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**The Influence of DASH Diet Education on Knowledge and Adherence  
in Primary Care: A Quality Improvement Project**

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### Abstract

**Background/Local Problem:** A rural family practice was concerned about the number of patients with uncontrolled hypertension, 19.86%  $n = 56$ , as defined by the Centers for Disease Control and Prevention (CDC). After several quality improvement (QI) initiatives to lower the prevalence rate of uncontrolled hypertension, including proper measurement techniques and home monitoring, the modifiable risk factor of adapting one's food intake was introduced using the Dietary Approach to Stop Hypertension (DASH) diet as an intervention. The DASH diet is an evidence-based approach for lowering blood pressure. The QI project was completed with the purpose of implementing DASH diet education and measuring patient adherence to the DASH diet.

**Methods:** The QI project is a pre/post QI design in which the PDSA cycle was used as a framework for implementation.

**Interventions:** Patients were educated on the DASH diet during an office visit and a follow-up telephone call three weeks later provided further support and assessment of knowledge and adherence.

**Results:** A paired t-test was run on the pre and post-surveys demonstrated a statistically significant change ( $p=0.048$ ) in knowledge and a moderately statistically significant change ( $p=0.076$ ) in adherence.

**Conclusion:** For patients with uncontrolled blood pressure in a rural family practice, education on the DASH diet and follow-up phone call, provides an opportunity to improve DASH diet knowledge and adherence. Further studies will determine if improved blood pressure is achieved in this population.

**Keywords** DASH Diet, Education, Adherence, Primary Care

### **Introduction**

There are 116 million people in the United States (U.S.) with diagnosed hypertension, which is nearly half of the U.S. population (Centers for Disease Control and Prevention [CDC], 2020). Of those with diagnosed hypertension, only 24% are within the goal (CDC, 2020). The United States Surgeon General has presented three goals for hypertension management which include: 1) making hypertension control a national priority, 2) ensuring that the places where people learn, live work and play are supportive of hypertension management, and 3) enhancing patient care for hypertension (CDC, 2020). In 2011, uncontrolled blood pressure was associated with \$45 billion in direct medical costs (CDC, 2018). The goal for hypertension as defined by the Center for Medicare & Medicaid Services (CMS, 2019) is less than 140 systolic and less than 90 diastolic. Likewise, the American Heart Association (2019) classifies stage two hypertension as a systolic greater than 140 or a diastolic greater than 90. Achieving these goals can be challenging and are related to modifiable and non-modifiable risk factors.

There are a variety of modifiable risk factors to influence blood pressure. One of the interventions that evidence supports is the use of the DASH diet for hypertension management (National Heart, Lung and Blood Institute, 2021.; Oza & Garcellano, 2015; Whelton et al., 2018; Unger et al., 2020; US Preventative Services Task Force, 2020). See Table 2. The DASH diet encourages increased intake of fruits, vegetables, and whole grains while limiting saturated fats, sugar-sweetened beverages, full-fat dairy products, and fatty meats. The DASH diet also encourages increased consumption of poultry, beans, and fat-free dairy products. The DASH diet is high in potassium, calcium, magnesium, fiber, and protein. It is low in sodium, saturated and trans fats (National Heart, Lung, and Blood Institute, 2021).

**Available Knowledge**

A rapid integrative review of the literature was completed using CINAHL Complete and PubMed to identify interventions to influence DASH Diet knowledge and adherence in primary care. Due to the limited amount of research specific to DASH diet education in primary care, the literature was also reviewed that included any nutrition counseling intervention rather than a hypertension specific or DASH dietary intervention. Additionally, professional organizations' recommendations for dietary intervention for hypertensive patients were included.

The results of the literature review revealed that counseling on nutrition is an effective strategy, but a single counseling session alone is not sufficient to change blood pressure (Dedum et al., 2019; Divens & Carter-Holmes, 2019; Nolan et al., 2018). The literature revealed that measuring compliance is a barrier to assessing the educational intervention. The studies inferred adherence based on blood pressure outcomes, but did not measure adherence directly.

Counseling related to diet and lifestyle modifications has the potential to be effective and should be included in a patient's plan of care (Oza & Garcellano, 2015; Whelton et al., 2018; Unger et al., 2020; US Preventative Services Task Force, 2020). Single sessions of education without follow up by the healthcare providers, however, are not effective to lead to behavior change and, in turn, influence blood pressure (Dedum et al., 2019; Divens & Carter-Holmes, 2019; Nolan et al., 2018; Wong et al., 2016).

Limitations of the review were that, while there is plentiful data on the DASH diet's effectiveness, there is a lack of research on the influence of counseling on adherence to the DASH diet. In addition, the researchers frequently mentioned the objective nature of a study of adherence to a diet without alternative measures. In other words, adherence was frequently measured via patient report rather than measured.

### **Organizational Assessment**

The rural family practice was assessed using the Burke and Litwin Model (1992). The assessment of the organization using this model offered insight into the internal and external factors that influence the culture within the practice. The Burke and Litwin Model (1992) is appropriate to assess the organization because the model is comprehensive and offers an opportunity for interaction between the concepts. A SWOT analysis was completed that offers insight into the organization's practices, external threats, and opportunities (See Table 1). The rural family practice is a privately- owned patient-centered medical home. The organization's employees work together to improve outcomes for their patients. The practice identified a need for lifestyle modification education for patients with hypertension. Previous interventions at the practice have focused on home blood pressure monitoring and training staff to accurately measure blood pressure (Aprillando, 2020; Crow, 2021). Previous interventions have not included the use of the DASH diet. A nutrition-based intervention for improving hypertension could result in improved outcomes for the patient population that the quality improvement (QI) intervention targets (Appel et al., 2003; National Heart, Lung, and Blood Institute, 2021), and would meet the needs of the practice identified using the Burke and Litwin Model (1992).

### **Phenomenon Model**

After completion of the organizational assessment, the Health Promotion Model (HPM) was used to examine the phenomenon of uncontrolled blood pressure within the rural family practice (Pender, 2011). The HPM is appropriate for assessing a nutrition-based hypertension intervention because the success or failure of the intervention relies heavily on the patient's knowledge and adherence to the diet. If patients successfully adhere to the DASH diet it is possible to lower systolic blood pressure up to 11 mmHg (American Heart Association, 2019)

rendering many to a normotensive pressure. The organization's staff provides the resources for success, but the behavior is the responsibility of the patient. Furthermore, evidence supporting the DASH Diet's effectiveness is reinforced by current studies and national guidelines for hypertension management in primary care (Oza & Garcellano, 2015; Whelton et al., 2018; Unger et al., 2020; US Preventative Services Task Force, 2020). In summary, the DASH Diet's effectiveness is highly dependent on patient adherence to the diet, as demonstrated in the HPM theoretical framework.

### **Specific Aims**

The results of the literature review, organizational assessment, and review of previous DNP projects at the clinical site related to hypertension led to the clinical question: Does the implementation of a standardized DASH Diet education program and patient follow up improve knowledge and adherence to diet in hypertensive patients in a rural primary care office? The purpose of this article is to discuss the findings of a rural primary care QI project to address uncontrolled hypertension through a dietary intervention.

### **Methods**

#### **Context**

The QI project had the purpose of improving the level of knowledge and adherence for hypertensive patients in a rural primary care practice through education and evaluation of adherence to the DASH diet. The population that was included in the intervention was patients with uncontrolled hypertension within the practice. Key stakeholders within the practice included one physician/practice owner, one nurse practitioner, one care manager, two medical assistants (MA), two desk staff, and one office manager. The QI project was a pre/post-intervention design incorporating the Plan-Do-Study-Act (PDSA) cycle as the framework (Crowfoot & Prasad,

2017) (See Figure 1). Powell et al. (2015) offers strategies for the implementation of a QI project. These strategies were used in the various stages of the QI project to operationalize the intervention. The strategies and their alignment with the PDSA cycle can be seen in Table 2. The following paragraphs will delineate the cycle steps of the Plan, Do, Study Act (PDSA) Cycle (Crowfoot & Prasad, 2017) in this QI project.

### **Intervention and PDSA Cycle Alignment**

#### **Plan Stage of the PDSA**

The organization was assessed for readiness and barriers and facilitators were identified through attendance at monthly staff meetings and a thorough organizational assessment (Powell et al., 2015). Prior to intervention, effective educational materials were identified. Educational materials included process flowcharts for the organizational stakeholders, and patient education materials from the local Health and Human Services office (Powell et al., 2015).

#### ***Ethical Considerations***

As part of the implementation planning, a formal implementation blueprint was developed (Powell et al., 2015). The university's institutional review board approved this QI project as not research. Ethical considerations that were accounted for before implementation of the QI project included data collection and data storage using codes and de-identified data. Only aggregate data were reported so that patients could not be identified. All patients had the opportunity to opt-out of the intervention. The report that identifies patients within the practice that have blood pressure greater than 140/90 was run by the project lead. The report revealed 40 patients with uncontrolled blood pressure. Of the 40 patients (N=40), 24 had appointments within the intervention time frame of December 2021-February 1, 2022. Of the 24 patients (n=24), four no longer met the inclusion criteria due to rescheduling their appointment for after



the intervention period. The final sample was 20 patients (n=20). Twenty patients received the educational intervention and completed the pre-intervention surveys.

### **Do Stage of the PDSA**

The intervention was completed over a period of 10 weeks. At the beginning and end of the intervention, patients completed surveys that measured their level of knowledge and adherence to the DASH diet. Patients were eligible for the intervention if they met the inclusion criteria of having a blood pressure at their most recent appointment of greater than 140/90 indicated on the EHR report, and having an appointment scheduled during the intervention time frame. Patients were excluded from the intervention if they did not have a follow-up appointment scheduled within the QI intervention timeframe, or if they chose not to participate.

Patients began the intervention by completing the pre-implementation surveys upon check-in for their appointment. The patients were given time to complete the surveys before being escorted to the exam room by the MA. The MA then collected the surveys and provided DASH diet education handouts and verbal education to the patient. The MA completed their intake and checked the patient's blood pressure. If their blood pressure was greater than 140/90, the provider was notified. The provider then gave additional DASH diet verbal education to the patient during the appointment and ensured the education was documented as completed in the EHR premade template. The patient was offered a referral to the care manager.

The project lead, acting as the care manager, completed a follow-up call within three weeks. During the follow-up call, the patient was asked about their compliance with home blood pressure medications, home blood pressure monitoring, and adherence to the DASH diet. Further education was provided to the patient regarding DASH-appropriate foods and ways to overcome barriers to adherence to the diet. Post-implementation surveys were administered to willing

patients. A note was placed in the patient's chart and the surveys were placed in the designated location.

### **Study Stage of the PDSA**

This QI project measured several outcomes and process changes. Tools for measurement were screened for reliability and validity. Measurement of outcomes included the patient's knowledge and adherence to the DASH diet before education on the DASH diet and at the three-week follow-up phone call. This was completed through pre and post-intervention surveys. The chosen survey for this intervention to study knowledge was a modification of the Becker et al. (2004) survey. See Figure 2. The Salt Intake Questionnaire was used to measure adherence (Charlton et al., 2008). See Figure 3. The measured process change was the stakeholder's adherence to the QI process. The project lead measured adherence by using a chart audit that identified if patients were educated on the DASH diet, if documentation of education was completed, and if care manager referrals were placed as appropriate.

### ***Outcomes***

Telephone follow-up was completed on n=13 patients. Of the 13 patients that were contacted via telephone, n=8 completed post-surveys measuring knowledge and n=7 completed post-surveys measuring adherence. See Table 3 and Table 4. Of the 20 patients (n=20) that were initially identified, 13 (n=13) received the intervention. The decrease in patients that received the initial intervention was due to barriers in contacting patients via telephone. Of the 13, the decrease in patients completing post-surveys was due to patient refusal to complete post-intervention surveys via telephone.

### ***Process Change***

There was no formal process in place for education and referral to care management

services at the primary care practice prior to the intervention. The literature revealed that diet education and patient follow up led to improved diet adherence. Therefore, site adherence was assessed to ensure the process was being followed. Site adherence was assessed via chart audit. Education was documented as completed in n=16 (80%) of patients. Of the patients that received the intervention (n=20), n=9 had a blood pressure at their appointment that was greater than 140/90 and, therefore, qualified for a care manager referral. Four had documentation of offer and patient referral refusal and five had no documentation of an offer for referral for care management services. Zero patients that qualified for care management services received a referral.

