

DASH Diet Education in the Onsite Wellness Clinics to Improve Dietary Compliance for  
Improvements in Hypertensive Outcomes

Sandra Smith

Paper submitted in partial fulfillment of the  
requirements for the degree of

Doctor of Nursing Practice

East Carolina University  
College of Nursing

4/30/2020

### Acknowledgments

I am grateful for the opportunity to complete this doctoral study, but it would not have been possible without the effort, support and encouragement of all the participants at the onsite workplace

I would also like to acknowledge the ECU faculty members that guided, supported and encouraged me to complete this Doctoral Degree

Lastly, but not least I would like to thank my family, and friends for their constant source of inspiration

Dedication

I would like to dedicate this paper to my faith in GOD for giving the strength, health, and guidance, through adversity and challenges, and empowering me to realize that success does not come without challenges.

I would also like to dedicate this paper in the memory of my father Thomas who always taught me never to give up

Lastly, I would like to dedicate this paper to John and Amber for your encouragement, support, and sacrifices throughout this journey

### Abstract

Hypertension is a leading risk factor for cardiovascular disease (AHA, 2015). Although hypertension is a modifiable risk factor, 54% of an estimated one million adults with hypertension have poorly controlled hypertension (CDC, 2017). Lifestyle modification, such as the Dietary Approach to Stop Hypertension (DASH) diet, have demonstrated reduced blood pressure (National Heart Lung Blood Institute, 2015). This project introduced the DASH diet plan to pre-hypertensive and hypertensive employees of a corporation that utilizes an onsite workplace clinic. The structured education was scheduled for 8-weeks of bi-weekly sessions. This project aimed to determine if a structured DASH education program along with DASH reference pamphlets would improve knowledge and awareness, change eating habits, and subsequently show a reduction in diastolic and systolic blood pressure. The results indicated that nine of the 27 participants had a reduction in diastolic and systolic blood pressure. Ninety-six percent responded that they understood the relationship between DASH nutrition and blood pressure. The post-education food frequency questionnaire showed 33% (11) responded had increased consumption of fruits, vegetables, and grains by two or more servings. The findings indicated that a structured DASH intervention could be successful in changing attitudes and knowledge about nutrition, and showed a positive impact on the reduction of blood pressure.

*Keywords:* DASH, diet, hypertension, education, blood pressure, nutrition, lifestyle modification, patient education, adherence, risk factors, prevention, heart disease, stroke, cardiovascular disease

## Table of Contents

Acknowledgments.....	2
Dedication.....	3
Abstract.....	4
Chapter One: Overview of the Problem of Interest.....	10
Background Information.....	10
Significance of Clinical Problem.....	12
Question Guiding Inquiry (PICO).....	14
Population.....	14
Intervention.....	14
Comparison.....	15
Outcome(s).....	15
Summary.....	15
Chapter Two: Review of the Literature Evidence.....	17
Literature Appraisal Methodology.....	17
Sampling strategies.....	17
Evaluation criteria.....	17
Literature Review Findings.....	18
DASH diet.....	19
Patient education.....	22
Limitations of Literature Review Process.....	24
Discussion.....	24
Conclusions of findings.....	24

Advantages and disadvantages of findings .....	25
Utilization of findings in practice change .....	25
Summary .....	26
Chapter Three: Theory and Concept Model for Evidence-based Practice .....	27
Concept Analysis .....	27
Theoretical Framework .....	28
Application to practice change.....	29
Evidence-Based Practice Change Theory .....	30
Application to practice change.....	31
Summary .....	32
Chapter Four: Pre-implementation Plan .....	33
Project Purpose .....	33
Project Management .....	33
Organizational readiness for change .....	33
Inter-professional collaboration .....	34
Risk management assessment .....	34
Organizational approval process .....	35
Information technology.....	36
Cost Analysis of Materials Needed for Project.....	36
Plans for Institutional Review Board Approval.....	37
Plan for Project Evaluation .....	37
Demographics .....	37
Outcome measurement.....	37

Evaluation tool .....	38
Data analysis .....	39
Data management.....	39
Summary .....	39
Chapter Five: Implementation Process .....	41
Setting .....	41
Participants.....	42
Recruitment.....	42
Implementation Process .....	43
Plan Variation .....	46
Summary .....	47
Chapter Six: Evaluation of the Practice Change Initiative .....	48
Participant Demographics.....	48
Figure 1 .....	49
Figure 2 .....	49
Intended Outcome(s).....	50
Findings.....	50
Table 1 .....	51
Table 2 .....	53
Table 3 .....	53
Table 4.....	54
Table 5.....	54

Summary .....	55
Chapter Seven: Implications for Nursing Practice.....	56
Practice Implications.....	56
Essential I: Scientific underpinnings for practice .....	56
Essential II: Organization and systems leadership for quality improvement and systems thinking .....	57
Essential III: Clinical scholarship and analytical methods for EBP .....	58
Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare.....	58
Essential V: Healthcare policy for advocacy in healthcare .....	58
Essential VI: Interprofessional collaboration for improving patient and population health outcomes.....	59
Essential VII: Clinical prevention and population health for improving the nation’s health .....	59
Essential VIII: Advanced nursing practice .....	60
Summary .....	60
Chapter Eight: Final Conclusions .....	61
Significance of Findings .....	61
Project Strengths and Weakness .....	63
Project Limitations.....	64
Project Benefits.....	64
Practice Recommendations.....	65
Final Summary.....	66
References.....	68



Appendix A: Literature Matrix .....	72
Appendix B: Letter Agreement.....	73
Appendix C: Letter Agreement.....	74
Appendix D: Survey Tool .....	75
Appendix E: DASH Consent .....	76
Appendix F: DASH Pamphlet .....	77
Appendix G: Pre-Education Questionnaire .....	78
Appendix H: Post- Education Questionnaire.....	79
Appendix I: Pre-Food Frequency Questionnaire .....	80
Appendix J: Post-Food Frequency Questionnaire.....	81
Appendix K: Outline DASH Session.....	82

## **Chapter One: Overview of the Problem of Interest**

Hypertension (HTN) is a leading risk factor for cardiovascular disease and a major cause of morbidity and mortality (American Heart Association [AHA], 2015). Although hypertension is a modifiable risk factor, 54% of an estimated one million adults with hypertension have poorly controlled hypertension (Center for Disease Control and Prevention [CDC], 2017). Primary care practitioners are uniquely positioned to counsel and give preventive services (Jarl, Tolentino, James, Clark, & Ryan, 2014). Lifestyle modification, such as the Dietary Approaches to Stop Hypertension (DASH) diet, have demonstrated reduced blood pressure (BP) (National Heart Lung Blood Institute [NHLBI], 2015). The evidence indicates interventions are needed to increase adherence to the DASH diet among hypertension patients (Jarl et al., 2014).

### **Background Information**

Hypertension prevention and management are major health challenges in the United States (CDC, 2017). According to the Eighth Joint National Committee [JNC-8], 2014) report on Prevention and Detection, Evaluation, and Treatment of High Blood Pressure), blood pressure is classified as pre-hypertension (120-139/ 80-89 mm Hg), Stage 1 hypertension (140-159/90-99), and Stage 2 hypertension (>160/ or > 100). Individuals with consistent systolic blood pressure (SBP)  $\geq$  140 mm Hg and consistent diastolic blood pressure (DBP)  $\geq$  90 mm Hg are hypertensive (EJNC, 2014).

Hypertension is the leading cause of mortality and morbidity due to its association with heart attacks and strokes (CDC, 2017). One way to reduce cardiovascular risk is to lower blood pressure (AHA, 2015). Reducing the SBP by 12-13 mm Hg could reduce stroke risk by 37%, coronary heart disease by 21%, and deaths secondary to Cardiovascular disease by 25% (CDC, 2017). Controlling hypertension is a national problem. Efforts to decrease blood pressure and

control hypertension must include lifestyle interventions (EJNC, 2014). The cost of insurance premiums and employee medical claims have never been higher, according to the CDC (2017); it costs \$47.5 billion annually to cover direct medical costs.

The Healthy People 2020 heart disease and stroke initiative aim to increase the proportion of hypertensive adults under control of their blood pressure to 61.2% by 2020. This would be a significant improvement from 43.7% of hypertensive adults with controlled BP in the years 2005 - 2008 (Healthy People, 2020). The Healthy People initiative attempts to coordinate health promotion and disease prevention to improve health outcomes (Healthy People, 2020).

Adopting the DASH diet, which is a blended diet of fruits, vegetables, nuts, whole grains, lean fish, poultry, and low-fat dairy foods, leads to decreased blood pressure (NHLBI, 2015). The diet requires reducing saturated fat, total fat, and cholesterol. According to Appel et al. (1997), the diet reduced BP in a random control trial. Participants who followed the DASH diet had their systolic blood pressure decreased an average of 7.7 mm Hg, and diastolic blood pressure decreased an average of 3.6 mm Hg (Blumenthal et al., 2010).

Kim & Andrade (2016) observed that hypertensive individuals' non-adherence to dietary recommendations is a major health care issue, and non-adherence rates are continuing to decline. Although the DASH diet reduces blood pressure, studies indicate multiple barriers prevent adherence to it (Viera, Kshirsagar, & Hinderliter, 2007). Motivating patients to modify their diets is a difficult aspect of managing hypertension (Samadian, Dalili & Jamal, 2016). Current educational provision on HTN and diet are limited due to time restraints and limited resources available in a typical office visit (Matyas et al., 2011).

The purpose of this project is to (1) provide knowledge about the DASH diet recommendations to pre-hypertension and hypertensive patients, (2) improve dietary patterns to

improve self-management of hypertension, and (3) to improve blood pressure outcomes from dietary modifications subsequently. The purpose will be accomplished by providing a structured DASH diet education program and distributing pamphlets to participants in the onsite health and wellness clinics.

### **Significance of Clinical Problem**

Hypertension remains a leading cause of preventable death, despite the availability of treatment. According to the CDC (2017), a small reduction in blood pressure impacts clinical outcomes and healthcare spending. A small reduction can also decrease the number of strokes and heart attacks (CDC, 2017). HTN costs have adverse health outcomes that have contributed to an economic, monetary cost in 2011 of \$48.6 billion (CDC, 2017).

Uncontrolled hypertension is associated with increased long-term risk of several serious conditions. Heart disease was the second leading cause of death, and strokes were the fourth leading cause of death, according to the CDC (2017). These two causes of death are cardiovascular complications secondary to HTN. One way to reduce cardiovascular complications is to improve patient adherence to hypertensive treatment. Hypertension control requires education and strategies to improve treatment adherence (Viera, Kshirsagar, & Hinderliter, 2007).

Health organizations urge healthcare providers to participate in programs that help patients control high blood pressure (CDC, 2017). Lifestyle change recommendations to treat hypertension include weight management, exercise, and diet (Matyas et al., 2011). Many patients do not adhere to the recommendations because of insufficient education. Educating patients about lifestyle modifications can have a significant impact on their beliefs about

hypertension (Matyas et al., 2011). Kwan et al. (2013) indicated that lack of education was a common reason that patients did not adhere to diet education.

Lifestyle modification with a significant emphasis on dietary behavior sets the focus of hypertension management based on guidelines from the CDC (2017). The EJNC (2014) has expanded the emphasis on lifestyle modification for hypertension prevention and treatment and has listed the DASH diet on the lifestyle medication of the hypertension algorithm. Neves' (2013) study indicated that dietary modification with patients has a beneficial effect on blood pressure regulation.

The DASH diet was studied in the original feeding trial to lower blood pressure, but compliance with diet must be persistent to maximize health benefits (Kwan et al., 2013). The feeding trial results demonstrated that it lowered systolic blood pressure by 5.5 mm Hg and diastolic blood pressure by 3.0 mm Hg. Blood pressure reduction happened within two weeks of DASH diet initiation. The authors concluded that the DASH diet resulted in BP reduction and BP related conditions (Appel, 1997).

Shirani, Salehi-Abargouei, Azadbakht, (2013) performed a meta-analysis of 17 studies on the DASH diet. Findings from these 17 studies compared the variables of SBP and DBP outcomes and selected them for advanced statistical analysis. Results of the meta-analysis indicated that DASH reduced SBP by 6.74 mm Hg and DBP by 3.54 mm Hg ( $p < 0.05$ .)

Several ways of providing patient education are available. One of the most cost-effective methods is face-to-face counseling, where providers can answer questions immediately (Magadza, Radloff, & Srinivas, 2009). According to Mahmoudian, Zamani, Tavakoli, Farajzadegan, and Fathollahi-Dehkordi (2017), educational intervention increases adherence to non-pharmacological hypertensive treatments, as evidenced by changes in weight, BMI, and

waist circumference. Structured health education programs for hypertension patients improved adherence to the recommended treatment, health conditions, and risk factors (Machado et al., 2016). According to Magadza et al. (2009), pamphlets are a cost-effective way to provide education. Magadza et al. (2009) evaluated the patient's understanding of HTN using motivational intervention questions. The patients received a questionnaire before and after education. The researchers found that motivational interviewing and questionnaires increased the patients' knowledge about HTN and medication importance. Magadza et al. (2009) findings suggested that patient education gave patients answers to their questions. Prompt answers to patient questions are likely to improve treatment adherence.

### **Questions Guiding the Inquiry (PICO)**

In reviewing pre-hypertensive and hypertensive patient's dietary patterns to improve hypertension, over 60% indicated they would be open to participating in a structured dietary program that could help improve their hypertension or prevent hypertension.

