4-7-2022

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DOI: https://doi.org/10.46409/sr.EHSY8886

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This Manuscript Partially Fulfills the Requirements for the

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April 7, 2022

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Action Planning with Self-Monitoring Blood Pressure Improves Blood Pressure Control in Geriatric Patients

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Abstract

Practice Problem: Uncontrolled hypertension is a global healthcare problem. Hypertension is controlled in fewer than 1 in 5 people and has been attributed to premature deaths (WHO, 2021).

PICOT: The PICOT question that guided this project was "In patients 65 years of age and older with uncontrolled blood pressure, how does a nurse-led blood pressure control program compared to standard of care improve blood pressure control at an outpatient clinic over 8 weeks?"

Evidence: Five studies provided evidence that a nurse-led blood pressure decreased blood pressure results. The evidence supported the practice change of implementing a nurse-led blood pressure control program for patients 65 years and older to improve blood pressure control at an outpatient clinic.

Intervention: The registered nurse developed joint goals with the patient based on their individual needs. The action assessed the patient's treatment such as medication adherence and lifestyle changes (e.g., diet, exercise). The program linked self-monitoring blood pressure with individualized goal planning.

Outcome: Due to the COVID-19 pandemic resurgence and an impending strike, timing of the project implementation was impacted. Department staffing and patient census was very low, which resulted in only two participants. Clinical significance was noted with one patient while the second patient did not have a decrease nor increase of their blood pressure at the 2 week follow up visit.

Conclusion: Further evaluation of the change in practice over time may provide more evidence of clinical significance. A toolkit was developed and provided to the staff for future implementation and adaptation.

Action Planning with Self-Monitoring Blood Pressure Improves Blood Pressure Control in Geriatric Patients

Nearly one in every two adults in the United States (U.S.) has high blood pressure. Hypertension has been attributed as a primary or contributing cause of nearly half a million deaths in 2018 (CDC, 2020). Seventy five percent of the adults, 65 years and older, in the U.S. have been diagnosed with hypertension. The impact of uncontrolled hypertension in the geriatric patient population affects the patient, family, society, quality healthcare system, safety, and legal concerns. There are also financial costs that impact the healthcare system, society, and the patient.

The DNP project was an evidence-based improvement project to control hypertension. The PICOT question sought to determine if a nurse-led intervention program would improve the high blood pressure for this patient population. The nurse-led blood pressure program consisted of self-monitoring of blood pressure (SMBP) in the home and the development of an individualized action plan that addressed medication adherence and lifestyle changes. The PICOT question, EBP framework, and change theory guided the project. The project setting, identified stakeholders, and the project sustainability plan were shared. The importance of interprofessional collaboration, addressing barriers and risks, and the leadership qualities needed to implement a project successfully were described. A detailed project overview along with project plan, timeline, budget, evaluation plan, results. and impact were discussed. Lastly, the project results and impact were disseminated to institutional staff, academic peers, and the manuscript archived in SOAR.

Significance of the Practice Problem

National, Global, Local, and Organizational Significance

The practice problem addressed in this project was uncontrolled hypertension. Patients with high blood pressure are at risk to develop heart disease and stroke, which are the leading causes of death in the United States (CDC, 2018). Nationally, 45% of the population or 108 million adults have hypertension or are taking medication for hypertension and only 24% of adults with hypertension have it under control (CDC, 2019). More men develop hypertension (47%) as compared to women (43%) and approximately 75% of the adults who have hypertension are 65 years and older (CDC, 2019). Globally, it is estimated that 1.13 billion people have high blood pressure, with two-thirds noted in low- and middle-income countries (WHO, 2021). Hypertension is controlled in fewer than 1 in 5 people and has been attributed to premature deaths (WHO, 2021).

The high blood pressure rate in adults in the San Bernardino County (SBC) in 2019 was 29.5% (San Bernardino County, 2021). The organization, in May 2020, had 52,556 adult patients, 65 years and older, diagnosed with hypertension. The target goal for controlled hypertension in the organization is 81% (Kaiser Permanente, 2020). However, only 75.5% were noted with controlled hypertension. There are measures to mitigate this practice problem that provides safe, ethical, quality care to the organization's geriatric population that this project addressed.

Patient, Society, and Quality Impact and Concerns

The patient's quality of life is impacted because high blood pressure has negative effects on the body. High blood pressure can lead to heart failure, heart attack, stroke, kidney disease or failure, chest pain, vision loss, sexual dysfunction, or peripheral artery disease (AHA, 2021).

Patients, as a result, have less physical activity, experience symptoms such as fatigue, pain, anxiety, and depression (AHA, 2021).

As the prevalence of hypertension continues to increase, societal concerns need to focus on increasing preventative care services to address the chronic condition (Kirkland, et al., 2018). Improved access to these services to screen and treat hypertension will over time decrease societal costs as chronic conditions are managed better (Kirkland, et al., 2018). Health policy updates to broaden reimbursement for services such as health education classes, lifestyle counseling, and remote monitoring in the patients' homes will also motivate healthcare organizations to adopt and promote these type of programs (Carey, et al., 2018).

Poor technique with using the blood pressure cuff has been identified as a quality concern (Whelton, et al., 2018). Proper training and support for the patients to monitor their own blood pressure will ensure competency and promote engagement in the plan of care (Roy, et al., 2021). Concerns with quality control have also been identified when patients report self-monitored blood pressure that they may withhold poor results or provide false results (Morrissey, et al., 2017; Whelton, et al., 2018). This puts the well-being and health outcome of the patient at risk. Encouraging patients to have an active role in their own care may negate this concern.

Legal and Ethical Considerations

Inadequately assessing a patient's level of health literacy poses as a legal risk to the healthcare organization. Patients who are unable to understand the health information received from the health care providers cannot participate with full knowledge and comprehension in health-related decisions (Magnani, et al., 2018). An ethical consideration to be aware of is the potential for inequity in patient access to medical care and blood pressure medications (Whelton, et al., 2018). It was important to learn if the patient has health insurance or financial assistance

and how they budget for their medical care and medications (Whelton, et al., 2018). This impacts the patient's compliance with the treatment care plan.