### **Act Stage of the PDSA**

The final data was analyzed and presented back to the practice by the project lead. The practice was provided the results and was offered suggestions for sustainability. The first suggestion was that the care manager's role is utilized to its full potential. This could be done by continuing to educate patients at each encounter. To assist in eliminating the barrier of telephone encounters, patients that are appropriate for care management services should be identified at the start of each day. When possible, the care manager should see the identified patients on the same day as their in-person visit with their healthcare provider at the primary care practice. Another opportunity for improved sustainability, identified by the project lead, was to continue to follow up with patients after the appointment. This could be completed through increased use of the patient portal. The patient portal could cue patients with recipes or follow-up messages to maintain dietary engagement. The final opportunity for sustainability identified by the project lead is to consider placing cues throughout the primary care office (posters, recipes, et cetera. Through these methods, there is hope that engagement with the diet will remain at the forefront

of the patient's mind and, therefore, improve adherence to the DASH diet.

The site was also provided data on the cost mitigation that this QI project offers. The potential cost of the intervention included in the cost mitigation analysis included project team time, and materials (such as handouts and surveys). The potential revenue for the practice during this QI intervention was \$2,724.44. See Table 5.

### **Results**

After the completion of the QI project intervention, the analysis of the results was completed. The results of the surveys were initially analyzed using MANOVA testing to determine if the data was normally distributed. The MANOVA test determined that the data was normally distributed without outliers. Therefore, a paired t-test was conducted on both the Salt Intake Questionnaire (Charlton et al., 2008) and the Becker et al. (2004) survey. The paired t-test was chosen because a paired t-test measures the difference between the two measurements. In this case, the paired t-test was used to address the mean difference between the patient's pre-and post-knowledge. In addition to the paired t-test, comments from patients were noted to provide additional insight into the patient experience.

The results of the paired t-test indicated a statistically significant change in knowledge ( $p=0.048$ ) after the intervention. The results of the paired t-test indicated a moderately significant change in adherence at the 0.1 level ( $p=0.076$ ). It is unclear if adherence would be statistically significant at the 0.05 level with a larger population. Additional comments from patients were collected via telephone encounters. The comments included expressions of increased awareness of the DASH diet and changes made. The patients also noted the difficulties encountered while trying to make changes around the holiday season. Many patients expressed appreciation of the calls to "keep the diet on [their] radar".

## **Discussion**

### **Summary**

At a rural primary care practice in the Midwest, there was an opportunity for improved lifestyle modification education for patients with uncontrolled hypertension. Previous DNP projects have set a foundation for improved hypertension management within the practice through education on proper blood pressure techniques and home blood pressure monitoring. However, the potential for increased incentive dollars from insurance payers remains. Insurance companies reimburse based on patients within the goal of less than 140/90. After an assessment of the organization and a review of the literature, a QI project with the aim of improving the level of knowledge and adherence to the DASH diet was implemented at a rural primary care practice using the PDSA cycle (Crowfoot & Prasad, 2017) and implementation strategies identified by Powell et al. (2015). The DASH diet is a well-researched diet that practitioners recommend to their hypertensive patients because it is based on evidence

The QI intervention was a pre-post study design that measured the level of knowledge and adherence to the DASH diet. Pre-intervention surveys were administered before education was provided by the MAs and providers. Three weeks after the educational intervention, the project lead completed a telephone follow-up call. During the follow-up call, the patient was further educated on the DASH diet and post-intervention surveys were administered.

This QI project shows that education and proper follow-up can improve knowledge and adherence to the DASH diet. The comments by the patients offer additional insight into the benefits of this intervention. Patients noted that the follow-up phone call allowed them to keep the DASH diet “on [their] radar.” In addition to the benefits for the patients, the primary care practice has the potential for increased revenue of \$2,724.44.

Telephone encounters proved difficult during the intervention. Because of the difficulty in contacting patients via phone, the project lead recommends that whenever possible the care manager intervene with the patients at the scheduled appointment, and at any subsequent appointments. There is an opportunity for the organization to modify the QI intervention and implement a subsequent PDSA cycle for improved sustainability.

### **Limitations**

This QI project was limited by the time available to complete the intervention. Therefore, the change in blood pressure was not able to be assessed. Future projects at this office could consider measuring the blood pressure of patients after adherence is assessed. Another limitation that should be noted is the variation in the method of pre and post-survey administration (in-person versus over-the-phone). While this was a limitation, it also offered an opportunity for the phone call to develop into additional educational opportunities based on the responses to the post-survey. The limitation of the particular chosen survey is that while the Salt Intake Questionnaire (Charlton et al., 2008) is reliable and validated, the Becker et al. (2004) survey was modified from its original version to meet the needs of this project, so the reliability and validity is diminished.

Another limitation to the project is the method in which pre and post-surveys were administered. The pre-survey was completed independently by the patient in person. The post-survey was administered by the project lead via telephone. This may have influenced the answers that patients provided. Finally, the project was limited by the fact that the project lead completed follow-up calls and collected data on all patients. Future use of the follow-up portion of the intervention would be limited to those that receive a care manager referral. The site has the opportunity to identify what the barriers to referral were in this QI project because zero referrals

were placed and, therefore, zero follow-ups would have been completed if it were not for the project lead making phone calls regardless of referral status.

### **Conclusion**

The use of the DASH diet is an evidence-based way to improve blood pressure in patients with hypertension. This QI project showed a statistically significant change in knowledge and a moderately statistically significant change in adherence. The project presented difficulty with telephone encounters. There is an opportunity for future interventions to modify the process in this QI project for improved sustainability and improved outcomes.

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## Tables

Table 1: SWOT Analysis

<i><b>SWOT Analysis</b></i>	
<i><b>Internal</b></i>	<i><b>External</b></i>
<i><b>Strengths</b></i>	<i><b>Opportunities</b></i>
<ul style="list-style-type: none"> <li>• Part of a private practice in southwest Michigan that allows for change without oversight from larger organization</li> <li>• Experienced staff that has participated in previous hypertension DNP projects that have provided a basis for this project</li> <li>• Appointment times are adequate to provide education and/or intervention for hypertension</li> <li>• On site case manager that has potential to provide nutrition consults</li> </ul>	<ul style="list-style-type: none"> <li>• Improving blood pressure control increases opportunity to capture incentive dollars from payors</li> <li>• Opportunity for billing for case manager services if she 1) receives proper training or 2) is trained on billing codes appropriate for visit (Centers for Medicare &amp; Medicaid Services, 2019; UnitedHealthcare Oxford, 2018).</li> <li>• Dietary Approaches to Stop Hypertension (DASH) eating plan offers opportunity for a decrease in systolic blood pressure an average of 11mmHg (American Heart Association, 2019).</li> </ul>
<i><b>Weaknesses</b></i>	<i><b>Threats</b></i>
<ul style="list-style-type: none"> <li>• Lack of communication with staff regarding quality measures and lack of knowledge by staff regarding quality metrics. Quality metrics are briefly communicated in monthly staff meetings</li> <li>• Private practice could be a weakness because of lack of resources and minimal guidance on primary and alternative contacts.</li> <li>• Lack of policy or procedure related to chronic condition management</li> <li>• As of June 2, 2021, n=56 patients are not at goal for hypertension (&lt;139/89) (19.86%).</li> </ul>	<ul style="list-style-type: none"> <li>• Insurance reimbursement does not consider yearly blood pressure readings. The only blood pressure reading that is considered in reimbursement is the last of the year. If a patient's last blood pressure reading of the year is not within goal, regardless of if all other readings are, then the organization does not meet goal.</li> <li>• Despite education and materials provided, the success of a nutrition based hypertension intervention relies heavily on patient compliance with the intervention</li> </ul>

Table 2: Implementation Strategies (Powell et al., 2015)

Implementation Strategy	Description	Framework Alignment
Assess for readiness and identify barriers and facilitators	Organizational assessment Monthly staff meetings	Plan, Act
Develop a formal implementation blueprint	Project proposal, IRB submission	Plan
Develop effective educational materials	Educational flowcharts for staff, educational materials for patients, staff	Plan
Develop tools for quality monitoring	Salt intake questionnaire (Charlton et al., 2008), Becker et al. (2004) survey	Plan, Study
Intervene with patients to enhance uptake and adherence	MA, provider, student	Do
Purposefully reexamine the implementation	EHR audit, review surveys	Act

Table 3: Knowledge Results

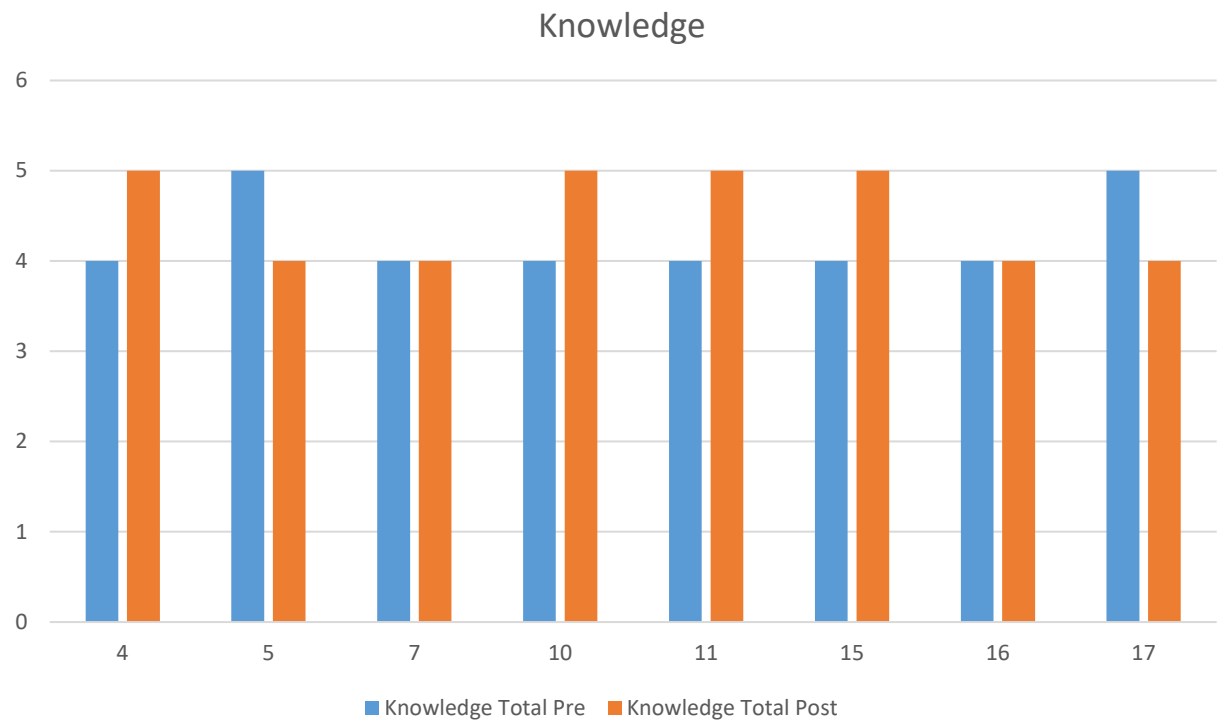


Table 4: Patient Adherence Results

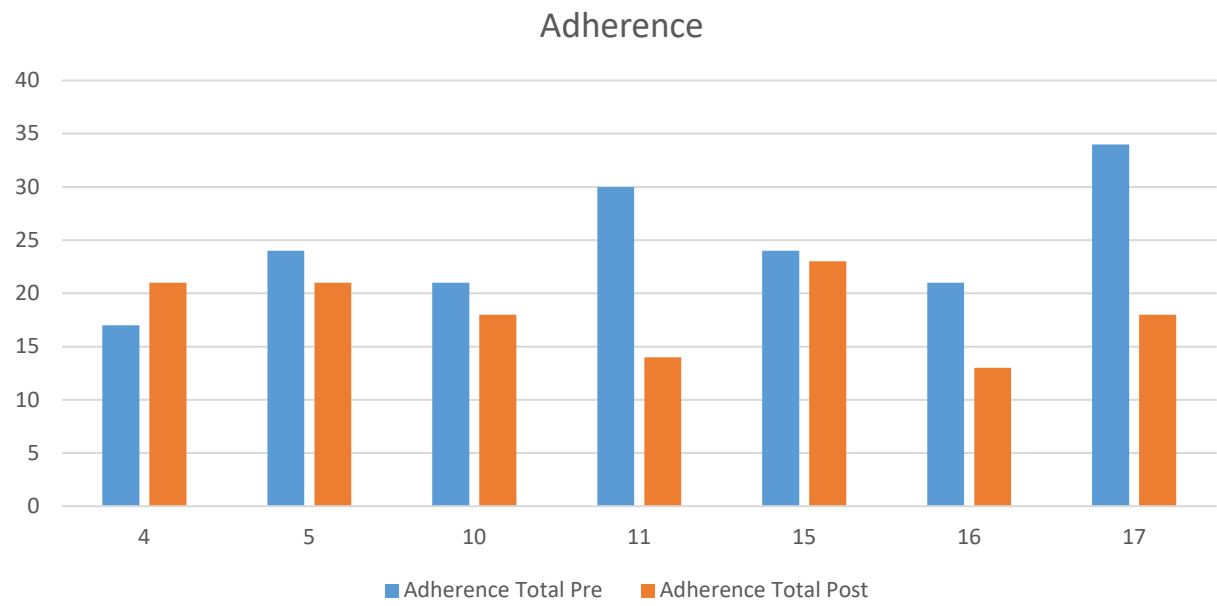


Table 5: Cost Mitigation

<b>Cost Mitigation if Blood Pressure Improved through Diet Adherence</b>	
Project Team Time (in kind donation)	\$12,580
Hypertension goal incentive	\$1,800
CPT Code 96152 for 1 patient	\$20.88 per 15 minutes
CPT Code 96152 for 20 patients	\$271.44
<b>Expenses for Implementation of Project</b>	
Project Team Time (in kind donation)	\$11,730
Team Member Education Time	\$88
Consultation with Site Mentor (in kind donation)	\$90
Materials (handouts, surveys, data storage)	\$64
Total Expenses	\$11,972
<b>Annual Cost Mitigation</b>	<b>\$2,724.44</b>



