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Improving Blood Pressure Control Among Hispanic Patient Population by Enhancing Providers' Attention to Culturally Competent Solutions Aimed at Increasing Self-Care and Treatment Adherence At and Post Hospital Discharge: A Quality Improvement Project

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Increasing Self-Care and Treatment Adherence At and Post Hospital Discharge:

A Quality Improvement Project

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Abstract

Background and Review of Literature: Hypertension is a primary, preventable risk factor for coronary heart disease, heart failure, and stroke. However, despite advances in preventive care and treatment modalities related to blood pressure control, the prevalence of hypertension in the United States remains at an undesirable level and disproportionately affects Hispanic patients. *Purpose:* The purpose of this quality improvement (QI) project was to determine if a culturally sensitive, multifaceted intervention focused on promotion of hypertension awareness and self-management strategies increases treatment compliance and blood pressure control among Limited English Proficiency (LEP) Hispanics. *Design/Methods:* The DNP project included a QI protocol with an education evaluation design aimed at improving blood pressure control and hypertension self-management in the LEP Hispanic patient population. *Implementation Procedures:* The DNP student lead a QI team to identify hypertensive LEP Latinos upon admission to an inpatient medical surgical unit. LEP Hispanic patients received language concordant education related to hypertension and self-management including home blood pressure monitoring paired with post discharge health coaching. Access to outpatient follow up care was ascertained to facilitate treatment continuum. *Results/Interpretation:* Ninety percent of participants (n=18) reported timely primary care follow up. Forty percent (n=8) attended the three month follow up and demonstrated 74% increase in medication adherence scores and 43% improvement in knowledge related to hypertension and self-management. Seven participants in the follow up group met target blood pressure goal and majority (n=6) verbalized interest in future health coaching opportunities. *Implications:* The multifactorial QI measure resulted in improved blood pressure control and engagement and in self-care and among LEP Latinos.

Key terms: Hispanic population, hypertension, blood pressure management, health coach, teach back, access to care, chronic care model, linguistic barriers, cultural competence.

Improving Blood Pressure Control Among Hispanic Patient Population by Enhancing Providers Attention to Culturally Competent Solutions Aimed at Enhancing Self-Care and Treatment Adherence Post Hospital Discharge.

Introduction

Historically, infectious disease was the major leading cause of death, however over the last decade the trend has shifted towards non-communicable diseases (Shoenthaler, et al., 2014). The World Health Organization (2017) noted particularly exponential prevalence of cardiovascular disease worldwide, to a certain degree attributed to increasing rates of hypertension. In 2008, cardiovascular disease related deaths amounted to 17.7 million globally; nine million of reported deaths were linked to hypertension (WHO, 2017). These health concerns are not only isolated to developing countries. Centers for Disease Control and Prevention (2016) estimated that 75 million American adults have hypertension and only about half of these individuals have their condition under control. Furthermore, hypertension was directly linked to more than 410, 000 deaths in the United States in 2014 (CDC, 2016).

In the United States, racial and ethnic differences account for the greatest percentage of disparities in early cardiovascular morbidity and mortality between African Americans and whites (Shoenthaler, et al., 2014). The disparities between whites and blacks have been widely studied, however due to rapidly growing Latino population in the United States, it is essential to address blood pressure control in Hispanics. CDC (2016) justifies the need for interventions tailored specifically to Hispanic population, based on knowledge that prevalence of uncontrolled hypertension is 24% higher among Latinos living in the Unites States than their white and African American counterparts.

The substantial hypertension control and related comorbidities disparity among US Hispanic population calls for strategies aimed at prevention and treatment with attention to cultural and socioeconomic factors affecting this population (Guzman, 2012). Based on this knowledge the goal of this QI project was to explore current trends, barriers, and evidence-based practices related to blood pressure management among Hispanics in order to design and implement interventions tailored specifically to this minority group. The DNP student chose to address the inequalities in awareness, treatment adherence and self-management at a Community Medical Center where as of 2010 Latinos account for 48.4% of city's total population, and where 26.4% of residents live below the poverty line (American Census, 2010). The evident racial, cultural and socioeconomic inequalities, and higher rates of hospitalization related to stroke, chronic heart failure, and coronary artery disease among Latinos living in the city as compared to general population justified the need for interventions aimed at improving health outcomes of this population.

Background

Hypertension and high grade prehypertension are independent risk factors for cardiovascular diseases, which are among the most frequent causes of death worldwide (Gu, Burt, Paulose-Ram & Gillum, 2008; Neves, Virdis, & Oigman, 2012; Ventura, Pina & Lavie, 2015). This major contributor to cardiovascular disease can be prevented, delayed, or easily treated with inexpensive medication. However, despite what is possible the prevalence and control of hypertension continues to be at an undesirable level in the United States with overall 29.0% prevalence for 2011–2014, similar among men (30.0%) and women (28.1%) (Sorlie, et al., 2014; Yoon, Fryar, Carroll, 2015). Furthermore, current research points to blood pressure control risk factors and disparities directly linked to ethnic and racial backgrounds.

Investigators at the National Center for Chronic Disease Prevention and Health Promotion (2012) urge providers, nurses, and others to review records in order to identify those who need more attention to control their blood pressure. It is essential to keep in mind the cultural variance among patient groups in the United States and differences in health outcomes that can results from genetic, environmental, and cultural factors. Sixteen percent of United States population comprises of Hispanics, a population, which suffers from rates of uncontrolled hypertension significantly exceeding those observed among non-Hispanic whites and blacks (Neves, Virdis, & Oigman, 2012). Researchers at the Centers for Disease Control and Prevention (2015) pointed out data suggesting that as compared to non-Hispanic whites, Hispanics have 35% less heart disease risk and overall lower death rate, however, they are faced with 24% more poorly controlled high blood pressure. These differences account for the disparity in cardiovascular related morbidity and age adjusted mortality between Hispanics and non-Hispanic whites (Rodriguez, Hicks, & Lopez, 2012).

Knowledge of current practice trends serves as a first steps in gaining better understanding of factors negatively affecting care related to hypertension in Hispanic patient population. The results of the New National Survey for the Hypertension Education Foundation (2007) by Harris Poll Online point to inequalities in knowledge related to blood pressure significance and associated risks, diagnosis and pharmacological and non-pharmacological treatment approaches, as well as health care provider responses to elevated blood pressure among Caucasian, Hispanic, and African American patients. Of those surveyed, 39% of Hispanic patients reported being diagnosed with hypertension during a routine health care visit as compared to 58% of Caucasian and 43% of African American patients (Moser & Franklin, 2007). Twenty three percent of Hispanic patients reported being diagnosed when they did not

feel well, which points to a statistically significant difference, as compared to 12% of Caucasian and 18% of African American respondents (Moser & Franklin, 2007). Researchers also observed differences in treatment, where 86% of Hispanic patients reported taking medications, compared with 91% and 93% for Caucasian and African American respondents respectively, as well as lower rate of exercise and alcohol abstinence among Hispanic population. Investigators further noted actions taken by providers to lower blood pressure to be disproportionate among studied groups. Providers were less likely to increase dosage of medication, advise regular exercise, change prescription to a different medication, ask if respondent was taking medication correctly, or advise their Hispanic patients about the importance of taking medication correctly (Moser & Franklin, 2007).

Hispanics are also less likely to be aware of their hypertension and subsequently are less likely to have their blood pressure adequately controlled (Rodriguez, Hicks, & Lopez, 2012). It is important to evaluate Hispanic population's distinct needs and implement evidence-based solutions to effectively serve this growing population, because if actions are not taken to address this existing disparity Hispanic patients may further disproportionately suffer from hypertension and its consequences.

Problem Statement

There is a 24% higher risk of uncontrolled blood pressure among the Hispanic patient population than their white counterparts in the United States indicated by poor medication adherence, low rate of home blood pressure monitoring and reporting, and poor patient engagement in self-care, and it is associated with providers' underutilization of culturally competent solutions tailored specifically to the Hispanic patient population aimed at improving discharge process, self-management teaching, and patient motivation.

Organizational "Gap" Analysis of Project Site

The Community Medical Center chosen by the DNP student to conduct the quality improvement (QI) project serves nine communities in two counties. Fifty-four percent of the counties' residents live in a healthcare professional shortage area and are additionally faced with insurance related challenges due to limited number of providers accepting Medicaid. Community Health Needs Assessment 2016 prepared for the Community Medical Center by Partners for a Healthier Community, Collaborative for Educational Services, and Pioneer Valley Planning Commission identified lack of resources to meet basic needs, housing needs, lack of community safety, transportation, food insecurity and food deserts, as well as institutional racism as prioritized community needs in the 2016.

In the healthcare organization's service area, approximately five percent of the population lives in linguistically isolated household; approximately eight percent has limited English proficiency. Furthermore, 10% of the population was noted to be unable to speak English well and 47% of the served population directly served by the healthcare institution identifies as Hispanic. Forty four percent of the patient population speaks language other than English at home. There is a widespread need for more bilingual services, providers and educational materials that are written at a third grade level due to low literacy rates in the served population. Health literacy, language barriers, and cultural humility were identified as a regional need (PHC, 2016).

Heart disease is among the leading causes of death in the two counties served by the Community Medical Center. More than half of older adults in the two counties have hypertension. In the 2012 hospitalization rate for stroke in the region served the healthcare organization was 29% greater than the state average, and the hospitalization rate for CHD was

53% higher than the statewide levels (MDPH, 2012). Stroke hospitalizations rates in 2012 among Latinos were greater than that of Whites in the same community and the overall statewide rate (PHC, 2016). Latinos experienced high hospitalization rates due to chronic conditions, including stroke and coronary artery disease diabetes, asthma, and COPD, as well as higher rates of hospitalizations/ER visits for mental health and substance use (PHC, 2016).

The specific needs of patient population served by the Community Medical Center have been recognized by the health system's key stakeholders and resulted in implementation of wide-ranging services related to chronic disease management, including CHF, COPD, and post stroke management. Patients enrolled in these programs receive comprehensive discharge and follow planning. However, similar services related to hypertension management are not enacted in the inpatient setting. At present, outpatient care clinics affiliated with the facility and community outreach programs support hypertension management, screening and education. However, a care model focused on outpatient preventive medicine does not fully address specific needs of the Hispanic community. This observation was made based on knowledge that Latino patients are more likely to be diagnosed with hypertension when they seek medical attention in times of illness, rather than during routine or preventive health care encounters (Mosner & Franklin, 2007). Therefore, an intervention addressing blood pressure control among Latino patients in the inpatient care setting has the potential to bridge the existing gap.

Review of the Literature

Method

To identify evidence-based solutions aimed at improving blood pressure control among Hispanic patient population Cumulative Index to Nursing and Allied Health Literature (CINAHL) Public Medline (PubMEd) , Education Resources Information Center (ERIC),

Cochrane Library, and ScienceDirect databases were used to conduct a literature review. Search key terms included Latino population, Hispanic population, hypertension, blood pressure control, blood pressure management, health coach, coaching, teach back, education, cultural competence, minority, low income, access to care, linguistic barrier. Terms heart failure, and COPD were excluded from the search to ensure adequacy. Only peer-reviewed articles published between 2007 and 2017 were selected based on the context, level of evidence, and relevance to conducted literature review. Two hundred and six articles were identified. Thirteen articles were selected based on established inclusion criteria.

Evidence was rated based on The Johns Hopkins Nursing Evidence-Based Practice Rating Scale (Newhouse, Dearholt, Poe, Pugh, & White, 2005). The DNP student compared 13 different studies based on their methodology and analysis of data. Evidence provided in the studies ranges from level I to level V. Lack of direct evidence supported by controlled trails can be explained by inability to control all confounding variables present in patients' environment and limited access to care for those who do not speak English and limited studies focused solely on Hispanic population.

Results

Effects of providers' cultural awareness and competency on hypertension management.

Hispanic patients have poorer blood pressure control than non-Hispanics, however current research among this patient population has shown that the disparity is not a result of biological differences (Gu, Yue, Desai, & Argulin, 2017; Guzman, 2012). In a controlled clinical trial setting, where external factors were uniform among patient groups, such as equal access to care and no-cost medications, Hispanic patients were observed to achieve

greater blood pressure control than non-Hispanic whites (Guzman, 2012). This finding points to

the importance of identifying lifestyle, economic, and cultural factors likely contributing to

overall increase risk for uncontrolled hypertension among Hispanic patient population.

The successful targeting of poorly controlled blood pressure among Hispanic patients

requires cultural awareness and competency when providing care to minority populations

(Mueller, Purnell, Mensah, & Cooper, 2015) (level IV B evidence). However, Kendrick and

fellow investigators (2015) revealed that although healthcare providers' generally acknowledge

disparities in hypertension control related to cultural and ethnic variances, only a small number

of physicians recognize these inequalities among patients they personally treat (level VB

evidence). In addition to inconsistent assessment of their unique needs, minority patients are

subjected to shorter and less patient centered office visits and less aggressive antihypertensive

treatment than their white counterparts (Gu, Yue, Desai, & Argulin, 2017; Traylor, Schmittdiel,

Uratsu, Mangione, & Subramanian, 2015). In their cross sectional study, Gu and fellow

investigators (2017) identified education level, social support, cultural awareness, access to care,

and patient-physician collaboration as factors directly affecting current poor control of

hypertension among Hispanics.

Kendrick and fellow investigators (2015) asked providers what programs might directly

improve care and address racial, ethnic, and socioeconomic disparities in blood pressure control.

Surveyed providers reported a need for local guidelines and treatment algorithms, list of

resources for low-income patients, culturally appropriate educational materials on hypertension

in multiple languages, and proper training in communication skills (Kendrick, et al., 2015).

These suggestions closely correlate with level C evidence presented by Juckett (2013)

recommending instituting more culturally competent care, incorporating teach back technique

into cross-cultural patient encounters to assure understanding, and patient activation as measures targeting present disparities.

Limited English Proficiency (LEP) and language concordance.

Minority patients' worldview and health beliefs are not only shaped by their native culture, but also culture's integral part, language. Traylor, et al. (2010) examined the role of language and race/ethnicity concordance in Hispanic, African American, Asian, and white patient population and its role on medication adherence. The researchers in their level II B study revealed marginal association between race/ethnicity concordance and CVD treatment adherence among African American patient population. However, the same statistically significant association was not observed among white, Asian, or Hispanic patient population. Racial and ethnic concordance does not significantly affect Latino patients' outcomes and adherence; however eliminating language barriers plays a significant role (Traylor, et al., 2010). This finding by Traylor and fellow investigators is essential due to observed shortage of Hispanic providers in the United States. As of 2001, only three percent of internal medicine physicians and four percent of cardiologists in the United States were Hispanic (Guzman, 2010).

Kim and fellow researchers (2017) further examined the relationship between Limited English Proficiency (LEP) and blood pressure control (level IIIB evidence). Based on result of their retrospective analysis of multi-year survey data adjusted for socioeconomic and cultural factors, these investigators pointed to a strong association between LEP and likelihood of elevated blood pressure in a clinical setting despite active hypertension treatment. Researchers attributed this outcome inequality to Limited English Proficiency (LEP), based on perceived risk for poor understanding of the disease process, importance of medication adherence, and prognosis. Furthermore, these characteristics correlate with decreased access to care, individual

case management, and lower treatment adherence (Kim, et al., 2017). Improved application of already existing interpretive services, both in person and virtual interpretive services, has the potential to increase Hispanic patients' adherence to hypertension treatment despite racial and ethnic variances among patients and providers.

   Patient empowerment and home blood pressure monitoring.

  Home blood pressure monitoring provides easy and inexpensive way to involve patients in taking an active role in their hypertension management (Peixoto, 2015) (level IVB evidence). Furthermore, Stergiou and colleagues (2007) found evidence suggesting home blood pressure monitoring to be not only as reliable as ambulatory monitoring in predicting hypertension induced target organ damage, but also to be of a higher value than blood pressure readings taken in a medical office (level IIB evidence).

  Home blood pressure monitoring and its use in an outpatient clinical setting has a high potential to improve blood pressure control among hypertensive patients. However, Viera and colleagues (2008) recognized that this intervention is not routinely recommended and utilized to its full potential by providers (level IIIB evidence). Researchers based their conclusion on results of a cross-sectional mail survey administered in 24 primary care practices in the state of North Carolina. Investigators observed that only one third of adult patients diagnosed with hypertension admitted to receiving provider's recommendation to monitor blood pressure at home. Furthermore, 70% of respondents indicated they did not share their blood pressure readings with their provider; and only 29% of surveyed patients had their monitor calibrated by a physician or a nurse (Viera, et al., 2008) (level IIIB evidence).

  These findings portray a small sample of general population, not adjusted for race, ethnicity, culture, or socioeconomic status. Hence, for the purpose of this literature review it was

essential to review not only indications and value of home blood pressure monitoring in general

patient population, but more importantly current trends associated with the use of this

intervention in Hispanic patient population.

The need for solutions tailored to meet group specific needs became evident in a

randomized control study led by Yi, et al. (2015). In their study, researchers examined the

effectiveness of self-blood pressure monitoring among predominantly Hispanic, uninsured, urban

communities (level IB evidence). Researchers cited cost of obtaining home blood pressure

monitoring device as a significant barrier faced by their population of interest. To overcome this

barrier investigators equipped their patients with home blood pressure monitoring devices,

trained patients how to use them and how to upload results into a secure database, as well as

encouraged them to share their findings with their health care providers. Patients were

randomized into two groups, interventions and control. No additional services were offered. At

nine month follow up self-blood pressure monitoring did not demonstrate improved blood

pressure control over usual care. Based on results of the study, Yi and colleagues (2015)

determined the presence of additional meaningful barriers to achieving blood pressure control

faced by Hispanic patients, which surpass access to the monitor itself.

