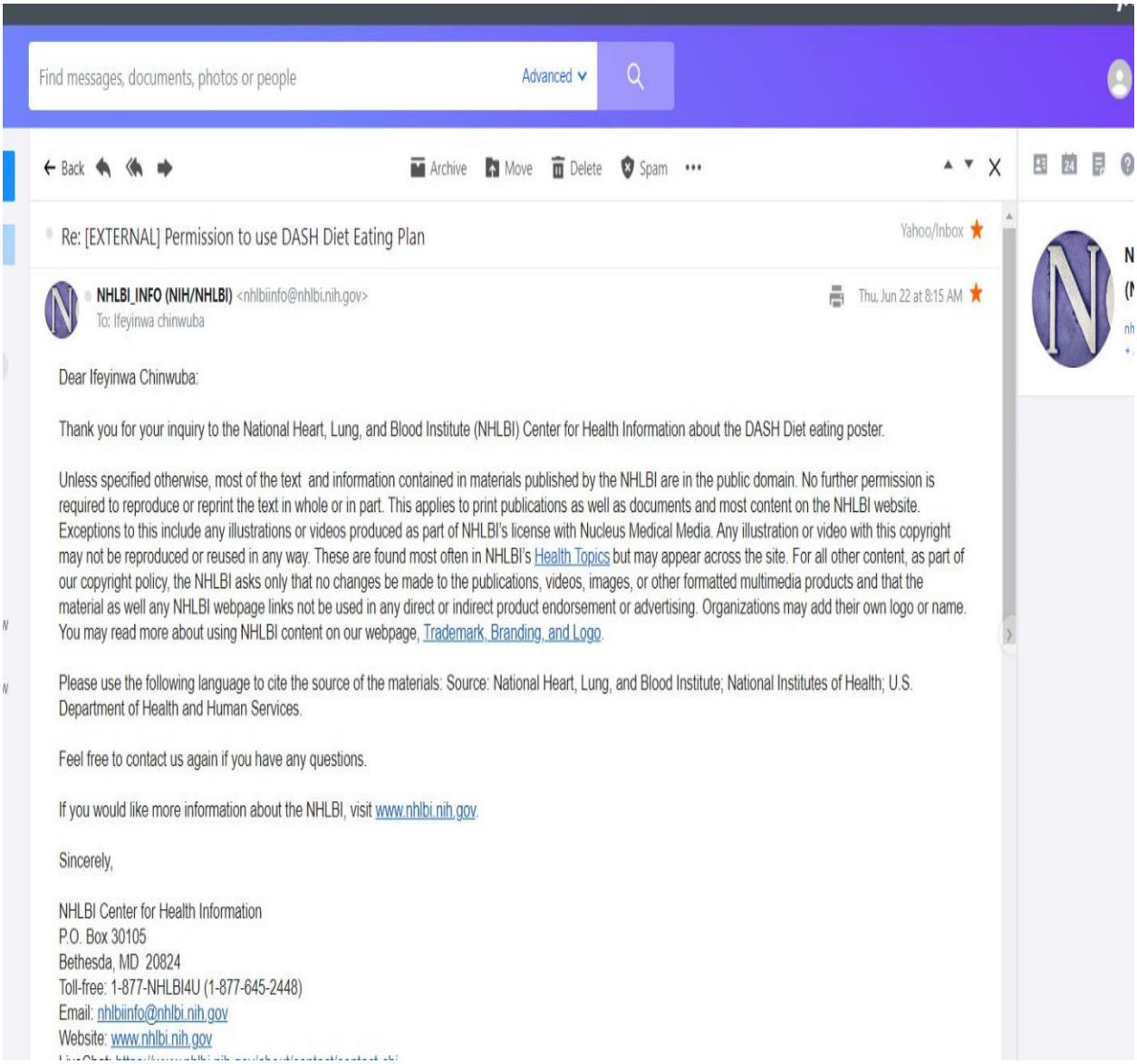
questionnaire for the patients in the outpatient clinic. Please, your consideration of my request is highly appreciated. Thank you.

Florence Chinwuba MSN, APRN, FNP-BC, DNP student

Appendix F

Permission to Use DASH Diet Eating Plan

Re: [EXTERNAL] Permission to use DASH Diet Eating Plan



Find messages, documents, photos or people Advanced

Back Archive Move Delete Spam

Re: [EXTERNAL] Permission to use DASH Diet Eating Plan Yahoo/Inbox

NHLBI_INFO (NIH/NHLBI) <nhlbiinfo@nhlbi.nih.gov>
To: Ifeyinwa chinwuba
Thu, Jun 22 at 8:15 AM

Dear Ifeyinwa Chinwuba:

Thank you for your inquiry to the National Heart, Lung, and Blood Institute (NHLBI) Center for Health Information about the DASH Diet eating poster.

Unless specified otherwise, most of the text and information contained in materials published by the NHLBI are in the public domain. No further permission is required to reproduce or reprint the text in whole or in part. This applies to print publications as well as documents and most content on the NHLBI website. Exceptions to this include any illustrations or videos produced as part of NHLBI's license with Nucleus Medical Media. Any illustration or video with this copyright may not be reproduced or reused in any way. These are found most often in NHLBI's Health Topics but may appear across the site. For all other content, as part of our copyright policy, the NHLBI asks only that no changes be made to the publications, videos, images, or other formatted multimedia products and that the material as well any NHLBI webpage links not be used in any direct or indirect product endorsement or advertising. Organizations may add their own logo or name. You may read more about using NHLBI content on our webpage, Trademark, Branding, and Logo.

Please use the following language to cite the source of the materials: Source: National Heart, Lung, and Blood Institute; National Institutes of Health; U.S. Department of Health and Human Services.

Feel free to contact us again if you have any questions.

If you would like more information about the NHLBI, visit www.nhlbi.nih.gov.