**Figures**

Figure 1: PDSA Cycle (Crowfoot &amp; Prasad, 2017)

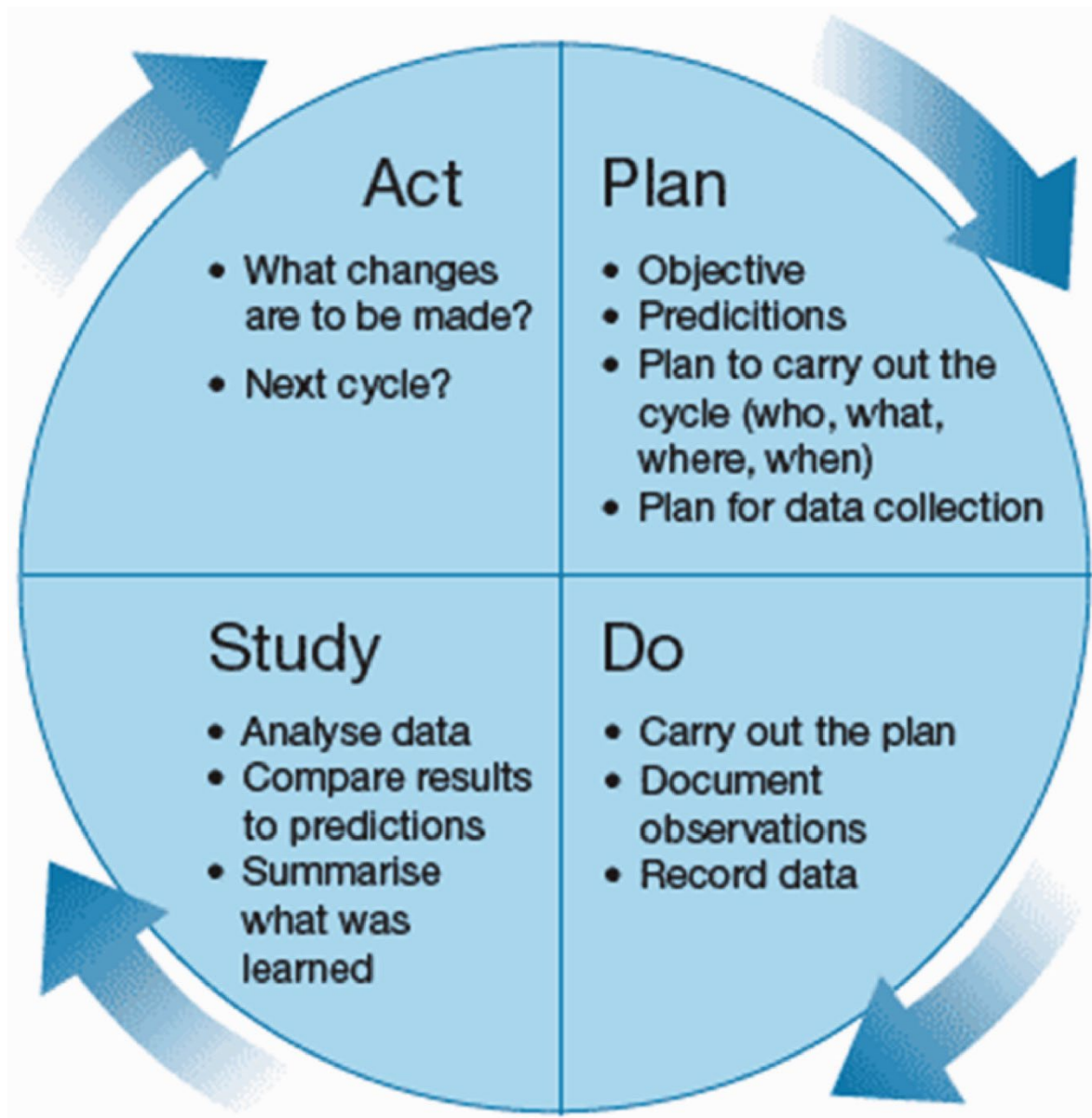


Figure 2: Becker (2014) Knowledge Survey

NAME \_\_\_\_\_

1. There is a relationship between the food I eat and my blood pressure

**True****False**

2. Amount of salt allowed for patients with high blood pressure is....

**none****2/3 teaspoon****1 teaspoon****unlimited****Don't know**

3. People should eat 5 or more portions of fruit and vegetables per day

**True****False**

4. Vegetables and fruit can reduce your blood pressure

**True****False**

5. Herbs can be used to flavor food instead of salt

**True****False**

Figure 3: Salt Intake Questionnaire

NUTRITIONAL AND LIFESTYLE HABITS							Office use	
The following questions are about your dietary and lifestyle habits. All your answers will be strictly confidential								
Study number:							3	
During the <b>PAST 7 days (1 week)</b> did you eat any of the following? IF YES, ASK HOW OFTEN (if no, circle never) [DO NOT PROMPT THE ANSWER OPTIONS BELOW]								
tel:012345%20012345	NOT EVERY DAY		EVERY DAY					
	1-3 times per week	4-6 times per week	1 time a day	2 times a day	3+ times a day			
White bread/white bread rolls	0	1	2	3	4	5	4	
Brown/wholewheat bread/rolls	0	1	2	3	4	5		
Breakfast cereal (processed)	0	1	2	3	4	5		
Breakfast cereal (minimally processed – weetbix, muesli, etc.)	0	1	2	3	4	5		
Crackers (ProVita, etc.)	0	1	2	3	4	5		
Cookies, biscuits, rusks	0	1	2	3	4	5		
Cake/scone/muffin/puddings/pancake/fruit pie/koeksister	0	1	2	3	4	5		
Roti/samosa/spring roll/doughnut	0	1	2	3	4	5		
Pizza	0	1	2	3	4	5		
Pasta/noodle dishes with cheese sauces (macaroni cheese, lasagne, noodle salad, etc.)	0	1	2	3	4	5		
Popcorn	0	1	2	3	4	5		
Crisps (Simba, Niknaks, etc.)	0	1	2	3	4	5		
Beef sausage (boerewors)	0	1	2	3	4	5		
Polony/salami/bacon/salami/pork sausages (processed meat, cooked, smoked and canned)	0	1	2	3	4	5		
Meat or chicken pies/sausage rolls	0	1	2	3	4	5		
Chicken – battered (KFC, etc.) and chicken burger only	0	1	2	3	4	5		
Meat and meat dishes (steaks, minced meat, cottage pie, mince, meatballs, stew, bobotie, etc.)	0	1	2	3	4	5		
Gravy, made with stock or gravy powder	0	1	2	3	4	5		
Biltong/dry wors/fish biltong	0	1	2	3	4	5		
Milk (all types, also dairy fruit juice, malted milk, milk shakes)	0	1	2	3	4	5		
Maas (fermented milk)	0	1	2	3	4	5		
Cheese	0	1	2	3	4	5		
Yoghurt	0	1	2	3	4	5		
Eggs	0	1	2	3	4	5		
Tinned fish (pilchards, tuna, etc.)	0	1	2	3	4	5		
Other fish and seafood	0	1	2	3	4	5		
Potato chips/French fries and potato salad	0	1	2	3	4	5		
Canned vegetables, incl. baked beans, tomato paste, sweet corn, etc.	0	1	2	3	4	5		
Soup (all types)	0	1	2	3	4	5		
Salad dressing/mayonnaise	0	1	2	3	4	5		
Ice cream (all types)	0	1	2	3	4	5		
Margarines, all types, also butter	0	1	2	3	4	5		
Chutney/atchar/chakalaka/Worcester sauce	0	1	2	3	4	5		
Savoury sauces (mushroom, monkey gland, white, cheese)	0	1	2	3	4	5		
Tomato sauce	0	1	2	3	4	5		
Salt	0	1	2	3	4	5		
Aromat/Fondor/mustard	0	1	2	3	4	5		
Peanuts	0	1	2	3	4	5		
Peanut butter	0	1	2	3	4	5		
Marmite/Bovril	0	1	2	3	4	5		
Chocolate sweets and sauce	0	1	2	3	4	5		
Beer and cider	0	1	2	3	4	5		

# The Influence of DASH Diet Education on Knowledge and Adherence in Primary Care

Paige Bekker  
DNP Project Defense  
April 8, 2022



# Acknowledgements

- Faculty advisor: Dr. Della Hughes-Carter
- Project Committee: Dr. Hoffman, Dr. Anne McKay
- Healthcare team
- Tori Basso Statistics GA
- No additional funding

# Objectives for Presentation

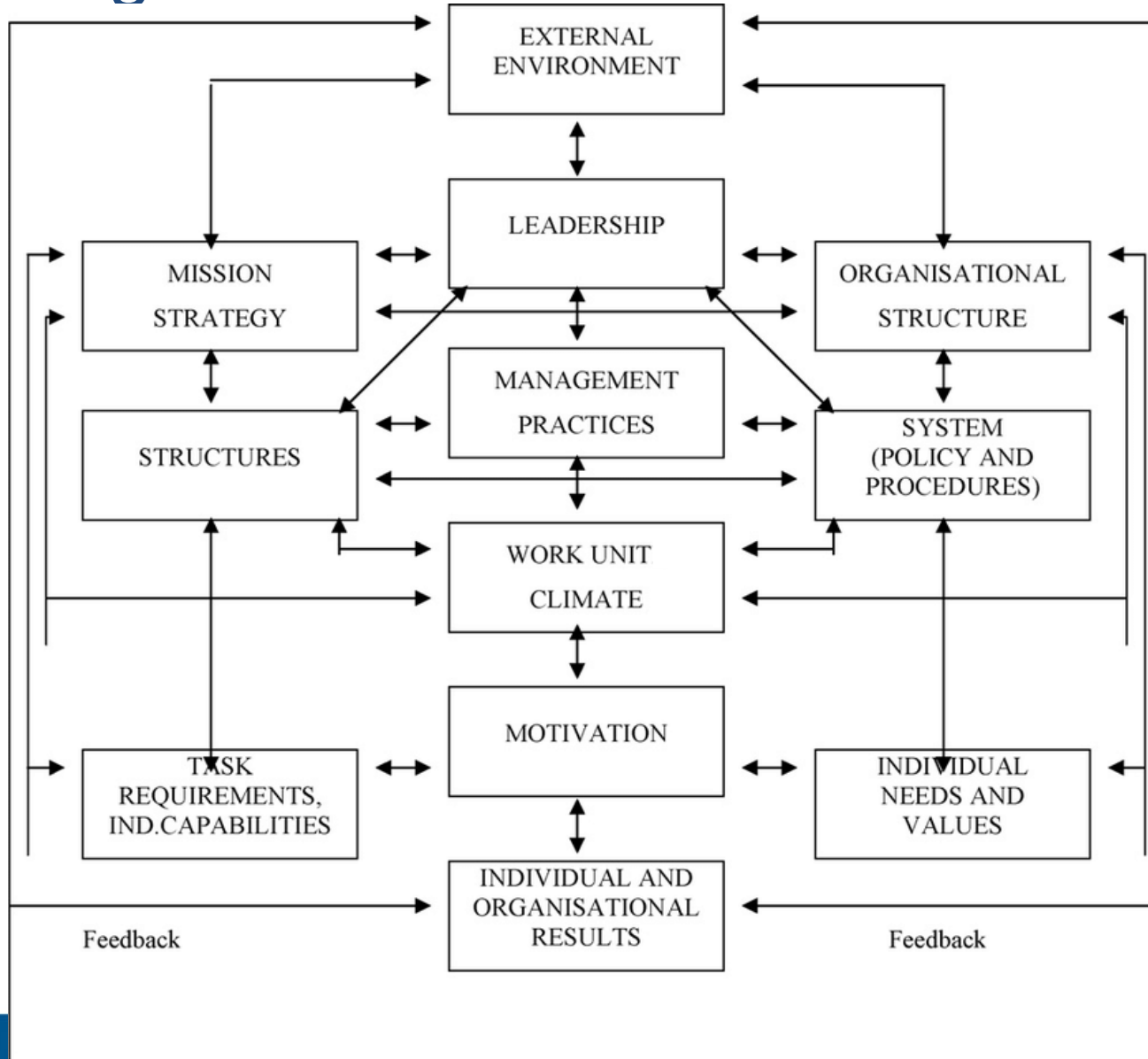
1. Assess the clinical problem of uncontrolled hypertension and patients' knowledge about DASH diet within the organization
2. Discuss the level of evidence available in literature related to DASH diet and hypertension management
3. Discuss the implemented QI project in a primary care office for patients with uncontrolled hypertension to improve adherence to DASH diet
4. Review the outcomes of the implemented QI project
5. Discuss strategies for sustainability