**Population.** Study participants will be employees of the consolidated corporation that participate in the health and wellness clinics. The employees will have a diagnosis of pre-hypertension or hypertension. They will be at least 21 years of age. The population will consist of males and females of multicultural and ethnic backgrounds who speak English.

**Intervention.** A four-session, bi-weekly interactive DASH education program will be presented to employees at two different onsite health and wellness clinics, lasting a total of eight weeks. The learning sessions will be presented utilizing PowerPoint presentations, hands-on interaction, and distribution of slide handouts, menus, and DASH diet pamphlets. Every bi-weekly session will cover a main component of the DASH diet recommendations. The participants attending the DASH diet education sessions will have the opportunity to learn about

the DASH diet and its relationship to controlling hypertension, the recommendation of sodium reduction in the DASH diet and, the specific components to follow a healthy eating plan based on DASH diet recommendations. The learning session will be interactive, motivational, and provide opportunities for questions and answers at the end of each session.

**Comparison.** This project will be compared to other studies that used DASH diet education to improve blood pressure outcomes. The overall benchmarks are to improve dietary knowledge to improve hypertension outcomes for participants of the onsite health and wellness clinics.

**Outcome.** This quality improvement project outcome is to determine if patients' increased knowledge, awareness, and adherence to the DASH diet after structured DASH diet education and determine if providing informational sessions could lead to the desired BP decreases.

### **Summary**

Hypertension is a major risk factor for developing CVD (CDC, 2017). Lifestyle modification can reduce blood pressure in HTN. One such lifestyle modification is an effective dietary recommendation to prevent and manage blood pressure (Kim & Andrade, 2016). The DASH diet was developed by the National Heart, Lung, and Blood Institute (NHLBI) to manage hypertension (NHLBI, 2015). The American Heart Association recommends the DASH diet for the treatment of hypertension (Kim & Andrade, 2016). According to Kim and Andrade (2016), DASH diet adherence reduces CVD risk among hypertensive patients.

Providing counseling and written education on the DASH diet could improve hypertensive outcomes in health and wellness clinics. The DASH diet lowers blood pressure and reduces the risk of cardiovascular complications. Considering the growing interest among

individuals to try nonpharmacological hypertension management, providers must engage in dietary education with patients.



## Chapter Two: Review of the Literature

Hypertension (HTN) remains a national health crisis. The effects of dietary components on blood pressure are important. Patients do not follow recommended dietary guidelines to manage hypertension, and health care providers do not provide the necessary nutritional education. Lifestyle interventions are recommended as a first step in managing HTN. This literature review focuses on HTN, DASH diet, and patient education.

### Literature Appraisal Methodology

The literature was searched to include non-pharmaceutical hypertension management through dietary intervention with an emphasis on the DASH diet. The Apple article was an original study from 1997. The other sources ranged from 2007 to 2018, which was an 11-year range that was needed to include original clinical trials and studies.

**Sampling strategies.** The search was conducted through electronic databases, Pub Med and CINHALL database, Laupus Health Science Library, and subject-specific websites. A total of 120 articles were screened, and 32 met the required criteria. Key terms included in the search were “blood pressure,” “hypertension,” “diet nutrition,” “education,” “patient education,” “DASH,” “barriers,” “adherence,” “lifestyle changes,” “nutritional counseling,” “risk factors,” “primary care,” “nurse practitioner education,” “cardiovascular disease,” “heart disease,” “stroke,” “prevention,” “lifestyle modification,” and “CVD.” The MeSH database was searched using (“American Heart Association” [MeSH] AND “hypertension”) OR (“HTN”) [MeSH] AND (“DASH diet” [MeSH] AND (“patient education” [MeSH])).

**Evaluation criteria.** Most articles supported the DASH diet with sodium reduction studies; however, most of these were excluded due to a stronger emphasis on sodium restriction. Most of the articles strongly supported adherence to the DASH diet with systematic reviews and

meta-analysis and expert opinions. Several of the articles were used to support utilizing educational materials for patients to improve adherence. Several other articles were reviewed regarding adherence and education but had a narrow focus on the concept of providing educational materials with DASH diet education.

The remaining articles reviewed utilized DASH with an emphasis on utilizing other interventions along with DASH diet education, such as exercising with walking or weight management and behavior changes. Although most of the articles had some major emphasis on the DASH diet, adherence, and education, only 22 were selected based on the relevance and content regarding the concepts of the DASH diet as well as improving blood pressure outcomes, education, and adherence in hypertensive patients.

The search inclusion was limited to adults over the age of 18 and articles written in the English language. Exclusion articles were non-adult trials, non-human trials, pregnant participants trials, and articles older than 2007, except DASH trial 1997. One hundred twenty articles were found with the original search.

Forty-four articles were screened for eligibility based on established inclusion criteria. Thirty-two of the articles were utilized for further review of the concepts to include DASH diet, adherence, blood pressure, and patient education. Twenty-six of the articles supported the DASH diet in lowering blood pressure with DASH alone or with other interventions. Seven of the articles supported patient education, improving the DASH diet recommendation. Fourteen articles strongly supported the DASH diet with lower blood pressures through the original randomized trials. Seven of the articles reviewed supported lifestyle management as a first intervention for hypertension. see attach literature matrix in Appendix A.

### **Literature Review Finding**

Most articles supported the DASH diet with sodium reduction studies, but many were excluded due to a stronger emphasis on sodium restriction. Most of the articles strongly supported adherence to the DASH diet with systematic reviews and meta-analysis and expert opinions. Several of the articles were used to support utilizing educational materials for patients to improve adherence. Several other articles were reviewed regarding adherence and education but had a narrow focus on the concept of providing educational material with DASH diet education.

The remaining articles reviewed utilized DASH with the emphasis of utilizing other interventions along with DASH diet education, such as exercising with walking or weight management and behavior changes. Although most of the articles had some major emphasis on the DASH diet, adherence, and education, only twenty-two were selected based on the relevance and content regarding the concepts of the DASH diet as well as improving blood pressure outcomes, education, and adherence in hypertensive patients.

**DASH diet.** The first DASH diet clinical study by Appel et al. (1997) was a multicenter 11-week feeding study that assessed the effects of dietary patterns on blood pressure. The participants in the study included 459 adults over the age of 22 with systolic blood pressures of less than 160 mm Hg and diastolic blood pressures of 80-95 mm Hg.

At the beginning of the study, all participants consumed a control diet low in fruits, vegetables, and dairy products for three weeks. For the next eight weeks, the participants received either the control diet, a diet rich in fruits and vegetables, or a combination diet that included fruits, vegetables, and low-fat dairy with decreased total fat. The blood pressure reduction began within two weeks of initiation of the diet and was maintained for six weeks.

The blood pressure realized with the combination diet was similar in magnitude to that observed in trials of drug monotherapy for mild hypertension.

The results of the DASH trial showed that a diet rich in fruits, vegetables, and low-fat dairy products, with reduced saturated and total fat, lowered systolic blood pressure by 5.5 mm Hg and DBP by 3.0 mm Hg more than the control diet. The DASH diet emphasizes foods rich in protein, fiber, potassium, magnesium, and calcium, such as fruits, vegetables, beans, nuts, whole grains, and low-fat dairy products. The study concluded that the DASH diet reduces blood pressure.

Another RTC by Blumenthal et al. (2010) compared the DASH diet to a control diet randomized into two groups. The first group was the DASH diet alone, and the other group was the DASH diet with weight management. The DASH alone group received only guidelines for their diet and were asked not to exercise. The DASH weight management group received a controlled menu plan with cognitive behavior weight loss intervention and supervised exercise program sessions. The controlled group consisted of the participants' usual diet. These participants were instructed to maintain normal diets for four months. The study spanned two weeks and included 144 participants over the age of 35 in a tertiary medical facility. Blood pressure measurement in the clinic was obtained using a manual cuff method. Measurement was obtained four times daily in each individual's home environment with an automatic blood pressure machine and twice at night. The mean BP was used.

Food frequency questions were used for nutritional assessment. The questionnaire recalled typical consumption in a four-week period and four-day food diary. This study found that the DASH diet both significantly lowered SBP ( $p < 0.001$ ) and DBP ( $p < 0.001$ ), compared to a control group. DASH with weight management also lowered SBP ( $p = 0.10$ ) and DBP ( $p =$

0.06). At the end of the study, six participants were clarified as hypertensive in the DASH with a weight management group and seven in the DASH alone group. This study concluded that DASH was more effective in lowering blood pressure with exercise, but that DASH alone was effective in lowering blood pressure as well.

Another study that evaluated the effects of the DASH diet was conducted by Azadbakht et al. (2005). It examined the effects of the DASH diet on patients with metabolic syndrome. This study was different because the patients used a weight management intervention with the DASH diet. This study enrolled 116 patients (34 men and 82 women) with metabolic syndrome. Three diets were prescribed for six months: a control diet, a weight-reducing diet, and the DASH diet with a sodium restriction to 2,400 mg daily. The participants were overweight or obese and had not participated in weight reduction during the past six months. The study spanned six months of interventional feedings, and the patients were followed monthly. The DASH diet resulted in higher HDL cholesterol (7 and 10 mm/dl), lower triglycerides (-18 and -14 mg/dl), lower systolic blood pressure (12 and -11 mm Hg), lower diastolic blood pressure (-6 and -7 mm Hg), and decreased weight (-16 and -15 kg) respectively ( $p < 0.001$ ). This study concluded the DASH diet could likely reduce metabolic risk in men and women with metabolic syndrome.

Seangpraw, Auttaman, Tonchoy, and Panta (2018) performed another study that evaluated the effects of the DASH diet. This study used behavior modification instead of weight management intervention. A quasi-experimental study was employed with two groups of elderly patients aged 60-80 in a rural community in Thailand. Ninety participants were in the intervention group, and 80 were in the controlled group.

The intervention group used behavior modification guidelines of the DASH program with self-efficacy for three months, including a 45-minute group education meeting, a 25-minute

group activity training session, and a 15-minute individual checklist. The controlled group received no intervention. The DASH diet, along with behavior modification, showed increased self-efficacy while SBP and DBP had decreased ( $p = 0.002$ ). The results showed that self-efficacy increased, as did awareness regarding the severity of complications of hypertension.

Ozemek, Laddu, Arena, and Lavie (2018) noted that appropriate prevention and management of hypertension was supported by adopting a diet rich in plant-based foods with whole grains, low-fat dairy products, and low sodium in accordance with the recommendations of the DASH diet. The Ozemek et al. (2018) review also found the DASH diet was more effective when paired with dietary counseling. In comparison, three studies found benefits from the DASH diet. In two studies, lifestyle modifications were added to the DASH diet intervention and found a greater reduction in the systolic and diastolic blood pressures. The original DASH study showed favorable effects on the reduction of BP but did not test diet adherence. All studies found the DASH diet to be effective in lowering blood pressure in participants. This was consistent with a meta-analysis conducted by Ndanuko, Tapsell, Charlton, Neale, and Batterham (2016), who compared several studies of dietary patterns in lowering blood pressure and concluded that the DASH diet lowers blood pressure.

**Patient education.** There are several methods of offering patient education. One of the most cost-effective means is face-to-face counseling. This technique lets providers answer questions without delay in communication. According to Magadza et al. (2009), a pamphlet is a cost-effective way to provide education in summary. Magadza et al. (2009) evaluated the patient's understanding of HTN using motivational intervention questions. In their study, 45 patients were interviewed and completed a questionnaire. This study showed that educational intervention could positively impact patient adherence. The participants received a questionnaire

pre- and post-education. The questionnaire was composed of four parts: the concept of HTN, antihypertensive medication, adherence to medication, and diet and lifestyle recommendations. In their case-controlled study, they found motivational interviewing and questionnaires increased participant knowledge about HTN and the importance of medication. These findings suggest that patient education provides patients with the opportunity to have questions answered, thus improving adherence to education.

Delichatsios and Weity (2005) performed a study on providing participants with resources to improve dietary habits. The resource was a dietary patient education booklet that focused on fruits and vegetables, red meat, and dairy foods. Booklets were mailed to patients' homes. The patient then had two motivational counseling sessions by telephone at two-week and four-month intervals. Following the two months, the intervention group increased their serving of fruits and vegetables by an average of 1.1 servings per day, compared to 0.3 serving per day for the control group. The finding showed no changes in the amount of red and processed meats. The intervention group increased fiber by 1 gram per day. The study concluded that 71% of the participants discussed the educational booklets with their primary care providers. This study addressed a lack of time in the primary care setting and alternative means of educating by mailing booklets and having telephonic follow up (Delichatsios & Weity, 2005).

Wong et al. (2015) performed a study on 556 Chinese patients who were newly diagnosed with hypertension. The participants received DASH-based dietary counseling tailored to a Chinese diet and were given 25-minute dietary counseling and DASH diet pamphlets. The outcome data were evaluated after six months and showed lower blood pressure. Wong et al. (2015) concluded that a self-monitoring tool that reinforces the implementation of dietary counseling would be more effective.

### **Limitation of Literature Review Process**

Even though the DASH diet's benefits of reducing BP have been supported by evidence, limitations exist. One of the studies did not test adherence in their feeding trials. Some of the trials placed the participants on controlled diets, and they had little choice in food selection. Another study on adherence included a primarily older Thai population, which limited results from other groups. Other trials were brief, ranging from a three- to eight-month span. Additionally, most of the literature lacked specific suggestions for serving. Nor was there a time frame indicated for the anticipation of behavior changes in increasing adherence.