Financial Implications

The estimated, adjusted annual incremental cost for patients with hypertension is $131 billion per year higher as compared to non-hypertensive patients (Kirkland, et al., 2018). This has an impact to the healthcare system as this patient population has "$1920 higher annual adjusted incremental expenditure, 2.5 times the inpatient cost, almost double the outpatient costs, and nearly triple the prescription medication expenditure" (Kirkland, et al., 2018, p. 5). The costs in outpatient expenses, emergency department visits, and home health services for this condition have steadily increased (Kirkland, et al., 2018, p. 5). Uncontrolled high blood pressure has significant impact on economics, healthcare, and quality of life.

PICOT Question

The PICOT question was: In patients 65 years of age and older with uncontrolled blood pressure(P), how does a nurse-led blood pressure (BP) control program (I) compared to standard of care (C) improve blood pressure control at an outpatient clinic (O) over 8 weeks (T)? The participants were all adults 65 years of age and older at a medical office outpatient clinic with BP greater than 150/90 (Whelton, et al., 2018). The intervention was a nurse-led blood pressure control program that established self-monitoring blood pressure and an individualized action plan. The action plan assessed the patient's treatment plan such as medication adherence, lifestyle changes (e.g., diet, exercise), and barriers (Appendix A). For the comparison, standard care was defined as standard routine follow-up BP monitoring in the outpatient clinic with the provider. The outcome was increased blood pressure control (less than 150/90). For time, the measurement period for the evidence-based practice change was eight weeks.

Evidence-Based Practice Framework & Change Theory

Evidence-Based Practice Model

The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model was used to guide this evidence-based practice change project. The JHNEBP incorporated a "three-step process called practice question, evidence, and translation (PET)" (Dang & Dearholt, 2017, p. 1). The practice question determined the problem of uncontrolled blood pressure in the patient population and stakeholders and an interprofessional team were identified for the project. The evidence was explored through an extensive literature search and resulted in three systematic reviews and two quantitative research studies, grades of 2 A's and 1 B, and 1 Level I, 1 Level II, and both grades of A, respectively. The translation involved the development of recommendations based on the evidence, implementation of the intervention, and evaluation of the outcomes. The model had several tools to facilitate the project. Each of the tools were important to the development of the practice question, analysis and synthesis of the literature evidence, level and quality grading, and the planning and implementation of the practice change.

Change Theory

Kotter's 8-step process was utilized as the change theory selected to guide the project and lead the change for implementation (Kotter, n.d.). The model was selected because the eight steps were logical and involved process steps that were easy to understand and follow (Table 1). Steps 1 – 4 involved communicating the significance of the problem to key stakeholders, gaining their support to implement the intervention, and building the interprofessional team. Steps 6 – 8 dealt with the implementation, sustaining the changes made, evaluating the performance outcomes, and determining spread for system-wide change.

Evidence Search Strategy

The evidence search strategy involved using the following three databases: CINAHL Complete, PubMed, and Cochrane Library. The *advanced search function* was applied in each database. The following keywords were used to narrow the search: high blood pressure control or management AND self-monitoring blood pressure. The Boolean term of *AND* was used. The inclusion criteria were research articles that compared a nurse-led high blood pressure control program to the usual care and reported the effect on high blood pressure control. The exclusion criteria were non-English and pregnant women. In the CINAHL Complete database search, the filters applied were studies published between 2015 to present, English, and adults 65 years and older. In the PubMed database search, the filters applied were studies published between 2015 to present, English, adults 65 years and older, and article type as journal article, meta-analysis, randomized control trial, and systematic review. In the Cochrane Library database search, the filter applied was studies published between 2015 to present. Ancestry searches were also performed to identify additional potential studies for inclusion.

Evidence Search Results

The literature search resulted in 345 citations along with two ancestry searches. The articles were initially screened by reviewing the title and abstract. Studies were excluded if they did not meet the eligibility criteria. Records were also removed if they were identified as a duplicate from another database search. Studies had a more in-depth appraisal when titles and/or abstracts were not clear or did not have enough information to provide a clear decision for inclusion or exclusion. Twenty-two citations were eliminated that included 2 duplicate articles and 22 articles that included pregnant women or patients under the age of 18 years of age. An additional 169 articles had interventions and/or outcomes that were not applicable to the PICOT question and hypertension was not included in 133 articles; therefore, were excluded and reduced

the number to 21 articles for a more detailed assessment. After further analysis, five studies remained for an in-depth review for their evidence level and strength. See Figure 1 for the PRISMA flow diagram.

From the five articles, two were quantitative research studies and three were systematic reviews. The JHNEBP Evidence Level and Quality Guide was used during the literature appraisal to provide ratings for the Level of Evidence and Quality Ratings. There are five evidence levels, and they were graded by the type of study design which include: 1) Level I: experimental study, randomized controlled trial, 2) Level II: quasi-experimental study, 3) Level III: nonexperimental study, 4) Level IV: opinion of respected authorities and/or nationally recognized expert panels, and 5) Level V: experiential and non-research evidence (Dang & Dearholt, 2017). There were three Quality Ratings of A, B, and C that indicated that the study was of high quality, good quality, and low quality or major flaws, respectively (Dang & Dearholt, 2017). One study had a Level of Evidence of I and the second study had a Level of Evidence of II. Both studies had Quality A ratings. For the three systematic reviews, two had Quality A ratings and the other one had a Quality B rating (Appendices B - E). As a result, the overall John Hopkins Quality Grade was A (Dang & Dearholt, 2017) and the Strength of Recommendation Taxonomy (SORT) Grade was A (Ebell, et al., 2004). For the SORT (Ebell, et al., 2004), it was a Level A because of the number of Level 1 quality studies that were evaluated.

Themes with Practice Recommendations

The synthesis of the literature provided relevant information to address the different parts of the PICOT question. The synthesis was comprised of five articles and are as follows: two quantitative studies (Kravetz & Walsh, 2016; Mattei da Silva, et al., 2020) and three systematic reviews (Glynn, et al., 2010; Mantovanil, et al., 2020; Tucker, et al., 2017). The two quantitative

studies were primary research articles and utilized an experimental design, with one study having a quasi-experimental design and the second as a 3-arm randomized controlled trial (RCT) (Kravetz & Walsh, 2016; Mattei da Silva, et al., 2020). The RCT study and one of the systematic reviews compared the implementation of nursing case management to standard care (Mantovanil, et al., 2020; Mattei da Silva, et al., 2020) while the quasi-experimental study and another systematic review compared the team-based approach to standard care (Kravetz & Walsh, 2016; Tucker, et al., 2017). The primary care provider, nursing, and pharmacy are identified as members of the healthcare team. In the third systematic review, nurse- or pharmacist-led care was identified as one of the interventions that was evaluated (Glynn, et al., 2010). See Appendices C and D. There were four themes generated: (1) Blood pressure outcomes, (2) Additional patient outcomes, (3) Types of interventions, and (4) Presence of heterogeneity.