# Clinical Phenomenon

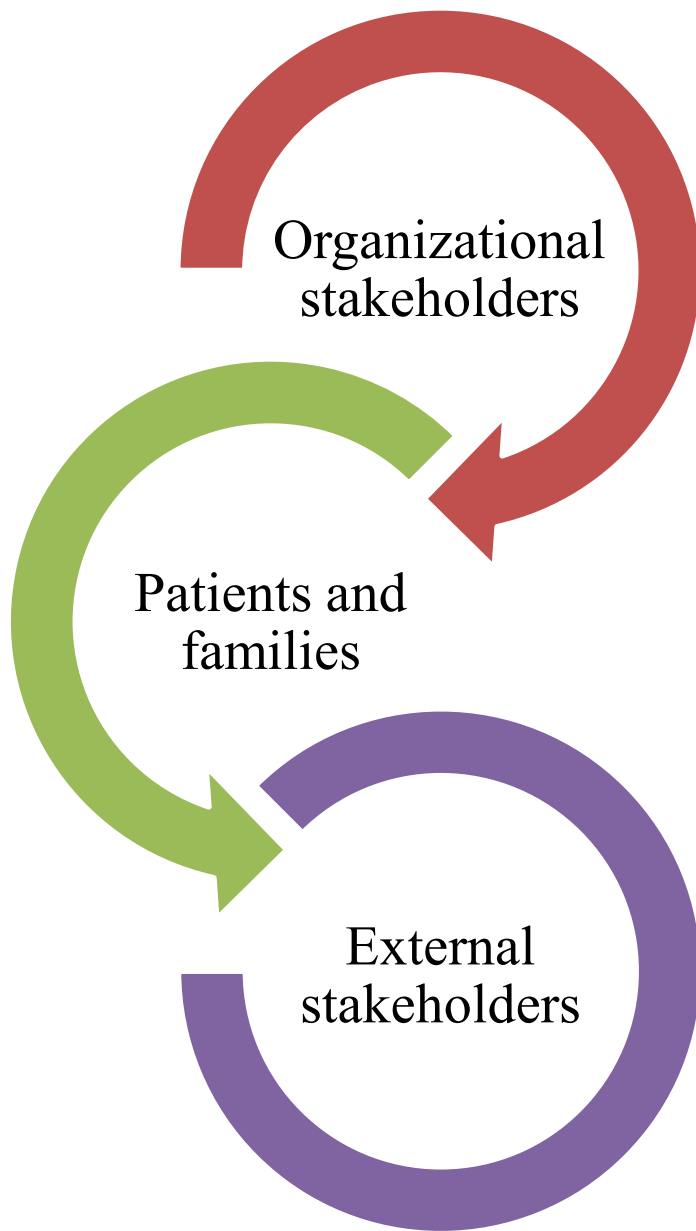
- Only 25% of the U.S. population with diagnosed hypertension are within goal (Center for Disease Control and Prevention, 2020)
- Uncontrolled blood pressure is associated with \$45 billion in direct medical costs (Centers for Disease Control and Prevention, 2018).
- Evidence supports the use of the DASH diet for hypertension management (National Heart, Lung and Blood Institute, n.d.; Oza & Garcellano, 2015; Whelton et al., 2018; Unger et al., 2020; US Preventative Services Task Force, 2020)
  - DASH diet's effectiveness is reinforced by current studies and national guidelines encouraging the use of the diet (Oza & Garcellano, 2015; Whelton et al., 2018; Unger et al., 2020; US Preventative Services Task Force, 2020).

# Organizational Assessment Findings



(Burke & Litwin, 1992)





- Physician and NP
- MA (2)
- Office manager
- RN Care manager
- Desk staff (2)
- Diagnosis of hypertension (ICD10: I10)
- Goal of <140/90 not met
- Families of those with hypertension diagnosis
- Center for Medicare & Medicaid Services
- Private Insurance companies

# SWOT Analysis

Strengths	Opportunities
<ul style="list-style-type: none"><li>• Part of a private practice in the Midwest</li><li>• Experienced staff that has participated in previous hypertension DNP projects</li><li>• Appointment times are adequate</li><li>• On site care manager</li></ul>	<ul style="list-style-type: none"><li>• <b>Opportunity to capture incentive dollars from payors</b></li><li>• Not a food desert</li><li>• <b>Dietary Approaches to Stop Hypertension (DASH) eating plan offers opportunity for a decrease in systolic blood pressure an average of 11mmHg (American Heart Association, 2019).</b></li></ul>

# SWOT Analysis

Weaknesses	Threats
<ul style="list-style-type: none"><li>• Opportunity for increased communication with team regarding quality measures</li><li>• <b>Lack of standardized process or procedure related to referral to CM for reimbursement</b></li><li>• At time of org. assessment, 56 patients are not at goal for hypertension (&lt;140/90) (19.86%)</li></ul>	<ul style="list-style-type: none"><li>• Incentive payments set by insurance companies are based only on most recent in office blood pressure</li><li>• The incentives placed by insurance companies do not consider patient or provider specific variables</li><li>• <b>The success of a nutrition based hypertension intervention relies heavily on patient compliance</b></li></ul>

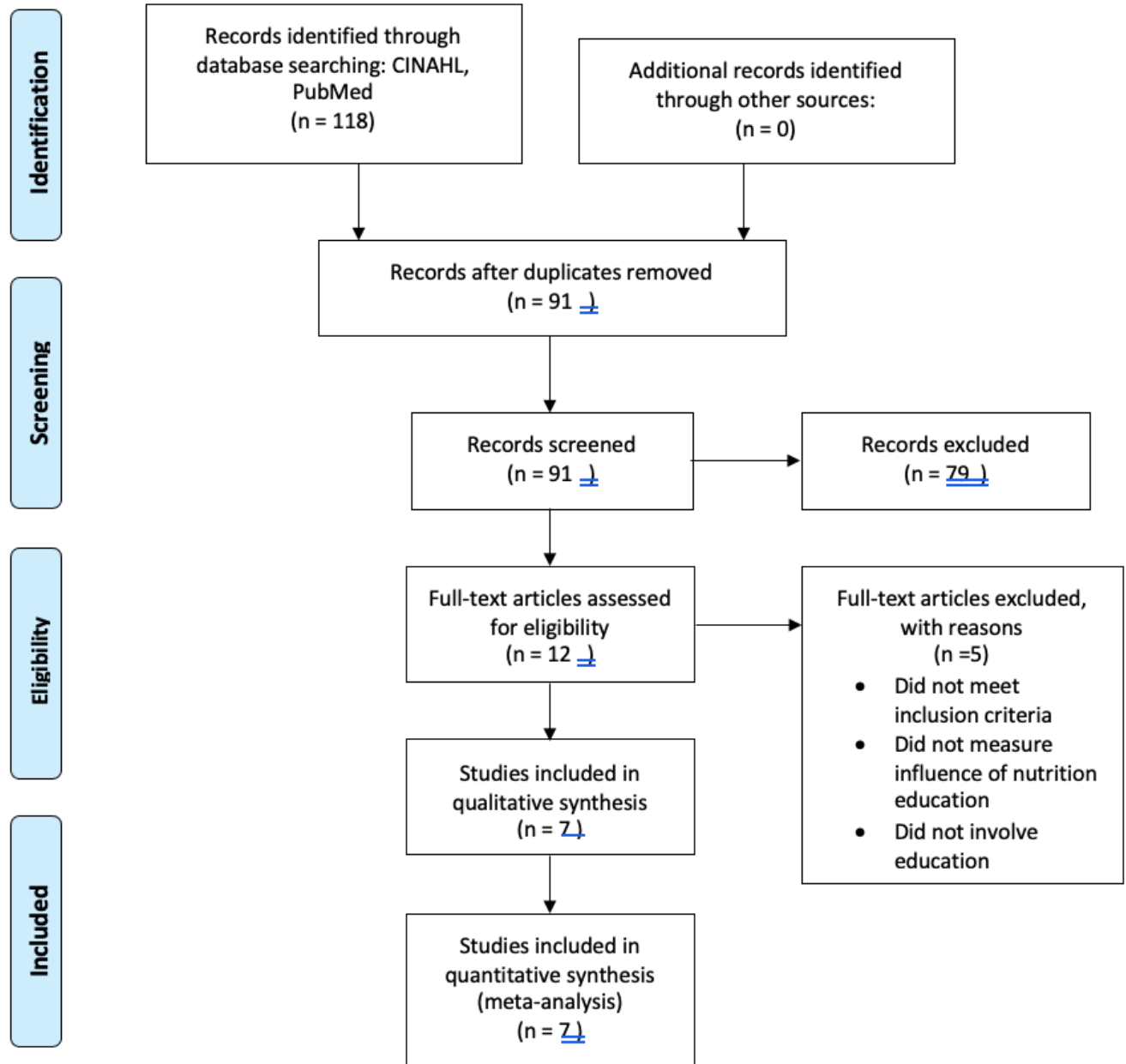
# Purpose of Literature Review

- Purpose: examine the current state of evidence related to the effect of nutrition-based counseling on the patient's ability to identify DASH diet appropriate foods and adhere to the DASH diet
- PICO Question: What is the impact of DASH diet education on DASH diet knowledge and adherence in hypertensive adults in primary care practice?

# Literature Review

- Process: Rapid integrative review
  - CINAHL Complete and PubMed
  - Inclusion: adult patients with or without hypertension and included an education and/or counselling intervention that focused on nutrition.
  - Exclusion: studied providers, children, gestational hypertension, or were not research.
  - Also included in the review is grey literature from professional organizations that offer recommendations for nutrition and hypertension and tools used for dietary screening.

# PRISMA Figure



# Synthesis of Results

- Dietary and lifestyle counseling is an effective strategy to improve BP control for patients in combination with other strategies
- Single sessions of education or education used out of conjunction with other interventions are not effective strategies for lifestyle modification (Dedum et al., 2019; Divens & Carter-Holmes, 2019; Nolan et al., 2018; Wong et al., 2016).