### **Discussion**

**Conclusion of findings.** The review of the literature supports the DASH diet's claim to improve blood pressure outcomes. The literature review included randomized trials, cross-sectional studies, and quasi-experimental studies that provided evidence to support the addition of the DASH diet to improve blood pressure outcomes. The randomized trials of Appel et al. (2005) and Blumenthal et al. (2010) both examined the effects of the DASH diet on blood pressure. The results confirmed the benefits of the DASH diet in lowering blood pressure and decreasing the cardiovascular risks of hypertension. Seangpraw et al. (2018), Azadbakht et al. (2005), and Blumenthal et al. (2010) evaluated the effects of the DASH diet with intervention and showed better blood pressure outcomes for both systolic and diastolic blood pressure.

The consensus of the literature also supports the benefits of promoting the DASH diet education. Delichatsios and Weity (2016) suggested mailing booklets and conducting telephone follow up as two ways to increase education in the primary care setting. Wong et al. (2015) suggested developing a self-monitoring tool to reinforce the implementation of dietary counseling.



The consensus of the literature shows that providing DASH diet education, along with written material, is more beneficial. As evidenced by many of the studies mentioned, educating patients to change their dietary habits can lead to systolic blood pressure reduction. All the studies revealed that educational intervention led to an increase in the participant's level of involvement as well as increased their knowledge about the DASH diet and HTN.

**Advantages and disadvantages of findings.** The DASH diet has been shown to reduce both systolic and diastolic blood pressure in hypertensive and pre-hypertensive patients across subgroups, genders, races, and ethnicities. Further studies have found that adherence to the DASH diet improve changes in cholesterol and reduce the risk of coronary heart disease and stroke. The DASH diet has shown eating whole foods, rather than processed foods, lowers blood pressure due to their lower sodium content. The DASH diet is beneficial, is well tolerated in these studies, and has yielded results with positive health outcomes in reducing blood pressure, with or without other interventions. The literature review of the DASH diet, however, has shown that the DASH diet is not well followed and that there is low adherence to the DASH diet. Increasing adherence to the DASH diet and improving education and implementation of the diet poses a challenge.

**Utilization of findings in practice.** Promoting a DASH diet education is vital for the clinician to encourage and motivate patients to make lifestyle changes in dietary choices and to develop ways to improve adherence and education on the DASH diet. One can tailor these implementation strategies to improve adherence by translating some of the clinical findings into practice. One way to do this is by providing more DASH diet educational material to patients. Another suggestion is to provide more DASH diet education on initial clinic visits. A further solution is to offer DASH diet educational counseling, along with DASH diet material, to

improve knowledge and awareness of the DASH diet. These DASH diet pamphlets can be reproduced and utilized in other health and wellness clinics.

Providing patient education in a health and wellness setting through face-to-face counseling is a cost-effective means. This technique allows providers to answer questions without delay in communication and to follow the discussion with a pamphlet. Providing a pamphlet while imparting educational information lifestyle changes increases the retention of information (Magadza et al., 2009).

Many healthcare providers are not educating patients on the recommended dietary guidelines for HTN (Sessoms, Reid, Williams, & Hinton, 2015). Therefore, the clinician needs to encourage patients to make lifestyle changes in dietary choices and to develop a DASH diet education session, along with pamphlets that will increase DASH diet knowledge and awareness for both patients and providers. Implementing this project will be beneficial to patients at the onsite health and wellness clinic setting, and it will increase their knowledge and awareness about DASH and will subsequently improve hypertension outcomes.

### **Summary**

Multiple studies have shown that the DASH diet lowers blood pressure. The challenge has been getting practitioners to incorporate this nutritional education. Many healthcare providers do not educate their patients on the recommended dietary guidelines for HTN (Sessoms et al., 2015) because of time restrictions during patient visits. Implementing this project will provide nutritional counseling and educational materials to patients at the onsite clinic setting. It will also increase their knowledge and awareness about DASH and subsequently improve hypertension outcomes.

### **Chapter Three: Theory and Concept Model for Evidence-based Practice**

The concepts related to this quality improvement project include the DASH diet, hypertension, blood pressure, cardiovascular disease, and nutritional counseling. These concepts are reviewed further in this section. The theoretical framework utilized to guide this quality improvement project is examined, as well as how it is applied to the DASH diet education change. Finally, the Plan Do Study Act (PDSA) model is explained, along with how it is utilized in this project proposal.

#### **Concept Analysis**

**DASH diet.** The DASH diet is a set of recommendations endorsed by the American Heart Association (AHA, 2015). DASH diet recommends an increase in vegetables, fruits, whole grains, poultry or fish, nuts and legumes, and low sodium consumption. It is recommended for individuals who have been diagnosed with HTN (NHLBI, 2015). The DASH diet promotes eating fresh and healthy foods, along with minimizing foods high in sodium, fats, and cholesterol. The DASH eating plan consists of 6-8 serving per day of whole grains, 4-5 servings per day of vegetables, 4-5 serving per day of fruits, 2-3 servings per day of fat-free or low-fat milk, six serving or less per day of lean meats, poultry, and fish, 3-5 servings per week of nuts, seeds, legumes, 2-3 servings per day of fats and oils, and less than five servings per week of sweets (NHLBI, 2015). For this project, the standard DASH diet listed above will be utilized.

**Blood pressure (BP).** Defined as the force of blood against the artery walls, BP is measured in millimeters of mercury (mm Hg) and recorded as two numbers. The top number is the systolic pressure where the heart forces blood out, and the bottom number is the diastolic pressure where the heart chambers fill (NHLBI, 2015).

**Hypertension.** Hypertension is a condition where averaged over time, systolic blood pressure is higher than 130 mm Hg, and diastolic blood pressure is above 80 mm Hg (EJNC, 2014). The blood pressure has been reviewed through the electronic medical record system (EMR) system.

**Nutritional counseling.** Nutritional counseling is the therapeutic educational session that helps an individual improve dietary habits by identifying areas where changes are needed in eating patterns or behavior. For this study, nutritional counseling was done face-to-face, and patients were given an educational pamphlet describing the DASH diet and HTN.

**Cardiovascular disease (CVD).** Cardiovascular disease is any abnormal condition characterized by dysfunction of the heart and blood vessels. Cardiovascular disease includes hypertension (high blood pressure), coronary heart disease—which can lead to heart attacks—and atherosclerosis, which can lead to strokes (AHA, 2015).

### **Theoretical Framework**

**Naming the theory.** The Health Belief Model (HBM) is a theory of health behavior and the one most widely used and recognized today (Butts & Rich, 2015). A group of social psychologists who were employed by the U.S. Public Health Services developed the model in the 1950s, and they were searching for ways to explain why people would not participate in health prevention or promotion programs (Butts & Rich, 2015). Therefore, these social psychologists began to explore what barriers prevented people from participating in preventive programs (Butts & Rich, 2015). Consequently, this led to the development of the HBM. This theory examines people's beliefs regarding their susceptibility to disease, how it affects their perception of the benefits of trying to avoid the disease, and how it may influence their readiness to act (Butts & Rich, 2015).

Behavior change theories have shown HBM can be useful in health behavior, including dietary behaviors. The theorist attempts to identify the determinant that contributes to the adoption of a specific behavior, such as a method for providing dietary advice (Butts & Rich, 2015). The HBM was one of the first models to apply theory from the behavioral sciences to health problems. The model was based on the assumption that people fear disease, that health actions are motivated in relation to the degree of fear (perceived threat), and that there is a net benefit (Butts & Rich, 2015).

The HBM was designed to examine the effect of a set of health belief patterns on a person's behavior and can be used to guide health promotion and disease prevention programs. It is used to predict and explain individual changes in health behaviors. The model examines the individual perceptions and belief patterns which include (1) perceived severity (beliefs about how serious the condition is and the related consequences); (2) perceived susceptibility or threat to a disease or condition, along with the severity or seriousness of the disease or condition; 3) cues to action, individual perception of the threat, and subjective benefits of engaging in a recommended action; 4) perceived benefit (effectiveness and validity of taking a particular course of action); and 5) perceived barriers, consequences or negative aspects related to following the course of action, or perceived barriers to engaging in the recommended action (Butts & Rich, 2015).

**Application to practice change.** The HBM attempts to explain and predict health behaviors by focusing on the attitudes of individuals. The HBM will be the theoretical foundation for the DASH diet education sessions. The HBM model will guide the planning and implementation of the quality improvement project. The model integrates interventions that are aimed at changing health behaviors to improve disease process. If people believe they are more

susceptible to hypertension due to dietary habits, they may consider steps or actions to modify their risk factors and make lifestyle choices. The HBM can guide participants through a process that will assist them in realizing their susceptibility to a health condition, acknowledging the severity of the disease, and accepting the benefits, barriers, and cues to action. The modified version of HBM for DASH education is examined below.

***Degree of perceived risk of a disease.*** This variable includes perceived susceptibility of contracting a health condition associated with an unhealthy diet and the perceived severity once the disease is contracted.

***Perceived benefits of diet adherence.*** A second benefit is the believed effectiveness of dietary strategies designed to help reduce the threat of disease.

***Perceived barriers to diet adherence.*** This variable includes potential negative consequences that may result from changing dietary patterns, including physical (weight gain or loss) psychological (lack of spontaneity in food selection), and financial demands (cost of foods).

***Cues to action.*** Events, such as educational training sessions and pamphlets that motivate people to change their dietary habits are crucial determinants of change.

***Self-efficacy.*** A person's belief that they can successfully execute the dietary behavior required to produce the desired outcomes, as well as accepting and applying the DASH diet as a daily routine.

The motivation for change depends on a sufficient degree of perceived risk combined with enough self-efficacy relative to achieving a dietary change. Perceived risk without self-efficacy can lead to defensive cognitive coping, such as denial and rationalization rather than behavior change (Jones, Smith, & Llewellyn, 2013).

### **Evidence-Based Practice Change Theory**

**Naming the change model.** Many models offer frameworks for change. The Plan Do Study Act (PDSA) cycle was adapted from the works of Shewart, Crowfood, and Prasad, (2017). The four-stage cycle focuses on the continual improvement of a product or process. The “Plan” stage is an initiative aimed at an identified improvement. The “Do” stage witnesses this change implemented. The “Study” stage examines the success of the change and checks the results. The “Act” stage identifies the adoption of the steps, as well as any other needed steps to make further improvements, adjustments, or restarts of the cycle (Shewart, Crowfood & Prasad, 2017).

**Application to practice change.** PDSA provides an ongoing approach to a quality-improvement process that will be utilized in this project. The project “Plan” will add DASH diet education to a medical treatment plan for selected hypertensive patients and develop educational pamphlets with information on DASH diet and methods to reduce hypertension. The “Do” will teach the patient about the DASH diet and reinforce the education with pamphlets on hypertension. Patients will be asked DASH diet post-education questions. The intervention will include reviewing the components of the DASH diet, distributing the pamphlets on the DASH diet, and manually measuring systolic and diastolic blood pressure pre- and post-diet intervention. The blood pressures will be recorded in the EMR records of the participating patients. The “Study” will compare the information collected and identify whether DASH education increases a patient’s knowledge of the DASH diet. It will also determine if there was a decrease in systolic and diastolic blood pressure by 2 mm Hg - 6 mm Hg in six weeks. It will examine what percentage of patients followed the DASH diet. The “Act” will determine if further implementation of this educational strategy should be used for HTN patients in other health and wellness clinics, and if further improvements or adjustments are needed, and if the cycle needs restarting.

**Summary**

Identifying and defining key concepts are important aspects of the quality improvement project. The HBM was used as the theory to ground this QI project. Using the HBM may help predict and explain the behavior for the expected dietary changes. The PDSA process model is ideal for this project because it identifies specific steps in the implementation process.



### **Chapter Four: Pre-Implementation Plan**

This chapter of this quality improvement project will discuss the methodology or design as to exactly how the project study was carried out. It will include: 1) project purpose; 2) project management, that will cover organizational readiness for change, interprofessional collaboration, and organization approval process; 3) informational technology that will be used to implement the project; 4) plans for Institutional Review Board approval and process obtained; 5) plan for project evaluation that will include demographic information collected; 6) defining and discussing the outcome measurements; and 7) a discussion of the evaluation tool used to evaluate outcomes.

#### **Project Purpose**

The purpose of this quality improvement project was to evaluate the effectiveness of DASH diet education into the nutritional plans of hypertensive patients of the onsite wellness clinic. The project will focus on increasing patient awareness and knowledge of the DASH diet, and its relationship with improvements in blood pressure. This project was to determine if this education was effective to implement a change in diet education in the wellness clinics subsequently, if it will affect self-efficacy in hypertensive patients for change about food habits that can affect blood pressure management.

#### **Project Management**

**Organizational readiness for change.** The DNP student introduced the project idea to the director of clinical education, director of human resources, clinic manager, and client manager. All have expressed interest in the intervention to improve blood pressure outcomes with hypertension patients and readiness for change. The leadership is visibly committed to the change due to the quick response of the first initiation of diet education. The on-site clinic

provided the DNP student with the tools to deliver training and education. The cooperation has provided support for change through approval for the opportunity to utilize the clinic and patients for the project idea.

**Interprofessional collaboration.** The team for this project is a collaboration between the DNP project student team leader and the other DNP team members. The DNP student is the project team leader. The DNP project team leader will facilitate the DNP project and implementation. The other members of the project team are the: DNP faculty chair member to help guide the DNP student in the development and implementation of the project and to provide support and approval of the project and the DNP champion who is a nurse practitioner and the director of clinical education. The DNP champion will assist with a process flow for approval from the clients at the operations level and be a liaison between the clinic manager, client manager, and risk management.