A more comprehensive approach to home blood pressure monitoring was evaluated by

Margolius and colleagues (2012), who piloted a randomized control investigation to determine

whether weekly health coaching with home blood pressure monitoring can improve blood

pressure control among predominantly Hispanic patient population (level IB evidence). Gathered

data allowed the researchers to demonstrate statistically significant reduction in mean systolic

blood pressure of 21.8 mm Hg closely correlated with more health coaching encounters

(Margolius, et al., 2015). It is noteworthy that the health coaches employed in the study spoke the same language as participating patients. Therefore, the linguistic barrier was eliminated.

Financial constraints faced by outpatient clinics serving underserved patient populations create a significant barrier to employing health coaches suggested by Margolius and colleagues (2015). Chuang et al. (2015) conducted a quality improvement study in a low income, predominantly Hispanic medically underserved population (level VB evidence). Researchers' project focused on establishing a hypertension quality improvement team consisting of a physician leader, representatives from medical staff, administrators, clerical staff, social work, nutrition, information technology support and nursing. Patients with previously uncontrolled hypertension were given home blood pressure monitors, received training on how to use them, and were closely followed by the team panel. As a result, 27.5% of enrolled patient gained blood pressure control by nine months, and the average systolic blood pressure decreased by 16 mm Hg (Chuang, et al. 2014). Furthermore, investigators observed that the perceived additional clinic duties of all involved did not appreciably increase their workload or detract them from their other responsibilities (evidence level IIIB). Although this study's outcomes were promising, it had several limitations, such as convenience sampling, in which selected patients were likely to comply.

Issue of non-compliance with home blood pressure monitoring among Latino patients was addressed by Huff, et al (2011) in a quality improvement project exploring factors responsible for non-participating in a home blood pressure monitoring program after patients were supplied with a complementary automated blood pressure monitoring device (level VB evidence). This level VB Study results revealed that Spanish-speakers were four times more likely not to use blood pressure monitoring devices. Additionally, forgetfulness, lack of time,

self-described laziness, and perception that providers did not care were identified as barriers to participation in home blood pressure monitoring. As an outcome of the study Huff, et al., (2011) identified reminder systems, actions to motivate patients, and education as measures geared towards achieving blood pressure control among Hispanic population. Despite promising results, this study had several limitations. Possible confounding variables such as cultural competency, literacy, socioeconomic status, and limited participation to those who could answer a phone limited value of the study.

Actions to patients' motivation and activation cited by Huff, et al. (2011) as a measure to increase compliance with self-monitoring and adherence to blood pressure control regimens were explored by analyses of 1,067 US born and foreign born Latinos conducted by Alegria, et al. (2009). As result of their level IIIB evidence study researchers noted that patient activation or motivation for change is more challenging in foreign-born Latinos, but can achieved through active dialogue and discussion. Guzman (2010) further dissertated the role of strong sense of fatalism in Hispanic patients, manifested by belief in lack of control over their cardiovascular disease and in turn less motivation to adopt healthy lifestyle changes, seek professional help, or adhere to prescribed treatment regimen. Supported by their findings, researchers suggested teach back method of providing instructions to non-English speakers as an instrument with a high potential for improving patients' adherence and active involvement in their treatment plan. Teach back method assures that messages transmitted to patients are received correctly and are meaningful. This method not only allows providers to assess understanding, but also provides patients with a sense of active dialogue, importance, and appreciation of their diversity.

Assessment and promotion of treatment adherence.

Emphasis on self-management and treatment adherence places a significant burden on Hispanic patients living in underserved areas secondary to lack of resources and poor health literacy (Perez-Escamilia, Garcia & Song, 2010). Perez-Escamilla (2010) acknowledged Latinos' poor medication adherence rates based on a nationwide internet survey results (level IVB evidence). Furthermore, Hispanics face the highest prevalence of uncontrolled hypertension, largely attributed to poor treatment adherence (Tong, Chu, Fang, Wall, & Ayala, 2016) (level IVB evidence). Tong and colleagues cited common barriers responsible for non-adherence, including affordability of treatment, perception of unnecessary treatment, and forgetfulness. Researchers emphasized the need for patient-centered strategies built upon awareness of sociocultural factors and patients' health perception to improve adherence and understanding of prescribed therapy.

Long-term medication therapy adherence significantly decreases over time. Therefore, it is essential to address existing barriers on ongoing basis and offer teaching reinforcement, counseling, and manual telephone follow-up as indicated (Nieuwlaat, 2014). Researchers suggest the use of medication adherence scales in clinical practice to better understand barriers and patients' perception of prescribed treatment. For patients with hypertension Culig and Leppe (2014) suggest the use of Morisky-Green, Beliefs about Medicines Questionnaire-Specific, Hill-Bone, and Culig adherence scales. These tools are easy to administer in a clinical setting and have been validated for use in hypertensive patients (Culig & Leppe, 2014).

Synthesis and Discussion

Current research indicates several effective strategies to improve blood pressure control in racial and ethnic minorities. The important themes that emerged include the effects of

providers' cultural awareness and competency, linguistic barriers and language concordance, self-management, patient empowerment, access to care, and treatment adherence.

Kendrick and colleagues (2015) disserted providers' general acknowledgement of disparities affecting hypertension control in Hispanic population. However, the awareness itself failed to translate into practice, as evidenced by less patient centered visits and less aggressive antihypertensive treatment among Latino patient population as compared to their African-American and white counterparts (Gu, Yue, Desai, & Argulin, 2017; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2015). To enhance current practice models Kendrick and fellow investigators (2015) suggested implementation of practice guidelines and treatment algorithms, lists of resources for low-income patients, educational materials in multiple languages, and providers' training in communication skills.

Traylor and fellow investigators (2010) emphasized the role of meaningful communication and language concordance in care of Hispanic patients. Researchers conclusion was further supporter by observation made by Kim et al. (2017) pointing to a strong association of limited English proficiency with poor understating of diagnosis, management strategies, and poor treatment adherence. The importance of employing medical interpreters during all health encounters was strongly suggested by both research teams. In addition, the incorporation of teach back method of learning evaluation was strongly advised (Juckett, 2013).

Effective communication and patients' motivation to take an active role in self-management emerged as one of the important variables affecting blood pressure control in Latino population. Peixoto and colleagues (2015) suggested home blood pressure monitoring as an effective way to engage patients in self-care. However, research conducted by Viera and fellow investigators (2008) revealed limited use of this measure in clinical practice. Furthermore,

Yi, et al. (2015) concluded lack of evidence suggesting improved blood pressure control in

Hispanic patients, who engaged in home blood pressure monitoring without subsequent health

coaching. In contrast, Margolius and colleagues (2015) noted statistically significant

improvement in blood pressure measurements with multidisciplinary approach and language

concordant health coaching. Chuang et al. (2015) supported this claim by presenting evidence of

improved health outcomes with concurrent home blood pressure monitoring and use of reminder

systems, such as phone follow-ups.

In summary, in order to improve blood pressure control among Hispanic patient

population it is crucial to implement intervention tailored to meet population specific needs.

Home blood pressure monitoring with the support of linguistically appropriate health coaching,

education, teach back method of learning evaluation, and providers' willingness to provide

culturally sensitive care proved to be the most successful intervention aimed at achieving greater

blood pressure control among Hispanic patient population.

Evidence Based Practice: Verification of Chosen Option

Translation of current investigations related to hypertension control among Hispanic

patient population into practice requires sustainable, multilevel interventions, and institutional

support (Mueller, et al., 2015). Based on gathered evidence, the DNP student chose to implement

a quality improvement project designed to improve blood pressure control among Latino

population served by the Community Medical Center.

To increase health care professionals' awareness of existing disparity and unique needs of

Latino patients first phase of the project involved Community Medical Center's stakeholders

education. Handouts and poster board presentation were be utilized as a teaching method. Teach

back method was used to evaluate effectiveness of provided teaching and to identify areas needing clarification and further training.

Medication adherence and barriers to treatment and self-management were evaluated. The Culig adherence scale was used to achieve this goal (refer to Appendix A). This tool was chosen based on the clinical validity in hypertension pharmacologic treatment (Culig & Leppee, 2014).

Patients were provided with educational materials in Spanish. In person or phone medical interpreters were utilized during teaching sessions. Patients received complimentary blood pressure monitors and detailed teaching related to their use and results interpretation. A referral to a local YMCA was provided to promote and reinforce lifestyle modifications. Two-week post discharge phone follow up and three month post enrollment in person health coaching was implemented.

To assure access and continuity of care, patients' needs related to outpatient follow up care were evaluated and addressed prior to participants' hospital discharge.

Theoretical Framework/Evidence Based Practice Model

Improvement of health outcomes and mitigation of consequences of chronic diseases in patients within a community with distinct needs requires implementation of multilevel changes in health system and delivery of care based on high quality evidence based practice models (Oprea, Braunack-Mayer, Rogers, & Stocks, 2010). Wagner's Chronic Care Model was developed after Wagner, Austin, and Von (1996) argued that standard medical care does not meet the needs of chronically ill patients and fails to contribute to effective self-management (refer to Figure 1, Appendix B). This care model is designed to encourage high quality chronic disease management (Institute for Healthcare Improvement, 2017). Drawing on extensive

research Wagner and colleagues (1996) identified six common findings shared among successful

randomized control trials, chronic disease programs, and quality improvement efforts

surrounding chronic illness management. Their findings outline and include elements within the

community, the health system, self-management support, delivery system design, decision

support, and clinical information systems with focus on change concepts used to direct

improvement efforts (IHI, 2017).

The Chronic Care Model addresses the efforts of this project aimed at improving blood

pressure control among Hispanic patient population by placing the responsibility for creating an

organization that provides a safe, high quality care on its key stakeholders. This obligation is

placed on the key collaborators within the health system based their responsibility for supporting

and promoting effective improvement strategies within and across the organization. Key

stakeholders have to ability to collaboratively allow agents of change to act upon health

disparities present in the community. Therefore, it is essential to analyze the role of several other

aspect of Health System and their role in implementing improvement strategies outlined in the

Chronic Care Model.

The community element plays an integral role. It encourages patients to participate in

effective community programs and allows forming partnerships with community organizations to

support and develop interventions that fill in needed services. The project's focus on improving

self-management and awareness of hypertension within Hispanic patient population is also

supported by Wagner's theoretical framework, as it encourages patient's to set goals, identify

barriers and challenges, and to monitor their own conditions. The Chronic Care Model's

principle to improve self-management is supported by the delivery system design, which plays a

role in assuring effective, efficient care and self-management, ensuring regular follow up, and providing care that patients understand and that agrees with their cultural background.

The framework's decision support element promotes care consistent with scientific data and patient preferences by embedding evidence based guidelines into daily clinical practice, sharing evidence based guidelines and information with patients to encourage participation, and uses proven education methods. Additionally, the framework encourages the use of clinical information systems that facilitate individual care planning by identifying relevant subpopulations for proactive care, and shares information with patients and providers to coordinate care. The care coordination between providers is a crucial feature of the project as it assures care continuum and access to needed services, follow up, and ongoing patient education.

The core elements of the Chronic Care Model incorporate essential requirements for improving health care delivery within an organization and providing support to patients, who are knowledgeable about their treatment goals and steps necessary to achieve them (Shapira, et al., 2012). However, health systems and providers serving minority patients must also be able to provide culturally sensitive care in the context of their patient values and beliefs. The Process of Cultural Competence in the Delivery of Healthcare Services care model supports cultural competency in care delivery (Engebretson, Mahoney, & Carlson, 2008). This culturally sensitive model of healthcare delivery developed by Dr. Josepha Campinha-Bacote (1998, 2003), who views cultural competence as an ongoing process, in which health care providers attempt to learn and understand patients' cultural background to optimize care (refer to Figure 1, Appendix C). This model further allows providers to see themselves as continuously striving to enhance their cultural awareness rather than assume cultural competency, which can be achieved by the integration of cultural awareness, cultural knowledge, cultural skill, cultural encounters, and

cultural desire (Campinha-Bacote, 2003). The Process of Cultural Competence in the Delivery of Healthcare Services care model may be used as a framework for health care organizations to provide culturally relevant services, especially when serving diverse patient population with limited ability for cultural concordance between patients and providers.

The Chronic Care Model and the Process of Cultural Competence in the Delivery of Healthcare Services care model were chosen by the DNP student to guide the QI project. These theoretical frameworks' have a potential to influence organizational change related to treatment and management of hypertension in Latinos. Wagner's and Bacote's care models takes into consideration involvement of key stakeholders necessary to gain approval of proposed interventions and the necessity of culturally tailored solutions to bring on necessary change. Furthermore, the theoretical values of both models correlate with the Community Medical Center's mission to "improve the health of all people in the community through expert and compassionate care, education and knowledge sharing, community partnerships, fostering innovation and growth" (Community Medical Center, 2016).

Goals, Objectives and Expected Outcomes

Effective interventions to improve blood pressure control in Hispanic population require sustainable, multilevel interventions, supported by organizational support and partnerships among patients, providers, policymakers, and community based organization (Mueller, et al. 2015). Interventions proposed and implemented in the Quality Improvement (QI) project by the DNP student took into consideration key stakeholder's role in change processes and focus on strategies to improve hypertension self-management and access to care. The DNP student chose to involve register nurses, medical interpreters, and case management team in actualization of the QI project to promote sustainability of proposed interventions if implemented QI intitiatives

prove to positively impact blood pressure control and self-management among Latinos with

Limited English Proficiency.

Goals Related to Program/Intervention/Providers

Goal one. Educational materials in appropriate language on lifestyle modifications and medication therapy implications as well as wallet size blood pressure goal cards will be provided.

Objective	Expected Outcomes	Result*
Educational materials in accordance with JNC 8 guidelines will be obtained from the Massachusetts Health Department, the American Heart Association, and the Centers for Disease Control and Prevention.	Educational materials will be gathered, reviewed, and compiled into patient toolkit folder by 7/2017 (see Appendix D, Figure 1-8).	Objective Met
Educational materials will be reviewed by hospital's quality improvement committee and nursing staff.	Educational materials will be reviewed and revised based on applicability and ease of use in clinical setting by 8/2017.	Objective Met
Nursing staff and medical interpreters will receive education related to use of educational materials in practice, teach back method of learning evaluation, and language concordant care.	Hundred percent of nursing staff and medical interpreters will verbalize understanding of teaching materials and participate in post education assessment. Nursing personnel will agree to review educational materials with patients upon admission and upon discharge in presence of medical interpreter or interpretive phone service line with teach back provided.	Objective Met

*See results sections, page 46.

Goal two. Hispanic patients with previously diagnosed hypertension or new onset hypertension will be identified upon admission to medical surgical unit.

Objective	Expected Outcome	Result*
Hispanic patients age 25-60 years old with BP >140/90, and Hispanic patients age 60 and older with BP >150/90 will be identified on admission to medical surgical unit by nursing staff.	Hispanic patients with hypertension will be identified.	Objective Met
Program targeting hypertension among Hispanic patient population will be reviewed with patients and patients willing to participate will be enrolled in the project.	Ninety percent of identified patients will express willingness to participate in the project.	Objective Met

* See results section, page 47.

Goal three. Home blood pressure monitoring and monitoring log will be introduced to patients.

Objective	Expected outcome	Result*
Patients will receive complementary blood pressure monitors prior to hospital discharge	Hundred percent of those enrolled will be equipped with home blood pressure monitors prior to hospital discharge.	Objective Met
Patients' willingness and understanding of home blood pressure monitoring will be reviewed.	Patients will verbalize understanding of home blood pressure monitoring and vice potential barriers to home blood pressure monitoring. Patients will be able to demonstrate use of home blood pressure monitor prior to hospital discharge.	Objective Met

See results section, page 48.

Goal four. Medication adherence and knowledge related to hypertension will be assessed upon admission to hospital.

Objective	Expected outcome	Result*
Culig Adherence Scale and its application in a clinical setting will be reviewed with nursing staff.	Hundred percent of nursing staff will verbalize understanding, application of the adherence scale, and willingness to administer it to patients upon admission.	Objective Met
Culig Adherence Scale will be administered on admission.	Culig Adherence Scale will be administered on admission to all patients enrolled in the project.	Objective Met
HELM knowledge assessment scale will be administered on admission and re-administered at three month follow up to evaluate learning.	HELM knowledge scale will be administered as proposed.	Objective Met

See results section, page 50.

Goal five. Outpatient follow up appointment will be provided upon discharge.

Objective	Expected outcome	Result*
Scheduling follow up appointments for patients will be introduced to discharge coordinator.	Barriers and facilitators will be reviewed with discharge coordinator and new discharge protocol will be implemented.	Objective Met
Follow up will be scheduled prior to hospital discharge.	Ninety percent of patient will have a scheduled outpatient follow up prior to discharge.	Objective Not Met**

See results section, page 56.
**See results section, page 57.*

Goal six. Enrolled patients will receive a referral to a local YMCA wellness program.

Objective	Expected outcome	Result*
Enrolled patients will receive a referral to a local YMCA wellness program.	Fifty percent of enrolled patients will verbalize willingness to participate in the program.	Objective Met

*See results section, page 58.

Goals Related to Patient Population

Goal one. Hispanics patients will achieve blood pressure control, self-management, and adherence to treatment.