# Critique of Evidence

- Wide variety of implementation strategies
- All studies in primary care
- All studies included nutrition based intervention
- Influence of education on knowledge vs. adherence



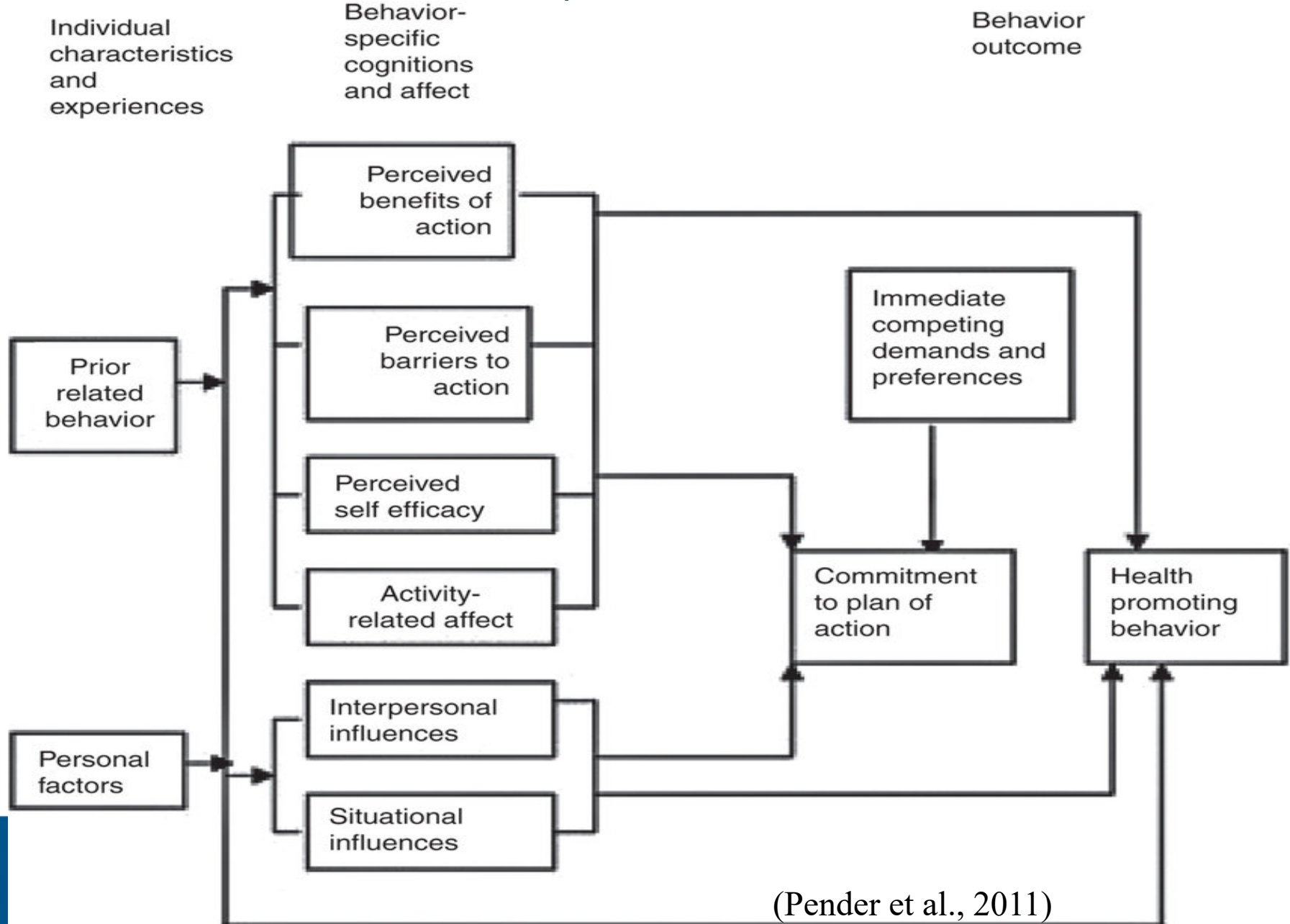
# Rationale for Intervention

- At time of org. assessment, total patients with diagnosis of hypertension including (I10: essential hypertension) was 282
- Population of patients not at goal when org. assessment completed was 56 or 19.86% of total patients
- Organizational request for nutrition intervention
- Previous DNP projects

# Clinical Practice Question

- **Does the implementation of DASH diet education and visit follow up improve knowledge and adherence to the DASH diet in hypertensive adults in a rural primary care office?**

# Framework/Conceptual Model for Phenomenon

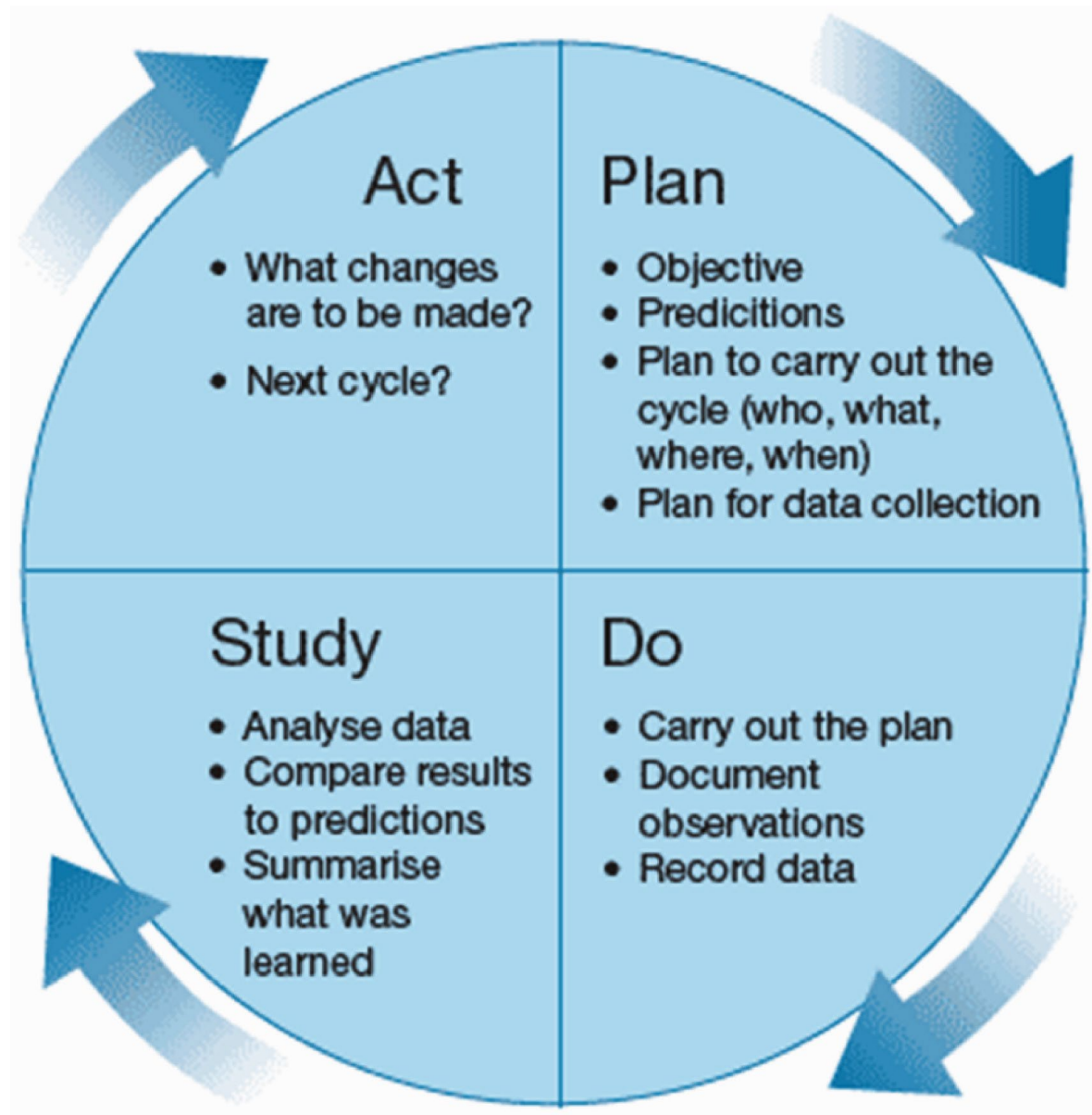


# PROJECT METHODOLOGY

# Purpose and Project Type

- Quality Improvement
- The purpose of this project is to improve level of knowledge and adherence to DASH diet for hypertensive patients in a rural primary care through education and evaluation of adherence to the DASH diet
  - Long term goal to decrease blood pressure

# PDSA Cycle



(Crowfoot & Prasad, 2017)

# Organizational Setting

- Privately owned primary care clinic in the Midwest
- Team members:
  - 1 physician/owner
  - 1 NP
  - 1 care manager
  - 2 MA's
  - 2 desk staff
  - 1 office manager

# Project Design

- Quality improvement project based on pre/post test intervention
- Improve knowledge and adherence to the DASH diet for hypertensive patients in primary care using educational intervention



# Short Term and Long Term Objectives

- Short term
  - Improve healthcare team knowledge of DASH diet
  - Influence patient knowledge and adherence to DASH diet
- Long term
  - Influence blood pressure for hypertensive patients
  - Improve reimbursement for hypertensive patients at blood pressure goal
  - Increase revenue for practice through CPT 96152

# Ethical Considerations

- Opportunity to abstain from intervention
- HIPPA
  - No identification of subjects in excel datasheet
- Privacy Considerations
  - Protect identifiers from improper use and disclosure via use of key and codebook
  - Destroy identifiers at the earliest opportunity

# IRB Approval



DATE: December 07, 2021

TO: Della Hughes-Carter  
FROM: Office of Research Compliance & Integrity  
PROJECT TITLE: The Influence of DASH Diet Education on Knowledge and Adherence in Primary Care  
REFERENCE #: 22-128-H  
SUBMISSION TYPE: IRB Research Determination Submission

ACTION: Not Research  
EFFECTIVE DATE: December 06, 2021  
REVIEW TYPE: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does not meet the definition of research\* according to current federal regulations. The project, therefore, does not require further review and approval by the IRB. Scholarly activities that are not covered under the Code of Federal Regulations should not be described or referred to as "research" in materials to participants, sponsors or in dissemination of findings. While performing this project, you are expected to adhere to the institution's code of conduct and any discipline-specific code of ethics.

A summary of the reviewed project and determination is as follows:

The project is the implementation of a process change for providing patient education on the DASH diet in those with uncontrolled hypertension in a rural primary care. The goal of this process change is to improve the care provided to patients and to maximize insurance reimbursement. This project is not designed to create new generalizable knowledge. Therefore, it does not meet the federal definition of research and IRB oversight is not needed.

This determination letter is limited to IRB review. It is your responsibility to ensure all necessary institutional permissions are obtained prior to beginning this project. This includes, but is not limited to, ensuring all contracts have been executed, any necessary Data Sharing Agreements and Material Transfer Agreements have been signed, and any other outstanding items are completed.

An archived record of this determination form can be found in IRBManager from the Dashboard by clicking the "\_ xForms" link under the "My Documents & Forms" menu.

If you have any questions, please contact the Office of Research Compliance and Integrity at (616) 331-3197 or [rci@gvsu.edu](mailto:rci@gvsu.edu). Please include your study title and study number in all correspondence with our office.

# PDSA Cycle



(Crowfoot & Prasad, 2017)

# Implementation Strategies & Elements (Plan)

1. Assess for readiness and identify barriers and facilitators
2. Develop a formal implementation blueprint
3. Develop effective educational materials
4. Develop tools for quality monitoring
5. Intervene with patients to enhance uptake and adherence
6. Purposefully reexamine the implementation
7. Audit and provide feedback



Based on Powell et al. (2015)

# Implementation Strategies & Elements

Implementation Strategy (Powell et al. 2015)	Description	Framework Alignment
Assess for readiness and identify barriers and facilitators	Organizational assessment Monthly staff meetings	Plan, Act
Develop a formal implementation blueprint	Project proposal, IRB submission	Plan
Develop effective educational materials	Educational flowcharts for staff, educational materials for patients, staff	Plan

# Implementation Strategies & Elements

Implementation Strategy (Powell et al. 2015)	Description	Framework Alignment
Develop tools for quality monitoring	Salt intake questionnaire, Becker et al. (2004)	Plan, study
Intervene with patients to enhance uptake and adherence	MA, provider, student	Do
Purposefully reexamine the implementation	EHR audit, review surveys	Act

# Implementation Strategies & Elements

Implementation Strategy (Powell et al. 2015)	Description	Framework Alignment
Audit and provide feedback	Sustainability plan for site	Study, Act



# PDSA Cycle



(Crowfoot & Prasad, 2017)

# Process Overview (Do)

Surveys distributed by  
front desk



MA collect survey and  
provide education



If BP > 140/90: provider  
aware

Provider reinforce  
education



Document DASH education  
and referral provided in plan



Follow up in 3 weeks via  
telephone call

Care manager call  
(within 3 weeks)

- Assess home BP monitoring and home medication compliance
- Educate patient on DASH diet
- Provide options for DASH appropriate foods
- Administer post intervention surveys

Documentation

- Document education provided in chart
- *Document billing codes*
- Place surveys in designated location

Ensure follow up

- Is follow up appointment scheduled?

# Implementation Tools

- DASH diet handout
- Salt handout
- EHR education template

Did you know eating too much salt can increase your blood pressure?