**Risk management.** The “strength” of the DASH diet is that randomized control trials have shown DASH eating plans to have compelling results in hypertensive patients. The DASH diet was designed to reduce high blood pressure and has potential benefits for reducing cardiovascular disease, weight loss, and cancer risk. The DASH has been supported through evidence-based practice and is a practitioner guided in some clinics. The DASH education project is cost-effective for education and materials.

The “weakness” for the DASH education project will be a lack of patient understanding of the educational information provided. The lack of adherence to dietary advice and the refusal to participate in the DASH education project could affect the outcome. Developing the questionnaire tool that adequately addresses the appropriate questions could also be an issue.

The “opportunities” for the DASH diet will increase awareness and knowledge of the DASH diet. Studies have shown it improves blood pressure outcomes and it will improve the eating habits of hypertensive patients. Pamphlets will serve as a resource material for reference. Implementing a DASH diet project can reduce overall health care costs.

The “threats” for the DASH project will be not getting IRB approval. The population could not be interested in participating. The material to be utilized could not be approved. There could be a lack of support for the project. There could be a change in the administration that denied approval for the project.

**Organizational approval process.** The organization's approval process started with the initial idea of improving blood pressure outcomes. The consolidated company houses the onsite clinic and contracts out to a health care provider company that staff the provider in this onsite clinic. The DNP student is the provider in this consolidated company onsite clinic. Both organizations are key stakeholders in the decision-making process for the implementation of this project.

Initially, a telephone conversation took place with the key stakeholder of the consolidated company who is also the director of human resources. The conversation was regarding the intent to provide DASH education for hypertension patients. The second telephone conversation took place with the director of clinical education of the health care provider company regarding an intent for the DASH project as well.

The consolidated company requests an email to be sent outlining the intent, goal, and summary of the project. The next business day, initial approval was given to proceed with the project idea. Please refer to Appendix B to view a copy of the Letter of Agreement. The director of clinical education of the health care provider company received an e-mailed copy of the letter

of agreement (from the consolidated company) to submit to the director of risk management for the health provider company. There was some email question back and forth for more specific details of the project before submission of the approval letter. It took about a week to receive the letter of approval for the project. Please refer to Appendix C to view a copy of the 2<sup>nd</sup> Letter of Agreement.

**Information technology.** The health provider company's electronic medical record system (EMR) was used to generate clinic activity reports to identify hypertension patients. The EMR data generates these reports, and they are sent out monthly to staff providers. The DNP student will utilize the electronic patient portal to send out messages regarding the DASH diet education program. The nutritional tracking will be done utilizing food Apps on the participants cellular device. Participants are asked to download the food app to best track nutritional intake. An Excel spreadsheet is utilized to store patient information and data. The manual aneroid sphygmomanometer will be used to measure blood pressures.

#### **Cost analysis of materials needed for project**

The project does not require a full financial budget. The resources for revenue for this project will come from the DNP candidate as well as some of the cost already built into the clinical site where the implementation of the project will take place. The DNP candidate will provide the revenue for the pamphlet development, posters, and printer ink. The other equipment such as sphygmomanometer, fax machine, and conference room are already available at the clinic. The participant's visits are nonbillable since this is a service that is already provided by the consolidated cooperation. The DNP candidate time will be factored in as education to the patients at no additional cost.

Cost of paper for pamphlets \$10.00

Cost of printing for pamphlets \$100.00 for 30 pamphlets

Cost of printer ink for printing additional information \$25.00

### **Plan for Institutional Review Board approval (IRB)**

This project did not require review by the IRB of Eastern Carolina University Research review committee. The project was a quality improvement project that evaluated the effects of dietary education to improving blood pressure outcomes for the hypertension patients in the onsite workplace. There were minimal significant risks associated with this project intervention. The participants were informed about the project and its associated benefits and risk. Patients were asked to participate in the project. The data collected did not result in information that could specifically identify participants. A coding system was used to identify participants and not include their personal information. The quality improvement form was submitted to determine that IRB approval was not required. IRB approval was not required from health clinic or corporation.

### **Plan for Project Evaluation**

**Demographics.** The study participants recruited will be adult patients that use the onsite wellness clinic with a diagnosis of pre-hypertension or hypertension identified through the electronic medical records quality improvement reports. The project is limited to English-speaking adult patients with a diagnosis of hypertension. The participant's age, race, and ethnic background will be collected. The participants will be asked to provide gender and educational background. This information will be collected using an intake survey tool. The results will be displayed using graphs, bar charts, pie charts, and a table format

**Outcome measurement.** 1) To determine if the nutritional educational intervention had a significant effect on knowledge, understanding, and retention of the DASH diet. 2) To determine

if the intervention increase patient educational knowledge of DASH. 3) To determine the likelihood that patients will follow DASH recommendation. 4) To determine if the patient will be able to adopt recommendations. 5) To evaluate the effectiveness of an education program in changing patient behavior 6) To determine if a decrease in systolic and diastolic blood pressure could be achieved post education. Evidence has shown that lifestyle change and teaching on the topic can improve a patient's hypertensive state. These outcome measures are to promote healthy eating following the DASH diet education to improve blood pressure from patients that follow the diet plan. Blood pressure will be taken pre-DASH diet initiation and post-DASH diet initiation. Studies have shown that following the DASH diet has lowered blood pressure systolic and diastolic in people with hypertension. According to NHLBI (2017), there could be an 8-14 mm Hg reduction in blood pressure. Lifestyle modification has been useful in the control of hypertension through a healthy diet (AHA, 2015).

***Evaluation tool.*** The evaluation tools used in this quality improvement project are pre- and post-questionnaires. The pre-intervention questionnaires are to assess their knowledge and belief of the DASH diet pre-intervention. The post-intervention questionnaires are to evaluate the effectiveness of education by re-evaluating knowledge and belief after DASH education. The post-intervention questionnaires are to be administered at the end of the 8-week session. The post-intervention evaluates the effectiveness of the DASH diet session.

Blood pressure measurement is taken pre-and post-educational intervention. Blood pressure will be measured pre-intervention and post-intervention to allow adequate time for adjustment. The blood pressure is taken using a mercury manual sphygmomanometer. A blood pressure reading by auscultation is considered the gold standard according to (NHLBI, 2017). Blood pressure will be measured in the left and right arms in the sitting position. The blood

pressure will be measured to evaluate if the significant reduction in blood pressure is obtained in the patients that followed the DASH. Blood pressure will be recorded on paper, then entered on an Excel flow sheet in the computer system.

**Data analysis.** Collected data is presented in tables and pie and chart graphs and analyzed by the computer software statistical package (SPSS version 16) using appropriate statistical methods. Frequency means and standard deviation will be used to summarize the data. Categorical data will be analyzed by using chi-square test. Descriptive frequency and statistics will be used to compute Demographics.

**Data management.** The DNP student will oversee storing and securing the intake data. The DNP student will place both the pre-questionnaire and post questionnaire in a vanilla folder and place them in the locked filed cabinet with a secured, locked door. The intake surveys and questionnaire will be coded with numbers and each participant will be given a separate number. The questionnaire will be stored in this secured place until the data can be entered into the Excel spreadsheet and the SPSS program. The pre/post questionnaires will then be shredded in the private office shredder and sent out for bulk disposal. The SPSS and excel information will be stored on the department private drive if approval is obtained. The ECU technology department will be contacted for approval for storage on a thumb drive or another secured data collection drive if needed.

## **Summary**

The DNP project is to educate the hypertensive patient on a nutritional method for managing blood pressure. The introduction and discussion of the DASH diet can increase health-promoting behaviors among hypertensive patients. Dietary appropriate education regarding nutrition is imperative to improving blood pressure outcomes. This DASH education program is

developed to address a lifestyle modification that is effective in the reduction of hypertension.

This DNP project has already gained support from the consolidated company and the onsite health wellness company to help to improve hypertensive patients' outcomes. The support of the champion and committed chair is ongoing.



## **Chapter Five: Implementation Process**

Researchers have not been able to find the exact causes of high blood pressure. However, it has been shown that lifestyle and dietary habits can affect blood pressure. Similarly, lifestyle and dietary modifications have been shown to prevent or delay increases in blood pressures in susceptible people and help others control their high blood pressure (Svetkey et al., 2005). This chapter will discuss the implementation of the DASH eating plan for the pre-hypertensive and hypertensive employees in two onsite health and wellness clinics located in an occupational setting.

### **Setting**

This project was implemented at one corporation's onsite health and wellness clinics. The corporation located in the southwestern section of North Carolina is a private entity that has no state or university affiliation. One of the clinics was located in a production facility, while the other was in a customer call center. The employees in the production facility, whose average age is over 40 years, work to process, package, and ship goods from a warehouse. The employees in the customer call center, a younger population primarily under age 40, receive and process sales orders using the Internet or telephonically. The education sessions for the production plant took place in an auditorium. The education sessions for the customer call center took place in the learning center.

The DNP project leader was the primary healthcare provider and offered education sessions at both locations. Both participating groups were employees of the corporation who used the clinic for disease management, health promotion, preventive health services, and acute episodic visits. The health and wellness clinics are an added health benefit to these employees.

The benefit of these services is to improve employee's health outcomes and increase employer productivity.

### **Participants**

The project participants were adults, 19 years of age or older, employed at the corporation who currently used the onsite medical clinics. They were either pre-hypertensive or hypertensive. Personal identifying information nor protected data was recorded. The targeted population was identified through clinic visit reports. The goal was to recruit 10% of the identified population. As questionnaires were utilized, only patients who spoke English fluently were asked to participate. Employees with a medical contraindication for blood pressure measurement in either arm (i.e., double mastectomy, poor circulation, arteriovenous shunt) were also excluded. The participants were from ethnically diverse backgrounds.

### **Recruitment**

Recruitment strategies included e-mail, verbal and written announcements, and invitations. E-mail through the patient portal provided easy access for all employees. Face-to-face encounters were one of the recruitment strategies that proved to be most beneficial. Other strategies included posters and flyers displayed inside and outside the clinic, employee breakrooms, and employee information bulletin boards.

There were 18 potential project participants from the production company and 34 potential project participants from the customer care center. The participants expressed interest due to the prevalence of hypertension among this patient population. More than 50% of the employees approached about the project indicated they would participate in the project, which focused on the improvement of patients' blood pressure, dietary patterns, and self-management of hypertension through dietary adjustments. (see Appendix D intake survey tool ).

There were some concerns with the scheduling of the DASH education sessions during the workday due to the time constraints of the employees. Participants were required to use their breaks or lunch to participate in this project. This presented issues for some employees since some of them did not always take breaks, or the scheduled project session times did not fit their schedules. Recruiting and maintaining participants was an ongoing issue. Some patients did not want bi-weekly blood pressure measurement, and this required changes in outcome measures. Contacting some of the participants to remind them of upcoming sessions was difficult due to telephone number changes, unread emails, absences from work, or department changes.

### **Implementation Process**

This project utilizes the Plan-Do-Study-Act (PDSA) model. The *plan* for this project was to introduce the components of DASH to prehypertensive and hypertensive patients through four power point presentation sessions. I plan to test knowledge, adherence, and blood pressure measurements. I will distribute pre-and-post surveys and measure blood pressure. The *Do* was observing the interaction of the teaching components of DASH diet and how adopting them might improve their blood pressure. The study was having to rearrange the DASH education sessions time to accommodate scheduling and time conflicts to increase participation. This required restarting the plan and changed the time's location and dates on three occasions. This structured lesson plan was designed for participants' convenience due to unstructured breaks and lunchtimes of the employees. The *Act* was concluding that the participants wanted to continue the DASH education session and were in the process of making dietary changes. Some had significant changes in blood pressure after two sessions. They completed all the post-intervention surveys and turned them in. The education session went well, and this was relayed to the site champion, as we discussed on occasion restarting the cycle due to schedule adjustments.

**Session one.** The participants were provided with the details of the DASH diet, and consent forms were signed and collected (see Appendix E). The DNP project leader used an automatic blood pressure machine to check blood pressure and then recorded the measures using an unidentifiable numeric coding system. Each participant was assigned a code number based on location starting with letter S or C to use as an identifier for their blood pressure measurements and questionnaires. The DNP project leader first distributed pre-questionnaires at the beginning of this session, the questionnaire evaluated the pre-knowledge of the DASH diet and related food choices (see Appendix G). After completion of the questionnaires, handouts of the material to be covered in session one was distributed to each participant. Twelve participants received the pre-questionnaires in the production plant, and 18 in the customer care center. There was a total of 30 questionnaires completed (see Appendix I for pre-food frequency questionnaires).

The first DASH session began with a PowerPoint presentation providing an informational overview of hypertension. The presentation began with an overview of normal ranges of hypertension, according to AMA (2017). The discussion continued with recommendations for systolic and diastolic blood pressure, blood pressure categories, risk factors modifiable and nonmodifiable, and long-term complications of hypertension. The complication discussed were a stroke, heart attack, kidney failure, and blindness. The session ended with a question and answer period.

**Session two.** The second DASH education sessions were held two weeks later. In the beginning, a quick review of the previous session was discussed, and a brief discussion followed to determine if they thought that information was useful. Handouts were distributed that included limiting salt intake and reading food labels. The PowerPoint presentation was a

discussion on high sodium and its effects on blood pressure, naturally occurring sodium in foods, and sodium contents in processed foods.