Blood Pressure Outcomes

Blood pressure outcomes were reported as measurements of the systolic and/or diastolic blood pressure values (Kravetz & Walsh, 2016; Glynn, et al., 2010; Mantovanil, et al., 2020; Tucker, et al., 2017) or blood pressure control (Mattei da Silva, et al., 2020). Blood pressure values less than 150/90 mmHg, in adults 18 years and older, were considered blood pressure control for this population (Mantovanil, et al., 2020; Mattei da Silva, et al., 2020; Tucker, et al., 2017). Statistical significance decreases in both the systolic and diastolic blood pressure readings were observed when care was provided by a registered nurse (RN) case manager, as a team approach from a health care team consisting of the provider, RN, and pharmacist, or during a blood pressure control program led by the nurse or pharmacist (Glynn, et al., 2010; Kravetz & Walsh, 2016; Mantovanil, et al., 2020; Mattei da Silva, et al., 2020). However, Tucker, et al. (2017) stated an improvement in the systolic blood pressure was shown while results for the

diastolic blood pressure were similar between the intervention and control groups. Control groups were identified as usual care without self-monitoring.

Additional Patient Outcomes

Several other patient outcomes were measured in the five studies. Body mass index (BMI) and medication adherence were evaluated in two studies (Mantovanil, et al., 2020; Mattei da Silva, et al., 2020). The findings were varied where one study showed a reduction in BMI was greater as compared to the usual care group (Mattei da Silva, et al., 2020) while, in the systematic review, of the three studies that had evaluated BMI only one study showed a significant decrease (Mantovanil, et al., 2020). An improvement in medication adherence was identified in both studies (Mantovanil, et al., 2020; Mattei da Silva, et al., 2020). Mattei da Silva, et al. (2020) reported a reduction in waist circumference was greater in the intervention group (Mattei da Silva, et al., 2020). Mantovanil, et al. (2020) reported a significant increase in physical activity, a reduction in LDL-cholesterol levels, and improved smoking cessation rates. The duration of the studies ranged from six to twelve months and, because the DNP project was completed in eight weeks, these specific outcomes were not observed.

Types of Interventions

Self-monitoring of blood pressure was an intervention present in all five studies (Glynn, et al., 2010; Kravetz & Walsh, 2016; Mantovanil, et al., 2020; Mattei da Silva, et al., 2020; Tucker, et al., 2017) with medication adherence noted in two studies (Kravetz & Walsh, 2016; Mattei da Silva, et al., 2020) and medication titration in another two studies (Kravetz & Walsh, 2016; Tucker, et al., 2017). Additional interventions utilized included behavioral interventions, motivational interviewing, and lifestyle counseling (Glynn, et al., 2010; Kravetz, et al., 2016; Tucker, et al., 2017). Glynn, et al. (2010) included educational interventions to the patient and

health profession, organizational interventions that improved patient care, and appointment reminder systems.

Presence of Heterogeneity

Heterogeneity was observed in all three of the systematic reviews due to the complexity and different type of interventions that could be applied by the nurse case manager to each patient as part of the patient's individualized care plan. As a result, meta-analyses could not be conducted to compare the results (Glynn, et al., 2010; Mantovanil, et al., 2020; Tucker, et al., 2017). It was observed, in the review of the individual studies, that self-monitoring combined with customized interventional supported lowered blood pressure results (Glynn, et al., 2010; Mantovanil, et al., 2020; Tucker, et al., 2017).

Practice Recommendations

Based on a comprehensive review of the literature using the PICOT question and evidence grading, there was strong evidence with consistent results that supported the practice change of implementing a nurse-led blood pressure control program for patients 65 years and older to improve blood pressure control at an outpatient clinic. The nurse-led blood pressure control program linked self-monitoring blood pressure with individualized goal planning. With nurse-led programs, blood pressure values and/or blood pressure control exemplified significant improvement across all five studies. All the studies were focused on patient outcomes and with the large number of Level 1 quality studies, the Strength of Recommendation Taxonomy (Ebell, et al., 2014) was considered Level A. The overall John Hopkins Quality Grade was A (Dang & Dearholt, 2017).

Setting, Stakeholders, and Systems Change

Setting

The organization where the DNP project was implemented is a medical center that has two hospitals and several ambulatory medical office buildings. The project was conducted in the Hypertension (HTN) nurse clinic. The outpatient department, called the Complete Care Department, is where the patients with chronic conditions such as uncontrolled high blood pressure were initially referred. The typical participant in the project was an adult, 65 years and older, who had a blood pressure greater than 150/90. The organization's mission is to provide high-quality, affordable health care services and to improve the health of the communities served. Their vision is to be a pioneer in medicine and research while striving for innovative care.

The medical center leadership team identified that patients with uncontrolled high blood pressure were at a higher risk for poor outcomes. The preceptor shared the concerns and expressed an interest in identifying potential solutions to improve outcomes for patients with uncontrolled high blood pressure. Organizational support for the project was confirmed through verbal approval from the preceptor after speaking with the Chief Nursing Officer, administrative leader, and department manager. These key stakeholders were engaged early in the beginning of project development stage to provide understanding, gain support, and receive approval to move forward with project planning.

Stakeholders

Using the JHNEBP Stakeholder Analysis Tool (Dang & Dearholt, 2017), the stakeholders were identified. The stakeholders for this project included the following: patients, Complete Care department manager, Complete Care Physician Leader, administrative leaders, RN case managers, Health Education department, Chief Finance Officer, Chief Operating Officer, preceptor, Chief Nursing Officer, Information Technology (IT), labor union stewards,

scheduling/receptionist, public affairs/marketing, communications, security, the patients, and the Hypertension Committee.