- ✓ High blood pressure is also called **hypertension**.
- ✓ High blood pressure can cause a stroke or heart attack.
- ✓ You can't feel high blood pressure.

Do you know your blood pressure numbers and what they mean?

ASK YOUR DOCTOR to help you sort out your blood pressure.	Top Number (systolic)	Bottom Number (diastolic)
Normal	120 or < 4	80 or < 4
Pre-high Blood Pressure (Pre-hypertension)	120-139	80-89
High Blood Pressure (Hypertension)	140 or > 4	90 or > 4

Numbers are for a healthy adult 18 years of age and older.

## How much sodium is too much?

The 2010 Dietary Guidelines for Americans recommend 1,500 mg of sodium each day for people:

- ✓ who are over the age of 51
- ✓ who are African American of any age
- ✓ with high blood pressure (hypertension)
- ✓ with diabetes, heart disease, or chronic kidney disease

People not listed above should eat less than 2,300 mg of sodium per day.

## What do these amounts of sodium look like?



## How much sodium do people eat now?

- ✓ Most people eat 3,400 mg of sodium each day or about 1 1/2 teaspoons of salt.
- ✓ Salt is added to restaurant, fast food meals and processed foods (like hot dogs, bacon, lunch meats, soups, canned foods, cereals, breads, and condiments) to increase flavor.
- ✓ It is easy to eat too much salt and not know it.
- ✓ Most of the salt we eat almost 80% comes from restaurant meals and processed foods.
- ✓ Most people only get 10% of their sodium from salt added during cooking or at the table.



## How can I eat less sodium?

### AT THE STORE

- ✓ Buy fresh foods and less pre-prepared and processed foods.
- ✓ Buy unsalted nuts, seeds, pretzels and other foods.
- ✓ Read food labels to learn how much sodium is in a serving.
- ✓ Choose foods with "unsalted" or "low sodium" or "no salt."

### AT RESTAURANTS

- ✓ Ask for a nutrition fact sheet. Use it to choose foods with less sodium.
- ✓ Ask to have your food made without salt.
- ✓ Only add pickled need to your food.

### AT HOME

- ✓ Drink no fresh fruits and vegetables instead of salty snacks.
- ✓ Try to eat 1/2 cup or more servings of vegetables each day. Much more potassium can be a potassium. Much more potassium can be a potassium.
- ✓ Cook more fresh foods at home.
- ✓ If you use salt, slowly eat less of it over time. You will get used to using less salt.
- ✓ Only add salt at the end of cooking; you will eat less.
- ✓ Use seasonings and herbs instead of salt to flavor your food. For example try one or more of these tips: Beef: onion, pepper, sage, thyme. Chicken: ginger, mustard, sage, thyme. Fish: curry powder, oil, dry mustard, lemon juice. Poultry: garlic, onion, parsley, sage, thyme. Tofu: salt, oil, onion, pepper.

## Your plan.

Check the ways you will eat less sodium.

- ✓ Eat more fresh fruits and vegetables.
- ✓ Cook more fresh foods at home.
- ✓ Eat less salty snacks.
- ✓ Read food labels to find the amount of sodium.
- ✓ Choose foods labeled "unsalted" or "low sodium."



Less salt. Better health.



Do we need salt? Yes. Some salt is necessary for good health. But, we don't need as much as we eat. Eating more fresh food, fruit, and vegetables is one way to help lower your blood pressure. Being physically active and keeping a healthy weight will also help lower blood pressure. Don't be misled by hypertension. a heart attack or a stroke - live better by cutting the salt.

Salt or sodium - which is it? Sodium is another name for salt. Food labels use the word sodium to tell you how much salt is in a serving. Sodium is measured in milligrams and is shown on labels as mg.





## GO Foods

Provide more nutrition and fewer calories; eat more often.

### VEGETABLES

All fresh or frozen vegetables: broccoli, spinach, dark green lettuce, collard and mustard greens, tomatoes, peppers, carrots, sweet potatoes, green beans, asparagus, peas, corn, potatoes, beans (lentils, kidney and pinto beans, chickpeas).

### FRUITS

All fresh, frozen, or canned (light syrup): Apples, bananas, oranges, melons, grapefruit, cherries, grapes, youth fruit juices, dried fruits, berries (strawberries, blueberries, raspberries).

### DAIRY PRODUCTS

Milk, fortified soy beverages, yogurt, cheeses (check sodium). Choices should be fat-free or low-fat.

### OILS

Use olive oil or canola oil; avoid fats that are solid at room temperature.

### GRAINS

Whole-wheat bread, whole-grain cereals and crackers, oatmeal, brown rice, enriched refined-grain products (bread, cereals, pasta, white rice).

### PROTEIN FOODS

All meat, poultry, seafood, eggs, nuts, seeds, and processed soy products (check sodium). Meat and poultry should be lean or low-fat and not processed.



## DASH Eating Plan Goals

by Calorie Level

Serving Size Examples	1,400 Calories	1,800 Calories	2,400 Calories
<b>Grains</b> 1 slice bread 1 ounce (½ cup) dry cereal ½ cup cooked rice, pasta, or cereal	5-6 servings daily	6 servings daily	7 servings daily
<b>Vegetables</b> 1 cup raw leafy vegetable ½ cup cut-up raw or cooked vegetable ½ cup vegetable juice	3-4 servings daily	4-5 servings daily	5-6 servings daily
<b>Fruits</b> 1 medium fruit ½ cup dried fruit ½ cup fruit, frozen, or canned fruit ½ cup fruit juice	4 servings daily	4-5 servings daily	5-6 servings daily
<b>Fat-free or low-fat milk, milk products</b> 1 cup milk or yogurt 1½ cup cheese	2-3 servings daily	2-3 servings daily	3 servings daily
<b>Lean meats, poultry, fish</b> 1 egg 1 ounce cooked meat, poultry, or fish	3-4 servings daily or less	6 servings daily or less	6 servings daily or less
<b>Nuts, seeds, and legumes</b> 1 oz nuts 2 tablespoons (½ cup) peanut butter ½ cup seeds ½ cup cooked beans or lentils	3 servings per week	4 servings per week	5 servings per week
<b>Fats and oils</b> 1 teaspoon (½ tsp) vegetable oil or olive oil 1½ tsp butter or soft margarine 2 tsp mayonnaise or salad dressing	1 serving daily	2-3 servings daily	3 servings daily
<b>Sweets and added sugars</b> 1 teaspoon sugar 1 tsp jelly or jam 1 tsp maple syrup or honey ¼ cup sorbet	3 servings per week or less	5 servings per week or less	1 serving daily
<b>Ideal sodium limit</b> ½ tsp salt = 1,500 mg	1,500 mg/day	1,500 mg/day	1,500 mg/day
<b>Maximum sodium limit</b> 1 tsp salt = 2,300 mg	2,300 mg/day	2,300 mg/day	2,300 mg/day

## Daily Calorie Needs

for Women

Age (years)	Calories needed to maintain weight Sedentary Activity Level	Calories needed to lose weight Sedentary Activity Level	Calories needed to maintain weight Moderately Active Level	Calories needed to lose weight Moderately Active Level	Calories needed to maintain weight Vigorous Activity Level	Calories needed to lose weight Vigorous Activity Level
19-30	2,000	1,500	2,000-2,200	1,500-1,700	2,400	1,900
31-50	1,800	1,300	2,000	1,500	2,200	1,700
51+	1,600	1,200	1,800	1,300	2,000-2,200	1,500-1,700

## Daily Calorie Needs

for Men

Age (years)	Calories needed to maintain weight Sedentary Activity Level	Calories needed to lose weight Sedentary Activity Level	Calories needed to maintain weight Moderately Active Level	Calories needed to lose weight Moderately Active Level	Calories needed to maintain weight Vigorous Activity Level	Calories needed to lose weight Vigorous Activity Level
19-30	2,400	1,900	2,600-2,800	2,100-2,300	3,000	2,500
31-50	2,200	1,700	2,400-2,600	1,900-2,100	2,800-3,000	2,300-2,500
51+	2,000	1,500	2,200-2,400	1,700-1,900	2,400-2,600	1,900-2,300

## Activity Levels

**Sedentary Activity Level**  
None or irregular physical activity.

**Moderate Activity Level**  
2 hours and 30 minutes (120 minutes) of moderate-intensity aerobic activity (like walking fast) every week and muscle-strengthening activities on 2 or more days a week.

**Vigorous Activity Level**  
1 hour and 15 minutes (75 minutes) of vigorous-intensity aerobic activity (like jogging or running) every week and muscle-strengthening activities on 2 or more days a week.

## 10 Minutes at a Time is Fine

We know 120 minutes each week sounds like a lot of time, but you don't have to do it all at once. Not only is it best to spread your activity out during the week, but you can break it up into smaller chunks of time during the day. As long as you're doing your activity at a moderate or vigorous effort for at least 10 minutes at a time.

## Give it a Try

Try going for a 10-minute brisk walk, 3 times a day, 5 days a week. This will give you a total of 150 minutes of moderate-intensity activity.



## STOP Foods

Are often higher in calories from fat and provide less nutrition; eat less often.

### HIGH SUGAR

Ice cream, cakes, cookies, candy, donuts, regular soda, sweet tea, energy drinks.

### HIGH SODIUM

Canned and frozen meals, snacks: Potato chips, some breakfast cereals, soups, canned or processed meats, canned vegetables, pizzas, condiments.

### HIGH FAT

Solid fats and trans fats: Solid fats (are solid at room temperature) like butter and shortening; high fat processed meats like sausage, bacon, and lunch meats; high-fat cuts of meat; fried meats; fat food choices that are fried and are large servings; restaurant meals prepared in butter and oil.



# EHR Education

“Our goal for your blood pressure is less than 140/90. Your blood pressure today is XXX. Strategies to decrease blood pressure include taking your medications as prescribed, checking your blood pressure at home and bringing the log with you to appointments, and making lifestyle modifications such as regular exercise and following the DASH diet. DASH stands for Dietary Approaches to Stop Hypertension. The DASH diet may help you lower blood pressure. You will eat less fat and more fiber on the DASH diet. This diet gives you more minerals that fight high blood pressure. Handouts for the diet were provided and discussed with the patient. Our care manager can help you identify appropriate dietary choices for hypertension. You HAVE BEEN/CAN BE\*\*\* referred to our care manager. “



# Timeline

December  
1: ran  
report

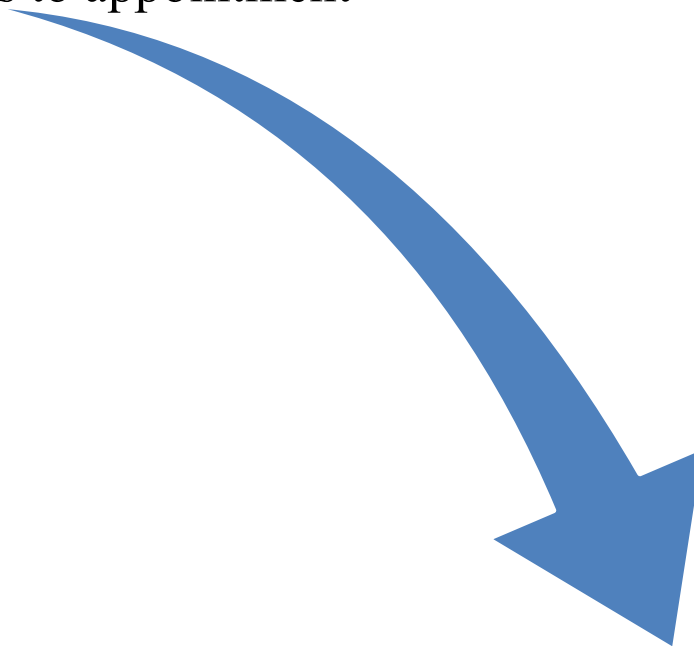
December  
8:  
intervention  
began

Feb 1: last  
"pre"  
survey  
given

Feb 22: last  
phone call  
made

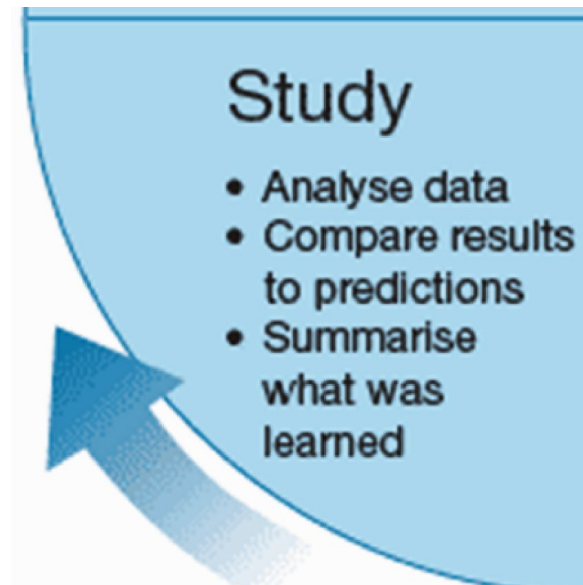
# Patient Timeline Sample

December 8: patient  
presents to appointment



December 29:  
follow up call

# PDSA Cycle



(Crowfoot & Prasad, 2017)