Objective	Expected outcome	Result*
Patients will be provided with educational materials in appropriate language and medical interpreter will be utilized during teach/teach back method of patient education.	Language concordance will improve patients understanding of provided teaching and promote dialog between patient and provider. Hundred percent of patients enrolled in the project will receive education, teach/teach back with presence of medical interpreter.	Objective Met
Patients will participate in daily blood pressure monitoring.	Improved awareness of blood pressure measurements and factors associated blood pressure variations. 70 % of patients will comply with home blood pressure monitoring.	Objective Met
Patients will follow up with their primary care provider after hospital discharge.	70% of patients will follow up with their primary care provider after hospital discharge.	Objective Met
The adherence to medication therapy will improve.	Culig adherence scores will improve by 70% upon completion of the project (three months).	Objective Met
The knowledge related to hypertension and self-management will improve.	At three month follow up patients will demonstrate 50% HELM score improvement.	Objective Not Met **
Blood pressure control will improve.	Seventy percent of patients will have a blood pressure at goal in accordance with JNC 8 guidelines upon completion of the project (3 months).	Objective Met
Patients will participate in YMCA Healthy Community Wellness Program.	Fifty percent of patients who verbalized willingness to participate in the program will be actively enrolled.	Objective Not Met***

*See results section, page 59.
**See results section, page 63.
***See results section, page 65.

Project Design

The DNP project included a Quality Improvement (QI) framework with an education evaluation design aimed at improving blood pressure control and knowledge related to hypertension self-management in Hispanic patient population. The QI project was patient-centered and recovery oriented. The QI project was focused on process improvement and the interventions were designed to provide patient oriented, safe, effective, timely, and sustainable solutions within a health system that serves a large Hispanic community. Process improvement was focused on commitment to wellness promotion and preservation, as well as support of individually defined health goals. The project design also took into account employee empowerment, shared governance, and active involvement of all key stakeholders. Ongoing feedback allowed for review and revision of planned intervention to meet set objectives and goals.

The DNP student, a current employee of the clinical site involved in patients' care at the institution lead, managed, and monitored a selected hospital employee QI team of providers and staff who were conducting the project. Within the quality improvement (QI) protocol, the DNP student enlisted strategies to address specific needs of Hispanic patients population diagnosed with hypertension by enhancing current practice model and existing processes. Recovery oriented services promoted and preserved wellness by meeting individually defined goals. Assessment of distinct patient needs, barriers to treatment adherence, and knowledge deficit upon admission and during the hospital stay promoted individualized, patient-centered care. Leadership personnel was presented with current research findings supporting the QI project's goals and objectives in order to gain approval and direction towards project implementation consistent with the mission, the strategic plan of the organization, and resource utilization. To

ensure data informed practice leadership and personnel's feedback was used to inform practice

and measure results. Decision-making and the project's interventions were evaluated based on

focus group response related to feasibility of planned interventions and sustainability of the

proposed interventions.

In order to avoid need for extensive improvement in the implementation phase prior to

the project actualization goals and objectives were evaluated based on received feedback,

feasibility in a clinical setting, and concordance with evidence based practice models. Feedback

of employees directly involved in care of Hispanic hypertensive patients was evaluated and the

project was revised to meet not only patient specific goals, but also goals of those responsible for

care delivery. This approach allowed for shared governance with emphasis on improved nurses'

work, satisfaction, and attainment of mutually set goal. Continuous improvement was achieved

by ongoing measuring and assessing the performance of implemented interventions through the

collection and analysis of data. Actions were taken to improve interventions as indicated by data

evaluation including benchmarking and direct feedback.

Project Site and Population

The quality improvement (QI) project took place on a medical surgical unit at a

Community Medical Center, which serves nine communities within two counties and an

aggregate population of 180,000. The DNP student chose the health care organization as a QI

project site based on data suggesting cardiovascular disease to be among the leading causes of

death in the two counties served by the health care institution (PHC, 2016). In the 2012 , the

Community Medical Center experienced 29% greater rate of stroke admissions and 53% increase

in hospitalization for coronary heart disease as compared to statewide levels. Furthermore,

Latinos experienced greater rate of stroke admission in the community than Whites (PHC, 2016).

Hispanic population served by the Community Medical Center is not only faced with disproportionately distributed cardiovascular disease risk, but also limited access to care, linguistic barriers and institutional racism (PHC, 2016). In the healthcare organization's service area, approximately five percent of the population lives in linguistically isolated household; approximately eight percent has limited English proficiency. Furthermore, 10% of the population was noted to be unable to speak English well and 47% directly served by the Community Medical Center identifies as Hispanic. Forty four percent of the patient population does not speak English at home. Detailed population characteristics have been discussed in the organizational "gap" analysis of the project site.

Setting facilitators and barriers.

Internal strengths. The quality improvement (QI) project's site offers in-person, as well as phone and virtual interpretive services. The healthcare organization also employs diverse medical, nursing, and professional staff, which allows for greater cultural and linguistic concordance. In addition to linguistic services comprehensive navigation programs related to chronic conditions management, such as COPD, CHF, and stroke are already present in the health system. These services include comprehensive, language concordant discharge and follow up planning. The Community Medical Center's focus on promoting wellness and chronic disease management strategies within the served community further supported goals and objectives of the QI project.

The Community Medical Center partners with a local Health Care Center serving low income, diverse patient population, a primary care group, a counseling center, city's Health Department and local YMCA chapter. Direct collaboration between these health care agencies is aimed at improving the health of individuals served by the Health System and its partners. This

partnership focuses on community level management of hypertension, pediatric asthma, tobacco use, diabetes prevention, obesity, and oral health. Health care providers employed by above organizations are responsible for offering hypertension screening and education related to monitoring blood pressure. The Community Counseling Center offers stress reduction techniques and behavior modification techniques, while the YMCA offers stress reduction through exercise .

Employed community health workers engage local community in these services through participation in health benefit community meetings and city's wellness program for municipal and school employees in conjunction with the YMCA. However, based on Mosner & Franklin's (2007) findings Hispanics patients are more likely than their white and African American counterparts to be diagnosed with hypertension when they seek medical attention in times of illness, rather than during routine or preventive health care encounter. Therefore, interventions targeting Hispanic hypertensive patients in an inpatient setting focused on outpatient management continuum are essential. Lack of timely availability of in person medical interpreters and institutional racism was presumed to pose as an internal barrier, however implementation phase of the project demonstrated interpretive staff engagement, partnership with the nursing staff and the DNP student, accountability, and cultural sensitivity. Organization's medical interpretive staff took pride in assisting patients, the DNP student, and the nursing staff.

Internal barriers. Internal barriers encountered within the health care organization included utilization of patients' family and friends as interpreters due to time constraints noted by nursing staff, and perceived difficulty using interpretive phone system. Proper use of interpretive services during encounters with Limited English Proficiency (LEP) patients was

also affected by several barriers, such as: assumed difficulty of using phone interpretive services, and lack of face to face interaction.

Teach back method of providing education is currently implemented at the Community Medical Center, however, it is often perceived as time consuming. Additionally, poor literacy assessment upon admission negatively affected patients' ability to fully comprehend provided materials. During the implementation phase, a number of patients who initially reported reading as best method of learning admitted to poor literacy level upon assessment with the DNP student and noted demonstration or verbal instructions to be their preferred learning method. Based on the DNP student's observations the teach back method of learning assessment, assessment of literacy level and evaluation of preferred teaching method should be reinforced with the nursing staff. Physical and staffing constraints also posed a significant barrier to prompt recognition of patients' needs. Inadequate staffing, additional responsibilities, and perceived increase in workload negatively affected needs assessment and discharge planning.

To decrease present linguistic barriers, the DNP student highlighted the value of language concordant care with the Community Medical Center's key stakeholders, nursing staff, and medical interpreters. The DNP student reinforced the use of phone interpreters with nursing and medical staff. An additional three-way phone was placed on the unit to assure timely access to language services available around the clock.

The importance of literacy assessment upon admission was emphasized with the unit's nursing and interpretative staff. This objective was initiated during staff education phase of the project. Nursing staff was also trained to administer the Culig Adherence Scale to patients

enrolled in the project. This intervention was aimed at recognition of barriers to treatment

compliance influenced by socio-economic and individual factors.

To provide easily accessible patient education materials written in Spanish at third grade

literacy level, the DNP student provided nursing staff with pre-printed materials in individual

folders. These folders were then placed alongside chronic disease management materials

including chronic obstructive pulmonary disease and congestive heart failure educational

materials currently provided to patients on admission. This approach allowed for easy access to

the educational toolkit. Provided materials included patient teaching materials obtained from the

Massachusetts Department of Health, the American Heart Association, and the Centers for

Disease Control and Prevention tailored specifically to Hispanic patient population.

External factors. Socio-economic factors, including high rate of poverty and

homelessness, overall low literacy level in the community, and Limited English Proficiency

among served community has a negative impact on health care delivery at the Community

Medical Center. Community needs assessment data noted 45% of county residents living in a

healthcare professional shortage area, compared to 15% statewide (PHC, 2017). This limited

availability of providers may negatively impact timely access to primary and specialty care.

However, such correlation was not observed within the immediate area served by the

Community Medical Center. Quality improvement (QI) participants were able to self-schedule

timely primary care follow up appointments. The limited availability of staff to take on the

responsibility of appointment scheduling and participants desire to self-schedule appointments

post hospital discharge had direct effect on discharge coordination and outpatient coordination of

care for patients with hypertension. To promote access to care and continuity of care post

hospital discharge the DNP student worked closely with the case management department to

assure that these complex patients do not face barriers to outpatient follow up care, such as limited health insurance coverage or lack of established care with a primary provider.

Setting facilitators. The Community Medical Center's initiative focused on increasing hypertension awareness within the community currently lacks interventions aimed at identifying inpatient hypertensive patients and directing their outpatient care. A significant benefit of overcoming present barriers includes improved patients' outcomes, improved patient satisfaction, communication, and patient retention within the health care system.

Implementation/Procedures

The Plan-Do-Check-Act model was used to test several solutions to identify the most effective interventions before implementation of the quality improvement (QI) project and to evaluate the outcomes (Deming, 1993) (see Appendix G, Figure 1). The process improvement initiative was centered on evidence-based interventions tailored specifically to LEP Hispanic patient population and took into consideration key stakeholders' guidance and received feedback.

The DNP student conducted a comprehensive community needs assessment supported by Community Health Needs Assessment 2016 findings prepared for the Community Medical Center. Management of hypertension among the predominantly Spanish-speaking Latino population emerged as a significant concern within the health system (PCH, 2016). The DNP student assessed current care practices related to hypertension management among Hispanics with Limited English Proficiency (LEP) by discussing the existing care model with the institution's key stakeholders (including hospital administrators, case management personnel, interpretive service staff, and registered nurses directly involved in patients' care).

Based on information obtained on site and evidence garnered from the literature exploring hypertension management strategies among Latino populations, the DNP student

formulated the Quality Improvement DNP Project plan. Decision-making about specific project interventions was based on work during strategic planning sessions with the QI team and was focused on practicality and sustainability of planned interventions. Feedback of employees directly involved in care of Hispanic hypertensive patients was sought and the project was designed and implemented to meet not only patient specific goals, but also goals of those responsible for care delivery. This QI team approach allowed for shared governance with emphasis on an improved work plan and workflow. Actions were taken to improve processes as indicated through the use of benchmarking and direct feedback.

The second phase of the Quality Improvement (QI) project was focused on testing proposed interventions in the clinical setting. Actions were taken to improve processes as indicated through use of benchmarking and direct feedback. Outcomes of implemented interventions were evaluated and compared with goals set prior to the QI project actualization. Continuous quality improvement (CQI) was achieved post project through ongoing measurement and assessment of implemented interventions.

Measurement Instruments

In order assess the outcomes of this DNP Project the following instruments were used: blood pressure readings, Culig adherence scale (see Appendix A) and the hypertension evaluation lifestyle and management (HELM) knowledge assessment (see Appendix H). Number of scheduled discharge follow-ups, patients' follow up rate with their primary care providers and the DNP student, and participation in the YMCA's wellness program also served as an outcome measure.

Blood pressure measurements obtained during patients' inpatient stay and their outpatient follow up with the DNP student served as data source aimed at evaluating blood pressure control

post intervention. The Culig adherence scale, a suitable measure of adherence in the setting of hypertension, was administered upon patients' enrollment in the project and at the three month follow up to assess patients treatment compliance (Culig & Leppee, 2012). The fourteen-item HELM knowledge assessment is a valid tool used to evaluate interventions designed to enhance management of hypertension (Schapira, et al., 2012). Thus, the results of the HELM knowledge scale administered upon admission and at the three month follow were used to evaluated hypertension knowledge, self-management, and awareness of therapy goals.

Data Collection Procedures

Data collection began in November of 2017 through the phases of the Plan-Do-Check-Act model after approval of the quality improvement (QI) proposal. The first intervention QI team education related to subject recruitment criteria, adherence and needs assessment, hypertension management, home blood pressure monitoring, and language concordant care. Poster presentation and small group teaching sessions were chosen as staff education strategies based on focus group discussion results. The DNP student provided a poster presentation to nursing staff, medical interpreters, case management personnel, and medical providers. Poster remained on the unit throughout the implementation phase of the project to provide ongoing access to learning materials and project's goals and objectives for the QI implementation team.

QI team and staff education was focused on: 1) JNC 8 hypertension guidelines; 2) strategies to identify barriers to self-management and treatment adherence among Latino patients using the Culig adherence scale and hypertension evaluation lifestyle and management (HELM) knowledge assessment; 3) self-blood pressure monitoring guidelines; and 4) outpatient follow up care coordination. The DNP student provided additional assistance and learning opportunities based on identified needs for additional instructions voiced by the members of the QI team.

Additionally, received feedback allowed the DNP student to evaluate and revise the proposed QI protocol as outlined by the plan-do-check-act model for continuous improvement. The DNP student's contact information was shared among all team members to assure the DNP student's availability for consultation as needed.

The participant enrollment phase of the QI project began at the end of November, 2017. The DNP student lead a quality improvement (QI) team to identify Hispanic patients with Limited English Proficiency (LEP) and hypertension. Blood pressure measurements inclusion criteria were defined as :1) blood pressure greater than 140 mmHg systolic and greater than 90 mmHg diastolic for patients age 25 to 60 years old and 2) blood pressure greater than 150 mmHg systolic and 90 mm/Hg diastolic for patients age 60 and older. The outlined blood pressure (BP) criteria were to be obtained on three separate occasions during patients' inpatient admission to the hospital's medical surgical unit. Established inclusion BP criteria were supported by the eight report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure.

Wide range of age in the project was supported by existing evidence concluding lower rates of hypertension awareness among young Hispanic patients as compared with non-Hispanic patient population. Bersamin and colleagues (2009) observed that Mexican Americans age 25 to 34 years old were less likely to be aware of their hypertension compared with older Mexican Americans. Targeting patients at risk for hypertension or clinically noted hypertension early on may lead to achieving greater control and better knowledge related to the disease. This method of recruitment and setting allowed for identification of patients with hypertension, who may otherwise not suffer from cardiovascular disease and may not be aware of elevated blood pressure.

Prospective participants' ability to make an informed decision regarding project enrollment was assessed by either a registered nurse assigned to an induvial patient or by the DNP student. Only patients who were able to demonstrate an understanding of proposed interventions, project goals, and potential risks were asked to participate. This data was related to the DNP student who provided each participant with a detailed consent form approved by the organization's Risk Management Department (see Appendix G). Consent forms were translated into Spanish by facility's licensed medical interpreter and were completed by participants in the presence of in-person or phone medical linguistics services.

Each participant enrolled in the project received a comprehensive patient education and self-management toolkit. Provided toolkits included learning materials in English and Spanish obtained from the Massachusetts Health Department, the American Heart Association, and the CDC, as well as blood pressure measuring guide and a complimentary blood pressure monitor. Pre- admission medication adherence was evaluated using the Culig adherence assessment. Nursing staff and/or the DNP student administered the Culig adherence questionnaire to gain insight into patients' beliefs and practices related to medication and treatment compliance. The nursing personnel and/or the DNP student also administered the hypertension evaluation of lifestyle and management (HELM) assessment upon patients' enrollment in the QI project. Obtained data guided patient education and resource utilization including a need for financial assistance, review of current prescribed therapies, and further learning needs. The initial patient education was provided by the DNP student and later reinforced by assigned registered nurses in the presence of on-site or phone medical interpretive services throughout patients' hospital stay. Patients were given the opportunity to familiarize themselves with provided learning materials and ask questions accordingly. When desired or permitted by patients, family members were

encouraged to join teaching sessions, however they were not allowed to serve as an interpreter to assure accuracy of provided education.

The hypertension evaluation of lifestyle and management (HELM) assessment, a 14 item questionnaire focused on lifestyle, medication management, general hypertension knowledge, treatment goals and measurements was administered upon initial participant enrollment. The HELM assessment tool was chosen by the DNP student as a self-management and knowledge evaluation method based on its validity and feasibility in the context of chronic disease management. Each participant completed the questionnaire in the presence of on-site medical interpret or phone linguistic services contracted by the health care organization. Obtained results allowed the DNP student to formulate individualized teaching plan for each participant with a focus on areas needing improvement. Initial proposed objective plan for this intervention involving re-administration of the tool prior to discharge did not prove to be a feasible option due to time constraints. Therefore, based on encountered barrier, the initial plan was revised, and patients were asked to verbally provide teach back immediately after outcome evaluation and teaching related to each item was provided. Correct answers and rationales were presented to participants in the presence of a medical interpret. Incorrect answers allowed the DNP student to openly discuss misconceptions patients may have had related to blood pressure management and general knowledge related to the condition. Patients' understanding of offered education was evaluated using the teach back method of learning assessment. Initial scores also served as a baseline assessment prior to follow up evaluation scheduled in three months post hospital discharge. The HELM assessment was re-administered during the three month health coaching follow up visit.