The participants brought in foods to be used during the discussion on reading labels and looking for sodium contents. Participants were asked to read the sodium content from the foods they brought and to identify how many times sodium or salt appeared in the labels. The discussion segued into reading the nutritional fact panels with participants identifying which foods had lower sodium contents. Participants were asked to rate their ability to limit sodium on a scale of 1 to 10. This was a short, interactive discussion in which there was overwhelming engagement. The session ended with a brief question and answer period.

**Session three.** Session three took place two weeks after session two and began with a quick review of the previous session. A brief discussion was on how information from the last session had been applied to eating patterns. Handouts were distributed, which contained the components of DASH eating plan. The DASH eating plan pamphlet was also distributed (see Appendix F ). Both handouts and pamphlets contained components of DASH eating plan to include fruits, vegetables, grains, nuts, sweets, fats and oils, and meats, and they illustrated the significance of serving sizes to DASH eating plan. Session three covered grain, vegetables, fruits, and meats. The remaining components were discussed in session four.

To begin, participants were queried about their knowledge of DASH. The DASH eating plan was then explained, and the session continued with a discussion of fruits, vegetables, grains, and meats, including recommendations for both 1,600 and 2,000 calorie diets. Food models were used to illustrate serving sizes. The participants were encouraged to follow the recommendations in the pamphlets. The discussion at the end was geared toward making dietary changes, and a brief question and answered session concluded session three.

**Session four.** The last of the biweekly nutritional education sessions were held two weeks after session three. Participants engaged in discussions about how they had integrated DASH recommendations into their diets and questions were answered. After this brief discussion, the handouts for session four were distributed. The distributed handout covered the remaining components of the DASH eating plan, sweets, fats and oils, nuts, and low-fat dairy products, and was the topic for session four discussion. Portion sizes and important nutrients such as potassium and magnesium and their effects on health and hypertension were reviewed. Participants were provided sample menus with DASH eating plans for breakfast, lunch, and dinner. Post-education questionnaires were distributed to participants and blood pressures were taken with the automatic blood pressure machine. A brief overview of all sessions was discussed, and this concluded the DASH eating plan nutritional education sessions (see Appendix K). The post education questionnaire was distributed and collected for post DASH sessions evaluation (see Appendix H ). The post education food frequency questionnaire was administered and collected (see Appendix J).

### **Plan Variation**

There was variation in the education plan due to the time constraints of the participants. The scheduled dates did not require adjustment, but the times changed with each biweekly session. Some participants were allowed to come in at the end of sessions, and a few were provided a one-on-one session due to missing a scheduled session. The target group changed because originally, the project was just open to hypertensive employees, but, as there was such an overwhelming response from other employees, the sessions were opened up to include pre-hypertensive employees as well.

### **Summary**

According to research (NHLBI, 2015), lifestyle modification such as the adoption of DASH diet has the potential to reduce blood pressure. This DASH eating plan project was implemented to help improve blood pressure measured through dietary modification. The setting was at the two onsite medical clinics for a corporation located in the southwestern area of the state. The education session took place in an auditorium or a learning center. The participants were employees with pre-hypertension or hypertensive and represented diverse ethnicities. The implementation was limited to four biweekly sessions over the course of eight weeks and allow scheduling flexibility to facilitate ease of participation.

## **Chapter Six: Evaluation of the Practice Change Initiative**

This chapter discusses the results of quantitative data analysis from this QI project. The section will discuss the results of the questionnaire about the DASH dietary intervention at the onsite wellness clinic. The results of the pre- and post-5-point Likert-type participant responses and the pre- and post-blood pressure measures are discussed and displayed utilizing descriptive frequency analysis. The data results are shown with tables, graphs, and charts that were developed in SPSS and Excel programs.

### **Participant Demographics**

There was a total of 27 participants in the nutritional education project. All were employees of the corporation and had benefits to visit the health and wellness clinics. The demographics were collected using a coding system with numbers for each location to protect the participants' privacy. There were two participating sites. Site One used codes S01 to S12 and Site Two used codes C01 to C15. Twelve (44%) of the participants were employed at Site One and 15 (56%) at Site Two. There were 16 females (59%) and 11 males (41%) who participated in the DASH intervention. There was racial diversity among the participants, though the majority identified as African America (see Figure 1). Participants were also from diverse ages with 50-59 years being the age group with the greatest participation (see Figure 2).



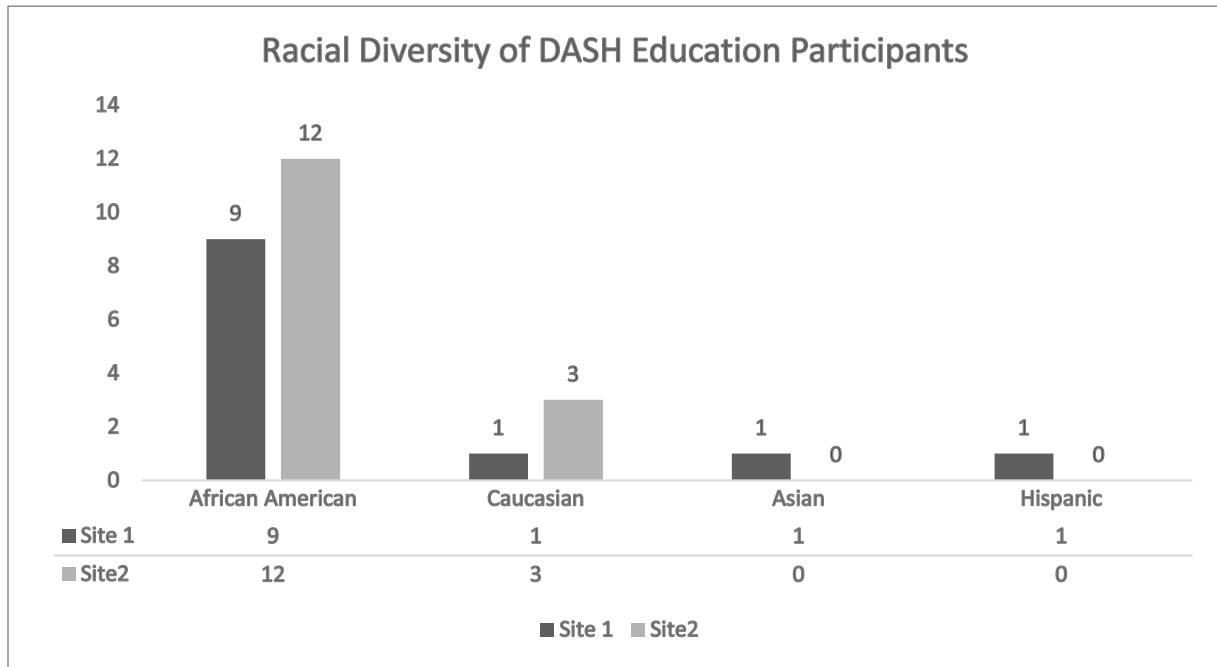


Figure 1. The racial diversity of the DASH participants by site location.

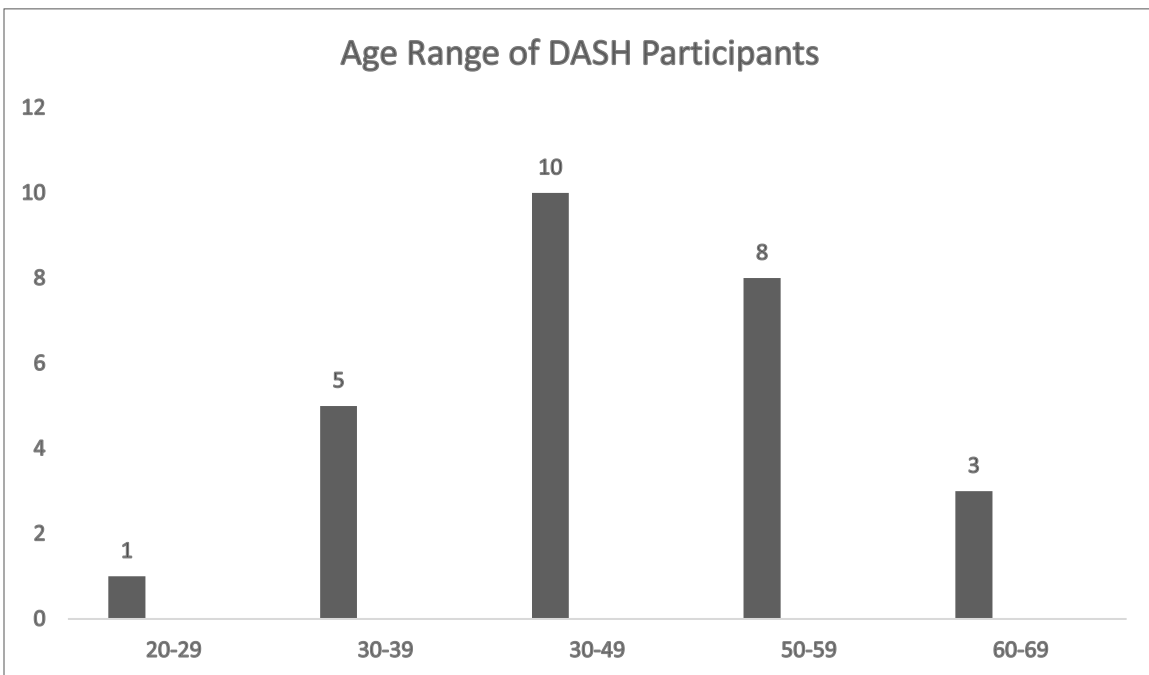


Figure 2. The age groupings of DASH participants.

**Intended Outcome(s)**

The short-term outcomes for this QI project were for the participants to complete the four bi-weekly DASH education sessions and complete the pre-and post-intervention questionnaires. The participants were expected to agree to have their pre-and post-intervention blood pressures measured. Compliance with these criteria determined if the patients had significant changes in knowledge, awareness, and attitude after receiving the benefits of the DASH intervention. The intermediate outcomes for this project were to determine if the participants had changes in systolic and diastolic blood pressure after the eight-week bi-weekly DASH intervention sessions.

The expected outcome was evaluated based on the responses from the 5-point Likert-type scales. It was expected that most of the participants would agree that the QI project was influential in improving their knowledge, awareness, and attitudes about the DASH diet and how following it improved their diastolic and systolic blood pressure. It was expected that blood pressures would decrease 2mmHg to 8mmHg after receiving the DASH education. The expected outcomes for the food frequency questionnaires were that participants would show a change in daily servings of fruits, vegetables, grains, and nuts to at least two or more servings daily.

Ideally, the long-term outcome for this project was to show an increase in participants' confidence in following dietary guidelines to improve blood pressure outcomes. This increased confidence could potentially demonstrate that structured nutritional education in workplace clinics can improve blood pressure readings for participants.

**Findings**

Blood pressures were taken pre-intervention and post-intervention of the DASH diet education.

Table 1

*Participants Pre- and Post-Education Blood Pressures*

Participant Number	Pre-Education Systolic BP	Post-Education Systolic BP	Percentage of Systolic Change	Pre-Education Diastolic BP	Post-Education Diastolic BP	Percentage of Diastolic Change
S01	144	132	-8.33	87	85	-2.30
S02	136	124	-8.82	80	80	0.00
S03	138	136	-1.45	90	84	-6.67
S04	154	140	-9.09	88	84	-4.55
S05	124	124	0.00	76	72	-5.26
S06	154	146	-5.19	90	90	0.00
S07	132	140	6.06	84	86	2.38
S08	174	176	1.15	100	100	0.00
S09	156	150	-3.85	90	92	2.22
S10	150	146	-2.67	87	90	3.45
S11	142	150	5.63	80	86	7.50
S12	138	140	1.45	78	80	2.56
C01	126	120	-4.76	72	70	-2.78
CO2	144	140	-2.78	80	80	0.00
CO3	151	149	-1.32	88	86	-2.27
CO4	142	144	1.41	81	78	-3.70
CO5	138	142	2.90	86	84	-2.33
CO6	166	164	-1.20	100	99	-1.00
CO7	126	118	-6.35	70	70	0.00
CO8	134	132	-1.49	56	76	35.71
CO9	156	150	-3.85	99	90	-9.09
C10	130	134	3.08	80	84	5.00
C11	140	136	-2.86	80	70	-12.50
C12	132	130	-1.52	90	80	-11.11
C13	138	136	-1.45	90	90	0.00
C14	144	139	-3.47	80	88	10.00
C15	140	142	1.43	82	84	2.44

*Note.* Gray cells indicate the percentage of reduction in BP measurements pre- and post-intervention. 18 participants had lower systolic measurements, and 12 participants had lower diastolic measurements post-educational intervention. Of those, 9 participants had lower systolic and diastolic BP measurements at the end of the DNP Project.

Forty-eight percent of the participants showed at least a 2mmHg or more decrease in systolic blood pressure post-intervention, and 29% showed a reduction in diastolic blood pressure post-DASH intervention (See Table 1).

Changes in systolic and diastolic blood pressure were evaluated based on a reduction in millimeters of mercury. Changes in the systolic blood pressure (SBP) measurement after an 8-week intervention indicated a systolic blood pressure reduction for 59% of participants of  $\leq$  10mmHg, while 7% of the participants had a decrease of SBP between 10-20mmHg. One participant had no changes in SBP, and 29% had increases in SBP (see Table 2).

Diastolic blood pressure (DBP) measurement indicate that 48% of participants had decreases in DBP  $\leq$  10mmHg. One participant had a reduction greater than 10mmHg. For 48% of participants, there was no improvement in DBP; six participants had no changes, and seven participants had increases in DBP (see Table 3).