Sincerely,

NHLBI Center for Health Information
P.O. Box 30105
Bethesda, MD 20824
Toll-free: 1-877-NHLBI4U (1-877-645-2448)
Email: nhlbiinfo@nhlbi.nih.gov
Website: www.nhlbi.nih.gov

Appendix G

DASH-Q (Dietary Approaches to Stop Hypertension Questionnaire)

The following questions ask about your diet during the past 7 days. For each question, circle the number of days that you performed that activity.								
Diet ***How many of the past 7 days did you:***	**Number of Days**							
1. Eat nuts or peanut butter?	0	1	2	3	4	5	6	7
	☐ I am allergic to nuts.							
2. Eat beans, peas, or lentils?	0	1	2	3	4	5	6	7
3. Eat eggs?	0	1	2	3	4	5	6	7
4. Eat pickles, olives, or other vegetables in brine?	0	1	2	3	4	5	6	7
5. Eat five or more servings of fruits and vegetables?	0	1	2	3	4	5	6	7
6. Eat more than one serving of fruit (fresh, frozen, canned, or fruit juice)?	0	1	2	3	4	5	6	7
7. Eat more than one serving of vegetables?	0	1	2	3	4	5	6	7
8. Drink milk (in a glass, with cereal, coffee, tea, or cocoa)?	0	1	2	3	4	5	6	7
9. Eat broccoli, collard greens, spinach, potatoes, squash, or sweet potatoes?	0	1	2	3	4	5	6	7
10. Eat apples, bananas, oranges, melons, or raisins?	0	1	2	3	4	5	6	7
11. Eat whole grain bread, cereals, grits, oatmeal, or brown rice?	0	1	2	3	4	5	6	7

January 16, 2017

Note.

Appendix H

Use Permission for Godin-Shephard Leisure Time Questionnaire

Re: Permission to use Godin Leisure Time Physical Exercise Questionnaire

Kaufman, Kai kai.kaufman@ubc.ca

To: Ifeyinwa chinwuba

Wed, May 17 at 1:22 PM

Hi Florence, I hope all is well. The Godin-Shepherd Leisure-Time Physical Activity Questionnaire is a public document. Therefore, we can grant permission for your use. Please ensure that the work and authors (Dr. Godin and Dr. Shephard) are cited appropriately.

Thank you,

Kai

Kai Kaufman MKin (She, Her, Hers)
Research Coordinator
Physical Activity Promotion and Chronic Disease Prevention Unit
The University of British Columbia | Vancouver Campus | Musqueam Traditional Territory
Lower Mall Research Station, Rm 102
2259 Lower Mall | Vancouver BC | V6T 1Z4 Canada
Phone 604 822 1337 | Cell 604 836 3242
kai.kaufman@ubc.ca

From: Ifeyinwa chinwuba <akuanyi@yahoo.com>

Sent: May 16, 2023, 12:36:11 PM

To: Kaufman, Kai

Subject: Permission to use Godin Leisure Time Physical Exercise Questionnaire

[**CAUTION:** Non-UBC Email]

Hi Kai,

Thanks for returning my call. As discussed earlier in our telephone call, my name is Florence Chinwuba. I am a Doctor of Nursing Practice student at the University of Texas at Arlington, Texas—United States of America. I am writing my final project on Hypertension Management with Education on Dietary Approaches to Stop Hypertension (DASH) diet and Physical Exercises to control blood pressure in patients with hypertension. I am seeking your permission to use the Godin -Leisure Time Physical Exercise Questionnaire to assess and evaluate the physical exercise adherence in my project participants with hypertension. Please take a look at the attached document. I will be grateful if my request is granted. Thank you.

Florence Chinwuba, MSN, APRN.

Appendix I

Approval Letter

METRO CARE Medical Clinics
CHIJIOKE D. UKOHA, M.D., P.A.
Internal Medicine - Board Certified

1800 N. Galloway Ave., Suite 100
Mesquite, Texas 75149

Tel: 972-279-1700
Fax: 972-279-1102

College of Nursing and Health Innovation

University of Texas at Arlington

411 S. Nedderman Dr,

Arlington, TX 76019

MetroCare MedClinic

1800 N. Galloway Ave, Suite 100

Mesquite, TX 75149

Date: November 18, 2022

Letter of Approval for Clinical Project

I, Dr Chijioke Ukoha, gives this letter of approval to inform the College of Nursing and Health Innovations, University of Texas at Arlington that, Florence Ifeyinwa Chinwuba is approved to do her school project in my clinic MetroCare MedClinic, Mesquite Texas.

Feel free to contact me at Office Telephone #: 972-279-1700 or Cell #469-774-2085

Sincerely

Chijioke Ukoha, MD

Appendix J
GNRC Letter of Approval for DNP Project

Chinwuba, Florence Ifeyinwa

To:Chinwuba, Florence Ifeyinwa
Cc:florify93@gmail.com

Mon 8/28/2023 11:13 PM

From: Eades, Tamara L <eades@uta.edu>
Sent: Sunday, August 6, 2023 2:40 PM
To: Plonien, Cynthia Gail <plonien@uta.edu>; Chinwuba, Florence Ifeyinwa <florence.chinwuba@mavs.uta.edu>
Cc: Trent, Tiffany R <tiffany.trent@uta.edu>
Subject: RE: GNRC Letter of Approval for DNP Project

Good morning Florence,
Congratulations on approval from the GNRC committee on your DNP Project. Welcome to N6620 DNP Practicum I. I am Dr. Tammy Eades, and I will be your lead faculty for the course. We are so excited about the implementation of your project. Your Faculty Project Advisor (FPA) through N6620 and N6621 will be **Dr. Tiffany Trent** will mentor you throughout the courses as you implement the project and prepare for the final presentation. You will soon hear from your FPA; plan for a TEAMS meetings with your mentor during the course, and always update and communicate with your FPA.