In addition to the hypertension evaluation of lifestyle and management assessment the DNP student chose to administer a 16 item Likert style Culig adherence questionnaire to each participant upon initial project enrollment. This method of evaluation was chosen by the DNP student based on its clinical validity for use in hypertensive patients. To complete the survey, patient were asked to rate degree of compliance with prescribed pharmacological therapies on a scale of one to four for each potential cause of non-adherence (eg. forgetfulness, medication timing, financial constraints, and fear of side effects). A score of four for each item indicated medication adherence. Survey scores of three to one for each item demonstrated decreased levels of adherence to prescribed therapy according to presented circumstances, for example due to forgetfulness. Individual scores were reviewed by the DNP student and served as teaching and needs assessment guide. Medication adherence education was provided to each participant by the DNP student based on survey's outcomes. Teach back method of learning evaluation was used to assure patients' understanding of provided instructions. The initial Culig adherence assessment scores served as a baseline measure of treatment adherence and were used to evaluate changes in treatment compliance at the scheduled three month follow up health coaching visit. Each participant also received a referral to a local YMCA hypertension management program. The referral was given in a format of a wellness prescription template to be further signed by patients' primary care providers during outpatient follow up visits.

Each enrolled participant received a complimentary, FDA approved, calibrated blood pressure monitor prior to hospital discharge. Patients received education on proper use of the device from the DNP student. Education included frequency of monitoring, as well as the need for measuring blood pressure in a chair with back support with the arm posited at the heart level, after they rested for three to five minutes and avoided tobacco and caffeine for thirty minutes

(Peixoto, 2015). The method of measuring blood pressure twice, two minutes apart and calculating the average was also reviewed with patient as the optimal method of obtaining readings. Blood pressure zones (see appendix E, figure 2) and appropriate action plans were discussed with patients. Post education session each participant was able to demonstrate accurate blood measuring technique, point to correct blood pressure zone and further management needs based on obtained result.

Detailed blood pressure monitoring guide in Spanish and English was given to each patient enrolled in the quality improvement (QI) project. Patients were asked to record measured blood pressure in a log included with the complimentary monitor. Enrolled patients agreed to daily blood pressure monitoring; daily blood pressure monitoring and recording was especially emphasized during the week prior to patients' scheduled follow up appointment with their primary care provider and the DNP student at completion of the project. Blood pressure log over a one-week period is reproducible and provides satisfactory information for clinical decision-making (Peixoto, 2015).

Discharge needs of patients enrolled in the QI project were assessed by the DNP student and case management department. Initial proposed objective involving scheduling primary care follow up appointment for each patient prior to discharge was determined not to be a feasible option based on participants' preference of scheduling their own appointments post hospital discharge. Therefore, based on the plan-do-check-act model for continuous improvement this objective was revised. Alternatively, to assure care continuum patients received detailed instructions regarding their follow up care including the name of the provider and outpatient practice phone number. The DNP student scheduled a two-week follow up health coaching

phone call utilizing phone interpretive services. This intervention assessed patients' adherence and provided additional guidance.

At three months post discharge patients were advised to schedule a follow up appointment at the Community Medical Center with the DNP student. At the time of the appointment the hypertension evaluation of lifestyle and management assessment and the Culig Adherence evaluation scale were re-administered to assess patients' hypertension-related knowledge and treatment adherence post intervention. Blood pressure readings were also obtained to assure accuracy. The benchmark goals included: 70% of enrolled patients will exhibit blood pressure control within JNC 8 guidelines, 70 % of patients will demonstrate compliance with home blood pressure monitoring, in three months there will be 70% improvement in Culig Adherence Scale, 50% improvement HELM assessment scores, and there will be a 90% follow up rate after hospital discharge. At the three month follow up patients were also asked about their participation in the YMCA wellness program recommended during inpatient stay. The benchmark goal for this intervention was set at 50% participation. Illustrative data was obtained from journals, focus groups discussions, individual meetings with stakeholders, and personal observations.

Data Analysis

Results of the quality improvement (QI) project were assessed and evaluated using descriptive and illustrative methods for data analysis obtained from the blood pressure measurements, HELM and Culig tools, the DNP student's journals, focus groups discussions, individual meetings with stakeholders, and personal observations.

Descriptive methods, item frequency distribution and percentages were used to analyze the outcomes of the Culig adherence scale, the hypertension evaluation lifestyle and management

knowledge assessment, results of blood pressure monitoring, and outpatient follow up results. Illustrative data including data obtained from journals, focus group discussions, structured interview questionnaires containing substantial open comments, surveys, and field notes was analyzed and interpreted in the context of the QI project. Quotes, anecdotes, and common themes that are representative of the project's leading findings were selected and evaluated.

Extracted data was described in context of the QI project and its framework. The DNP student took into consideration extraneous variables, which may have bearing on the interpretation of results, including consistency and quality of instructions provided to patients, patient self-report of adherence to treatment regimen, and chronic conditions affecting blood pressure control.

Results

Population characteristics.

This quality improvement (QI) project aimed determine if a culturally sensitive, multifactorial intervention initiated in an inpatient care setting focused on promoting hypertension awareness and self- management strategies in Limited English Proficiency Hispanic population has the potential to increase patients' treatment adherence, self-management strategies, blood pressure control, and providers awareness of specific needs of LEP Latino patients.

Twenty patients agreed to participate in an individualized educational session related to hypertension, home blood pressure monitoring, self-home blood pressure monitoring, over the phone health coaching, primary care follow up, and a three month follow up with the DNP student. Hundred percent (n=20) of enrolled participants were Hispanic and demonstrated Limited English Proficiency. Seventy-five percent (n=15) of the participants were female, males

enrolled in the project accounted for 15% (n=5) of project participants. The participant age

ranged from 25 to 75 years old; the mean age was 52.55 years. Seventy five percent of the

enrolled patient population (n=15) had pre-existing diagnosis of hypertension and 25% (n=5)

verbalized receiving home blood pressure monitoring instructions and a prescription for a blood

pressure monitor from their primary care provider; 10 % (n=2) verbalized using blood pressure

monitors at home. Ninety-five percent (n=19) of participants were established with a primary

care provider and had adequate health insurance coverage; five percent of participants (n=1) had

limited health insurance coverage, no primary care provider, and lack of knowledge on

outpatient healthcare access. The mean systolic blood pressure (BP) upon project enrollment was

157 mmHg, mean diastolic blood pressure was 83 mmHg. Systolic BP ranged between 140

mmHg and 192mmHg, diastolic BP ranged between 65 mmHg and 101 mmHg .
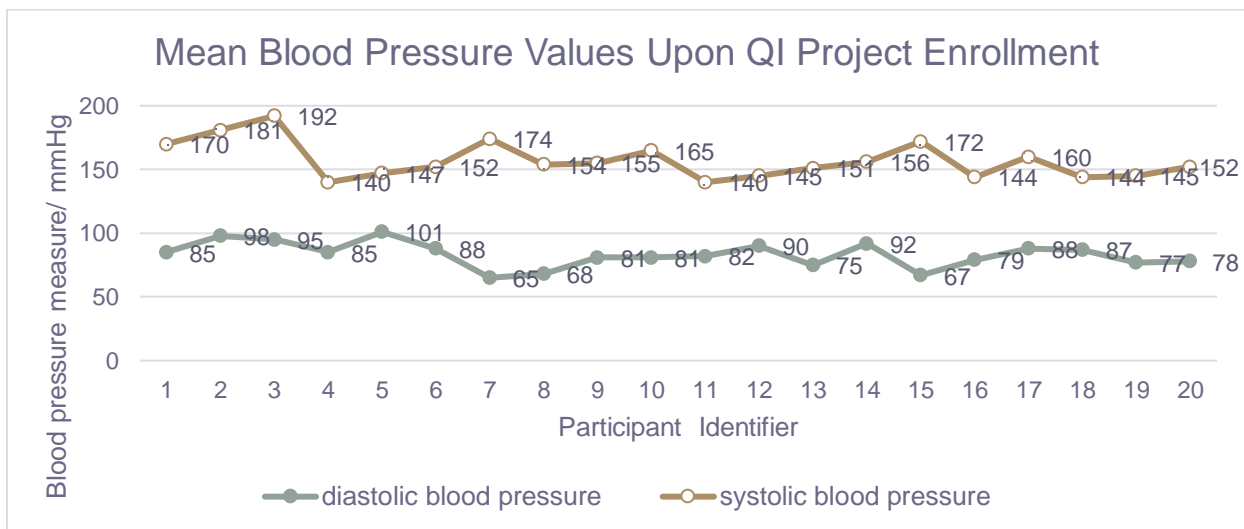
Figure 1. Mean blood pressure values upon enrollment in the quality improvement project

(N=20).

Results related to provider, facility, and patient population upon project

actualization.

Goal one. Educational materials in appropriate language on lifestyle modifications and medication therapy implications as well as wallet size blood pressure goal cards will be provided.

Objective	Expected Outcomes	Results
Educational materials in accordance with JNC 8 guidelines will be obtained from the Massachusetts Health Department, the American Heart Association, and the Centers for Disease Control and Prevention.	Educational materials will be gathered, reviewed, and compiled into patient toolkit folder by 7/2017 (see Appendix E, Figure 1-8).	Patient toolkit was completed at the end of 7/2017 and included materials obtained from the American Heart Association and Massachusetts Health Department.
Educational materials will be reviewed by hospital's quality improvement committee and nursing staff.	Educational materials will be reviewed and revised based on applicability and ease of use in clinical setting by 8/2017.	Patient toolkit, its' validity and applicability in the clinical setting was reviewed and approved to use by facility administration. Educational booklets were printed in Spanish and English at the facility's print shop department at the end of 8/2017.
Nursing staff and medical interpreters will receive education related to use of educational materials in practice and teach back method of learning evaluation.	100 % of nursing staff and medical interpreters will verbalize understanding of teaching materials. Nursing personnel will agree to review educational materials with patients upon admission and upon discharge in presence of medical interpreter or interpretive phone service line with teach back provided.	One hundred percent of nursing staff and medical interpreters received education related to teaching goals of the quality improvement project, background, and related patient teaching materials. Poster presentation and demonstration were chosen as the teaching methods. Nursing staff and interpretive staff agreed to participate in the QI project.

Patient education toolkit was compiled by the DNP student prior to quality improvement

(QI) project actualization. Patient teaching materials and blood pressure measuring guides

included in the toolkit were obtained from the American Heart Association and Massachusetts

Health Department, and the CDC. All materials were reviewed by the facility's QI team and

patient education department members. All provided materials were made available in English

and Spanish. The blood pressure management patient toolkit was approved and recommended

for use in the inpatient care setting by facility's Chronic Disease Management Director, who

voiced interest in incorporating it as a standard of care post project completion. Based on the

toolkit's perceived value and applicability in the clinical setting the DNP student received

permission to print needed amount of toolkits at the healthcare institution. All materials are

available for reprint and/or can be requested at no charge from the American Heart Association,

Massachusetts Health Department, and the CDC, therefore do not pose financial burden on the

healthcare institution.

Goal two. Hispanic patients with previously diagnosed hypertension or new onset hypertension,
or will be identified upon admission to medical surgical unit.

Objective	Expected Outcome	Results
Hispanic patients age 25-60 years old with BP >140/90, and Hispanic patients age 60 and older with BP >150/90 will be identified on admission to medical surgical unit by nursing staff.	Hispanic patients with hypertension will be identified.	Between 11/22/2017 and 12/28/17 30 Hispanic patients with Limited English Proficient and hypertension were identified. Twenty two met the inclusion criteria to participate in the QI project. Out of the 22 patients 20 verbalized willingness to participate in the project.
Program targeting hypertension among Hispanic patient population will be reviewed with patients and patients willing to participate will be enrolled in the project.	Ninety percent of identified patients will express willingness to enroll in the project.	Ninety percent of identified patients (n=20) expressed willingness to participate in the project.

The DNP student and registered nurses on the medical surgical unit at the Community

Medical Center were responsible for identification and enrollment of LEP Hispanic patients with

hypertension as outlined by the JNC 8 guidelines. Blood pressure measures were obtained from

the electronic medical record. The participation identification procedure yielded 30 prospective

project participants. Eighty-three percent (n=25) were identified by the DNP student and

remaining 17% (n=5) were identified by registered nurses assigned to patients. Seventy three

percent (n=22) patients met inclusion criteria. The total amount of participants enrolled equaled

to 90% (n=20) of the total eligible participants. Nursing staff noted time constraints and urgent

patients' needs as a reason behind low rate of hypertensive LEP Hispanic patient identification.

The 10% (n=2) of patients who declined project participation noted disinterest in blood pressure

management program due to lack of time and health care concerns requiring immediate attention

responsible for their inpatient hospital admission.

Goal three. Home blood pressure monitoring and monitoring log will be introduced to patients.

Objective	Expected outcome	Results
Patients will receive complementary blood pressure monitors prior to hospital discharge	100% of those enrolled will be equipped with home blood pressure monitors prior to hospital discharge.	One hundred percent of enrolled patients received a complimentary, FDA approved, blood pressure monitor prior to hospital discharge.
Patients' willingness and understanding of home blood pressure monitoring will be reviewed.	Patients will verbalize understanding of home blood pressure monitoring and voice potential barriers to home blood pressure monitoring. Patients will be able to demonstrate use of home blood pressure monitor prior to hospital discharge.	One hundred percent of patients enrolled in the QI project demonstrated proper use of portable blood pressure (BP) monitor and were able to verbalize factors negatively affecting blood pressure readings. Potential barriers to home BP monitoring were discussed with patients on individual basis.

Upon enrollment in the QI project patients were informed about their eligibility to receive

a FDA approved home blood pressure monitor upon completion of a therapy adherence and

hypertension knowledge assessments and subsequent learning session. These criteria were also

outlined in the informed consent (see Appendix F) received by all project participants. Hundred

percent of all enrolled patients (n=20) met conditions to receive the complimentary blood

pressure monitor provided by the DNP student.

Upon assessment of prior knowledge related to hypertension self-care and management,

20 % (n=5) of enrolled patients stated that they were told to monitor home blood pressure by

their primary care provider and received a prescription for a home blood pressure monitoring

device. However, only 10% (n=2) of participants reported buying the device as prescribed and

monitoring their blood pressure regularly. One of the two patients' stated, "I have the machine,

but I don't know what the numbers mean". Upon further discussion it was noted that the

prescribing provider did not equip this patient with a home management guide or an action plan detailing how to address elevated blood pressure (BP) measures. Receiving instructions to measure blood pressure at home without concrete action plan devised by a medical provider was noted by patients who were told to monitor their blood pressure at home. Fifteen percent (n=3) of patients who received a home BP measuring device prescription did not know where to obtain it and additionally noted a concern of a potential expense as a barrier to purchasing it.

Prior to receiving blood pressure self-monitoring guidelines and education on proper use of home BP measuring device each patient received detailed verbal instructions supported by printed materials provided by the DNP student. Each patient was required to demonstrate BP measuring technique, including proper position and was asked to discuss factors affecting BP readings, such as caffeine intake or timeline between a meal or exercise. Blood pressure monitoring technique was then corrected as needed and demonstrated by the DNP student. Each patient was also asked to point out or verbalize blood pressure zone and further actions he/she should take based on obtained results. Hundred percent (n=20) of patients were able to demonstrate and verbalize accurate BP measuring procedure at the end of the teaching session.

In addition to incomplete instructions received by patients from their providers, one patient who confidently noted daily blood pressure monitoring at home revealed unawareness of the actual readings. When the DNP student inquired about what the home BP values show, patient stated "I check it every day, but I cannot see the small numbers". Further discussion with the patient revealed that due to a visual impairment patient is unable to see small numbers and has been using a manual BP monitoring device secondary to associated cost. Patient was uncomfortable to admit the visual impairment and financial constraints. The BP monitoring

device provided by the DNP student displayed easy to read numbers and the patient was able to correctly state obtained reading.

Results obtained from the home BP measuring learning session revealed a need to provide detailed BP measuring and management guidelines by providers paired with a thorough assessment of individual barriers. A demonstration of BP monitoring device use coupled with teach back learning assessment has the potential to enhance patients' learning, engagement in self-care, and correct home blood pressure monitor use.

Goal four. Medication adherence and knowledge related to hypertension will be assessed upon admission to hospital.

Objective	Expected outcome	Results
The Culig adherence scale will be reviewed with nursing staff and its application in the clinical setting.	100 % of nursing staff will verbalize understanding, application of the adherence scale, and willingness to administer it to patients upon admission.	100 % of nursing staff verbalized understanding, application of the adherence scale, and willingness to administer it to patients upon admission.
The Culig adherence Scale will be administered during inpatient admission	The Culig adherence scale will be administered on admission to all patients enrolled in the project.	The Culig adherence scale was administered to patients on admission, however due to fast paced environment and external factors the adherence assessment was administered to patients also mid hospital stay, given adequate time for review and education.
The hypertension evaluation of lifestyle and management (HELM) scale will be administered during inpatient admission.	HELM knowledge assessment will be administered as proposed.	HELM scale was administered to patients upon admission or during hospital stay.

One hundred percent of nursing staff received education related to the Culig medication adherence assessment. The Culig medication adherence evaluation was administered by the DNP student to 75% (n=15) of enrolled patients upon admission or during their inpatient stay, registered nurses provided the patient adherence questionnaire to 25% of participants (n=5).

Registered nurses noted time constraints and multiple patient care tasks as a barrier to administering the adherence assessment. In addition, due to facility's agreement criteria specifying the DNP student's role in patient education and quality improvement project participation consent procedure the adherence assessment was completed by the DNP student and either an in-house or a phone medical interpreter was used in the process. Each patient received a version of the assessment written in Spanish. Copies in English were available as a reference.

The Culig medication adherence assessment was administered prior to the blood pressure management learning session in order to individualize teaching plan for each participant. Patients were asked to rate their level of adherence to prescribed pharmaceutical therapy using the Culig medication adherence scale, a 16-item Likert scale with the following responses noting degree of noncompliance with prescribed therapy, *1: often (more than 5 times yearly), 2 Sometimes (3-5 yearly), 3: Very rare (1-2 yearly), and 4 (never).* For the purpose of the QI project a score of 3.5 or greater was considered to represent adequate medication adherence.