# Evaluation and Measures (Study)

- Measurement tools
  - Salt Intake Questionnaire (adherence)
  - Modified Becker et al (2004) survey (knowledge)
  - EHR audit to assess staff adherence to intervention
- Data assessment pre and post intervention

**NUTRITIONAL AND LIFESTYLE HABITS**

The following questions are about your dietary and lifestyle habits. All your answers will be strictly confidential

**Office use****Study number:**

3

During the **PAST 7 days (1 week)** did you eat any of the following? IF YES, ASK HOW OFTEN*(if no, circle never)***[DO NOT PROMPT THE ANSWER OPTIONS BELOW]**

Food item	<b>NEVER</b>	NOT EVERY DAY		EVERY DAY		
		1–3 times per week	4–6 times per week	1 time a day	2 times a day	3+ times a day
White bread/white bread rolls	0	1	2	3	4	5
Brown/wholewheat bread/ rolls	0	1	2	3	4	5
Breakfast cereal (processed)	0	1	2	3	4	5
Breakfast cereal (minimally processed – weetbix, muesli, etc.)	0	1	2	3	4	5
Crackers (ProVita, etc.)	0	1	2	3	4	5
Cookies, biscuits, rusks	0	1	2	3	4	5
Cake/scone/muffin/puddings/pancake/fruit pie/koeksister	0	1	2	3	4	5
Roti/samosa/spring roll/doughnut	0	1	2	3	4	5
Pizza	0	1	2	3	4	5
Pasta/noodle dishes with cheese sauces (macaroni cheese, lasagne, noodle salad, etc.)	0	1	2	3	4	5
Popcorn	0	1	2	3	4	5
Crisps (Simba, Niknaks, etc.)	0	1	2	3	4	5
Beef sausage (boerewors)	0	1	2	3	4	5
Polony/salami/bacon/salami/pork sausages (processed meat, cooked, smoked and canned)	0	1	2	3	4	5
Meat or chicken pies/sausage rolls	0	1	2	3	4	5
Chicken – battered (KFC, etc.) and chicken burger only	0	1	2	3	4	5
Meat and meat dishes (steaks, minced meat, cottage pie, mince, meatballs, stew, bobotie, etc.)	0	1	2	3	4	5
Gravy, made with stock or gravy powder	0	1	2	3	4	5
Biltong/dry <i>wors</i> /fish biltong	0	1	2	3	4	5
Milk (all types, also dairy fruit juice, malted milk, milk shakes)	0	1	2	3	4	5

4

20

Maas (fermented milk)	0	1	2	3	4	5	
Cheese	0	1	2	3	4	5	
Yoghurt	0	1	2	3	4	5	
Eggs	0	1	2	3	4	5	
Tinned fish (pilchards, tuna, etc.)	0	1	2	3	4	5	
Other fish and seafood	0	1	2	3	4	5	
Potato chips/French fries and potato salad	0	1	2	3	4	5	
Canned vegetables, incl. baked beans, tomato paste, sweet corn, etc.	0	1	2	3	4	5	
Soup (all types)	0	1	2	3	4	5	
Salad dressing/mayonnaise	0	1	2	3	4	5	
Ice cream (all types)	0	1	2	3	4	5	
Margarines, all types, also butter	0	1	2	3	4	5	
Chutney/atchar/chakalaka/Worcester sauce	0	1	2	3	4	5	
Savoury sauces (mushroom, monkey gland, white, cheese)	0	1	2	3	4	5	
Tomato sauce	0	1	2	3	4	5	
Salt	0	1	2	3	4	5	
Aromat/Fondor/mustard	0	1	2	3	4	5	
Peanuts	0	1	2	3	4	5	
Peanut butter	0	1	2	3	4	5	
Marmite/Bovril	0	1	2	3	4	5	
Chocolate sweets and sauce	0	1	2	3	4	5	
Beer and cider	0	1	2	3	4	5	

NAME \_\_\_\_\_

1. There is a relationship between the food I eat and my blood pressure

True

False

2. Amount of salt allowed for patients with high blood pressure is....

none

2/3 teaspoon

1 teaspoon

unlimited

Don't know

3. People should eat 5 or more portions of fruit and vegetables per day

True

False

4. Vegetables and fruit can reduce your blood pressure

True

False

5. Herbs can be used to flavor food instead of salt

True

False

# Process and Outcome Indicators

- Process: are stakeholders engaged and adhering to the process?
  - Measured with observation and EHR audit
- Outcome: did the intervention change knowledge or adherence?
  - Pre and post surveys



24 eligible  
patients

20 patients  
received  
intervention

- N=40
- n=20
- Report ran December 2021 indicated 40 patients with uncontrolled HTN, 24/40 had follow up appointments scheduled for intervention time frame as of December
  - 20/40 received intervention, fallout of 4 patients

# Results

n=13 (65%)

- Telephone follow up completed

n=8  
(61.5%)

- completed pre and post knowledge surveys

n=7  
(53.8%)

- completed pre and post adherence surveys

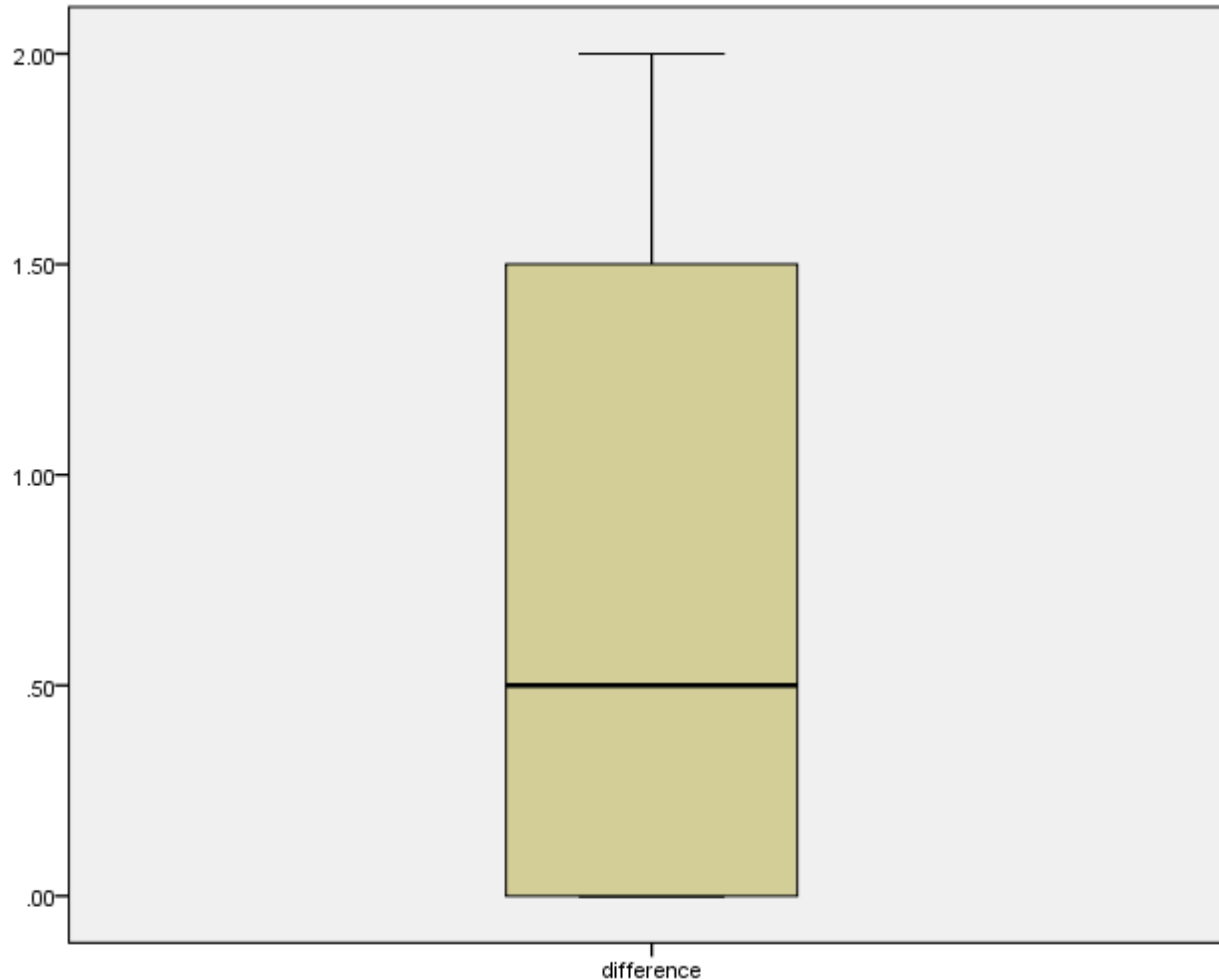
# Clinical Practice Question

- **Does the implementation of DASH diet education and visit follow up improve knowledge and adherence to the DASH diet in hypertensive adults in a rural primary care office?**

# Analysis

- Compare pre and post intervention survey results
- Evaluate process outcomes
- Use data experts & data software for statistical analysis
  - Statistician
  - SPSS
- Quantitative methods
  - If it is normally distributed data, a paired t-test on each of the measurements
    - MANOVA prior to running test
  - If its not normally distributed, we planned to use a nonparametric test