Now, housekeeping things to be completed:

1. Make sure you register for N6620 with your DNP Advising team. Dr. Taylor and his team are there to make sure you transition smoothly. You can reach them at dnp@uta.edu
2. Exxat: Upon admission into the program, you were told to purchase Exxat. You must complete all clinical compliance before you begin your practicum experience. This **must be done** before starting your project or non-project hours. If not already completed, you should look for an email from the clinical coordination team with instructions for the background check and drug screen. These items are ordered no more than 30 business days before the start of practicum. Dr. Eckhardt and her team are there to help you with requirements in Exxat. Please reach out to the clinical coordination team at DNPplacements@uta.edu If you have any questions about the compliance or MyRequest submission. If you are having issues with Exxat, please contact: v4support@exxat.com
3. Project: Once in the course you will upload the GNRC approval letter for your project, the recommendation/condition rubric that was sent to you, and the approved proposal returned to you by the GNRC. These will all be uploaded into the same portal.
4. Project Revisions: the following status from GNRC, you are required to complete additional steps:
    a. **Approval with Recommendations**: The GNRC committee has approved your project with some recommendations that they think will make the project stronger. Please review these recommendations and work with your FPA to meet these recommendations and make the project a strong project. This is only a recommendation not requirement. This choice is yours.
    b. **Approval with Conditions**: The GNRC committee has approved your project with conditions this means you **must** work with your FPA to meet the conditions set forth as

part of the approval. You cannot pass N6620 without the conditions being completed. Once these conditions are met your FPA will contact the GNRC committee to let them know.

c. Once you have received approval for their project (recommendations completed and conditions met) **nothing can be changed**. The PICOTS, question, methods, plan, everything must stay as it is after approval, and statisticians cannot change the PICOT/Question, **nothing can be changed unless it first goes back to the GNRC for review and approval**.

5. DNP Practicum Hours: a total of 1000 hours must be completed between DNP Practicum I & II. These hours include MSN hours (6333 hours), non-project hours, and project hours. Coming into N6620, you have the following hours:

    a. MSN hours: I will get back with you on hours soon.

6. N6620 Syllabus state:

    a. Students must achieve a total of 1000 practicum hours to meet the degree requirements.
    b. APRNs which include nurse practitioners, certified nurse midwives, certified RN anesthetist, and clinical nurse specialists, are allowed to count a maximum of 500 hours from their master program toward the 1000 hours.
    c. All other nurses will have a gap analysis at admission and verification of clinical hours in their master's program that will count toward the 1000 hours. This may be as low as zero to a maximum of 500 hours.

7. **Requirements to pass the N6620, DNP Practicum I Course**
    a. **Required practicum hours minimum needed to be completed per degree plan.**
        i. A minimum of 100 to a maximum of 150 hours are to count toward the project implementation.
        ii. Non-project related activities hours must be completed in this practicum:
            1. **50% of hours determined to be non-project for the two practicums must be completed in this course**
    b. Examples of hours:
        i. 500 MSN Hours-N6620-250 hours (125 project & 125 non-project)-N6621-250 hours (125 project & 125 non-project)
        ii. 400 MSN Hours-N6620-300 hours (150 project & 150 non-project)-N6621-300 hours (150 project & 150 non-project)
        iii. 300 MSN Hours-N6620-350 hours (175 project & 175 non-project)-N6621-350 hours (175 project & 175 non-project)
        iv. 270 MSN Hours-N6620-365 hours (182.5 project & 182.5 non-project)-N6621 365 hours (182.5 project & 182.5 non-project)
        v. 180 MSN Hours-N6620-410 hours (205 project & 205 non-project)-N6621-410 hours (205 project & 205 non-project)
        vi. 60 MSN Hours-N6620-470 hours (235 project & 235 non-project)-N6621-470 hours (235 project & 235 non-project)
        vii. 0 MSN Hours-N662-500 hours (250 project & 250 non-project) N6621-500 (250 project & 250 non-project)

Please make sure you are checking your UTA Mav email account daily as well as announcements in the course. You are responsible for making sure you know and understand course requirements.
Again, congratulations , and we wish you the best of luck.
Your faculty,
Dr. Eades
Tammy Eades, DNP, MSN, RN
Clinical Assist Professor
MSN Administration Program Dir
DNP Practicum I & II Lead
Texas Nurses Association (TNA) President 2020-2022, Past-Pres 2022-2023
From: Plonien, Cynthia Gail <plonien@uta.edu>
Sent: Sunday, August 6, 2023 12:30 PM
To: Chinwuba, Florence Ifeyinwa <florence.chinwuba@mavs.uta.edu>
Cc: Trent, Tiffany R <tiffany.trent@uta.edu>; Eades, Tamara L <eades@uta.edu>
Subject: GNRC Letter of Approval for DNP Project

Florence,

Great job on your project. Attached is your formal letter of DNP Project approval. The GNRC has approved your project with Conditions to be met before the end of the course. The Conditions are outlined in the attached GNRC Rubric. Dr. Trent will be working with you. Great job. We are all looking forward to the implementation of your DNP Project.

Dr. Tammy Eades will send information to you soon regarding the next steps in transitioning to Practicum 1.

Sincerely,
Dr. Plonien
Cynthia Plonien DNP, RN, CENP
Clinical Associate Professor
Director, Doctorate Program of Nursing Practice
Chair, Graduate Nursing Review Committee
UTA Faculty Senator
College of Nursing and Health Innovation
University of Texas at Arlington

plonien@uta.edu

Appendix K

Recruitment Flyer

Participants Wanted for High Blood Pressure Project!

A project is being conducted to educate participants on the DASH diet and Physical Exercises to control High Blood Pressure. Interested people must be:
African American, Aged 18 years and older, Diagnosed with High Blood Pressure/Hypertension.