Table 2.

The Culig Adherence Scores Upon Project Enrollment (n=20)

Item	Adherence Score	Item	Adherence Score
I was not at home.	2.9	I was sleepy at medication time.	3.7
The drug was not available due to short supply.	3.5	I had a cold.	3.7
I just forgot.	2.7	I felt depressed or broken.	3.3
I take a number of drugs several times a day.	2.8	I had problems with medication timing.	3.4
I wanted to avoid side effects.	3.2	I consumed all of it.	3.4

I did not want other people seeing me taking drug.	3.8	I felt well.	3.2
My doctor frequently changes my therapy.	3.6	I was afraid of developing drug dependence.	3.8
I felt the drug to be toxic/harmful.	3.6	The drug was too expensive.	3.3

Analysis of the medication adherence assessment demonstrated that main factors responsible for non-adherence to pharmaceutical therapy among QI project participant included unavailability of medication at the administration time (not being at home), frequency of administration times throughout the day, fear of side effects, feeling depressed, problems with medication timing, perceived lack of need to take medication due to feeling well, lack of timely refill, and medication cost.

The 14 item Hypertension Evaluation of Lifestyle and Management (HELM) assessment was administered alongside the medication adherence scale in order to individualize patient teaching based on individual learning needs. All participants (n=20) completed the questionnaire. Eighty-five percent (n=17) of participants correctly noted a systolic blood pressure (BP) of 140 mmHg or greater and diastolic BP measure of 90 mmHg or greater as hypertension. One of the participants noted the blood pressure in question to be low, remaining two participants voiced unawareness of blood pressure values. Blood pressure zones and self-management action plans.

Fifty-five percent of patients (n=11) incorrectly believed that most people can tell when their blood pressure is elevated because they do not feel well. Common symptoms noted by patients included headache and anxiety. This data allowed the DNP student to discuss the silent presentation of blood pressure and the need for BP monitoring despite feeling well.

Fifty percent (n=10) of participants were able to correctly point to kidney failure as a consequence of uncontrolled blood pressure. Forty five percent (n=9) believed uncontrolled BP

may cause elevated cholesterol level, and five percent (n=1) listed diabetes as a potential outcome.

Fifty percent of participants (n=10) listed smoking a pack of cigarettes as a hypertension risk factor, 40% (n=8) attributed it to gaining 15 pounds, 10% (n=2) perceived drinking more than two cups of regular coffee a most significant risk factor. None of the participants believed weight lifting may increase their risk of hypertension.

Eighty percent of participants (n=16) correctly noted that people with hypertension need to continue their pharmacological therapy even if they exercise regularly. Twenty percent (n=4) falsely believe that initiating regular exercise regimen allows them to discontinue their medications without consultation with their physician.

When asked about a correct statement about taking blood pressure 35% of patients (n=7) correctly noted that more than one type of blood pressure medicine can be taken at the same time. This questions allowed the DNP student to discover than one participant discontinued one of her blood pressure medications after a different class medication was added by her provider due to uncontrolled blood pressure. Patient did not consult her provider due to assumption that only one medication can be taken. After further discussion patient agreed to see her provider within a week of discharge to assure proper therapy. Fifty percent of participants (n=10) believed that blood pressure medicine should not be taken if a person drank alcohol that day. Patients' responses allowed the DNP student to discuss alcohol consumptions, allowed daily alcohol intake, and associated risks. Ten percent of participants (n=2) assumed that blood pressure medicine should always be taken with food.

Item seven on the HELM scale, inquired about sodium consumption and its' dietary sources. Fifty-five percent (n=11) of participants correctly assumed that most salt Americans use

is not added with a salt shaker. Forty-five percent believed that salt added at the time of a meal is the main source of their dietary sodium intake. The DNP student reviewed dietary guidelines following patients responses. A guide how read nutrition labels was provided. All participants (n=20) were able to demonstrate understanding of nutritional labels after receiving education as determined by return demonstration and teach back learning evaluation.

Item eight, inquired about calories present in commonly consumed beverages. Only 20% (n=4) of participants correctly stated that there is as many calories in 12 ounces of orange juice as there is in 12 ounces of regular cola. Eighty percent (n=16) believed orange juice has less calories. The DNP student further reviewed nutritional guidelines with patient based on their responses. Healthy ways of incorporating flavored beverages into their daily diet and alternatives were discussed. Hundred percent of patients (n=20) were able to verbalize the correct statement after discussion and provided education.

Question nine on the HELM scale investigated lifestyle modifications needed to improve blood pressure control, participants were asked to pick one of four options related to presented case scenario: *"An overweight 60-year-old man has hypertension. He drinks one bottle of beer and 4 cups of regular coffee a day. He adds regular table salt to his food at most meals. Which one of the following changes is most likely to lower his blood pressure?"*. Forty percent (n=8) of participants correctly noted losing 10 pounds as having the greatest advantage. Thirty-five percent (n=7) believed the person in question should stop drinking alcohol, 15% (n=3) suggested switching to decaffeinated coffee, and 10% (n=2) assumed that the greatest blood pressure control will be achieved after the person switches to sea salt.

When asked about dietary changes most likely to lower blood pressure (question 10), 75% of participants (n=15) answered correctly that it can be achieved by eating more fruits,

vegetables, whole grains, and low fat dairy products. Twenty-five percent (n=5) noted drinking herbal tea instead of coffee as having greatest blood pressure benefit. None picked drinking one glass of wine daily or eliminating spicy foods as a measure to control blood pressure.

Question 11 investigated a relationship between exercise and blood pressure. Seventy five percent (n=15) of participants picked the right answer, stating "exercise for 30 minutes every day lowers blood pressure more than exercising for 30 minutes, three times a day. This item allowed the DNP student to offer each participant a prescription to local YMCA's wellness program. Fifteen percent of participants believed that weight lifting should be avoided by people with high blood pressure and 10% (n=2) assumed people who are on their feet most of the day will not benefit from more exercise. None of the participants chose option describing a need to raise their heart rate to at least 100 beats a minute to improve blood pressure.

Item 12 involved a case scenario as follows: "*A man reports that his blood pressure is 148/78 mm Hg when he checks it using the blood pressure machine in the pharmacy, 144/66 mm Hg in his family doctor's office, and 132/74 mm Hg when he checks it at home. Which of the following statements is true?*". Sixty percent of participants (n=12) correctly chose that it is common for blood pressure to vary in this manner. Twenty percent (n=4) assumed these are normal readings, 15% (n=3) pointed to the lowest reading as the correct one, and five percent of participants (n=1) picked the highest reading to be correct.

Question 13 on the HELM assessment was designed to evaluate knowledge regarding measuring blood pressure at home. Forty percent of participants (n=8) chose correctly that two readings should be taken a minute or two apart and average should be calculated. Thirty percent (n=6) implicated that several readings should be obtained, a minute or two apart and the lowest one should be recorded. Twenty five percent of participants (n=5) assumed that blood pressure

should always be measured before taking blood pressure medicine. One participant assumed that blood pressure should be taken right after exercise and at least two hours after a meal.

A case scenario presented in question 14 was designed to evaluate participants understanding of blood pressure (BP) goals and BP target ranges. When presented with the following question: *"Blood pressure is measured with two numbers, an upper number and a lower number. It is usually written as upper/lower. If someone is told that their goal blood pressure is 126/76, when have they reached that goal?"*, only 25% (n=5) of participants noted that goal blood pressure is reached when the upper number is below 126 and the lower number is below 76. Fifty percent (n=10) of participants chose the answer describing a goal blood pressure in relation to presented scenario as the upper number below 126, even when the lower number is over 76. Twenty percent (n=4) believed that goal BP is achieved when the average of the upper and the lower is below 100. One person, assumed the goal is reached when the lower number is below 76, even when the upper number is over 126.

Goal five. Outpatient follow up appointment will be provided upon discharge.

Objective	Expected outcome	Results
Scheduling follow up appointments for patients will be introduced to discharge coordinator.	Barriers and facilitators will be reviewed with discharge coordinator and new discharge protocol will be implemented.	QI project's objectives were reviewed with discharge coordinator and case management. Individual discharge needs were assessed by case management during patients' hospital stay.
Follow up will be scheduled prior to hospital discharge.	Ninety percent of patient will have a scheduled outpatient follow up prior to discharge.	Fifty percent (n=10) of enrolled patients verbalized having scheduled follow up visit with their primary care providers in an adequate timeframe and declined further assistance. Forty-five percent (n=9) of patients declined appointment scheduling prior to discharge secondary to time constraints. This group was able to verbalize appropriate follow up time frame and name their primary care provider. Five percent of participants (n=1) had limited insurance coverage and no primary care provider. Assistance was provided by the DNP student and case management personnel.

The initial objective of the quality improvement (QI) project of assuring scheduled follow up visit for each participant enrolled in the project was deemed not to be feasible secondary to several internal limitations and patients' wishes regarding their follow up care. Weekend admission and discharges posed one of the greatest challenges to scheduling a follow up visit secondary to primary care office's times of operation. In addition, 50% of enrolled patients (n=10) verbalized existing appointments with their primary care providers in the time frame corresponding with discharge care instructions. Forty-five percent of patients (n=9) noted time constraints and possible conflicting schedules post discharge as a reason for electing not to have their primary care visit scheduled prior to discharge. Out of the nine patients, five noted the need to schedule their appointment based on their family/friends availability due to transportation needs. Remaining four patients noted challenging work schedule and a need to discuss time off from work with their employer prior to selecting a date for their follow up. These patients were reluctant to having have to reschedule appointment or possibly miss it if the time frame does not work for them. However, all were able to state adequate follow up time frame and name their primary care provider. The DNP student provided all of the nine patients with their primary care provider's phone numbers included in the patient education and self-management toolkit.

One of the QI project's participants, who presented to the hospital secondary to persistent headaches and uncontrolled blood pressure noted reliance on urgent care clinics for blood pressure management and medication prescriptions. This participant reported limited health care coverage and unawareness of actions necessary to establish outpatient care with a primary care provider. Institution's case management team and the DNP student assisted the patient in selecting appropriate coverage plan. The DNP student arrange a phone call with the patient and her insurance provider, during which the participant chose a primary care group. Further follow

up care instructions were reviewed, written, and discussed with the participant by the DNP

student. Due to the time frame required by the insurance carrier to activate new health care

coverage plan patient was required to schedule the initial appointment with a new primary care

provider three days post hospital discharge. Post intervention patient noted a sense of relief due

to increased self-care knowledge and long term outpatient care options. This patient stated,

"before, I would go without my medications, because it is expensive to go to an urgent care and I

have two kids to take care of".

Goal six. Enrolled patients will receive a referral to a local YMCA wellness program.

Objective	Expected outcome	Results
Enrolled patients will receive a referral to a local YMCA wellness program.	Fifty percent of enrolled patients will verbalize willingness to participate in the program.	100% of enrolled patients verbalized willingness to participate in the YMCA program. A wellness prescription to be filled out by patients' primary care provider was given to each participant.

Patients enrolled in the project were not aware of wellness/hypertension management

program offered by a local YMCA available at no cost to those who qualify and are referred by

their medical provider. A prescription template to join the program was given to all project

participants. All were given detailed instructions to present the template to their primary care

provider at their follow up appointment. Unfortunately, provided prescription could not be

completed by patients' attending physicians in the in-patient care setting. This posed a barrier to

program enrollment as noted by project's participants who wished to receive a signed

prescription prior to their discharge.

Results related to patient population and follow up goals.

Goal one. Hispanics patients will achieve blood pressure control, self-management, and adherence to treatment.

Objective	Expected outcome	Results
Patients will be provided with educational materials in appropriate language and medical interpreter will be utilized during teach/teach back method of patient education.	Language concordance will improve patients understanding of provided teaching and promote dialog between patient and provider. 100% of patients enrolled in the project will receive education, teach/teach back with presence of medical interpreter.	100% of patients enrolled in the project received education, teach/teach back with presence of a medical interpreter or phone interpretive services.
Patients will participate in daily blood pressure monitoring.	Improved awareness of blood pressure measurements and factors associated blood pressure variations. 70 % of patients will comply with home blood pressure monitoring.	During 2 week health coaching over the phone follow up 90% (n=18) of participants reported compliance with home blood pressure monitoring; 65% (n=13) of total enrolled participants reported daily blood pressure monitoring, 25% (n=5) of patients reported weekly blood pressure monitoring, and 10% (n=2) did not initiate home blood pressure monitoring.
Patients will follow up with their provider after hospital discharge.	70% of patients will follow up with their provider as scheduled upon hospital discharge.	Ninety percent of participants reported follow up with their primary care provider indicated by discharge instructions.
The adherence to medication therapy will improve.	Culig adherence scores will improve by 70% upon completion of the project (three months).	At three month follow up there was an overall 74% increase in adherence scores.
HELM scale will be re-administered at 3 month follow up to evaluate learning.	At three month follow up patients will demonstrate 50% score improvement.	Forty three percent improvement in hypertension evaluation of lifestyle and management scale scores was noted as compared with the initial assessment.
Blood pressure control will improve.	70 % of patients will have a blood pressure at goal in accordance with JNC 8 guidelines upon completion of the project (three months).	Goal blood pressure range was demonstrated by 88% (n=7) of participants who followed up in three months after project actualization; 85 % (n=6) of those who provided home BP data achieved goal BP according to JNC 8 guidelines.

Patients will participate in YMCA Healthy Community Wellness Program.	Fifty percent of patients who verbalized willingness to participate in the program will be actively enrolled.	Upon initial participant enrollment 100% of patients (n=20) verbalized interest and willingness to participate in the wellness program. Upon completion of the QI project none enrolled.

Primary care and health coaching follow up outcomes.

The DNP student conducted a two-week post discharge follow up health coaching phone calls with the assistance of phone medical interpretive services contracted by the Community Medical Center. Hundred percent of participants were reached by the DNP student; 90% (n=18) reported compliance with home blood (BP) pressure monitoring; 65% (n=13) of total enrolled participants reported daily BP monitoring, 25% (n=5) of patients reported weekly BP monitoring, and 10% (n=2) did not initiate home BP monitoring. The 10% of participants who declined home BP readings perceived a lack of a need to participate, further education and encouragement was provided by the DNP student. Twenty percent of patient (n=4) requested additional printed materials and pocket blood pressure monitoring guides, which were then mailed to them from the facility.

Ninety percent of the participants (n=18) reported a follow up with their primary care provider post discharge. Twenty percent of patients (n=4) reported pharmacological BP management adjustments. Ten percent (n=2) had their follow up scheduled within two weeks of the health coaching phone follow up.

Seventy-five percent of patients (n=15) scheduled three month follow up appointments at the Community Medical Center with the DNP student. Forty percent (n=8) attended schedule visits. Out of the seven patients who did not attend the three month in person heath coaching session two patients relocated and canceled their follow up due to distance, one patient was admitted to an inpatient rehabilitation facility secondary to unrelated health issue, two

appointments were canceled due to inclement weather, and remaining two participants did not show nor returned phone calls. Twenty-five percent (n=5) of enrolled patient who did not schedule a follow up visits noted a belief that they do not need to further health coaching.

Seventy-five percent of patients (n=6) who followed up with the DNP student verbalized an interest in future educational sessions and follow up in the format presented by the DNP student. One person asked, "when is the next session?". Another participant stated, "once the weather is nicer and I can walk more, you'll be very happy with my results". This result supports further continuation of outpatient health coaching initiatives related to blood pressure management.

In addition to hypertension knowledge, adherence, and blood pressure assessment, the DNP student worked with patients to overcome barriers to care that may have not been present at the initial encounter. One patient noted losing her primary care provider due to change in the health coverage and lack of knowledge where she can turn due to limited coverage. The DNP student was able to schedule an appointment for this patient with a new primary care provider affiliated with the Community Medical Center to assure access to medical treatment and chronic disease care continuum.

Medication adherence re-assessment.

At the three month follow up the adherence assessment was re-administered and scores and pre and post scores were matched among those who followed up (n=8). The follow data analysis showed improved scores in all 16 domains as presented in Table 3.

Table 3.