Sustainability Plan

An evaluation of the outcome and sustainability measures were needed to determine if the changes were sustained. The data would continue to be shared and monitored monthly with the key stakeholders and the Complete Care department manager, physician leader, and staff to show whether progress and improvements are occurring. If the process, outcome, and sustainability measures met the set goals and continued a consistent positive trend, the project would be headed in the right direction for sustainability. In addition, support and buy in to change the practice from the staff and leadership was crucial to sustain the measures.

Interprofessional Collaboration

With the initiation of a project, building an effective interprofessional team began with identifying the right team members that provided the needed knowledge, expertise, and skills (Harris, et al., 2018). For this project, the interprofessional team consisted of the DNP student project manager, RN case manager, department manager, physician, health educator, Information Technology (IT), and preceptor. Additionally, communication and collaboration between the team ensured team effectiveness as quality, accurate information was shared in a transparent, bidirectional manner (Harris, et al., 2018; Landry & Erwin, 2015).

SWOT Analysis

A SWOT (strengths, weaknesses, opportunities, threats) analysis was performed on the DNP project. Strengths of the project were the skilled nursing staff and leadership support. There were several weaknesses identified and they were discussed with the department manager and other key stakeholders to address how the project would not negatively impact the RN's current

workload. A staff meeting was planned to present the benefits of the project and how it would enhance their current work. And lastly, patients were outreached regarding the project and provided information on the nurse-led blood pressure control program (Appendix F).

Systems Change

The project had a micro level of systems change through the goal planning that the RN case manager jointly developed with the patients. The patients would be able to achieve improved blood pressure control from following the individualized action plans and self-monitoring blood pressure at home. The individual patient data collected was aggregated and compared to the organization's benchmark data to determine the effectiveness of the nurse-led blood pressure control program to improve uncontrolled hypertension in the identified patient population. As outcome measures exemplify the benefits and results achieved with hypertensive patient's control, it has the potential to create a macro level system change within the clinic. Success in managing uncontrolled hypertension has the potential to create a meso level systems, or system-wide, change with the different model of care delivery (Patient-Provider Partnerships) impacting the overall health outcome for identified patient populations. Executive leadership observe performance outcomes; thereby, support the spread of interventions in the other medical office buildings across the organization.

Implementation Plan with Timeline and Budget

Project Objectives

The purpose of the project was to determine if implementing a nurse-led blood pressure control program for up to 8 weeks in the nurse clinic among patients, 65 years and older with uncontrolled high blood pressure, would result in improved blood pressure control. Control was measured by the blood pressure readings taken by the staff in the outpatient clinic and the aim

was to achieve blood pressure levels of less than 150/90 mmHg, as indicated by the healthcare organization's hypertension treatment guidelines (Whelton, et al., 2018). The change in practice was the implementation of self-monitoring of blood pressure in the home along with individualized action planning that the RN case manager developed jointly with the patient.

The first objective of the project was to reach the goal of 90% of patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, achieve blood pressure levels of less than 150/90 mmHg by the end of project implementation. The case manager developed joint goals with the patient, upon enrollment into the program, based on the individual needs of the patient. The RN case manager assessed if the patient had an automated blood pressure machine and provided instructions on how to correctly take a blood pressure reading using an automatic machine. Monitors that fit on the upper arm are recommended by the American Heart Association for accuracy of measurement and should have been properly validated and tested from the Association for the Advancement of Medical Instrumentation (AAMI), the BHS, and the EHS (CDC, 2013, p. 6). Patients were instructed to take blood pressures readings twice a day, once in the morning and once in the evening, and keep a log of the readings for the RN case manager to review. The RN case manager called the patients every two weeks for follow up and addressed medications, blood pressure readings, and progress on agreed-upon goals. The RN case manager documented the conversation with the patient and the most current home blood pressure reading into the EMR.

The second objective was 90% of the electronic medical record (EMR) documentation by the RN case manager demonstrated a discussion regarding action planning and self-monitoring blood pressure occurred with the patient within two weeks of being enrolled into the nurse-led

program. A chart review of the EMR was performed by the project manager for each patient to audit the RN case manager's documentation.

The third objective was 90% of the patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, reported taking their blood pressure twice a day, at least five days per week. The RN case manager asked the patient during the bi-weekly follow-up calls for the patients' blood pressure logs to assess whether the blood pressure was taken twice a day.

The fourth objective was 90% of the patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, have maintained blood pressure levels of less than 150/90 mmHg. The RN case manager will continue to follow up with the patient once a month through email and/or telephone. This frequent and routine touch points with the patient will encourage and support the patient to self-monitor their blood pressure and continue to sustain their plan and goals.

John Hopkins Nursing Evidence-Based Practice Model

The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model guided this evidence-based practice (EBP) project. The JHNEBP incorporated a "three-step process called PET: practice question, evidence, and translation" (Dang & Dearholt, 2017, p.1). In the evidence step, the analysis of the literature demonstrated that there is strong evidence to support the PICOT recommendation of a nurse-led blood pressure control program. The translation step guided the process to quickly implement the intervention over an eight-week period, evaluated its outcomes for success and effectiveness, and determined if it is a best practice to be spread across the organization (Dang & Dearholt, 2017, p. 1). A timeline with milestones and action plan ensured the project would stay on track. Project objectives were measurable and evaluated

at baseline, 14 days, and 30 days of the start of the project. Updates to the leadership team, project team, and department stakeholders were provided at regular intervals. The project's outcomes, learnings, and next steps were discussed at the final meeting of the project.

Change Management Process

Kotter's process for leading change was used to guide the tasks involved in the project planning and implementation (Table 1). Steps 6 – 8 in Kotter's model was used to build the implementation, evaluation, sustainability, and dissemination plans. Kotter's change theory was selected because each of the steps followed the project and change management process.

Having a defined timeline and goals to measure results to determine project success provided additional evidence to staff and stakeholders on the project's value and need for sustainability (Appendix G). The organization planned to utilize existing staffing resources for this project and any available resources to keep expenses as budget neutral for the department (Table 2).

Leadership Qualities and Skills

Being the project manager, this DNP student utilized transformational leadership skills to convey the vision for the project and motivate the team and other stakeholders towards the mission. A strong communication strategy was employed with the team. Key points of the project were presented to the team, managers, and staff (Appendix H). Communicating frequently, soliciting feedback and ideas to encourage active participation and engagement, and listening to concerns and responding quickly to address barriers were important to continue to align the team and key stakeholders towards the purpose and mission of the project.