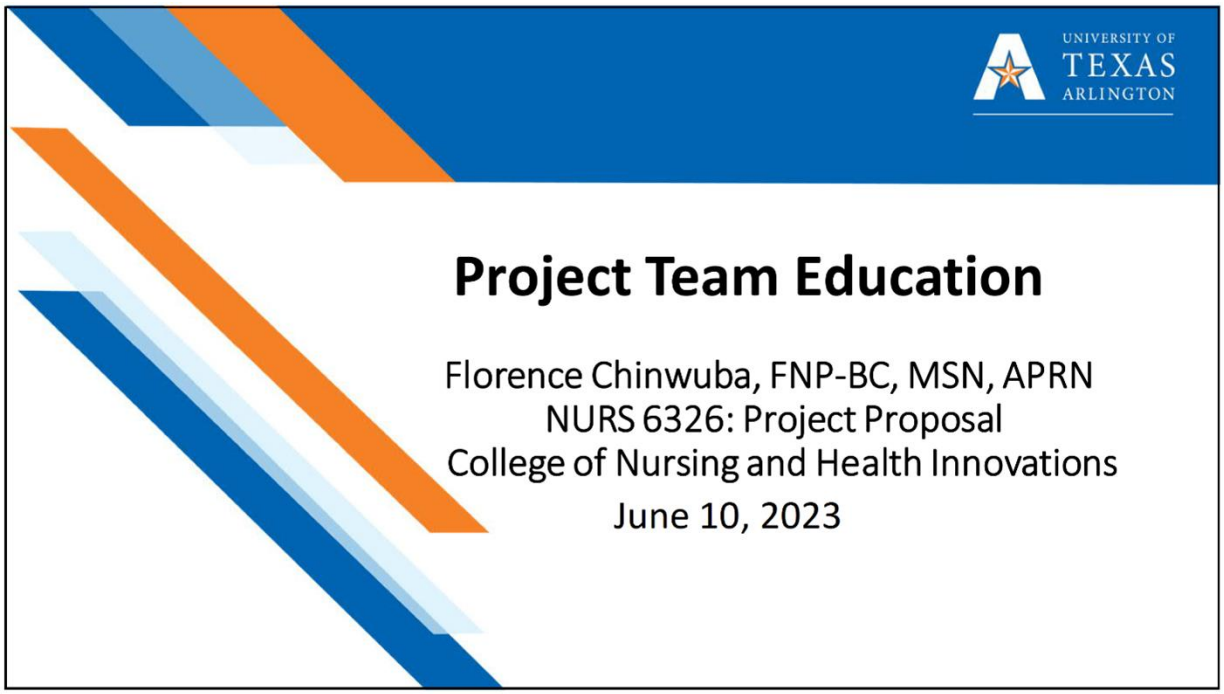
I am a student at the University of Texas at Arlington. I am conducting a project about the impact of the DASH diet and Physical Exercise to control Blood Pressure. I am seeking your help with the participation.

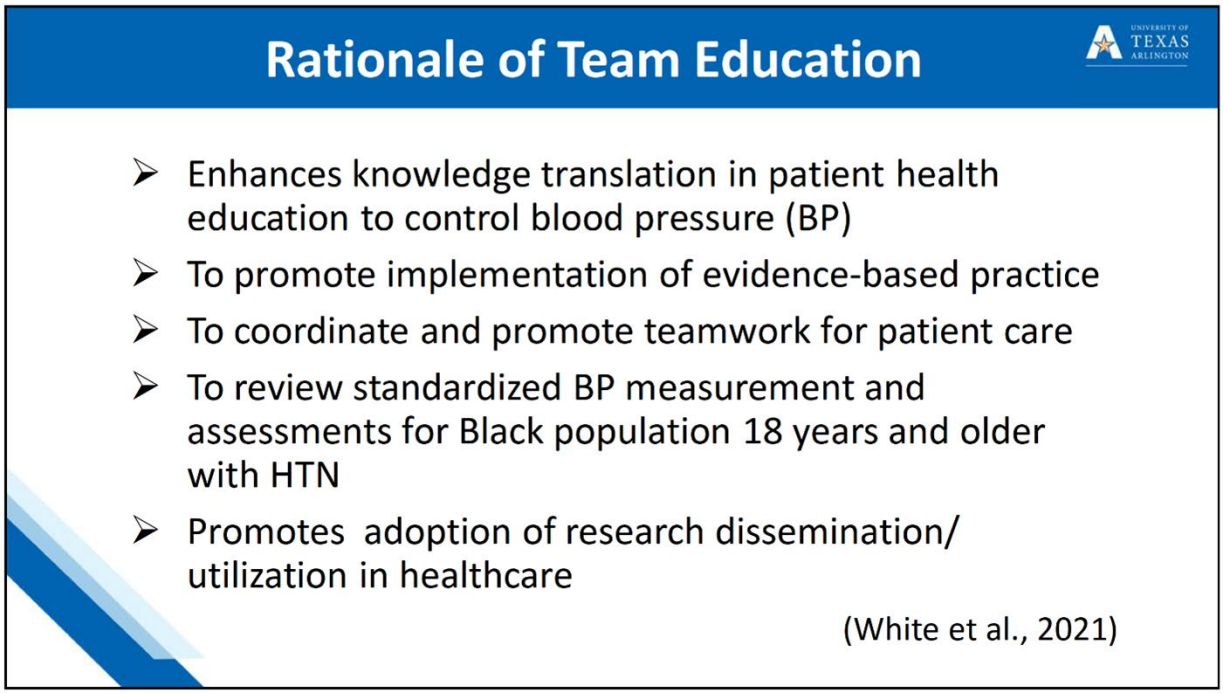
Participants will complete some questionnaires and BP measurements, receive teaching instructions on the DASH diet and physical exercises, and receive follow-ups.
Participation is voluntary, with no cost and no foreseeable risks.

For further information on participating, please contact:
Florence Chinwuba at florence.chinwuba@mavs.uta.edu **or (214)-675-9616**

Appendix L

Project Team Education





Introduction

- Quality improvement with education, DASH diet and physical exercise for Black population to control BP.
- Team educated on their roles to have a collaborative effort in the project.
- Help the project leader to teach patients on the project core values for BP control through distribution of flyers, posters and handouts.
- Duration of the project is eight weeks.

Target Population

Hypertension bundle for Black adult population, age 18 years and older with hypertension including:

- Both male and female participants,
- Established patients of the outpatient clinic primary care site,
- Participants with systolic blood pressure (SBP) 130 to 139 mmHg,
- Participants will have diastolic blood pressure (DBP) 80 to 89 mmHg.

Education Handouts

- Quality improvement initiatives to control BP for patients through education.
- Provide handouts on the evidence-based DASH diet information.
- Hand-outs on AHA/ACC recommended 150 minutes/week schedule for physical exercises.

Strategies in Communication

- Use motivating interviewing to encourage cooperative participation.
- Establish self monitoring and recording of food and exercise diaries.
- Schedule regular follow ups.
- Free walk-in BP checks are encouraged to promote compliance.
- Provide participants with information and location of fresh fruit and vegetable programs nearby.