The Culig Medication Adherence Scores Pre and Post Intervention

Item	Adherence Score		Item	Adherence Score	
	PRE	POST		PRE	POST
I was not at home	2.9	3.1	I was sleepy at medication time	3.5	4
The drug was not available due to short supply	3.1	3.4	I had a cold	3.8	3.9
I just forgot	2.6	3.4	I felt depressed or broken	3.1	3.9
I take a number of drugs several times a day	2.3	3.1	I had problems with medication timing	3.3	4
I wanted to avoid side effects	2.8	4	I consumed all of it	3.4	3.6
I did not want other people seeing me taking drug	3.9	4	I felt well	2.8	3.4
My doctor frequently changes my therapy	3.9	3.9	I was afraid of developing drug dependence	3.8	3.8
I felt the drug to be toxic/harmful	3.6	4	The drug was too expensive	3.1	3.6

To further analyze the initial adherence data and the three month follow up results participants' responses to items one through sixteen were scaled as follows: score one through three demonstrated a degree of non-adherence and a score of four verified medication treatment compliance. Obtained results demonstrated a 74% mean adherence improvement between the initial scores and re-assessment results among the eight participants who followed up with the DNP student three months post hospital discharge (see Figure 4).
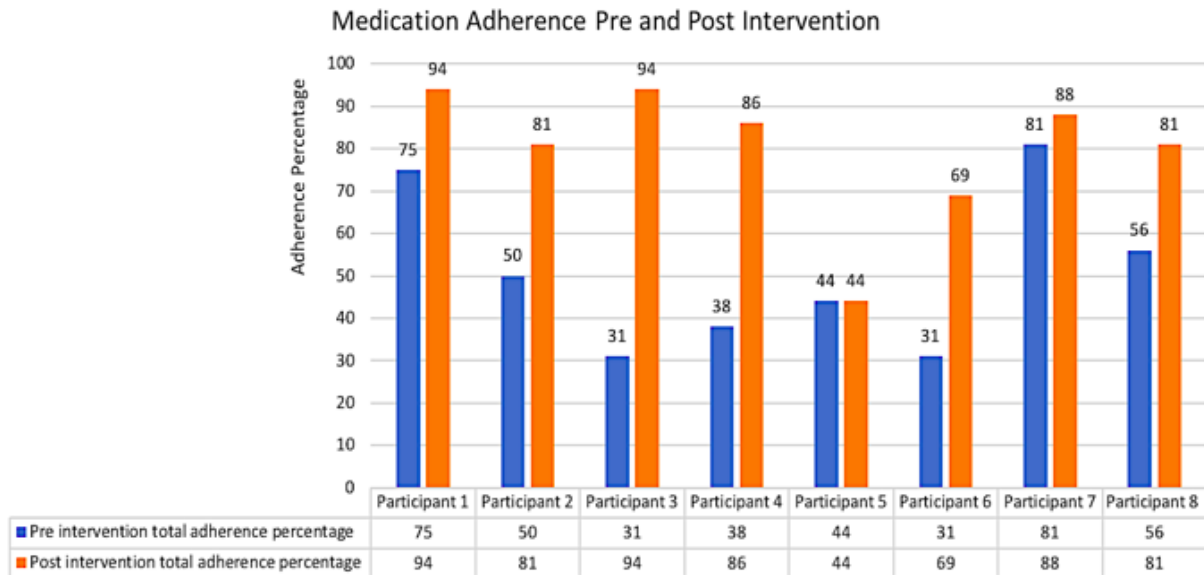
Figure 4. Medication adherence pre and post intervention.

Hypertension evaluation of lifestyle and management re-assessment.

The hypertension evaluation of lifestyle and management pre and post intervention

assessment (see table 5) demonstrates percentages of correct answers at project enrollment and

score improvement at three month follow up among the eight participants who followed up with

the DNP student. The percentage of improvement ranged between 14% and 121%, thus mean

improvement percentage amounted to 43%. The result did not meet the improvement benchmark

of 50% as proposed prior to project's actualization, however 60% of follow up data was missing

due to lower amount of three month follow up visits than anticipated.

Table 5.

The Hypertension Evaluation of Lifestyle Management - Pre and Post Assessment

Participant ID	Percentage of correct answers- initial assessment	Percentage of correct answers- three month follow up	Improvement percentage from the initial score
1	57%	86%	51%
2	64%	93%	45%

3	71%	93%	31%
4	50%	57%	14%
5	64%	79%	23%
6	43%	57%	33%
7	57%	71%	26%
8	29%	64%	121%

Outcomes of home blood pressure readings and three month follow up BP values.

Table 6.

Initial and Reassessment Blood Pressure Values

Participant ID/age	Mean BP during inpatient admission	Mean home BP over a three month period	BP at three month follow up
1/ 68	170/85	139/76	148/80
2/69	165/81	156/99	188/81
3/74	152/78	120/70	106/62
4/68	160/88	126/82	130/78
5/47	140/85	126/81	131/75
6/79	154/68	136/70	137/79
7/43	144/87	132/82	140/86
8/62	174/65	missing data	148/72

Data presented in Table 6 portrays matched mean blood pressure (BP) values obtained during the quality improvement (QI) project actualization, mean home BP values obtained by patients over three month follow up period, and BP obtained at the three month follow up visit with the DNP student. Forty percent (n=8) of participant followed up with the DNP student three months after the initial project enrollment. The QI project's objectives aimed to achieve goal

blood pressure in accordance with the JNC 8 standards among 70% of participants. A mean home blood pressure values at goal, BP of less than 140 mmHg systolic and 90 mmHg diastolic, was achieved by two persons age less than 60 years old. A JNC 8 BP target of less than 150 mmHg systolic and less than 140 mmHg diastolic was achieved by five participants age greater than 65. One participant was not able to provide home blood pressure values, thus was excluded from home BP analysis. Follow up values obtained at the three month follow up with the DNP student revealed goal BP values met by seven participant.

Participant, whose BP value at the three month follow up demonstrated a value of 188/81 and elevated mean home BP values of 156/99 mmHg was scheduled to see her PCP at the same location immediately following the appointment with the DNP student.

Based on the BP results 88% (n=7) of participants who followed up with the DNP student met the target blood pressure goal three months after project enrollment. Seventy five percent (n=6) of those who followed up demonstrated mean home BP at goal according to JNC 8 guidelines.

YMCA wellness program participation at three month post project actualization.

None of the project's participants demonstrated enrollment in the YMCA wellness program. Patients noted time constraints, weather (due to winter months), transportation issues, and lack of self-motivation as main barriers to participate in the program.

Discussion and Implications for Practice

Implementation of the quality improvement (QI) project at the Community Medical Center demonstrated prior inconsistent assessment and awareness of distinctive needs of Limited English Proficiency (LEP) Hispanics patients. This observation correlates with current literature findings suggesting a need for cultural awareness and competency among providers caring for

hypertensive LEP Latinos (Gu, Yue, Desai, & Argulin, 2017; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2015). Initial project proposal was met with interest among facility's chronic disease management facilitators, however the same level of enthusiasm was not observed among the staff members directly caring for LEP Hispanics. Registered nurses reported perceived inconvenience of providing additional education not directly related to patient's admitting diagnosis, presumed difficulty of obtaining timely interpretive services, and lack of knowledge related to unique population needs and JNC 8 hypertension guidelines. Post poster presentation and demonstration of patient education toolkit staff members responsible for project implementation and monitoring noted increased confidence in their ability to care for hypertensive LEP Hispanics.

The QI project was also effective in overcoming clinical inertia and assisted providers and clinical staff in recognition of lack of culturally competent solution addressing hypertension among LEP Latinos within the Community Medical Center Health System. The streamlined patient education toolkit coupled with easy to follow therapy adherence and knowledge assessment tools proved to be a feasible solution that can be easily implemented in a clinical setting. However, while the patient education method is easy to deliver and evaluate in a clinical setting, the time required to provide meaningful, individualized patient education amounting to an hour spent with each patient poses a significant time challenge for staff. Future QI undertakings could examine appointing a hypertension champion at the Community Medical Center. This role could be potentially assumed by chronic disease management educator currently working closely with patients diagnosed with COPD and CHF. However, workload and time allocation necessary to carry out the QI protocol would have to be considered by facility's stakeholders for adjustments considerations in staffing to accommodate.

Continuity of care in an outpatient setting was assured by providing LEP Hispanic patients with detailed instructions related to follow up care based on their needs assessment, mainly related to health insurance coverage and transportation. Ninety percent of project's participants reported timely follow up with their primary care post hospital discharge. Ongoing needs assessment conducted during the two week over the phone and the three month follow up health coaching visit allowed the DNP student to assist patients overcome barriers to care encountered post hospital discharge. Post discharge barriers were mainly related to limited number of providers accepting Medicaid health insurance in the region. The DNP student was able to direct patients who encountered this obstacle to a primary care group affiliated with the Community Medical Center, thereby overcoming this barrier and changing it into a facilitator. This approach not only allowed continuity of care but also demonstrated a potential patient acquisition and retention measure benefiting the Community Medical Center Health System.

The QI project's participants noted Limited English Proficiency (LEP) as a presumed barrier to participation in the program. However, this barrier was no longer a concern after patients were assured that interpretive services will be provided at all times and all teaching materials are available in Spanish. The DNP student did not encounter obstacles accessing interpretive services at the Community Medical Center. Follow up health coaching was conducted with the assistance of phone interpretive services contracted by the facility. All QI project participants were educated about their rights to language concordant care at all encounters with their health care team. This approached further ascertained continuity of care, as demonstrated by patients' prior reluctance to follow up without the presence of their English speaking family members or friends. LEP Hispanics noted greater self-care motivation and freedom to access care when medical interpretive services were provided.

Self-management is an important factor in overcoming obstacles to treatment and management of hypertension, which is leading cause of cardiovascular disease and if untreated can lead to target organ damage (Gu, Burt, Paulose-Ram & Gillum, 2008). Common hindrances to medication adherence noted by these QI project's participants included unavailability of medication at the administration time (not being at home), frequency of administration times throughout the day, fear of side effects, feeling depressed, problems with medication timing, perceived lack of need to take medication due to feeling well, lack of timely refill, and medication cost. Main hypertension management and knowledge gaps included unawareness of consequences of uncontrolled blood pressure and poor understanding of modifiable lifestyle risk factors. The QI project was successful in addressing participants' knowledge related to self-management and enhanced adherence to pharmacological treatment among those who followed up three months after project enrollment. Results demonstrated a mean 43% improvement in lifestyle and management assessment and mean 74% improvement in self-reported medication adherence among these participants. LEP Hispanics enrolled in the project valued teaching materials tailored specifically to their needs over generalized instructions translated into their primary language. Nutritional guidelines including commonly consumed ethnic foods and instructions presented in Spanish were highly appreciated.

Assessment of barriers to self-management and therapy adherence experienced by LEP Hispanics within the Community Medical Center's Health System was an integral part of the QI project. The obstacles faced by project's participants included incomplete self-care instructions related to home blood pressure measuring, knowledge gaps, lack of interpretive services present during encounters with their healthcare providers, and financial constraints. Instituting clinical tools such as the Culig adherence assessment and the hypertension evaluation of lifestyle and

management evaluation during patient encounters allows providers to recognize individual

patients' needs. Furthermore, both assessments are easy to complete and allow for open

discussion of self-management strategies with patients upon completion.

Project participants also noted increased self-management motivation supported by

measurable blood pressure (BP) goals and the ability to share home BP readings with their

medical providers. The target blood pressure goal was met by 86% of participants who followed

up with the DNP student three months after project enrollment. Seventy-five percent (n=6) of

those who followed up and provided home blood pressure readings demonstrated mean home BP

readings at goal according to JNC 8 guidelines. The QI project design, shorter timeframe, and

lower than anticipated participant follow up rate did not allow for evaluation of BP readings

among all participants post initial educational intervention. Yet, the pilot was successful in

garnering data on eight patients who did show for follow-up visits and inferences can be made

for future use of the protocol. Although inferential statistical analyses were not appropriate for

this project, descriptive, comparative, and qualitative results show a promising trend and

potential for future QI undertakings replicating this project's protocol aimed at improving blood

pressure control among LEP Hispanic patient population.

Cost, a barrier to self-blood pressure monitoring via personal home monitors, as cited by

Yi and colleagues (2015), was commonly noted by the QI project's participants. The QI project

was successful in overcoming this barrier by the DNP student equipping all participants with an

FDA approved home blood pressure monitor provided at no cost to them. At project completion,

participants noted increased motivation to self-management secondary to knowledge of proper

device use, understanding of blood pressure zones and corresponding management strategies as

outlined by JNC 8 guidelines. In future projects replicating this work, it will be optimal for the

facility to provide the home monitors for patients who cannot afford them either as an in-kind cost or through grant or foundation sponsored monies.

Lack of detailed instructions related to home blood pressure monitoring received by LEP Hispanic patients from their primary care providers emerged as an important theme. Future investigations can be undertaken to explore methods of patient education and strategies to enhance patient self-motivation related to home blood pressure monitoring in the outpatient care setting. In addition, further work testing the feasibility of the devised patient education toolkit used in the QI project coupled with on-site home blood pressure measuring education can be explored in the outpatient care setting within the Community Medical Center Health System.

Providing patients with home blood pressure devices at no cost to them poses a challenge to implementation of this intervention as a standard of care in a clinical setting. However, feature QI endeavors can explore feasible options of obtaining the home BP devices, including rental programs, financing supported by the Prevention and Wellness Trust Fund awarded by the state's Department of Public Health, and manufacturer sponsorship. These options were not undertaken for this QI project due to the shorter time frame designed for this pilot secondary to academic calendar constraints.

Although only eight patients enrolled in the project followed up with the DNP student three months post hospital discharge, this number represent 40% of patients enrolled in the project protocol and the majority showed an interest in future health coaching sessions. This result demonstrates a need for implementation of future strategies within the Community Medical Center to meet the demand for outpatient hypertension health coaching tailored specifically to LEP Latinos.

Cost-Benefit Analysis/Budget

The costs of the QI project (see Appendix I, Table 1) included printed educational materials and home blood pressure monitors required to carry out planned interventions. Printed materials included educational pamphlets in Spanish and English as well as pocket blood pressure guide and tracking card. Learning materials used in the projects were obtained from the Massachusetts Department of Public Health and the American Heart Association, and the Centers for Disease Cotnrol and Prevention, all three institutions offer free of charge, printed patient and provider materials available upon request.

The DNP student obtained a permission to print patient education materials available for print only via the DPH and AHA websites at the facility free of charge. The DNP student was responsible for printing patient surveys. The total cost of materials including blood pressure monitors equaled $613.00 and the DNP student bore the cost.

The benefits of the quality improvement (QI) project (see Appendix I, Table 2) include patient and practice related benefits. Patient-centered benefits encompass improved blood pressure control and potential decreased risk of hospital admissions, mortality, and morbidity related to uncontrolled blood pressure and coronary vascular disease. Increased self-care motivation and knowledge related to hypertension among LEP Hispanics. Practice related benefits include improved patient satisfaction, improved performance related to cardiovascular health, and potential patient retention within the healthcare system.

Ethical Considerations/Protection of Human Subjects

The University of Massachusetts, Amherst (UMass) Internal Review Board (IRB) approval was obtained prior to initiation of the DNP project. The DNP student, a current employee of the Community Medical Center directly involved in patients' care at the institution

complied with the Health Insurance Portability and Accountability Act (HIPAA) standards by assuring that participants' personal information is not used in data extraction and analysis process. All data was handled only be the QI team and as customary and usual in the hospital QI projects. All results from the screening tools were anonymous and followed strict HIPAA regulations. Patients' identifiers, including demographics were kept anonymous throughout the process. Phone follow-ups were conducted at the clinical site, following usual standard of care practices within the sites to assure confidentiality. In addition based on facility's agreement criteria institutions identifiers were removed from the final write-up of the DNP project. To uphold this condition, institution's name was changed to *Community Medical Center* for write-up purposes. Potential site identifiers were removed from the facility agreement form and patient consent (see Appendix E).

Conclusion

Supported by the Chronic Care Model and the Process of Cultural Competence in the Delivery of Healthcare Services framework, the DNP student successfully completed a culturally sensitive, multifactorial intervention with an educational design initiated in an inpatient care setting focused on promotion of hypertension awareness and self- management strategies in LEP Hispanic population. As a result, participants who completed the project demonstrated 74% increase in medication adherence and 43% improvement in hypertension knowledge and self-management strategies. Ninety percent of participants noted home blood pressure monitoring compliance and 88% of patients who followed up with the DNP student three months post completion of the initial educational phase obtained blood pressure control in accordance with the JNC 8 guidelines. The multifaceted quality improvement initiative paired with outpatient follow up health coaching and home blood pressure monitoring demonstrated a sustainable

measure to improve treatment adherence and hypertension self-management knowledge among LEP Latino population. The DNP student was also able to increase providers' awareness of LEP Hispanic hypertensive patients' distinctive needs, their barriers to self-care and treatment compliance, and what strategies work to enhance self-management that may lead to long-term adherence and blood pressure control.

The DNP project helped to demonstrate that improved blood pressure control among the LEP Hispanic patient population can be achieved by revision of current practice models to include a more comprehensive protocol enhanced with evidence based interventions proven to improve patients' treatment adherence and self-management practices. The QI protocol included revised screening for barriers to adherence, tools promoting self-management and disease related knowledge, home blood pressure monitoring , and access to outpatient health coaching.

The increased prevalence of uncontrolled blood pressure among the fast growing Hispanic patient population in the United States as compared with their non-Hispanic counterparts calls for improvement in health care delivery protocols addressing specific cultural characteristics of this population (Neves, Virdis, & Oigman, 2012,Yoon, Fryar, Carroll, 2015). Future investigations and hypertension quality improvement endeavors must further address commonly identified learning needs related to blood pressure control and barriers to self-care demonstrated by the LEP Hispanic patient population served by the Community Medical Center Health System.

The Community Medical Center's chronic disease management team noted interest in implementation of the patient education toolkit and self-care assessment strategies as a standard of care in the inpatient care setting based on the knowledge that results of implemented QI protocol met set objectives. However, in order to replicate this complex, multifaceted QI

protocol, Community Medical Center's stakeholders must address workload allocation among team members necessary for its further execution. Additionally, oversight of the initiative must be appointed to personnel experienced in quality improvement strategies, resource utilization within the Community Medical Center Health System, and measures to improve care delivery among underserved patient populations. Allocation of the QI procedure's supervision to the facility's Chronic Disease Management department would be a feasible option due to the department's current focus on chronic heart failure and post stroke management and the knowledge that hypertension is the number one, preventable risk factor for both conditions. Replication of the QI protocol at the Community Medical Center also requires the facility to provide the home blood pressure monitors for patients who cannot afford them either as an in-kind cost or through grant or foundation sponsored monies. Future undertakings of the QI protocol should also take into consideration implementation of the QI initiative among a larger population size in order to meet statistical power needed for advanced statistical data analysis. The DNP student ascertains the availability and commitment to serve as a consultant for future QI endeavors.

The quality improvement project write-up utilizing the Doctor of Nursing Practice DNP Project framework will be shared via poster presentation at University of Massachusetts, Amherst, College of Nursing's Scholarship Day and published in the University's library via ScholarWorks©. The QI write up and poster presentation will be further shared with Community Medical Center's stakeholders and an outpatient primary care group affiliated with the health care organization. Future additional dissemination will occur through presentation at regional and/or National venues.