The pre-questionnaire was administered using a 5-point Likert scale (see Table 2). The participants completed a food frequency questionnaire pre- and post-educational intervention (see Table 3 and Table 4, respectively). This questionnaire was to determine how frequently participants self-reported eating grains, vegetables, and fruits daily. The results indicated a need for an increase in participants' daily servings of these food groups. The DASH diet is known to strongly influence increasing the daily servings of these food groups.

The post-intervention questionnaire was administered using a 5-point Likert scale to assesses personal knowledge, likelihood to change eating style, whether the education improved their knowledge, and participants' ability to identify the meaning of the DASH acronym (see Table 4). This quality improvement project demonstrated how structured education sessions could have an impact on patient, knowledge, behavior, and attitude for making a necessary dietary modification to improve blood pressure outcomes (see Table 5 for comments by participants

post-education).

Table 2

*Pre-DASH Education Questionnaire Responses*

Questions 1-5	Completely Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Completely Agree
#1 I know what DASH stands for	9	3	3	8	4
#2 I know about the benefits of the DASH diet	10	5	4	6	2
#3 I can identify foods in the DASH diet	9	7	4	7	0
#4 It is important to understand the DASH diet	8	5	3	4	7
#5 Following the DASH diet could improve my blood pressure	4	2	5	3	13
<i>Note.</i> Numbers represent the number of participants who chose the response on a 5-point Likert-type scale that elicited baseline knowledge.					

Table 3

*Response to Food Frequency Questionnaire*

Participants' Self-Reported Daily Food Intake by Food Group								
	1 Serving		2 Servings		3 Servings		4 or more Servings	
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
Grain	14	6	10	9	3	9	0	4
Vegetables	17	5	8	14	2	5	0	3
Fruits	16	5	6	12	3	7	2	3
<i>Note.</i> Numbers represent the number of participants who chose the number of daily servings for each food group.								

Table 4

*Post-DASH Education Questionnaire Responses*

	Completely Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree
DASH education program changed my eating style	0	0	1	14	13
DASH education program changed my attitude about diet modification to improve my blood pressure	0	0	0	2	25
DASH education improved my knowledge of nutrition and high blood pressure	0	0	0	2	25
I know what DASH stands for	0	0	0	0	27
<i>Note.</i> Numbers represent the number of participants who chose the corresponding response to the questionnaire.					

Table 5

*Comments of Participants on What They Learned and Changed after DASH Education*

I eat more fruits and vegetables
I use less salt
I read the food label more carefully
I have increase vegetables servings in my diet
I think DASH education was beneficial to my health
I eat more servings of fruits
DASH handouts and pamphlets were a useful resource
<i>Note.</i> Free comments of participants post DASH education sessions

**Summary**

The DASH education project showed an increase in the participants' knowledge and awareness of DASH and its relationship to blood pressure. The DASH intervention was structured to support the needs of the participants. Eighteen participants had lower systolic measurements, and 12 participants had lower diastolic measurements of post-educational intervention. Of those, 9 participants had lower systolic and diastolic BP measurements at the end of the DNP Project.

Post- DASH food frequency questionnaires indicated that participants had changed some dietary habits during their participation in the DASH education. There were improvements in the participants' responses to increasing daily servings of grains, vegetables, and fruits. The results of the pre- and-post-questionnaires showed that DASH education enhanced participants' knowledge, awareness, and the likelihood of making dietary changes. The findings indicated that the structured DASH educational intervention presented at two workplace clinics increased the knowledge, awareness, and attitudes of change in nutritional habits after the DASH intervention.

## Chapter Seven: Implications for Nursing Practice

Nurses who hold the Doctor of Nursing Practice (DNP) degree contribute to nursing science by evaluating, translating, and disseminating research into practice. All DNP programs, regardless of specialty, are required to meet eight curricular elements and competencies outlined in *The Essentials of Doctoral Education for Advanced Nursing Practice* (American Association of Colleges of Nursing [AACN], 2006). These are the foundational competencies that all DNPs must meet (AACN, 2006). The following sections discuss how the eight DNP Essentials were met in this project.

### Practice Implications

**Essential I: Scientific underpinnings for practice.** DNP Essential I will align with the overall idea of this quality improvement project. DNP Essential I state that DNP programs shall prepare graduates to ensure that nursing science is integrated “with knowledge from ethics, biophysical, psychosocial, analytical, and organizational sciences as the basis for the highest level of nursing practice” (AACN, 2006, p. 9). This Essential utilizes evidence-based theories and concepts to enhance and improve health and health care delivery and evaluate those outcomes disciplines (AACN, 2006). Essential I guided the DNP project student leader to use scientific strategies to further improve and decrease adverse health outcomes in hypertensive patients through the education of the DASH diet to encourage change dietary habits in a hypertension population. The Health Belief Model guided this project aimed to change dietary health belief in improving disease processes (Jones, Smith, & Llewellyn, 2013). Promoting lifestyle changes may be more acceptable to a population that is affected by hypertension utilizing the scientific strategies to overcome barriers to dietary change that may improve knowledge and promote self-efficacy of dietary behaviors. The utilization of science-based concepts, nursing



practice, and theories was significant in the development of this DNP project, and my ability to use the knowledge has been enhanced.

**Essential II: Organizational and systems leadership for quality improvement.**

Essential II addresses the need for organizational and system leadership to improve patient health care outcomes. The DNP knowledge and skills in this area are to eliminate health disparities in practice at a broader and global level to meet the complex need of nutritional health promotion. The DNP must understand how the organizational system in which the project or change will be implemented operates. This project required knowledge of the onsite clinic's operation and how a health promotion and education project could be implemented for employees. The identified stakeholders were the human resources director, clinical education director-NP, client manager, and the clinic manager. The clinical issue identified was that hypertension was not well managed, and there is no structured nutritional educational program geared toward hypertensive patients. Essential II also analyses the effectiveness of practice initiatives for risk and improvement of healthcare outcomes.

The expectation of health promotion and education provides on nutrition, disease prevention, and hypertension management would likely lead to an improvement in the health of employees and a minimal improvement of health care knowledge. Providing structured DASH education programs with the distribution of educational information is cost-effective when compared to the expensive complications of hypertension. Promoting nutritional education is a benefit to the organization's employees that should be utilized by healthcare providers. The knowledge obtained providing nutritional education will be used to develop strategies that will improve practice guidelines for nutritional education.

**Essential III: Clinical scholarship and analytical methods for evidence-based practice.** Essential III explores the ability of the DNP student to review and analyze existing literature, design, implementation, and evaluation of quality improvement projects; and to disseminate finding from these projects to develop practice guidelines and improve practice and practice environment. The DNP graduate will function as a practice consultant in a collaborative knowledge-generating project (AACN, 2006). This QI project required a literature review, design, data collection, and analysis. The project required an evaluation of outcomes to guide the project. There was a thorough review of the literature that supported that implementation of education on DASH, and the benefits of the DASH diet resulted in lower blood pressures. The design and the result of this project will be shared with key stakeholders of the organization so that other providers may replicate the design and expand their knowledge on the DASH diet to share with the hypertensive patients. The knowledge gained from this project has improved my ability to provide structured nutritional education to improve overall health outcomes.

**Essential IV: Information systems/technology and patient care technology for the improvement and transformation of health care.** Essential IV guides the DNP student's use of information systems and technology to manage and collect data, as well as use this information to evaluate health care systems and outcomes to improve patient outcomes (AACN, 2006). Microsoft Office, Excel programs, and SPS software were utilized to organize and evaluate collected data for this QI project.

**Essential V: Health care policy for advocacy in health care.** Essential V focuses on DNP student's advocacy in healthcare policy for improvement in healthcare delivery system including, but not limited to, access to care, health care disparities, and quality of care (AACN, 2006). The DNP graduate is prepared to engage in the policy that shapes the framework for

healthcare. Healthcare is moving toward a provider's ability to provide reasonable education and care. This DNP project promoted evidence-based practices using the DASH diet as a recommended lifestyle change. This project examined participants' knowledge for nutritional based hypertension self-management, including dietary choices and understanding nutritional information on food labels. The role of health promotion through nutrition is beneficial for patient outcomes. The NP be maybe an advocate for change by integrating structured nutritional programs into their standard healthcare practice.

**Essential VI: Interprofessional collaboration for improving patient and population health outcomes.** Essential VI focuses on inter-professional collaboration with inter-professional teams to improve patient, population, and health care delivery system outcomes (AACN, 2006). The growing complexity of health care often requires a collaborative approach to best address patient needs. The successful implementation of this project involved collaboration between the DNP student and the corporation project partner, specifically the corporation's employees and a clinical education director-NP, employed by the contracted health and wellness entity. Communication with leaders of both organizations was necessary to be granted permission to implement this project at the onsite clinic locations.

**Essential VII: Clinical prevention and population health for improving the nation's health.** Essential VII indicates that the DNP student should be able to analyze data on individual and population health and synthesize concepts related to health promotion and illness prevention (AACN, 2006). The DNP student used education on the DASH diet to address health promotion and population health among a hypertensive and pre-hypertensive population int two corporate settings. The risks associated with hypertension are significantly reduced when blood pressure is

decreased. This quality improvement project contributed to decreasing the burden of hypertension through participants' awareness of the DASH diet as lifestyle modification.

**Essential VIII: Advanced nursing practice.** According to Essential VIII, the DNP student should be able to design, implement, and evaluate evidence-based care to help improve patient outcomes (AACN, 2006). In this project, the DNP student attempted to improve health outcomes by identifying foods that contribute to poor blood pressure control and by providing information about specific servings of foods in the DASH diet. The project's goal was to increase dietary knowledge and increase patient self-efficacy of hypertension, and self-management through education on the DASH eating plan. The application of this knowledge can result in improvements in systolic and diastolic blood pressure. The work invested in this DNP project has enhanced my current knowledge of nutrition and uncovered new knowledge as a result of the DASH diet education. This DNP project generated new knowledge for practice through the integration of systematic literature review and utilizing clinical expertise and patient preference to make changes in the onsite wellness clinics. These changes will lead to improve patient hypertensive outcomes and increase NP's professional development.

### **Summary**

The DNP Essentials were addressed through the planning, implementation, and evaluation of this quality improvement project. The eight Essentials hold DNP students to a high standard, and the components need to be present in all work. The DNP Essentials play a vital role in advancing nursing practice and providing quality, evidence-based care to patients and the community.

## **Chapter Eight: Final Conclusions**

Hypertension remains a growing problem among the American workforce, especially in production facilities, where there is limited access to healthy food choices due to long shifts and short break periods. According to Blumenthal et al. (2010), lifestyle modification, such as the adoption of the DASH diet has the potential to reduce blood pressure. Dietary modification is often discussed with patients and can provide a significant benefit in blood pressure management. The project determined whether or not post-education showed a reduction in the participants' systolic and diastolic blood pressure. This project-centered around a DASH diet intervention aimed to improve awareness and knowledge of nutritional components in pre-hypertensive or hypertensive employees in the onsite workplace.

This project implemented an introduction to the DASH diet and education on the nutritional components of DASH at an onsite clinic in the workplace. This chapter will discuss the significance of the findings, strengths, weaknesses, and challenges that were noted during the planning and implementation of this DNP project at the workplace.

### **Significance of Findings**

The strategies implemented through this project focused on the contributions that nutritional education and subsequent adoption of that education can play in blood pressure reduction for individuals. The results of this project indicated that some participants exhibited a reduction in blood pressure and low to moderate modifications in daily servings of grains, vegetables, and fruits. The increase in the food frequency intake as recommended by the DASH diet could demonstrate improved nutritional knowledge and awareness of the benefits of increasing servings in grain, fruits, and vegetables, which are essential components of the DASH. It is possible that the findings indicated that some individuals simply lacked knowledge

about dietary benefits prior to DASH education. Once the education was provided, these individuals used their newly acquired education to increase their daily intake of beneficial foods. These findings may support a need for ongoing structured nutritional education programs for pre-hypertensive and hypertensive patients in the workplace.

The clinicians, however, need the support and trust of the employees to further assist them in achieving their health goals. This post-education results showed that participants were better prepared to adopt some recommendations of the DASH diet, including appropriate amounts of sodium, potassium, calcium, magnesium, and fiber. All of these components affect blood pressure. The employees commented post-intervention that one of the learning activities they continued to follow to read and interpret nutritional facts on food labels. The participants participated in training to assist them in making dietary changes to benefit their health without sacrificing all their favorite foods, thus increasing self-efficacy. This project demonstrated that participating in health education initiatives could be fun and straightforward.

Studies have shown that DASH diet adherence reduces hypertension and can lower cardiovascular risk factors such as strokes, heart attacks, and congestive heart failure, which are high dollar emergency room visits (CDC, 2017). As such, employee understanding of the DASH diet can reduce the long-term disease burden of hypertensive diagnoses. One impact for the organization was expanding the services of their onsite clinic to include nutritional education. In addition, the project may have opened the door for increased onsite management of more patients diagnosed with pre-hypertension and hypertension, reducing some participants' need for time off to see a provider at another location. This has the potential to increase employee utilization of the workplace clinic and improve patient activation for self-management of hypertension. These educational sessions have the potential to decrease absenteeism due to

employees' poor blood pressure control and decrease expenses related to complications of hypertension, including costs of emergent and inpatient care. This DNP project could prompt the organization to re-evaluate health promotion in workplace clinics, including nutrition education and other informational sessions.