Provision of Scripts

- Educate team on the use of DASH Questionnaire
- Educate team on the use of *Godin-Shephard Leisure Time Physical Exercise* Questionnaire.
- Teach on DASH food components
- Teach on types of moderate-intensity physical exercises
- Teach on types of vigorous intensity exercises.

Review of BP Measurement

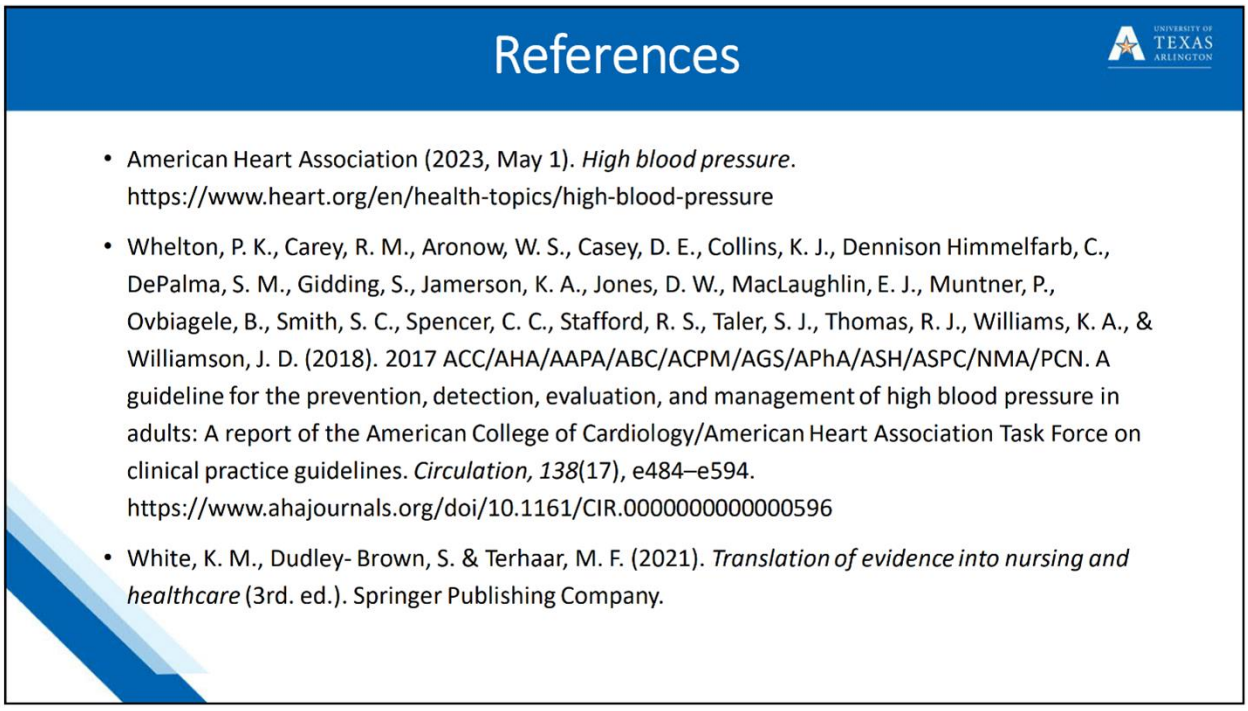
- All blood pressure readings obtained during a single examination visit.
- After a 5-minute rest in a seated position, brachial SBP and DBP measurements are taken 30 seconds apart.
- Two consecutive BP readings with at least 30 seconds intervals between measurements by the project leader

BLOOD PRESSURE PARAMETERS

- Normal blood pressure - 120/80 mmHg or lower.
- Elevated blood pressure - SBP 120 to 129 mmHg and DBP is below 80 mmHg.
- Stage 1 hypertension - SBP 130 to 139 mmHg or DBP between 80 to 89 mmHg.
- Stage 2 hypertension - SBP is 140 mmHg or **higher** or DBP is 90 mmHg or higher.
- BP higher than 180/120 mmHg is a hypertensive crisis. Seek emergency medical help for anyone with these blood pressure numbers (Whelton et al., 2018).

BP PARAMETERS POSTER

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120



Appendix M

Alphabetical Code for Participants De-Identification Dashboard and Demographics

A =5	B = 6
C = 7	D = 8
E = 9	F = 10
G =11	H = 12
I = 13	J = 14
K = 15	L = 16
M = 17	N = 18
O = 19	P = 20
Q = 21	R = 22
S = 23	T = 24
U = 25	V = 26
W = 27	X = 28
Y = 29	Z = 30

In alphabetical order, participants are coded. The coding style uses the initial of the first name - the initial of the last name - the project year 2023, and the participants' number - 1.

For example:

The first participant's first name initial was C, and the last name was initial C.
The de-identification code = 7-7-2023-1.

A second participant with a first name initialed D, and a last name initialed E.
The de-identification code is 8-9-2023-2.

A third participant with a first name initial E and a last name initial F.
The de-identification code = 9-10-2023-3

Demographic Information

Do you consent to the project? ☐ 1. Yes ☐ 2. No

What is your age? _____

What is your gender? Male: ____ Female: _____

What is your race? Black ____ Others____

Level of Education: High School or Less: __ College: ___

Have you been diagnosed with high Blood Pressure (Hypertension)? Yes: ☐ No: ☐

Do you know about DASH diet components? 1. Yes ☐ No ☐

Do you use the DASH diet meal plan to control your Blood Pressure? Yes: __ No: ____

Do you perform Physical Exercise such as Brisk walking 30 minutes a day for 5 times a week?

Yes: ☐ No ☐

Please can you fill out the forms for the DASH Questionnaire and Godin-Shepherd Leisure Time

Physical Exercise Questionnaire? Yes: ☐ No: ☐

Appendix N

Sample of DASH Eating Plan Servings of Food Per Day

- Whole grains: 6 – 8 servings
- Fruits: 4 - 5 servings a day
- Vegetables: 4 - 5 servings a day.
- Low-fat dairy foods: 2 - 3 servings
- Fats and oils: 2 - 3 servings
- Fish or poultry: 2 servings or fewer

Foods to Limit for the DASH Diet

The diet limits the following:

- Fatty meats, such as beef, pork, and lamb.
- Full-fat dairy products.
- Tropical oils, such as coconut and palm oils.
- Sweets and sugar-sweetened drinks.
- The DASH diet has 1500mg of sodium daily (about one teaspoon of salt), while a typical American meal contains 3400mg of sodium (NHLBI, 2023; Mayo Clinic, 2023).