Results

Approval for the project was obtained from the USAHS Evidence Based Project Review Council (EPRC) before submitting for approval from the organization's IRB committee. Next, the project was submitted to the organization's IRB committee for review and approval prior to the project go live date. Retrospective patient data for patients who had a documented blood pressure reading greater than 150/90 mmHg was extracted from the EMR as comparison data. Comparison data resulted in 471 patients, 65 years and older, that had uncontrolled high blood pressure being identified for the medical office clinic. Pregnant patients were not included in the project. The documented data was collected from the EMR and the data collection tool. The data collected from the patients who received the intervention was aggregated (Table 4). There were four patients that were identified to receive the intervention during the 4-week period. The low participation from patients was due to several reasons. Because the approval process delayed the start, the project length was shortened, and the project occurred during the holiday season. Patients were less likely to participate in action planning or follow up during this time. Since the project implementation period was shortened to four weeks instead of the originally planned eight weeks there was less time for the staff to outreach patients for an appointment at the nurse clinic. The organization also received a strike notification that impacted the entire nursing team. The organization was experiencing a fifth surge for the COVID-19 pandemic where the clinic nurses were reassigned to assist in the inpatient units and COVID-19 testing site. This decreased the clinic staff. Also, patients were even less motivated to come into the clinic for follow up with the nurses.

Two of the patients did not meet the inclusion criteria because the baseline blood pressure reading at the nurse clinic visit was below the blood pressure level of 150/90 mmHg. As a result, these two patients were excluded from the project.

The project manager collected, analyzed, and stored the data in a secure computer that was password-protected and only accessible to the project manager. The data collection tool that the nursing staff documented the patient information on was located on a secured site that only the nursing staff, project manager, department manager, and preceptor had access to. The patients participating in the nurse-led program were given a unique identifier to keep private health information and demographics confidential and private. Missing data was noted but still included into the project data. An attempt to obtain missing data was made by review of the patient's EMR and contacting the patient.

Baseline data was collected for the blood pressure reading in the clinic, and again at 2 weeks and 4 weeks, and the RN or assigned healthcare practitioner recorded the information on a data collection tool (Appendix I). Two BSN-prepared registered nurses evaluated the data collection and action plan tools to ensure its face validity. The evaluation plan included the criteria for evaluation, the categories of measures, time points for data collection, type of data produced, statistical test used, and benchmarks for each measure (Table 2). The data produced from the clinic blood pressure readings was considered continuous data because an actual number or value is produced. Paired t-tests analyzed the differences in the diastolic and systolic blood pressure readings before and after the nurse-led blood pressure program intervention for the group of participants. Statistical significance would be noted with $p < .05$. The analysis showed that statistical significance was not achieved, which would be expected with only two participants.

The clinically meaningful improvement data was more important to consider in this EBP project. The intent of the DNP project was to show the impact of the intervention on the clinical outcome of the identified patient population versus validating or invalidating the effectiveness of the intervention itself. Clinical significance typically would have been noted when the last three

blood pressure readings are less than 150/90 to indicate that blood pressure control was established along with patient compliance with the agreed-upon action plan and self-monitoring of blood pressure. However, with the shortened project timeline, only one additional blood pressure reading was obtained by the nurse at the two week follow up visit for each patient. For the outcome measure, one of the two patients showed a decreased blood pressure reading below 150/90 mmHg. The blood pressure reading for the second patient did not show any difference from the initial reading. For the process measures, the RN case manager documented in both patient charts that a discussion regarding action planning and self-monitoring blood pressure took place. However, documentation on the patient reporting taking their blood pressure at home twice a day was missing in the EMR for both patients. This was a result of the staff noncompliance to document the information into the EMR. This will be reinforced by the department manager to remind the staff regarding the documentation and to monitor compliance through patient chart audits. For the balancing measure, overtime minutes attributed to the project were not incurred during the eight weeks. For the financial measure, there were no costs attributed to the email outreach to the patients since the project manager performed this function herself. Clinical significance is exhibited in one of the two patients with the noted decrease in the blood pressure reading below 150/90 mmHg. It can be extrapolated that with additional patients who receive the intervention and compliance in documentation from the nursing staff regarding the patients' progress with action planning, that clinical significance can be achieved from the intervention for the identified patient population. Although the second patient did not have a decreased blood pressure at the 2 week follow up, the reading did not show an increase in the blood pressure. Further evaluation of the change of practice at the 4 week follow up may provide more evidence of clinical significance for the patients.

For the sustainability measure, the registered nurse would continue with the intervention of SMBP and action planning to measure if the patients have maintained blood pressure levels of less than 150/90 mmHg. Based on the project results, a toolkit was provided to the department manager consisting of the action plan (Appendix A), instructions on how to complete the action plan (Appendix J), and a secure messaging script for the email outreach to the patients (Appendix K). The toolkit would provide the leadership team with the tools for future implementation and adaptation of the nurse-led blood pressure program to improve the program's outcomes and increase the likelihood for system-wide adoption. The organization's leadership team would decide, based on the clinical significance results of the patients' blood pressure readings, whether the practice change would continue as a standard operating procedure.

Impact

The project's goal was to reduce the high blood pressure for patients 65 years and older who had uncontrolled hypertension. The practice change was to introduce action planning combined with self-monitoring of blood pressure in the home. The project educated the nursing staff to the evidence supporting the practice change. The staff recognized the importance of the intervention. Before the project implementation, the nurses would measure the blood pressure and communicate with the physician regarding high blood pressure readings and request for medication treatment adjustments to aid in the hypertension control. Since the implementation, the nurses discussed with the patients regarding their action planning and identified individualized improvement goals such as medication adherence and lifestyle changes. The nurses in the clinic are supportive of the intervention and plan to continue with this practice.