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Appendix A

Culig Adherence Scale

People do not take their medication for various reasons. Here is a list of reasons for not taking your medication/drug. Below, please circle a number next to each cause of non-adherence that affects your ability to take medications as prescribed.

CAUSE OF NON-ADHERENCE	NEVER	VERY RARE (1-2 YEARLY)	SOMETIMES (3-5 YEARLY)	OFTEN (MORE THAN 5 YEARLY)
1. I was not at home	4	3	2	1
2. The drug was not available due to short supply	4	3	2	1
3. I just forgot	4	3	2	1
4. I take a number of drugs several times a day	4	3	2	1
5. I wanted to avoid side effects	4	3	2	1
6. I did not want other people seeing me taking drug	4	3	2	1
7. My doctor frequently changes my therapy	4	3	2	1
8. I felt the drug to be toxic/harmful	4	3	2	1
9. I was sleepy at medication time	4	3	2	1
10. I had a cold	4	3	2	1
11. I felt depressed or broken	4	3	2	1
12. I had problems with medication timing	4	3	2	1

13. I consumed all of it	4	3	2	1
14. I felt well	4	3	2	1
15. I was afraid of developing drug dependence	4	3	2	1
16. The drug was too expensive	4	3	2	1

Used with author's permission. Adapted from Culig and Leppee (2014).

Culig, J., & of pée, M. (2014). From Morisky to Hill-Bone; Self-reports Scales for Measuring Adherence to Medication. Collegium Antropologicum, 38(1), 55.

Appendix B
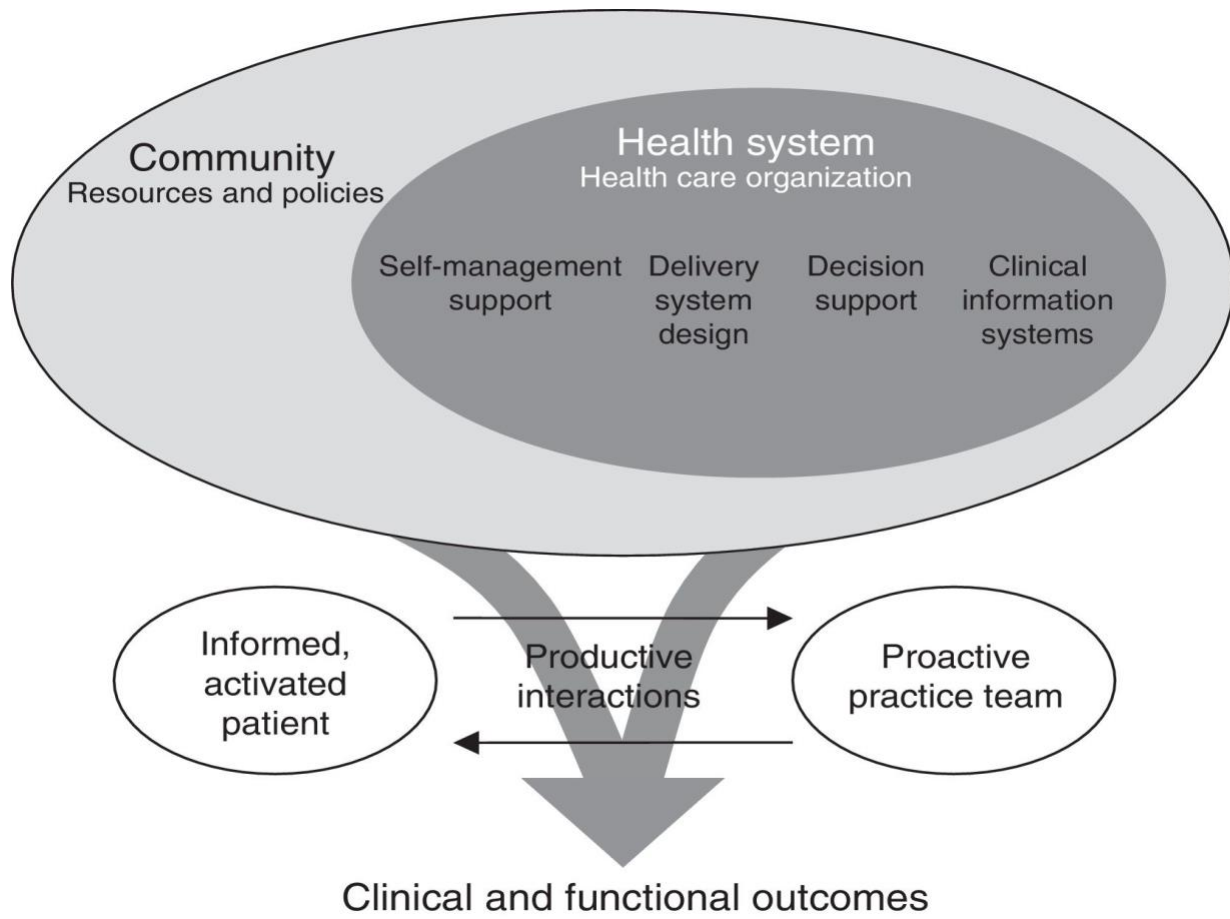
Figure 1. Chronic care model diagram.

Wagner, E. H., Austin, B. T., & Von, K. M. (1996). Organizing care for patients with chronic illness. *The Milbank Quarterly, 74,* 4, 511-44.

Appendix C
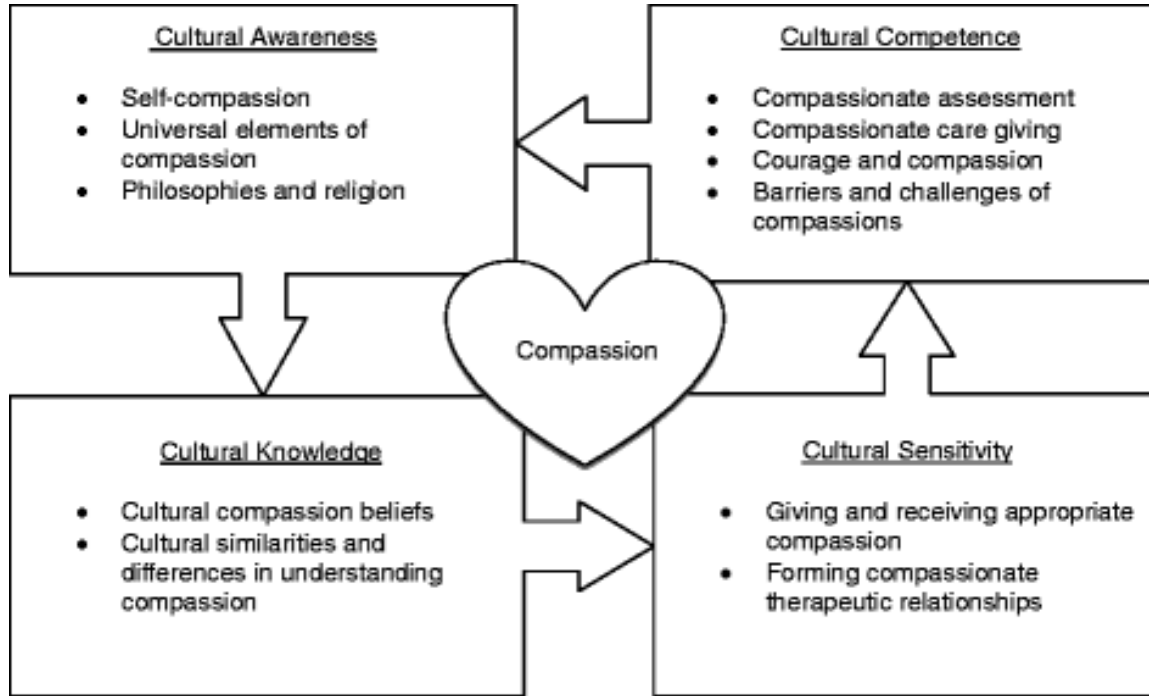
Figure 1. The process of cultural competence in the delivery of healthcare services care model.

Campinha-Bacote, J. (2003). The process of cultural competence in the delivery of healthcare services: A culturally competent model of care. *Cincinnati, Ohio: Transcultural C.A.R.E. Associates.*

Appendix D

Patient Education Toolkit
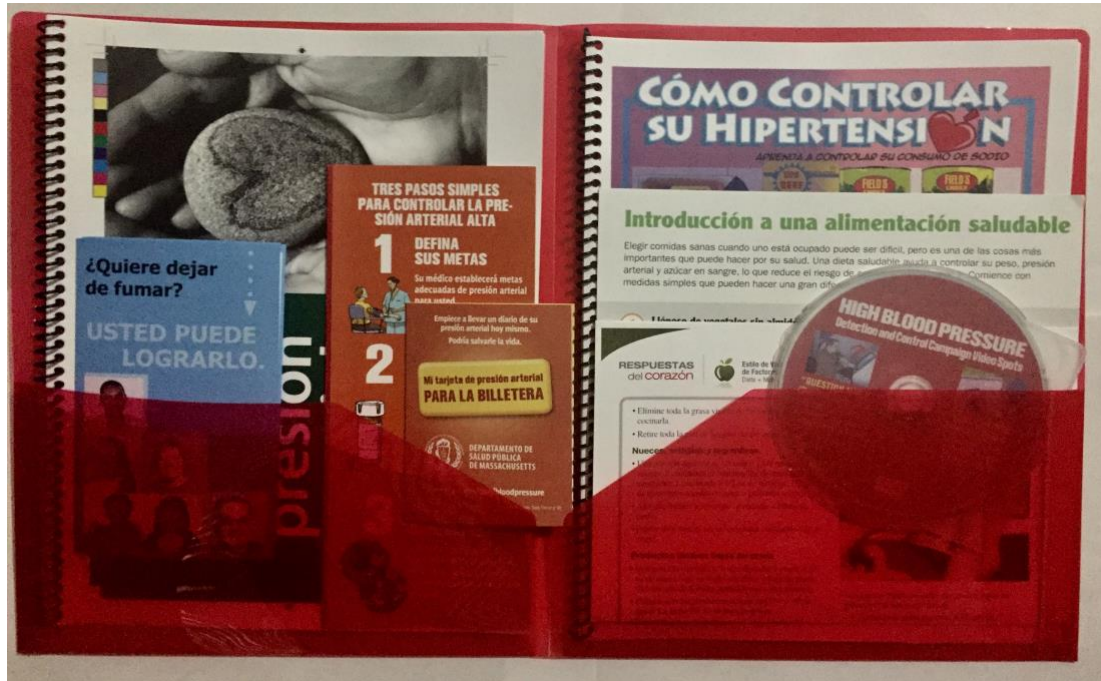
Figure 1. Patient education toolkit.*

Patient education materials were obtained from 1) the American Heart Association, 2) Centers for Disease Control and Prevention, and 3) the Department of Public Health-Massachusetts.
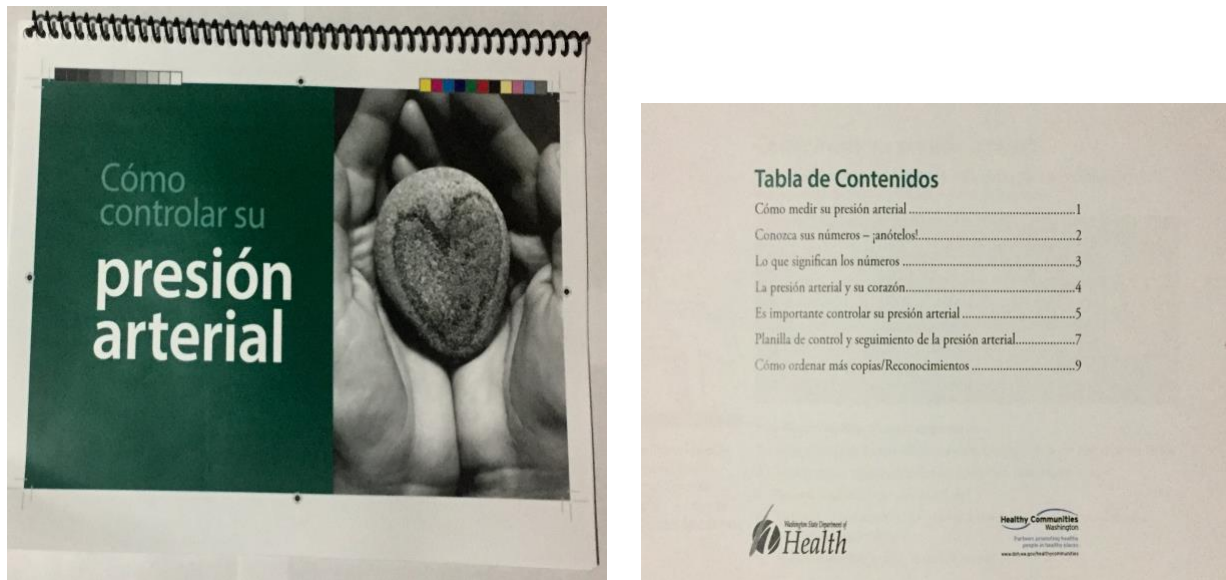
Figure 2. Blood pressure home monitoring and management guide.*

Cómo medir su presión arterial

Ya sea usted o su proveedor de atención médica quien mida su presión arterial, es importante usar el tamaño adecuado de banda para su brazo.

Antes de empezar

◆ No tome café por lo menos 30 minutos antes de medirse.

◆ No use tabaco o sus derivados por lo menos 30 minutos antes de medirse.

◆ No haga ejercicio o coma una comida grande dos horas antes de medirse.

◆ Use el baño. Una vejiga llena puede afectar sus resultados.

Los resultados pueden variar de un brazo a otro. Use el mismo brazo cada vez que se mida su presión arterial.

Para obtener medidas precisas, asegúrese de:

1. Siéntese tranquilo en una silla durante cinco minutos antes de realizar la medición.
2. Siéntese con su espalda apoyada y los pies planos sobre el piso.
3. Remover vestimenta que cubra su brazo.
4. Asegúrese de que su brazo esté apoyado a la misma altura de su corazón sobre una mesa o un apoyabrazos.
5. No hablar mientras se mide la presión arterial.

1

Conozca sus números – ¡anótelos!

El monitor medirá su presión arterial alta (sistólica) y baja (diastólica) y también su pulso.

120 ← Sistólica
80 ← Diastólica
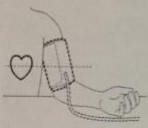
Registre su presion arterial anotando la fecha y la lectura del monitor en el cuadro que se encuentra al dorso de este cuadernillo.

Si la lectura es muy diferente de lo que usted esperaba, consulte a su proveedor de servicios médicos para confirmar la lectura.

Usted *puede* controlar su presión arterial

◆ Le recomendamos que lleve su monitor de presión arterial a la oficina de su proveedor de servicios médicos dos veces al año para revisar que este calibrado.

◆ Trabaje junto con su proveedor de servicios médicos para monitorear y controlar su presión arterial.

La presión arterial cambia durante el día, así que es mejor si usted mide su presión arterial a la misma hora todos los días.

Lo que significan los números

Categoría de presión arterial	Sistólica mm HG (número superior)		Distólica mm Hg (número inferior)
Normal ¡Excelente! Estos son los valores normales de presión arterial.*	Menos de 120	Y	Menos de 80
Prehipertensión Está subiendo. Modifique su estilo de vida para evitar que estos valores suban y se convertan en hipertensión.	120 – 139	O	80 – 89
Presión arterial alta (hipertensión) Grado 1 Su presión arterial es alta. Debe ver a su proveedor de servicios médicos.*	140 – 159	O	90 – 99
Presión arterial alta (hipertensión) Grado 2 Su presión arterial es muy alta. Busque asistencia médica de inmediato.*	160 o más	O	100 o más
Crisis hipertensiva (se necesita atención médica de emergencia) Su presión arterial es peligrosamente alta. Llame al 911 ahora.*	Mayor a 180	O	Mayor a 110

*Consejo de salud del Heart Disease, Stroke and Diabetes Prevention Program (Programa de prevención de las enfermedades cardíacas, apoplejías y diabetes) del Washington State Department of Health (Departamento de Salud del Estado de Washington)

Adaptado de la American Heart Association (Asociación Estadounidense del Corazón). Creado por el Heart Disease, Stroke and Diabetes Prevention Program, Washington State Department of Health.

3

Figure 2. Blood pressure home monitoring and management guide.*

Figure 3. Pocket blood pressure log. *

Figure 4. Dietary education.