Appendix O Sample DASH Diet Menu

Breakfast

- One cup of mixed fruit, such as melon and grapes.
- 1/2 whole-wheat bagel.
- One tablespoon of natural peanut butter.
- One cup skim milk.
- Coffee, tea, or water. (Mayo Clinic, 2023).

Lunch

- Romaine lettuce salad with:
  - Three cups fresh Romaine lettuce.
  - One sliced pear.
  - 1/2 cup canned mandarin oranges.
  - One tablespoon of red wine vinegar.
  - One tablespoon olive oil.
  - One ounce of cottage cheese.
  - Three ounces of cooked chicken.
- One small whole-wheat roll.

Sample Dash Menu Dinner

- Vegetarian pasta with:
  - 1/2 cup marinara sauce.
  - One cup of chopped summer squash.
  - 1/2 cup cooked chopped spinach.
  - 1 1/2 cups whole-wheat.
  - One cup of melon.
  - One cup of skim milk.

Snack (anytime)

- 1/4 cup trail mix not salted

(NHLBI,2023; Mayo Clinic, 2023).

DASH Eating Plan

The Benefits: Lowers blood pressure & LDL "bad" cholesterol.

Eat This	Limit This
Vegetables	Fatty meats
Fruits	
Whole grains	Full-fat dairy
Fat-free or low-fat dairy	
Fish	Sugar sweetened beverages
Poultry	
Beans	Sweets
Nuts & seeds	
Vegetable oils	Sodium intake

www.nhlbi.nih.gov/DASH

NIH National Heart, Lung, and Blood Institute

THE heart TRUTH

Appendix P

CDC Examples of Recommended Levels of Physical Activity for Adults 18 Years and Older

Moderate-intensity aerobic activity	**Duration**	**Examples**
Moderate-intensity aerobic exercises allow the participant to talk but not sing during the activity (CDC, 2022). The recommended physical exercise is moderate-intensity exercise for 30 minutes five days a week. Additionally, Perform muscle-strengthening activities that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) at least 2 or more days a week.	150 minutes every week of moderate-intensity activity is recommended.	Brisk walking at 3 miles/hour. Doing water aerobics Playing doubles tennis Pushing a lawn mower Gardening for 30-45 minutes Washing and waxing a car Washing windows or floors Wheeling self in a wheelchair Bicycling Ballroom dancing (social) Stair walking for 15 minutes
Vigorous-intensity aerobic activity	**Duration**	**Examples**
Vigorous-intensity physical exercises will not allow you to say a few words without pausing for breath. And Muscle-strengthening activities on 2 or more days work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).	75 minutes every week is recommended.	▪ Jogging or running ▪ Swimming laps ▪ Riding a bike fast or on hills ▪ Playing singles tennis ▪ Playing basketball (shooting baskets) for 30 minutes. ▪ Playing volleyball ▪ Playing touch football ▪ Aerobic dancing ▪ Jumping rope ▪ Bicycling 10 miles per hour or faster may include hills.

Note. Adapted from *Physical Activity* by Centers for Disease Control and Prevention, June 2, 2022 (https://www.cdc.gov/physicalactivity/basics/adults/index.htm). In the public domain.

Appendix Q

Pre-Test DASH Questionnaire Questions Dashboard

ID	Q1 In the past 7 days, how many days did you- Eat **nuts or peanut butter**?	Q2 How many days did you eat **beans, peas, or lentils**?	Q3 How many days did you eat **eggs**?	Q4 How many days did you eat **pickles, olives, or other vegetables in brine**?	Q5 How many days did you eat **five or more servings of fruits and vegetables**?	Q6 How many days did you eat **more than one serving of fruit** (fresh, frozen, canned, or fruit juice)	Q7 How many days did you eat more than **one serving of vegetables**?	Q8 How many days did you eat more than **one serving of vegetables?**	Q9 How many days did you eat **broccoli, collard greens, spinach, potatoes, squash, or sweet potatoes?**	Q10 How many days did you eat **apples, bananas, oranges, melons, or raisins**	Q11 How many days did you eat whole grain **bread, cereals, grits, oatmeal, or brown rice**	DASH-Q scores
7720231	0	1	2	3	2	2	2	1	3	3	3	22
8920232	0	1	4	3	3	2	3	2	3	2	2	25
91020233	1	2	3	3	2	2	3	2	2	2	2	24

Appendix R

Godin-Shephard Leisure-Time Physical Activity Questionnaire

During **a** typical **7-day period (**a week), how many times do you do the following types of exercise for **more than 15 minutes** during your free time? Write on each line the appropriate number.

Weekly leisure activity score = (9 x Strenuous) + (5 x Moderate) + (3 x light)

Intensity of Physical Exercises	**Times per week**	**Score**	**Totals**
a) STRENUOUS EXERCISE (Heart beats rapidly). Examples: Jogging or running, hockey, squash, cross-country skiing, judo, roller skating, vigorous swimming laps, riding a bike fast or on hills, skiing, playing singles tennis, basketball, volleyball, soccer ball, football, Aerobic dancing, jumping rope, long-distance bicycling 10 miles per hour or faster.		X 9	
b) MODERATE EXERCISE (Not Exhausting) (e.g., brisk walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, popular and folk dancing, stair walking, pushing a lawn mower, gardening, washing a car or floor).		X 5	

c) MILD/LIGHT EXERCISE (MINIMAL effort) (e.g., yoga, archery, fishing from the riverbank, bowling, horseshoes, golf, snowmobiling, easy walking).		X 3	
WEEKLY LEISURE-TIME ACTIVITY SCORE			

EXAMPLES

Strenuous = 3 times/week
Moderate = 6 times/week
Light = 14 times/week
Total leisure activity score = (9 x 3) + (5 x 6) + (3 x 14) = 27 + 30 + 42 = 99