Limitations identified are related to the timing of the project implementation and the COVID-19 pandemic. Also, the organization received a strike notice that would have impacted the entire nursing team. As a result, the department faced staffing challenges from increase sick calls and reassignment to the inpatient units and COVID-19 testing sites. In addition, the project was initially implemented during the holiday season, which contributed to low participation from the patients. It was recommended to the department manager and preceptor that the project would have increased chances for success if implemented during the spring or summer months and when the COVID-19 pandemic has improved. Ongoing follow up to the nursing staff from the department manager along with sharing the monthly data for controlled hypertension for the patient population for their specific medical office building will promote sustainability. The project will not be expanded at this time due to the lack of participation during the pilot. However, the department manager will look at another pilot this coming spring or summer and will monitor the patient data for improved outcomes. The nursing staff expressed strong support for the intervention and discussed how to spread to other departments within the medical office building and across the organization. Based on their enthusiasm and strong support during the pilot, they will most likely continue to engage patients with making action plans and home monitoring of blood pressure. The nurses recognized and acknowledged that by improving the patients' uncontrolled hypertension it would have positive outcomes by reducing clinic visits, possibly reducing the use of medications, and improve their health through exercise and diet changes. The two patients were receptive to the nurses discussing action planning with them and engaging them what actions they could take to improve their lifestyle that would help reduce their blood pressure. A toolkit was put together to provide the tools and resources used during the pilot. The toolkit consisted of the patient action planning document, instructions on how to

complete the action planning document, scripting for telephone and email outreach to patients regarding enrolling into the program, the data collection tool, and instructions on how to fill out the data collection tool. The patient action planning document also had embedded website links to patient education topics on high blood pressure, monitoring blood pressure at home, following a DASH diet, monitor weight, and increasing physical activity.

Dissemination

The project findings were shared with the department manager and preceptor. Both individuals recognized the limitations of the project and supported the toolkit development as an additional resource for future use. The project findings were presented to the organization's nursing leaders and other interprofessional team members. A meeting to present the project findings with the organization's nursing leaders and other interprofessional team members was scheduled the following month. It was shown as a presentation in PowerPoint format and shared the project objective, evidence, toolkit, trends, findings, and recommendations. The abstract submission was submitted at the organization's national nursing conference, Alpha Alpha Alpha Chapter Sigma USAHS SON DNP Scholarly Project Symposium, and in the SOAR@USA database. SOAR@USA is the institutional repository that collects scholarly works of students, staff, and faculty for the University of St. Augustine. Within the professional community, the findings will be submitted for abstract submission at the annual conferences for the American Academy of Ambulatory Care Nursing (AAACN)'s annual conference in the coming summer. The AAACN is the professional organization for ambulatory care and is an appropriate choice to disseminate the information and learnings to spread to other ambulatory clinics and locations. Peer reviews of podium and/or poster presentations prior to submitting to the professional organization were conducted.

Conclusion

The DNP project objective evaluated if the intervention of a nurse-led blood pressure control program would affect the blood pressure control in patients 65 years and older who had uncontrolled blood pressure. Strong evidence in the literature supported that self-monitoring blood pressure along with patient-specific co-interventions will improve blood pressure control. Uncontrolled high blood pressure in geriatric patients has negative impacts to their health outcomes and quality of life. This has a downstream affect and financial implications to the patient, family, and healthcare system. The John Hopkins Nursing Evidence-Based Practice model was an effective resource to appraise and synthesize the existing evidence and research. Kotter's change theory provided guidance to the change process through its eight steps for leading change. The evidence searches through three databases ultimately produced five results that provided the strong evidence to support the DNP project. It was observed that multiple interventions along with self-monitoring of blood pressure were employed towards controlling high blood pressure in patients.

The DNP project setting was implemented at an outpatient department where patients with high blood pressure were identified. The medical center leadership team recognized that a gap in blood pressure control existed in their patient population. Interprofessional collaboration between the stakeholders and professions was essential and each team members' input and perspective helped towards identifying barriers and working together towards solutions. The SWOT analysis identified several weaknesses and threats for continuously monitoring. The project timeline outlined the project tasks to be completed and an evaluation plan, with the project objectives, that aided to determine the effectiveness of the intervention and project.

Due to several limitations, the project implementation was impacted, which resulted in only two participants in the pilot. Clinical significance was noted in one patient while the second patient did not show an improvement nor worsening of the blood pressure reading. As a result, further evaluation of the intervention over time with more participants may provide indication of clinical significance. At the project close, a toolkit with resources was provided to the leadership team for future implementation. The findings were also disseminated at a DNP scholarly project symposium, in the university's scholarly resource database, and an abstract for a professional organization's annual conference was submitted.

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Table 1

Kotter's 8-Step Process for Leading Change

1.	Create a sense of urgency	• Communicate to key stakeholders the significance of the problem by sharing organizational, national, and local statistics and data, financial impact to organization, and impact to patient's quality of life and health. • Engage stakeholders early in the project timeline leads to gaining their support and approval.
2.	Build a guiding coalition	• Form a workgroup made of interprofessional team members who would champion the project but also provide their expertise. • The RN case manager collaborates with the physician, social worker, health educator, and pharmacist on the patient's care to ensure that the patient's medical care and needs are being met.
3.	Form a strategic vision & initiatives	• Speak to the *why* to create a vision • Communicate it across all levels and frequently to encourage open dialogue and a forum to surface barriers and concerns. • Communication will take place frequently in staff meetings, emails, and flyers.
4.	Enlist a volunteer army	• Identify champions and early adopters that support the project and will help to lead the change for implementation.
5.	Enable action by removing barriers	• Involve and engage staff and managers in the process and the project in the beginning. • Provide opportunities to listen and respond to questions and concerns with timely follow up to build trust with the staff.
6.	Generate short-term wins	• Develop milestones and then celebrating as milestones are accomplished motivates the team and the stakeholders. • Identify low hanging fruit that can be easily accomplished and celebrated.
7.	Sustain acceleration	• Ensure that a change occurs quickly in order to sustain the sense of urgency and keep the momentum and energy around the project. • Through frequent updates and feedback from the staff, make any adjustments needed.
8.	Institute change	• Establish a timeline, with deliverable action steps, measurable goals, and an end date that signifies that there is a starting and ending to the project.