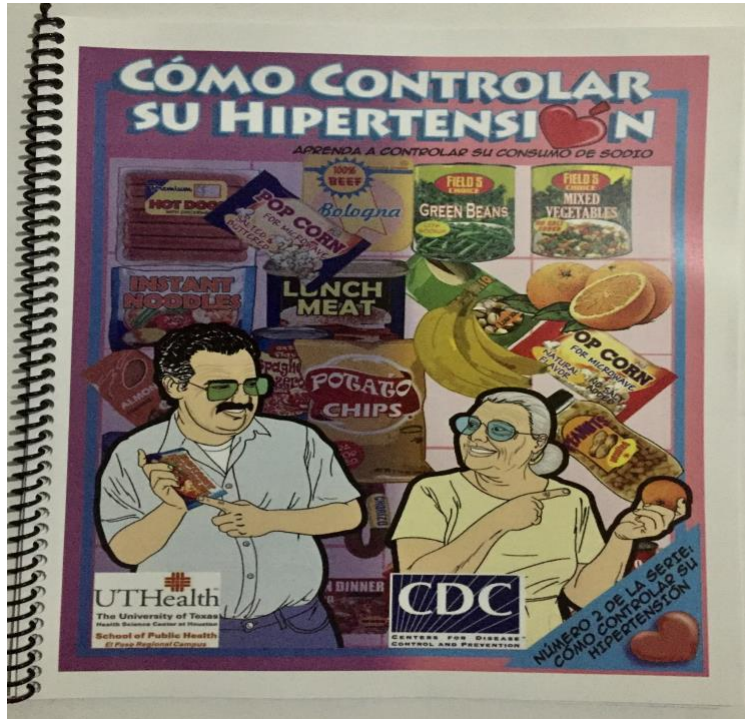*Figure 5.* Blood pressure management guide. *

Figure 6. Sodium intake control education booklet.* (CDC, 2017)

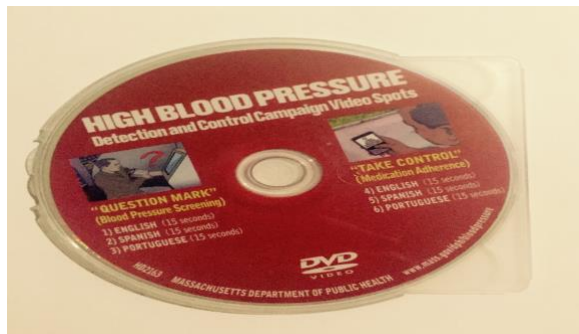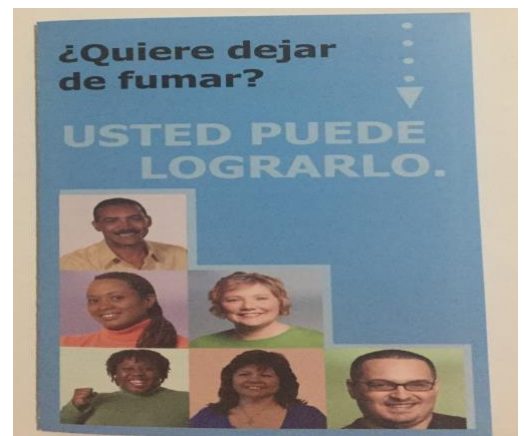*Figure 7.* High blood pressure detection and control video. *

Figure 8. Smoking cessation

booklet*

Appendix E

Facility Agreement

11/2/2017

Dear IRB Review Committee,

My name is ████████████; I am the Chief Quality Officer for ████████████
███. I have evaluated the DNP Quality Improvement project proposal submitted by
Katarzyna Swistak, DNP FNP student at the University of Massachusetts Amherst, College of
Nursing, titled "Improving Blood Pressure Control Among Hispanic Patient Population by
Enhancing Providers Attention to Culturally Competent Solutions Aimed at Increasing Self-Care
and Treatment Adherence Post Hospital Discharge".

Based on her project proposal, her QI project does not warrant a ██████ full IRB review, as it is
not a research study and is not designed as a research operations activity. Rather, it is my opinion
that all patients of the QI project will be covered under our usual standards of care for this patient
population. For this project, all HIPPA standards of care will be upheld and all patient
information will be de-identified for any data analysis purposes. Any electronic data will be
password protected and all paper documents kept in a locked area. All information gathered
during the project is meant for ███ patients only, therefore, will not be generalizable. The
project is being undertaken to address a call to change acknowledged within our health system.
The DNP student will sign our risk and confidentiality form and acknowledge the condition that
the ███ institution name and any PHI will not appear in any final result dissemination. All of
the above safeguards and requirements will be explained to Ms. Swistak and monitored by our
Risk Management Office.

I am in full approval of this project and look forward to working with the team to secure critical
outcomes data for our institution.

Sincerely,

Chief Quality Officer

Appendix F

Participant Consent Form

Consent Form for Participation in a Quality Improvement Project
University of Massachusetts Amherst

Quality Improvement Team Leader: Katarzyna Swistak, DNP FNP student, University of
Massachusetts Amherst, School of Nursing
Quality Improvement Project Title: Improving Blood Pressure Control Among Hispanic
Patient Population by Enhancing Providers Attention to Culturally Competent Solutions Aimed at
Increasing Self-Care and Treatment Adherence Post Hospital Discharge
Facility: Community Medical Center – facility's names was de-identified for purposes of the
DNP project write-up.

1. WHAT IS THIS FORM?

This form is called a Consent Form. It will give you information about the Quality
Improvement Project so you can make an informed decision about your participation.

This consent form will give you the information you need to understand why this project
is being done and why you are being asked to participate. It will also describe what you will need
to do to if you decide to participate and any known risks, inconveniences or discomforts that you
may have while participating. We encourage you to take some time to think this over and ask
questions now and at any other time. If you decide to participate, you will be asked to sign this
form and you will be given a copy for your records.

2. WHO IS ELIGIBLE TO PARTICIPATE?

You are eligible to participate if you have 1) pre-hypertension and hypertension during
hospital admission, 2) limited English proficiency/Spanish speaking, 3) Hispanic ethnicity, 4) age
greater than 25 years. Both men and women can participate.

3. WHAT IS THE PURPOSE OF THIS QUALITY IMPROVEMENT PROJECT?

The purpose of this quality improvement project is to determine if it improves blood
pressure control for the patients who are participating. This project begins with patients identified
during hospital stay, and includes helping patients to be aware of their hypertension and how to
manage it in your daily life. We will measure if this increases providers' identification of
Hispanic hypertensive patients and awareness of barriers to self-management and treatment
compliance, and improves blood pressure control.

4. WHERE WILL THE PROJECT TAKE PLACE AND HOW LONG WILL IT LAST?

The project will take place at Community Medical Center during your inpatient
admission. You will be presented with educational information about hypertension and given a
complimentary blood pressure monitor. Two weeks after your discharge the project leader will
call you to help answer any questions you may have about your blood pressure management.
Three months after your discharge you will be asked to schedule an appointment at Community
Medical Center where you blood pressure control and self-management can be evaluated.

5. WHAT WILL YOU BE ASKED TO DO?

If you agree to take part in this project, you will be asked to participate in an educational
session provided to you during this hospital stay related to blood pressure management. It will not
interfere with your treatment plan or length of hospital stay. You will be asked to complete two
questionnaire forms, the Culig Adherence Scale and Hypertension Evaluation Lifestyle and

Management Knowledge Scale. Both of these forms include questions related to blood pressure management and treatment adherence. You may skip any question you feel uncomfortable answering. You will be given a free blood pressure monitor and printed information on how to take your blood pressure at home. A follow up appointment with your primary care provider will be scheduled. You will be encouraged to go to that appointment. You will also receive a referral to a local YMCA wellness program that you will not have to pay for. Two weeks after you are discharged the project leader will call you to answer any questions you may have related to blood pressure management at home. Three months after your discharge you will be asked to schedule an appointment at Community Medical Center where your blood pressure control and self-management can be assessed. You will be asked again to complete the Culig Adherence Scale and Hypertension Evaluation Lifestyle and Management Knowledge Scale. This information will help to determine if your involvement in the project helped manage your blood pressure at home. Additionally, you will be guaranteed access to a medical interpreter at all times during the project.

6. WHAT ARE MY BENEFITS OF BEING IN THIS PROJECT?

Your benefits of being in this project include improved knowledge related to blood pressure control, self-management, potential decreased risk of hospital admissions and complications related to uncontrolled blood pressure.

7. WHAT ARE MY RISKS OF BEING IN THIS PROJECT?

The quality improvement team believes there are no known risks associated with participation in this project; however, a possible inconvenience may be the time it takes to complete the project. You may withdraw your participation at any point if you find it negatively affecting you.

8. HOW WILL MY PERSONAL INFORMATION BE PROTECTED?

The quality improvement team will keep all project records, including any codes to your data, in a secure, locked cabinet at Community Medical Center. All Health Insurance Portability and Accountability Act (HIPAA) standards to protect your information will be upheld and all of your information will be de-identified for any data analysis purposes. Any electronic data will be password protected. Only the quality improvement team will have access to this information. A master key that links names and codes will be maintained in a separate and secure location at Community Medical Center. The master key and gathered information will be destroyed after project completion and reporting of the results. At the end of this project, the quality improvement team leader may publish the findings. Information will be presented in summary format and you will not be identified in any publications or presentations. The hospital name will also not appear in the final results.

9. WHAT IF I HAVE QUESTIONS?

Take as long as you like before you make a decision. The quality improvement team leader will be happy to answer any questions you have about this project. If you have further questions about this project you may contact the project's leader, Katarzyna Swistak at (413) 455-5016 or kswistak@umass.edu. If you have any questions concerning your rights as a project participant you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or humansubjects@ora.umass.edu.

10. CAN I STOP BEING IN THE PROJECT?

You do not have to participate in the project if you do not want to. If you agree to be in the project, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

11. SUBJECT STATEMENT OF VOLUNTARY CONSENT

When signing this form I am agreeing to voluntarily enter this project. I have had a chance to read this consent form, and it was explained to me in a language that I use and understand. I have had the opportunity to ask questions and have received satisfactory answers. I understand that I can withdraw at any time. A copy of this signed Informed Consent Form has been given to me.

_____   _____   _____

Participant Signature: Print Name: Date:

By signing below I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

_____   _____   _____

Signature of Person   Print Name: Date:
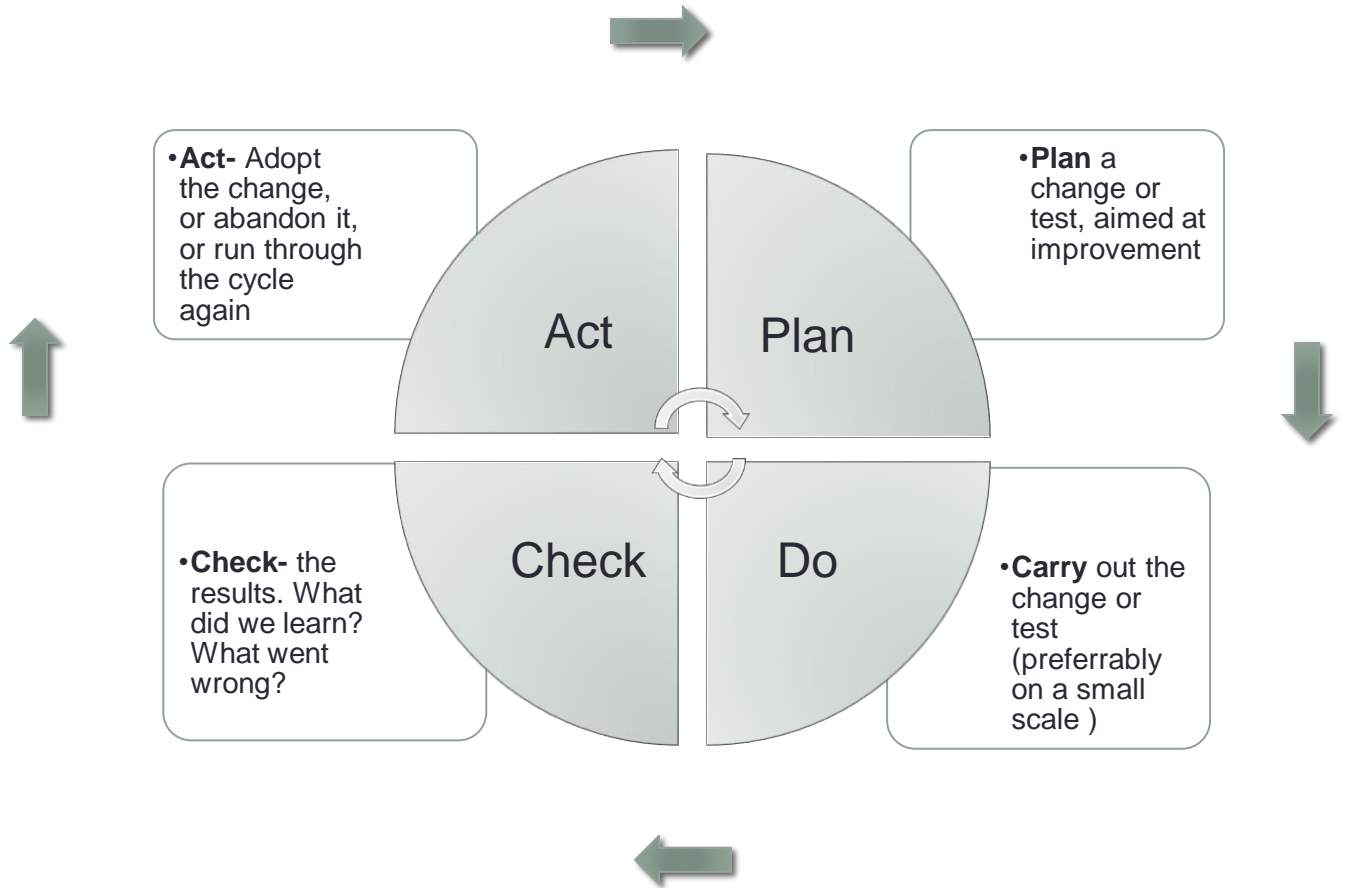Obtaining Consent

Appendix G

Figure 1. Plan-do-check-act model. Adapted from Deming (1993).

Deming, W.E. (1993) PDCA. *The new economics*. MIT Press Cambridge, MA.

Appendix H

Hypertension Evaluation Lifestyle and Management (HELM) Knowledge Scale.

This questionnaire will help to assess your knowledge related to hypertension and formulate individualized teaching and management plan.
Below, please circle the response, which in your opinion is correct.

Item no.	Stem	Response Choice
1.	A person is considered to have hypertension if either systolic blood pressure is 140 or their diastolic is 90 or higher on two separate occasions	True False
2	Most people can tell when their blood pressure is high because they feel bad.	True False
3.	Uncontrolled hypertension can lead to which of the following:	Lung cancer Kidney failure High cholesterol Diabetes

4.	Which of the following increases your risk of having hypertension?	Weight lifting Drinking >2 cups of coffee a day Smoking a pack of cigarettes Gaining 15 pounds
5.	People with hypertension do not need to take medicine if they exercise regularly	True False
6.	Which of the following statements about taking blood pressure medicine is TRUE?	- Blood pressure medicine should always be taken with food - More than one type of blood pressure medicine can be taken at the same time - Blood pressure medicine works best if it is taken at bedtime - Blood pressure medicine should not be taken if a person drank alcohol that day
7.	Most of the salt Americans eat is added with a saltshaker.	True False
8.	There are about as many calories in 12 ounces of regular orange juice as there are in 12	True False

	ounces of regular cola.	
9.	An overweight 60-year-old man has hypertension. He drinks one bottle of beer and 4 cups of regular coffee a day. He adds regular table salt to his food at most meals. Which one of the following changes is the most likely to lower his blood pressure?	- Lose 10 pounds - Stop drinking alcohol - Switch to decaffeinated coffee - Switch to sea salt
10.	Which one of the following changes to your diet is most likely to lower blood pressure?	- Eat more fruits, vegetables, whole grains, and low-fat dairy products - Eliminate spicy foods - Drink one glass of red wine daily - Drink herbal tea instead of coffee
11.	Which one of the following statements about exercise and blood pressure is TRUE?	- People who are on their feet most of the day will not benefit from more exercise - Exercising for 30 minutes every day lowers blood pressure more than exercising for 30 minutes, 3 days a week - Weight lifting should be avoided by people with high blood pressure When exercising, you must raise your heart rate to at least 100 beats a minute to improve blood pressure
12.	A man reports that his blood pressure is 148/78 mm Hg when he checks it using the blood pressure machine in the pharmacy, 144/66 mm Hg	- It is common for blood pressure readings to vary like this

	in his family doctor's office, and 132/74 mm Hg when he checks it at home. Which of the following statements is TRUE?	- The highest blood pressure reading is the correct one - The lowest blood pressure reading is the correct one - He can be reassured that his blood pressure is normal
13.	When measuring your blood pressure at home, you should:	- Always take your reading before you take your blood pressure medicine - Take several readings, a minute or 2 apart, and record the lowest one - Take your blood pressure right after exercising and at least 2 hours after a meal - Take two readings, a minute or 2 apart, and write down the average value
14.	Blood pressure is measured with two numbers, an upper number and a lower number. It is usually written as upper/lower. If someone is told that their goal blood pressure is 126/76, when have they reached that goal?	- When the upper is below 126 and the lower is below 76 - When the upper is below 126, even if the lower is over 76 - When the lower is below 76 even if the upper is over 126 - When the average of the upper and the lower is <100

Adapted from Schapira, et al. (2012).

Schapira, M., Fletcher, K., Hayes, A., Eastwood, D., Patterson, L., Ertl, K., & Whittle, J. (2012). The Development and Validation of the Hypertension Evaluation of Lifestyle and Management Knowledge Scale. Journal Of Clinical Hypertension, 14(7), 461-466.

Appendix I

Costs and Benefits

Table 1.
Costs

Category	Details	Costs in three months
Printed educational materials	20 x $ .50 (cost of patient education folders)= $10 20 x 4 x 10 cents (cost of printing Culig and HELM scale pre and post intervention)= $ 8.00	Total cost: $18.00
	Blood pressure guide, tracking card, nutritional guide	Student cost: N/A. Educational materials were obtained from the Massachusetts Department of Public Health and the American Heart Association. PDF files were printed at the facility after permission was granted.
Home blood pressure monitors	Calibrated home blood pressure were supplied by the DNP student. 20 x $25.00 = $500.00	Total cost: $500.00 (student cost)

Table 2.
Benefits

Category	Details	Benefit in three months
Patient outcome	Improved blood pressure control and hypertension self-management knowledge among LEP Hispanic patient population.	Potential lower risk of hospital admissions related complications related to uncontrolled blood pressure/CVD. Increased hypertension self-management and blood pressure control among LEP Hispanic patient population.
Practice related	Improved patient satisfaction.	Potential patient retention within the healthcare system. Increased patient satisfaction.