Godlin Scale Score	**Interpretation**
24 units or more	Active
14- 23 units	Moderately Active
Less than 14 units	Insufficiently Active/ Sedentary

***Note*:** Adapted from Godin, G. (2011). The Godin- Shephard Leisure -time physical activity questionnaire. *Health Fitness Journal of Canada, 4*(1), 18-22.
The weekly frequencies of strenuous, moderate, and mild physical activities are multiplied by nine, five, and three. These numbers correspond respectively to Metabolic Equivalent (MET) values categories of the activities. The total weekly leisure activity score is computed in units by summing the products of the separate components.
Formula: Weekly leisure-time activity score = (9 x Strenuous) + (5 x Moderate) + (3 x Mild) = [SCORE]

Godin-Shepherd Leisure Time Physical Exercise Questionnaire

- Godin Gaston originally developed the *Godin-Shephard Leisure Time Physical Exercise Questionnaire* in 1986 but revised it later.

- God*in Shephard Leisure Time Physical Exercise Questionnaire* is a validated tool to assess leisure time physical activity (Godin & Shephard, 2011).

- The questionnaire asks for participants to answer if, during the 7-day, how many times they have physical exercise on the categories as follows:

  - Strenuous exercise (Heart beats rapidly).
  - Moderate exercise (Not exhausting)
  - Mild/Light exercise (Minimal effort)

Values of the Exercise Intensity

- Each frequency score of how many times one engages in physical exercise is multiplied by a corresponding Metabolic Equivalent of Task (MET) value, which includes:

- 3 is the value for mild intensity.

- 5 is the value for moderate intensity.
- 9 is the value for strenuous intensity.
- Then the value is summed together to obtain a leisure score index (LSI) expressed in units.

Analysis of Godin- Shepard Leisure Time Physical Exercise Questionnaire

- Godin scale score:
- 24 units or more are Active.
- 14 -23 units are Moderately Active.
- Less than 14 units are Insufficiently Active / Sedentary (Godin & Shephard, 2011).

Appendix S

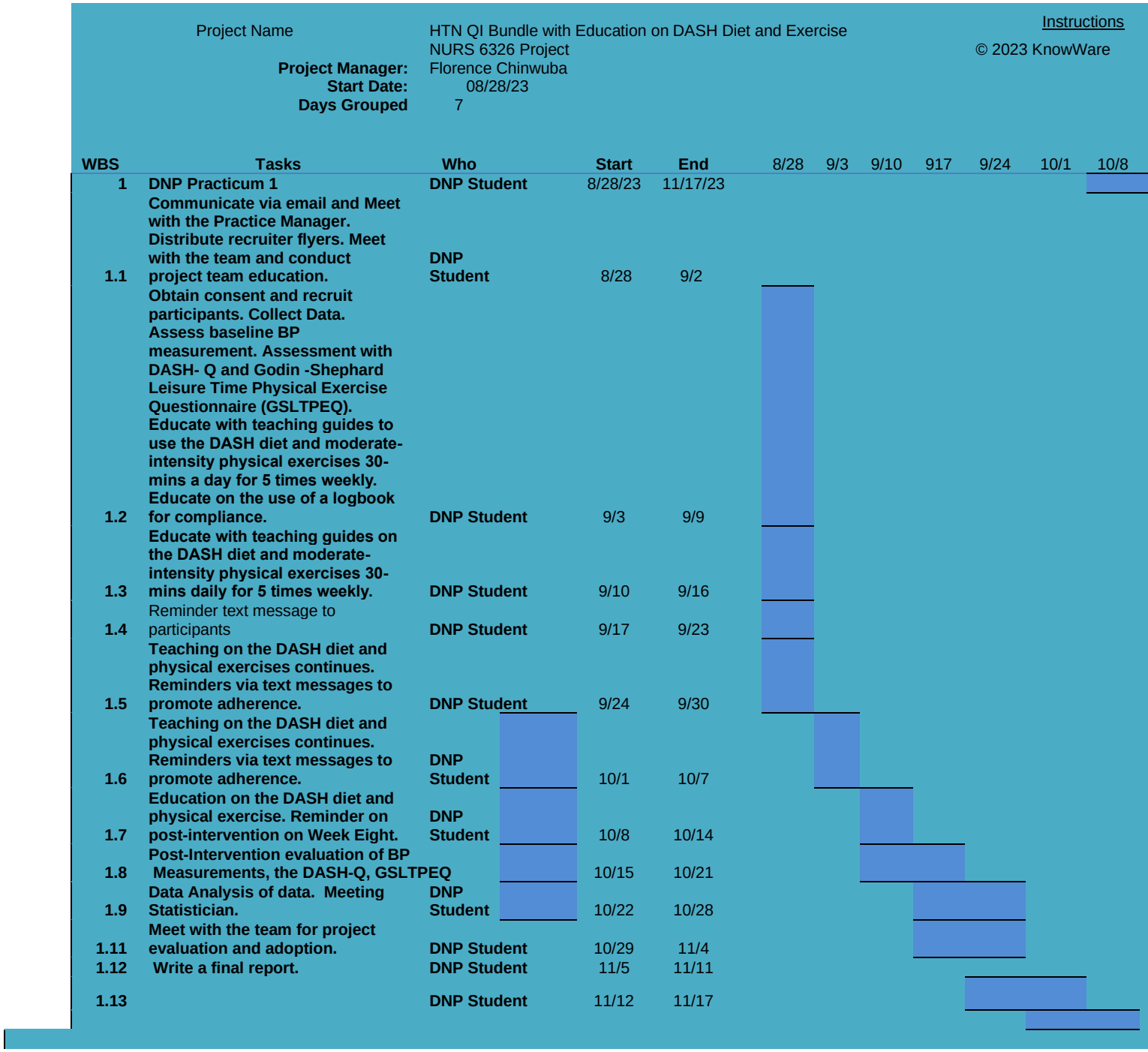
Pre-test Godin-Shephard Leisure Time Physical Exercise Questionnaire Dashboard

In 7 days, how many times do you do the following types of exercise for more than 15 minutes during your free time? Write on each line the appropriate number.
Weekly leisure activity score = (9 x Strenuous) + (5 x Moderate) + (3 x light).