Table 2

Budget

EXPENSES	
Direct	
Salary and benefits for RN case manager ($50/hr x 40 hrs/wk x 10 wk)	$20,000
Supplies (fliers, mailers, posters)	$2000
Patient education materials	$1000
Statistician ($50/hr x 10 hours)	$500
Total Expenses	$23,500

Table 3

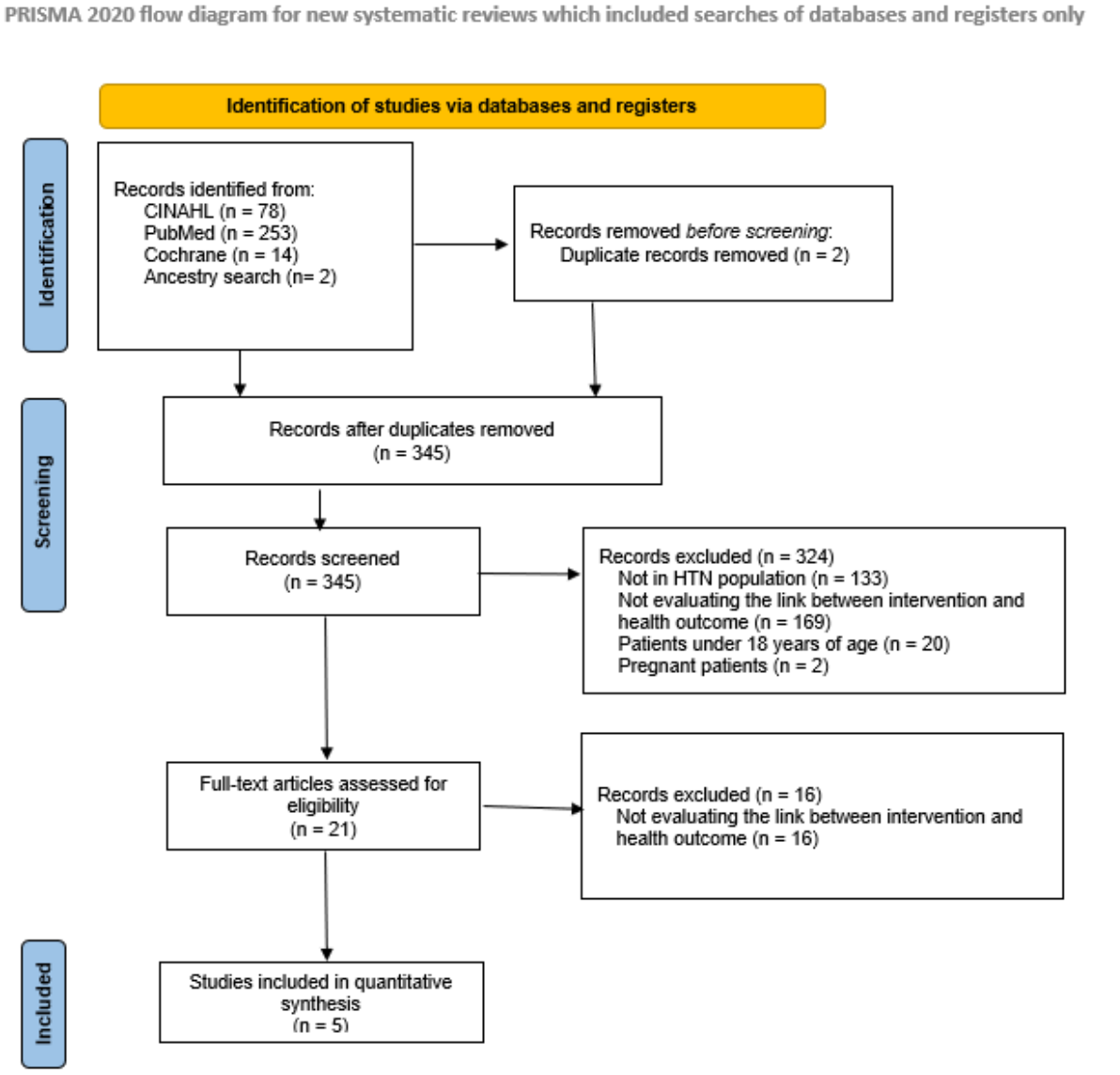
Evaluation Plan

MEASURES	CATEGORIES						TIME FOR DATA COLLECTION			TYPE OF DATA PRODUCED	STATISTICAL TEST				Criteria	Define the	BENCHMARK	
Name & Metric (definition)	OUTCOME	PROCESS	BALANCING	FINANCIAL	SUSTAINABILITY	CONTEXT	Baseline	2 weeks	4 weeks		paired t-test	unpaired t-test	χ^2	Other	State the p value or other criteria	Clinically meaningful criteria	4 weeks	8 weeks
EMR documentationby RN case managers: % of EMR documentation by the RN case manager that demonstrate a discussion regarding action planning and self-monitoring blood pressure occurred with the patient within two weeks of being enrolled into the nurse-led program		X					NA	X	X	nominal	X				$p < 0.05$	>90%	85%	87%
Self-reported SMBP 2x/day: % of patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, report taking their blood pressure twice a day, at least five days per week		X					X	X	X	nominal	X				$p < 0.05$	>85%	85%	87%
Blood pressure control: % of patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, who achieve blood pressure levels of less than 150/90 mmHg	X						X	X	X	continuos	X				$p < 0.05$	>85%	85%	87%
Blood pressure control (long-term): % of the patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, have maintained blood pressure levels of less than 150/90 mmHg					X		X	X	X	continuos	X				$p < 0.05$	>85%	85%	87%
RN case manager hours: # of hours RN case managers spent with patients in the program						X	NA	X	X	continuos	X				$p < 0.05$	10 hours/wk or 40 hr/mo	40	80
Overtime: Sum of overtime minutes in a given period incurred by RN case managers			X				NA	X	X	ratio	X				$p < 0.05$	< 60 minutes	15 mins	30 mins
Marketing Costs: dollars allocated for marketing and communication to members and the community are within budget				X			NA	X	X	continuos	X				$p < 0.05$	$2000 allocated in budget	$1,000	$2,000

Table 4

	A	B	C	D	E	F	G
	id	Gender_Nomina	age	PreSystolic	PreDiastolic	postSystolic	postDiastolic
	Scale	Nominal	Scale	Scale	Scale	Scale	Scale
1	1	0	65	143	86	135	85
2	2	0	81	148	61	150	59

Figure 1



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix A

My Blood Pressure Action Plan

Patient name: _____ Date:_____

Current blood pressure _____/_____

The table below shows what your Blood Pressure (BP) numbers mean.