One healthcare provider taking on this challenge may have been too ambitious. A lesson learned from this project was that education might be more impactful using an interprofessional approach. It would be optimal to spread the workload and topics among other professionals, such as nutritionists, health educators, or integrative health coaches. Unfortunately, at the time of implementation, diverse professionals were not available, which likely limited the possible services, including taking participant's blood pressures at each session. Using other professionals in the educational sessions would have freed the nurse practitioner to take blood pressures at each encounter and provide coaching via motivational interviewing with participants.

### **Project Strengths and Weaknesses**

One of the strengths of this project was that it was relatively cost-effective, with monies spent primarily for copies of educational material and providing healthy snacks at each session. Nutritional education was part of the health and wellness program, and there was no added cost to participate. Another advantage of this project was DASH education sessions were held in the workplace, allowing the participants to seek out the program on their work time or lunch break without having to travel to another location. Participants were motivated and prepared for each upcoming session. Offering the DASH session during these time frames probably improved leadership participation, as several participants worked in supervisory roles. Providing participants with healthy snacks was an added value during each of the bi-weekly sessions.

One weakness of the DNP project may have been the lack of opportunity to provide individual consultation. There was not enough flexibility in the schedule, as the time slots available required that the sessions be limited to 15 minutes. More flexibility and longer sessions would likely have allowed for more interaction concerning private health concerns that may have had an impact on eating patterns. Another potential weakness of the findings was that African Americans made up 75% of the participants. The results could be skewed since this is not an accurate representation of the population in the workplace.

### **Project Limitations**

The project was limited to bi-weekly sessions provided at 15-minute increments over eight weeks. This may not have been adequate time to give the education session and reinforce the concepts of the DASH diet. There was no organizational support from middle management. The participants' scheduled breaks were changed at the last minute, and the pre-arranged location for the training sessions changed with little notice. Rearrangement and adjustments did not always accommodate all the participants. The setup for the education sessions was the sole responsibility of the educator. The low participation rate may be due to the fact that participation was limited to employees' lunch and break times. The small sample size did not reflect the full demographic of the employees of the corporation.

### **Project Benefits**

Teaching the DASH eating plan as a health promotion initiative can support healthy dietary habits that patients can use throughout life. Education on the DASH diet has been shown to prevent other serious medical conditions such as heart attack, strokes, heart failure, kidney disease, and colon cancer. Creating a structured approach to educating patients on this diet is an easy, low-cost health promotion initiative for any size workforce. While DASH is primarily



known to lower blood pressure, it may also promote weight loss (CDC, 2017). This could help decrease healthcare costs associated with obesity and obesity-related diagnoses. An additional benefit of DASH diet education is the mental and physical health benefits experienced by employees due to increased energy from proper nutrition. Improved nutrition could help to combat stress-related work-life balances, especially for those who work off shift.

This DASH education project can be a lifelong eating plan that focuses on consuming fruits, vegetables, lean proteins, whole grain, and the reduction of foods high in sugar or sodium. Providing nutritional education at the workplace clinic increases accessibility to employees. Another benefit was the participants were distributed DASH diet pamphlets that can be used as ongoing guides to assist in maintaining adherence to DASH diet recommendations. Workplace interventions, such as those used in this DNP project, have the potential to create an employee-to-employee support system, which may increase the likelihood that employees will maintain healthy eating habits.

### **Practice Recommendations**

It is recommended that this QI project be replicated at other onsite clinics as an intervention to increase participants' motivation and self-efficacy toward pre-hypertension and hypertension self-management. The result of this project may bridge the gap to offer a more structured nutritional program to empower patients to optimize wellbeing through dietary choices. This project could open a collaboration with health insurance companies to negotiate nutritional services to be covered in an onsite workplace. Onsite clinic workplace settings should include prevention of chronic disease and other health promotion activities, as well as treatment and management of chronic diseases. Based on the experience of this DNP project, it is recommended that an interprofessional group provide education and counseling sessions to assist

employees in changing dietary habits that contribute negatively to pre-hypertension and hypertension. It is also recommended that employees be given short breaks to attend education and counseling sessions. This will likely maximize employee participation. This recommendation will require support from middle management to ensure that employees have adequate time scheduled for self-care without using their personal breaks or lunches to attend the session.

Empowering patients to optimize their wellbeing through diet education would be best achieved with the addition of health coaches or nutritional coaches. Health coaches promote wellness and lifestyle changes, including dietary counseling, lifestyle modification through behavior change, and chronic disease self-management sessions.

Another recommendation would be the onboarding of nutritional health promotion through telephonic or virtual nutritional counseling. Providing service at this level could support the health, nutrition, and stress management of the employees. This could allow employees spouses to be integrated into the nutritional education process; spouses may be shopping for food or preparing the meals. Providing spouses with nutritional counseling could have a direct impact on employee health and resultant healthcare costs.

Costs for the nutritional health promotion staff could be minimized by utilizing masters-level students, either nurse educator or nutrition students, as interns. This would provide experience for master's level students and support for employees. It is recommended that the organization develop partnerships with universities well ahead of the scheduled health promotion initiative. Successful execution will require significant time and advanced arrangements to ensure that the opportunity is well planned.

## **Final Summary**

Hypertension continues to be a growing problem in America. There is an increasing need to reduce the burden of chronic disease associated with hypertension, including the increased risk of death and the costs related to treating and managing the hypertension-related disease. According to NHLBI, 2015), initiating lifestyle modification, such as dietary changes, can have a significant effect on the reduction of blood pressure. This DNP project demonstrated an effective way to increase employees' knowledge of the DASH diet for participants at two workplace clinics. Though there were some barriers and limitations, the project had 27 participants, with 33% of those participating having lower diastolic or systolic blood pressures at the end of the 8-week DASH diet education series. This could be an indication of positive benefits from workplace nutritional education for patients diagnosed with pre-hypertension or hypertension. This project provided participants with face-to-face education on hypertension and the DASH diet, as well as DASH diet pamphlets that can be used to guide food choices. The DASH program provided education sessions that were interactive and motivational. Based on participants' self-report, the project enhanced participant knowledge and self-efficacy in making meaningful changes in dietary habits.

Sustainability of this project will require the interprofessional team, minimal financial resources, and increased organizational support to promote flexibility in employees' schedules to attend the sessions.

## References

- American Association of Colleges of Nursing (2006). The essentials of doctoral education for advance nursing practice. [PDF File]. Retrieved from [https://www.pncb.org/sites/default/files/2017-02/Essentials\\_of\\_DNP\\_Education.pdf](https://www.pncb.org/sites/default/files/2017-02/Essentials_of_DNP_Education.pdf)
- American Heart Association (2015). The American heart association's diet and lifestyle recommendations. Retrieved from <https://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/The-American-Heart-Association-Diet-and-Lifestyle-Recommendation>.
- Appel, L.J., Moore, T.J., Obarzanek, E. Vollmer, W.M., Wvetkey, L.P., Sacks, G.M., ... & Karanja, N. (1997). A clinical trial of the effects of dietary patterns on blood pressure: DASH collaborative research group. *New England Journal of Medicine*, 336(60), 1117-1124.
- Azadbakht, L., Mirmiran, P., Esmalizadeh, A., Azzizi, T., & Azizi F. (2005). Beneficial effects of dietary approaches to stop hypertension eating plan on features of the metabolic syndrome. *Diabetes Care*, 28(12), 2823-2831.
- Blumenthal, J.A., Babyak, M.A., Hinderliter, A.W., Watkins, L.L., Craighead, L., Lin, P.H., ... & Sherwood, A. (2010). Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: The ENCORE study. *Archives of Internal Medicine*, 170(2), 126-35.
- Butts, J. B., & Rich, K. L. (2015). *Philosophies and theories for advanced nursing practice*. Burlington, MA: Jones and Bartlett Learning.

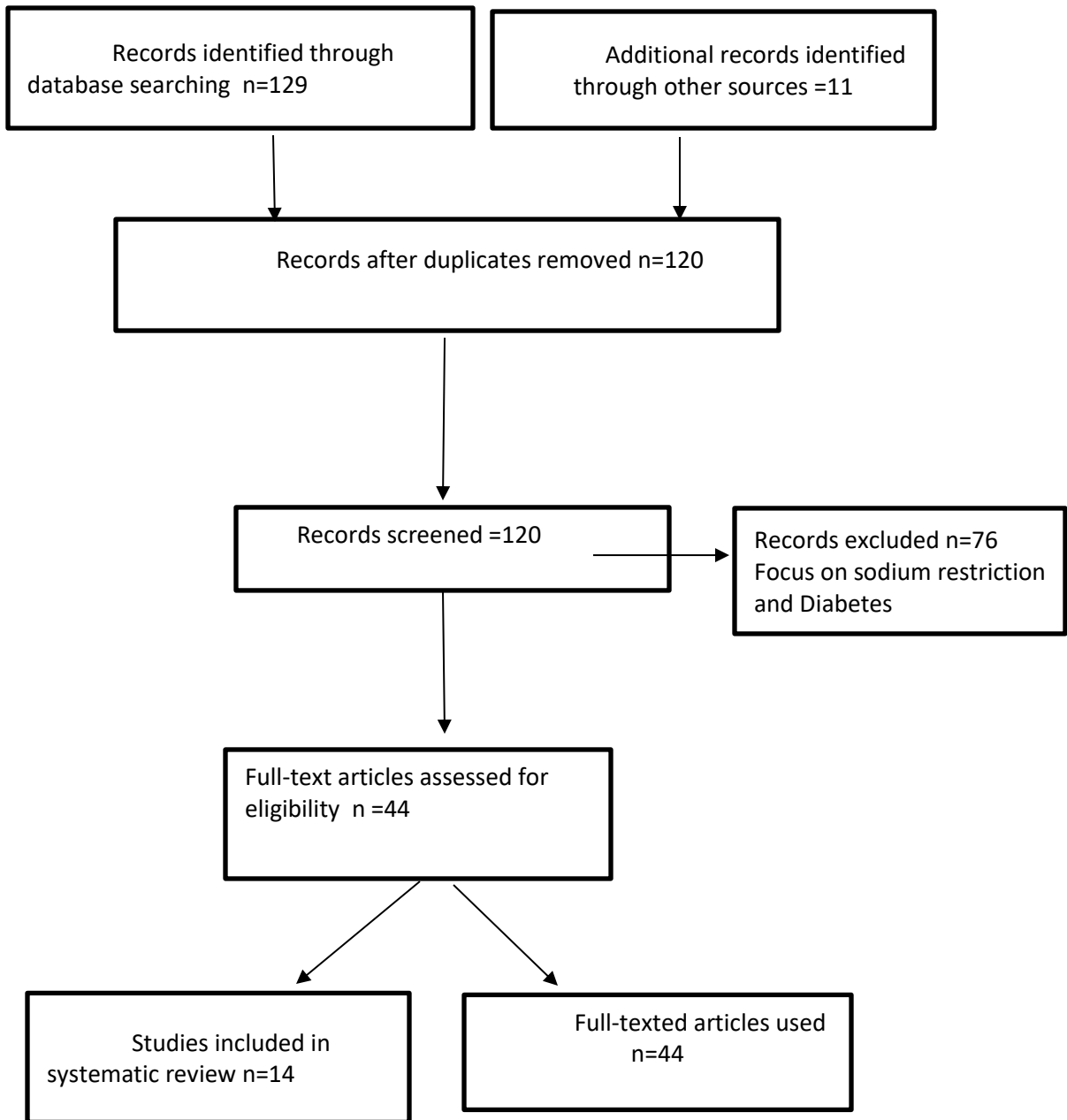
- Center for Disease Control and Prevention (2017). High blood pressure statistical report for health professional. Retrieved from <http://www.cdc.gov/bloodpressure/index.htm>:
- Crowfoot, D., & Prasad, V. (2017). Using the plan-do-study-act (PDSA) cycle to make a change in general practice. *InnovAiT*, 10(7) 425-430. DOI. 10.1177/1755773801704472.
- Delichatsios, H.K., & Welty, F.K. (2005). Influence of the DASH diet and low-fat, high carbohydrate diets on blood pressure. *Current Atherosclerosis Report*, 7(6), 446-454.
- Eight Joint National Committee (2014). Guidelines and the outpatient management of hypertension in the African American population. *North American Journal of Medical Sciences*, 7(10), 438-445. doi: 10.4103/1947-2714.168669.
- Healthy People (2020). Health-related quality of life & well-being. Retrieved from <http://www.healthypeople.gov/2020/topics-objectives/topic/health-relatedquality-of-life-well-being>.
- Jarl, J., Tolentino, C.J., James, K., Clark, M. & Ryan, M. (2014). Supporting cardiovascular risk reduction in overweight and obese hypertensive patients through DASH diet and lifestyle education by primary care nurse practitioners. *Journal of the American Association of Nurse Practitioners*, 26(9), 498-503. doi: 10.1002/2327-6924.12124.
- Jones, C., Smith, H., & Llewellyn, C. (2013). Evaluating the effectiveness of health belief model intervention in improving adherence: A systematic review (2014). *Health Psychology Review*, 8(3), 253-269.
- Kim, H. & Andrade, F. C. D. (2016). Diagnostic status of hypertension on the adherence to the Dietary Approaches to Stop Hypertension (DASH) diet. *Preventive Medicine Reports*, 4, 525-531.