ID	Q1	Q2	Q3	Total Scores
	Strenuous Exercises: Jogging, running, riding a bike, playing basketball, vigorous swimming	Moderate Exercises: Brisk walking, playing baseball, mowing lawn	Mild yoga, archery, fishing from the riverbank, bowling, easy walking, and golf.	
7720231	0	5	6	11
8920232	0	0	9	9
91020233	0	5	3	8

Appendix T

Gantt Chart



	Project Name	HTN QI Bundle with Education on DASH Diet and Exercise										Instructions
		NURS 6326 Project										© 2023 KnowWare
	Project Manager:	Florence Chinwuba										
	Start Date:	08/28/23										
	Days Grouped	7										
WBS	**Tasks**	**Who**	**Start**	**End**	8/28	9/3	9/10	917	9/24	10/1	10/8	
1	**DNP Practicum 1**	**DNP Student**	8/28/23	11/17/23								
1.1	**Communicate via email and Meet with the Practice Manager. Distribute recruiter flyers. Meet with the team and conduct project team education.**	**DNP Student**	8/28	9/2								
1.2	**Obtain consent and recruit participants. Collect Data. Assess baseline BP measurement. Assessment with DASH- Q and Godin -Shephard Leisure Time Physical Exercise Questionnaire (GSLTPEQ). Educate with teaching guides to use the DASH diet and moderate-intensity physical exercises 30-mins a day for 5 times weekly. Educate on the use of a logbook for compliance.**	**DNP Student**	9/3	9/9								
1.3	**Educate with teaching guides on the DASH diet and moderate-intensity physical exercises 30-mins daily for 5 times weekly.**	**DNP Student**	9/10	9/16								
1.4	Reminder text message to participants	**DNP Student**	9/17	9/23								
1.5	**Teaching on the DASH diet and physical exercises continues. Reminders via text messages to promote adherence.**	**DNP Student**	9/24	9/30								
1.6	**Teaching on the DASH diet and physical exercises continues. Reminders via text messages to promote adherence.**	**DNP Student**	10/1	10/7								
1.7	**Education on the DASH diet and physical exercise. Reminder on post-intervention on Week Eight.**	**DNP Student**	10/8	10/14								
1.8	**Post-Intervention evaluation of BP Measurements, the DASH-Q, GSLTPEQ**		10/15	10/21								
1.9	**Data Analysis of data. Meeting Statistician.**	**DNP Student**	10/22	10/28								
1.11	**Meet with the team for project evaluation and adoption.**	**DNP Student**	10/29	11/4								
1.12	**Write a final report.**	**DNP Student**	11/5	11/11								
1.13		**DNP Student**	11/12	11/17								

Appendix U

Log Sheet for DASH Diet Eating Plan and Physical Exercise

Date	Write the serving of foods you eat daily. You need 6-8 servings of whole grains, 4-5 servings of fruits, 4 -5 servings of vegetables, 2-3 servings of low-fat dairy, 2 servings of poultry and fish, beans, and nuts, and you eat each meal (DASH Diet Meal Plan)			Do Physical Exercise for 30 minutes 5 times a week (such as brisk walking)	Home BP Readings
	Breakfast	**Lunch**	**Dinner**		

Appendix V

Patient Education Information on Hypertension

Definition of Hypertension

- High blood pressure is also called Hypertension.
- High pressure occurs when the force of blood pushing against the artery walls as the heart pumps is too high.

Causes of Hypertension

- Genetic endowments
- Unhealthy diet of high sodium
- Lack of physical exercise
- High consumption of alcohol
- Tobacco use
- Other causes include kidney disease, Aortic coarctation, and primary aldosteronism.

Symptoms of Hypertension

HTN has no signs /symptoms until it has caused severe problems; it is called a "silent killer." (National Heart Lung and Blood Institute [NHLBI], 2022).

- Headache
- Dizziness or lightheadedness
- Blurred vision
- Shortness of breath-fast, shallow breathing
- Feeling fatigued

Systolic and Diastolic Blood Pressure

- Systolic blood pressure (SBP) is the top number of blood pressure readings.
- SBP is the pressure on the wall of the arteries, recorded as the heart contracts.
- Diastolic blood pressure (DBP) is the bottom number of the blood pressure reading.
- DBP is the pressure on the wall as the heart relaxes.

Blood Pressure Guidelines

- According to American Cardiology and American Heart Association 2017 guidelines, the Blood parameters are as follows:
- Normal blood pressure. Blood pressure is 120/79 mmHg or lower.
- Elevated blood pressure. The top BP number ranges from 120 to 129 mmHg, and the bottom BP number is below, not above, 80 mm Hg.
- Stage 1 hypertension. The top number ranges from 130 to 139 mmHg, and the bottom number ranges between 80 to 89 mm Hg.
- Stage 2 hypertension. The top number is 140 mmHg or higher, and the bottom number is 90 mmHg or higher.
- Blood pressure exceeding 180/120 mmHg is considered a hypertensive emergency or crisis. Seek emergency medical help for anyone with these blood pressure numbers (Whelton et al., 2018).

Management of Hypertension

- Dash diet: healthy eating of fruits, vegetables, whole grains, and low-fat dairy.
- Potassium intake (Bananas, nuts)
- Reduce salt intake to 1500 mg/day.

- Physical Exercise, such as brisk walking, should be up to 150 minutes of aerobic exercise per week (NHLBI, 2022).

Complications of Hypertension

- Coronary Artery Disease
- Heart attack
- Stroke
- Kidney disease and kidney failure
- Eye diseases.

(Centers for Disease Control and Prevention, 2021).

Appendix W

Human Subjects Training Certificate

UNIVERSITY OF TEXAS ARLINGTON

Human Subjects Protection Training (HSP): Training Completion Certificate

This document certifies that Florence Chinwuba completed the training entitled "Human Subjects Protection Training (HSP)" on June 19, 2023.

Training Start time: 06/19/2023 02:24 PM; Training End Time: 06/19/2023 04:07 PM

The Office of Regulatory Services	regulatoryservices@uta.edu	817-272-3723