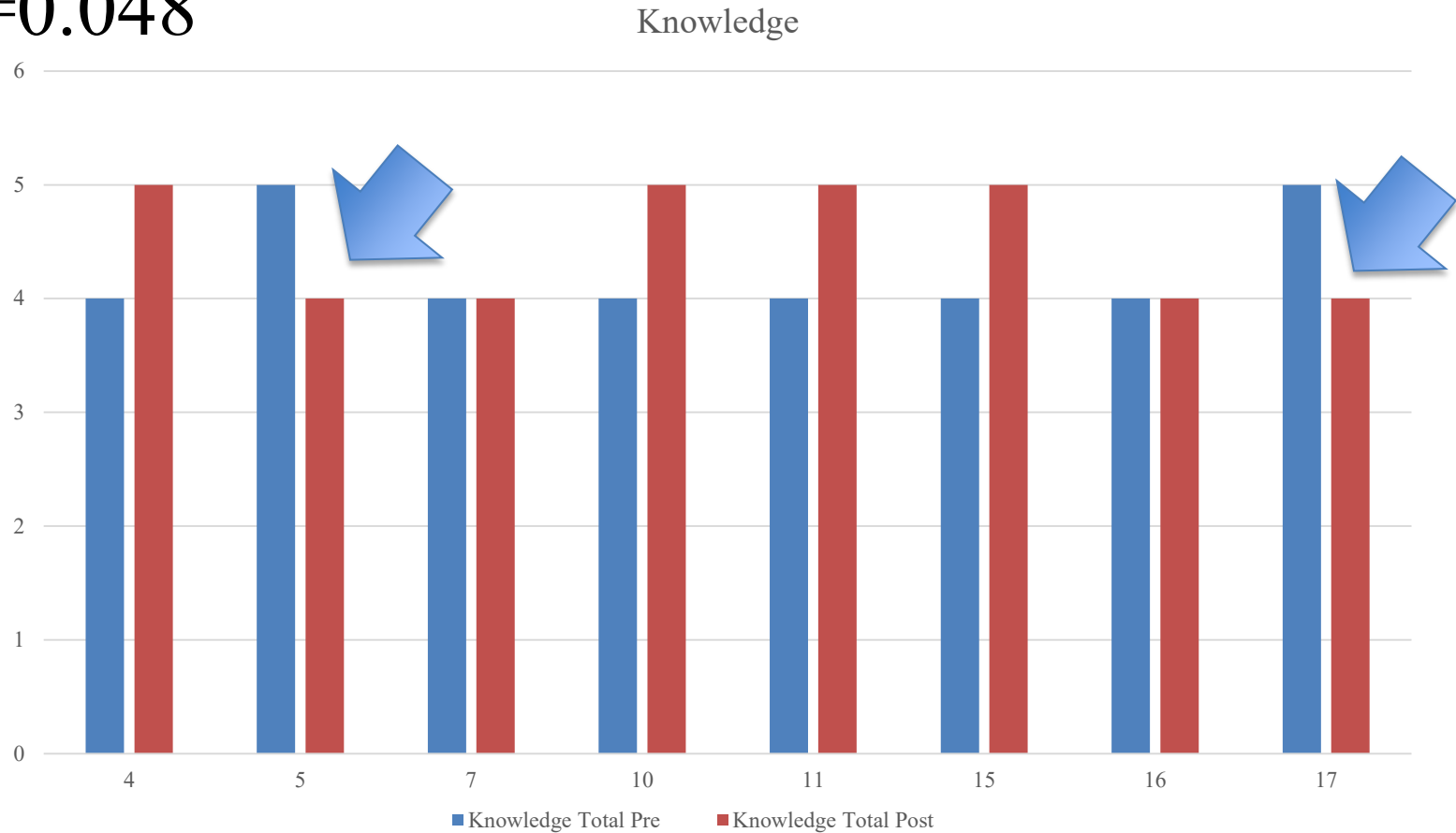
# Results: Knowledge



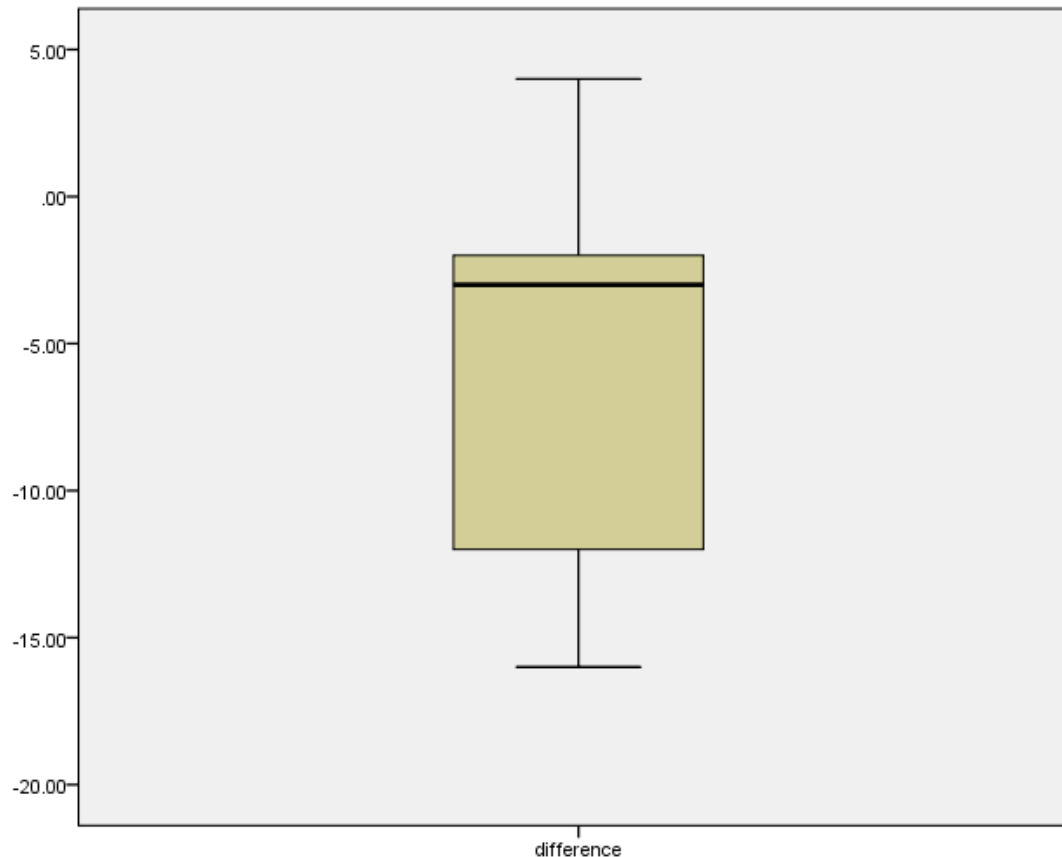
Perform paired  
T test

# Results: Knowledge

$P=0.048$



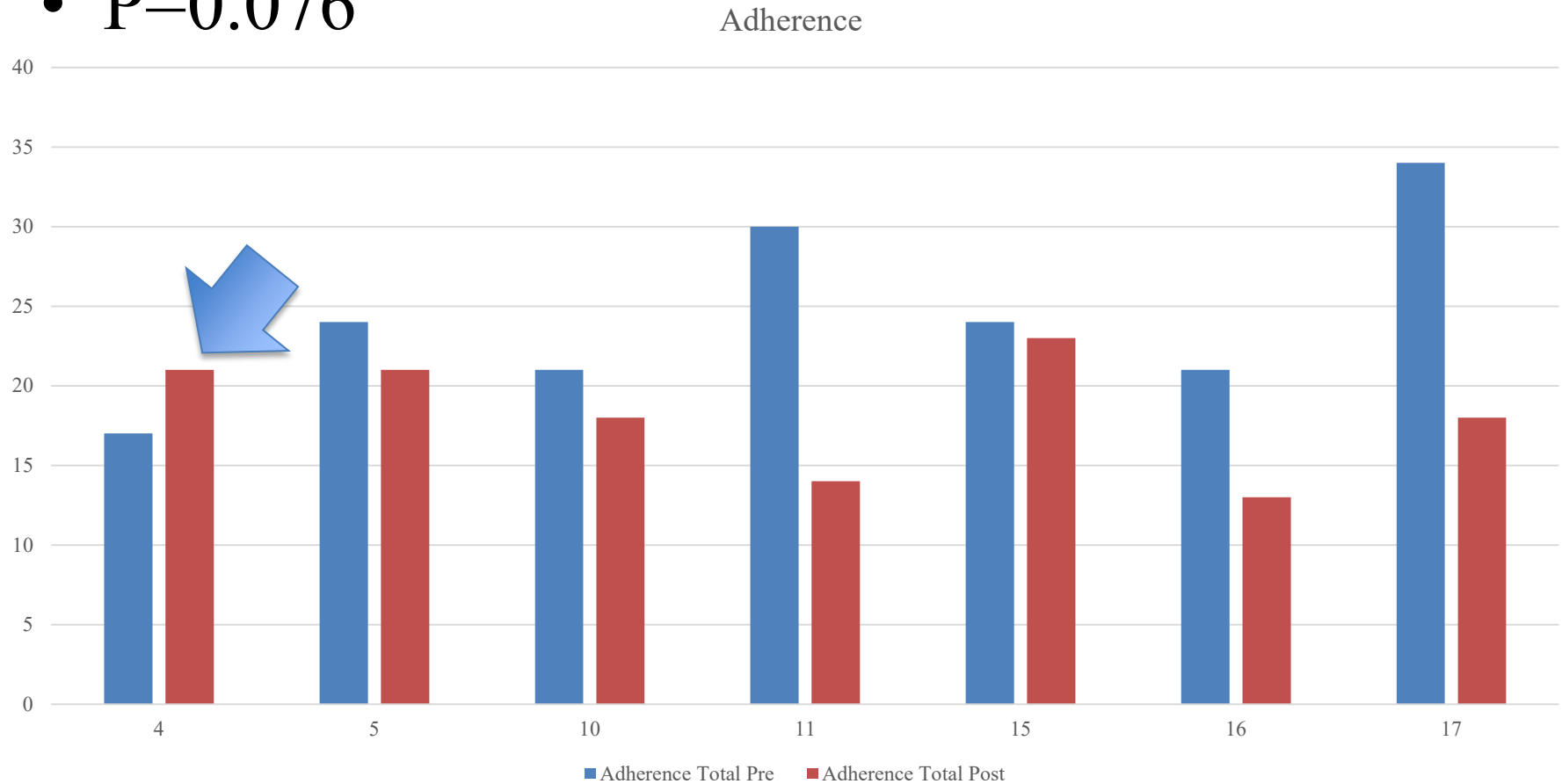
# Results: Patient Adherence



Perform paired T  
test

# Results: Patient Adherence

- $P=0.076$





# Results: Site Adherence

- Education completed and documented: n=16 (80%) participants

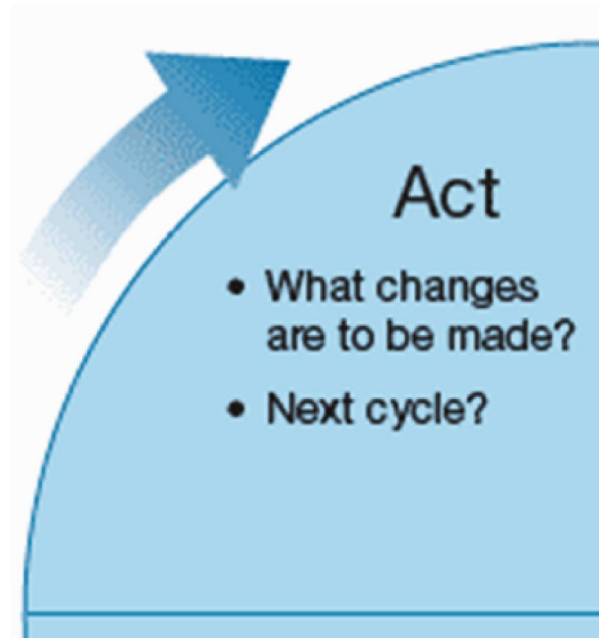
# Results: Site Adherence

- CM referral: n=9 (45%)
  - Of the n=20, 9 patients were not at goal, which signifies that they need a CM referral
  - 4 documented offer and patient declined
  - 5 no documentation of offer for referral

# Additional Comments

- Survey refusal, but expressing changes made
- Comments about the Holidays
- Caregiver unavailable to aid in completion of surveys
- Appreciation of call to "keep diet on [patient's] radar"

# PDSA Cycle



(Crowfoot & Prasad, 2017)

# Limitations

- Survey limitations: self vs. phone administration
- Unable to contact over the phone
- At previous appointment, the BP was not WNL so patient qualified for intervention
  - n=11 didn't qualify for CM referral at follow up because BP was now WNL
- For the purpose of this project, I completed the call to obtain post-intervention data, although they may not have had a referral

# Discussion

- Statistically significant change in knowledge with the intervention of handouts, and MA/provider education
- Unclear if adherence would be statistically significant at 0.05 level with larger population.
  - Statistically insignificant at 0.05 level with current population

# Implications for Practice

- Maintain engagement with patient while attempting to influence diet
- Patients may decline referral, but be receptive to an encounter on same day with CM
- Consider placing cues throughout office
  - Posters, recipes, etc

# Budget & Resources

## Cost Mitigation if Blood Pressure Improved through Diet Adherence

Project Team Time (in kind donation)	\$12,580
Hypertension goal incentive	\$1,800
CPT Code 96152 for 1 patient	\$20.88 per 15 minutes
CPT Code 96152 for 20 patients	\$271.44

## Expenses for Implementation of Project

Project Team Time (in kind donation)	\$11,730
Team Member Education Time	\$88
Consultation with Site Mentor (in kind donation)	\$90
Materials (handouts, surveys, data storage)	\$64
Total Expenses	\$11,972

## Annual Cost Mitigation

\$2,724.44



# Sustainability Plan

- Continue to educate patients at every encounter
  - Utilize CM role to full potential
- Continue to follow up with patients after the appointment
  - Consider use of patient portal option
- Consider placing cues throughout office
  - Posters, recipes, etc

# Conclusions

- Statistically significant change in knowledge at 0.05 level
- Moderately significant change in adherence at the 0.1 level
  - Additional evidence if larger population
- Difficulty with telephone encounters
- Opportunity for further interventions and modifications to process

# Dissemination

- Scholarworks
- Potential for journal submission
  - based on editor feedback

# DNP Essentials Reflection

DNP Essential:	Satisfied Through:
I: Scientific Underpinnings for Practice	Literature review for evidence based strategies for improving BP that include a nutrition intervention
II: Organizational and Systems Leadership	Organizational assessment, SWOT analysis, stakeholder engagement, cost analysis
III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice	Implementation of practice strategies, analysis and dissemination of results
IV: Information Systems/Technology	Used EHR for data collection and for documentation of intervention by providers
V: Advocacy for Health Care Policy	Analysis of CMS and private insurance providers reimbursement policy

DNP Essential:	Satisfied Through:
VI: Interprofessional Collaboration	Collaboration with care team including strategies for successful implementation
VII: Clinical Prevention and Population Health	Development and implementation of lifestyle modification intervention related to HTN
VIII: Advanced Nursing Practice	Incorporation of patient centered, evidence based HTN management strategies

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