- Kwan, M.W., Wong, M. C., Wang, H. H., Liu, K. Q., Lee, C. L., Yan, B. P., ... & Griffiths, S. M. (2013). Compliance with Dietary Approaches to Stop Hypertension (DASH) diet a systematic review. *Plos One*, 8(10), e78412. doi: 10.1371/journal.pone.0078412.
- Magadza, C., Radloff, S.E. & Srinivas, S. C. (2009). The effect of an educational intervention on patients' knowledge about hypertension, beliefs about medicines and adherence. *Research in Social and Administrative Pharmacy*, 5(4), 363-375. doi:10.1016/j.sapharm.2009.01.004.
- Mahmoudian, A. Zamani, A., Tavakoli, N., Farajzadegan, Z., Fathollahi-Dehkordi, F., (2017). Medication adherence in patient with hypertension: Does satisfaction with doctor-patient relationship work. *Journal of Research in Medical Sciences*, 22, 48-50. Retrieved from <http://www.jmsjournal.net>.
- Matyas, E., Jeitler, K., Horvath, K., Semlitsch, T., Hemkens, L. G., Pignitter, N., & Siebenhofer, A., (2011). Benefit assessment of salt reduction in patients with hypertension: Systematic overview. *Journal of Hypertension*, 29(5) 821-827.
- National Heart, Lung, and Blood Institute. (2015). Retrieved from <https://www.nhlbi.nih.gov/health-topics/dash-eating-plan>.
- Ndanuko, R. N., Tapsell, L. C., Charlton, K.E., Neale, P., & Batterham, m.J. (2016). Dietary patterns and blood pressure in adults. A systematic review and meta-analysis of randomized trials. *Advanced Nutrition*, 7(1), 76-89. doi 10.3939/an.115.009753.
- Ozemek, C., Laddu, D., Arena, R. & Lavie, C. (2018). The role of diet for prevention and management of hypertension. *Current Opinion Cardiology*, 33, 388-393. doi: 1097/HCO0000000000000532.

- Samadian, F., Dalili, N., & Jamalian, A. (2016). Lifestyle modifications to prevent and control hypertension. *Irian Journal of Kidney Disease*, *10*(5) 237-242.
- Seangpraw, K., Auttaman., Tonchoy, P., & Panta, P. (2018). The effect of the behavior modification program Dietary Approaches to Stop Hypertension (DASH) on reducing the risk of hypertension among elderly patients in the rural community of Phayo, Thailand. *Dove Press*, *12*, 109-118.
- Sessoms, J., Reid, K., Williams, I., & Hinton, I. (2015). Provider adherence to national guidelines for managing hypertension in African Americans. *International Journal of Hypertension*.1-8 doi: 101155/2015/498074.
- Shirani, F., Salehi-Abargouei, A. & Azadbakht, L. (2013). Effects of Dietary Approaches to Stop Hypertension (DASH) diet on some risk for developing type 2 diabetes: A systematic review and meta-analysis on a controlled clinical trial. *Nutrition*, *29*(7-8 )939-947. doi: 10.1016/j.nut.2012.12.012.
- Svetkey, L.P., Erlinger, T, P., Vollmer, W.M., Feldstein, A., Cooper, L. S., Appel, L. J., ... & Stevens, V. J. (2005). Effect of lifestyle modification on blood pressure by race, sex, hypertension status, and age. *Journal of Human Hypertension*, *19*, 21-31.
- Viera, A., Kshirsagar, A.V., Hinderliter, Alan L. (2007). Lifestyle modification advice for lowering or controlling high blood pressure: Who's getting it? *Journal of Clinical Hypertension* *9*(11) 850-858.
- Wong, M. C.S., Kawan, M. W. M., Wang, H.H. X., Fong, B. C. Y., Chan, W. M. Zhang, D. X., Griffiths, S. M. (2015). Dietary counseling with the Dietary Approaches to Stop Hypertension (DASH) diet for Chinese patients with grade 1 hypertension: A parallel group, randomized controlled trial. *European Heart Journal*, *36*(38), 2598-2607.

Appendix A

Prisma Flow Diagram





Appendix B

Letter of Support



Date: July 25, 2018

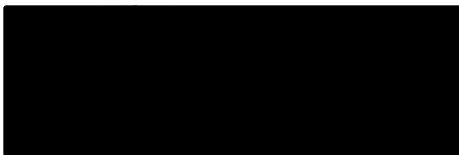
To Whom It May Concern

We at [REDACTED]. Consolidated have reviewed Sandra Smith's DNP project Dietary Approach to Stop Hypertension (DASH) / DASH Diet Education for Hypertensive Patients. Ms. Smith has organizational support and approval to conduct her project within facility populations to which she's assigned for the provision of clinical services to our employees. These facilities consist of [REDACTED] Production Center and related operations, and our Customer Care Center and its related options, both of which are domiciled in Charlotte, NC. We understand that for Ms. Smith to achieve completion of the DNP program, dissemination of the project will be required by the University, which will include a public presentation related to the project and a manuscript submission will be encouraged.

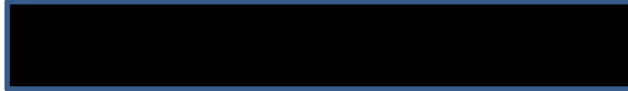
Our organization considers this project to be a research and quality improvement initiative in service to our employees who use the Company's contracted on-site clinical services on a voluntary basis at no cost to the employee. [REDACTED]. Consolidated approves this project without prejudice noting that it provides no direct clinical monitoring or oversight and will not be a discrete validating party to the results or data produced from the project.

Thank you

Sincerely,



Appendix C  
Letter of Support



April, 15, 2019

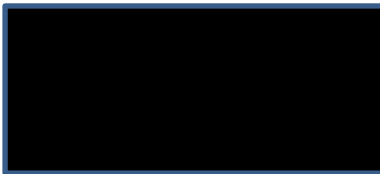
To Whom it may concern,

Sandra Smith, Nurse Practitioner, has requested to do her Doctor of Nursing Practice (DNP) at her place of employment- the [REDACTED] employee health clinics located in Charlotte, NC. The purpose of Sandra's project is to provide verbal and written education on the DASH diet to improve dietary adherence and blood pressures outcomes.

We have received written permission from the client, [REDACTED] hereby grant Ms. Smith permission to conduct her DNP study in our clinics, as long as her work does not interfere with the care and attention to the rest of her [REDACTED] patients.

Please feel free call me if you have any questions.

Sincerely yours,



Appendix D  
Intake Survey Tool

CODE # \_\_\_\_\_

What is your age?

- a. 21-29
- b. 30-39
- c. 40-49
- d. 50-59
- e. 60-69
- f. 70 or older

2. What is your Gender?

- a. Male
- b. Female

3. What is your race

- a. White
- b. African American
- c. Asian or Pacific Islander
- d. American Indian
- e. other Please specify \_\_\_\_\_

Appendix E

DIETARY APPROACH TO STOP HYPERTENSION (DASH) Diet Education Consent Form

This is a quality improvement education project to improve your knowledge of the DASH diet recommendation. This information may prevent you from getting hypertension or improve your blood pressure outcomes if you already have hypertension. You are being invited to take part in this education project because you have high blood pressure or want knowledge on ways to prevent high blood pressure. By participating in this project, I hope you learn DASH diet education may have a significant impact on your dietary compliance to prevent or improve blood pressure outcomes.

The education sessions will be biweekly for a total of 4 sessions. The total amount of time for each session should be about 15 minutes. Your blood pressure will be taken at each session. You will be asked to complete pre- and post-education questionnaires. The result of the questionnaires will be shared with Eastern Carolina University and [clinic site]. No identifying or confidential data will be shared.

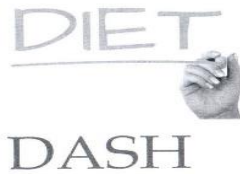
Thank you for your participation,

Participant's Name (Print)\_\_\_\_\_

Participant's Name (Signature)\_\_\_\_\_

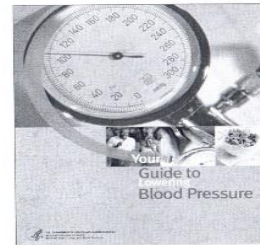
Principal Project Lead (Signature)\_\_\_\_\_

Appendix F  
DASH Pamphlet



DASH EATING PLAN

HOW TO LOWER YOUR BLOOD PRESSURE



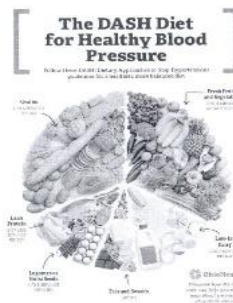
Blood Pressure Categories

BLOOD PRESSURE CATEGORY	STRETCH mm Hg (systolic/diastolic)	DIAPYLOSIS mm Hg (systolic/diastolic)
NORMAL	LESS THAN 120 and LESS THAN 80	LESS THAN 130 and LESS THAN 85
ELEVATED	120-130 and 80-85	LESS THAN 130 and 85-90
HIGH BLOOD PRESSURE IN PREVIOUS PHASE	130-139 and 85-89	90-95
HIGH BLOOD PRESSURE IN PREVIOUS PHASE	140 or higher and 90 or higher	95-100
HYPERTENSION CRISIS (seek medical attention)	HIGHER THAN 180 and/or HIGHER THAN 120	HIGHER THAN 120

HYPERTENSION

Hypertension is a clinical condition characterized by high and sustained blood pressure levels. Hypertension is a modifiable risk factor but is a major cause of heart disease, stroke and congestive heart failure. DASH diet has been shown to be an effective nutritional approach towards prevention and treatment of high blood pressure.

DASH DIET



Standard DASH diet

Low sodium DASH allows 1500mg sodium daily

- 2000 cal typical DASH diet
- 6-7 serving **grains** daily (wheat bread, brown rice, cereal, pasta)
- 4-5 serving of **fruits** daily (apple, bannan, figs, apricots, orange, peach, mango, melon, strawberries, and pineapple)
- 4-5 servings of **vegetables** daily (carrots, kale, green peas, beans, broccoli, potatoes, spinach, and tomatoes).
- 2-3 serving of **oils and fats** daily (vegetable oils, olive oil, canola oils, and salad dressings).
- 4-5 serving of **nuts, legumes**, weekly (almonds, peanuts, walnuts, lentils, sunflower seeds, kidney beans).
- Less than five serving of **sugary foods and beverages** weekly (sugar, jams, and jellies, carbonated beverages).

Appendix G

Pre-Education Questionnaire

Please read each of the following statements and circle the appropriated number that corresponds to your answer to the question: 1 = Completely Disagree 2= Somewhat Disagree 3=Neither Agree nor Disagree 4= Somewhat agree 5= Agree

	1 = Completely Disagree	2= Somewhat Disagree	3=Neither Agree nor Disagree	4= Somewhat agree	5= Agree
I know what <b>DASH</b> stands for					
I know about the <b>benefits</b> of <b>DASH</b> diet					
I can <b>identify</b> <b>foods</b> in the <b>DASH</b> diet					
It is <b>important</b> to <b>understand</b> <b>DASH</b> diet					
Following <b>the</b> <b>DASH</b> diet can <b>improve</b> my <b>blood pressure</b>					

## Appendix H

## Post- Education Questionnaire

Please read each of the following statements and circle the appropriated number that corresponds to your answer to the question: 1 = Completely Disagree 2= Somewhat Disagree 3=Neither Agree nor Disagree 4= Somewhat agree 5= Agree

	1 = Completely Disagree	2= Somewhat Disagree	3=Neither Agree nor Disagree	4= Somewhat agree	5= Agree
I know what <b>DASH</b> stands for					
I know about the <b>benefits</b> of <b>DASH</b> diet					
I can <b>identify</b> <b>foods</b> in the <b>DASH</b> diet					
It is <b>important</b> to <b>understand</b> <b>DASH</b> diet					
Following <b>the</b> <b>DASH</b> diet can <b>improve</b> my <b>blood pressure</b>					

## Appendix I

## Pre-Education Food Frequency Questionnaire

Please read each of the following statements and check the appropriated box that corresponds to your answer to the question: 1= often 2= sometimes 3= seldom 4= never

	1= Less than once weekly	2= 1-2 times weekly	3= 3-4 times weekly	4= every day
How often do you eat <b>grains</b>				
How often do you eat <b>fruits</b>				
How often do you eat <b>vegetables</b>				



## Appendix J

## Post-Education Food Frequency Questionnaire

Please read each of the following statements and check the appropriated box that corresponds to your answer to the question: 1= often 2= sometimes 3= seldom 4= never

	1= Less than once weekly	2= 1-2 times weekly	3= 3-4 times weekly	4= every day
How often do you eat <b>grains</b>				
How often do you eat <b>fruits</b>				
How often do you eat <b>vegetables</b>				

## Appendix K

## DASH Diet Education Outline DASH Education Sessions

## Session 1 (Week 1)

- Introduction
- Blood pressure checks
- Prequestionnaire distributed
- Distribute handout
- Overview of hypertension
- Summarize material answer questions

## Session 2 (Week 2)

- Review any question from the last session
- Prequestionnaire distributed if not completed the last session
- Distribute handouts
- Overview of Sodium (Salt)
- Comparing and Reading Labels
- Summarize material answer question

## Session 3 (Week 3)

- Review any question from the previous session
- Distribute handouts
- Introduction to DASH diet eating plan
- Overview of Grains, Vegetables, Fruits, Meats
- Plan recipes and review creating a menu
- Distribute DASH diet pamphlet's

## Session 4 (Week)

- Review any question from the last session
- Discussion about DASH diet menus created
- Overview of the other components DASH
- Nuts, Low Fat dairy, Sweets, Oils,
- Review food selections
- Blood pressure checks
- Summarized DASH recommendations
- Complete post-education questionnaires