Normal blood pressure	120/80
Elevated blood pressure	120-129/80
High blood pressure/Stage 1	130-139/80-89
High blood pressure/Stage 2	135/85*

*All adults with confirmed hypertension, treat to a goal of SBP < 140 mmHg and goal DBP < 90 mmHg; In adults with ASCVD, CKD, age ≥ 75 years, treat to a goal SBP of < 130 mmHg

Additional information on high blood pressure may be found on the kaiserpermanente.org website under the search term *high blood pressure*

My healthcare team's treatment goals for my BP is: Less than _____/_____

My personal action plan: *(Focus on 2 goals each week)*

X **Monitoring my blood pressure**

- ☐ Taking medications daily
- ☐ Follow a low sodium DASH diet
- ☐ Monitoring my weight
- ☐ Move More

My Personal Action Plan	Resources
Take my MEDICATIONS To help me remember to take my pill(s) daily, I will: ☐ Use a medication reminder (pillbox, alarm) ☐ Take my pill(s) at meals or bedtime	High Blood Pressure: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-should-i-take-medicine.zx1768
Monitor my BLOOD PRESSURE To keep track of my blood pressure I will: ☐ Measure my blood pressure 2 sets of 2-3 readings each day (morning and evening) at least 3 days each week ☐ Record my blood pressure in a log	Checking Your Blood Pressure at Home: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-checking-your-blood-pressure-at-home.zp2624
Follow a low sodium DASH diet To reduce my salt (sodium) intake, I will: ☐ Eat a healthy diet of vegetables, fruits, and whole grains ☐ Choose heart-healthy proteins	Using the DASH Diet: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-using-the-dash-diet.zp3284

☐ Choose unsaturated fats and oils such as olive, canola, or peanut oil ☐ Limits sodium (salt), sugar, and alcohol ☐ Choose low fat dairy products	
Monitor my WEIGHT To keep track of my weight I will: ☐ Weigh myself every day ☐ Keep track of my weight in a journal	Healthy Eating: Starting a Plan for Change https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.zx3211#zx3212 Weight Management: Stop Negative Thoughts https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.uf9874#uf9875
MOVE More **To increase my physical activity, I will:** ☐ Go to an exercise class at a gym or senior center ☐ Do light housekeeping or yard work ☐ Take a brisk walk ☐ Do strength training exercises — with light weights or without weights ☐ Other:	Get active. Regular physical activity can lower blood pressure in those who have high blood pressure. Try to do moderate activity at least 2½ hours a week. Or try to do vigorous activity at least 1¼ hours a week. Fitness: Adding More Activity to Your Life https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.zx3160#zx3161
***Possible problems for meeting my goal:**	
***Things that will help me meet my goal:**	

Appendix B

John Hopkins Nursing Evidence-Based Practice: Evidence Level and Quality Guide

Evidence Levels	Quality Ratings
Level I Experimental study, randomized controlled trial (RCT) Explanatory mixed method design that includes only a level I quaNtitative study Systematic review of RCTs, with or without meta-analysis	**QuaNtitative Studies** **A High quality**: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence. **B Good quality**: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence. **C Low quality or major flaws**: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.
Level II Quasi-experimental study Explanatory mixed method design that includes only a level II quaNtitative study Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis	**QuaLitative Studies** No commonly agreed-on principles exist for judging the quality of quaLitative studies. It is a subjective process based on the extent to which study data contributes to synthesis and how much information is known about the researchers' efforts to meet the appraisal criteria. *For meta-synthesis, there is preliminary agreement that quality assessments of individual studies should be made before synthesis to screen out poor-quality studies[1].* **A/B High/Good quality** is used for single studies and meta-syntheses[2]. The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in sufficient detail; and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all of the following is found in the report: • Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated. • Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence. • Verification: The process of checking, confirming, and ensuring methodologic coherence. • Self-reflection and scrutiny: Being continuously aware of how a researcher's experiences, background, or prejudices might shape and bias analysis and interpretations. • Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated. • Insightful interpretation: Data and knowledge are linked in meaningful ways to relevant literature. **C Low quality** studies contribute little to the overall review of findings and have few, if any, of the features listed for high/good quality.
Level III Nonexperimental study Systematic review of a combination of RCTs, quasi-experimental and nonexperimental studies, or nonexperimental studies only, with or without meta-analysis Exploratory, convergent, or multiphasic mixed methods studies Explanatory mixed method design that includes only a level III quaNtitative study QuaLitative study Meta-synthesis	

Appendix C

Summary of Primary Research Evidence

Citation	**Design, Level Quality Grade**	**Sample Sample size**	**Intervention Comparison (Definitions should include any specific research tools used along with reliability & validity)**	**Outcome Definition**	**Usefulness Results Key Findings**
Kravetz, J.D. & Walsh, R.F. (2016). Team-based hypertension management to improve blood pressure control. *Journal of Primary Care & Community Health, 7*. https://doi.org/10.1177/2150131916645580	Design: QE Level: II Quality Grade: A	Sample: PT with BP >160/100 mmHg in primary care clinic. 25 - 98 years of age. Mean age was 72.7	INT: team-based approach to BP management C: usual care Team-based approach: multiple interventions around RX compliance, RX titration, SMBP, nutrition counseling, & motivational interviewing.	Improve blood pressure control Measurement of BP change from entry to 4 month F/U	Significant ↓ in mean SBP from 167.7 to 152.1 mmHg ($P < .001$) and mean DBP from 84 to 78.6 mmHg ($P < .001$) in INT group. Significant ↓ SBP in INT group vs C group (15.6 vs 9.9 mmHg; $P < .001$).

		years in INT group and 72.2 years in C group. Sample size: 665	Team included primary care provider, nursing, and pharmacy. Usual care: routine primary care F/U Analysis: Student's *t* test for paired sample with 2-tailed distribution. Chi-square test used for bivariate comparisons, and null hypothesis was rejected when 2-sided *P* values were < 0.5		62% of INT group had lower SBP post intervention as compared with 41% of usual care group. 54% INT group had lower DBP as compared to 37% of usual care group (P < 0.001). Team approach, involving nursing, is effective to BP management.
Mattei da Silva, Â. T., de Fátima Mantovani, M., Castanho Moreira, R., Perez Arthur, J., & Molina de Souza, R. (2020). Nursing case management for people with hypertension in primary health care: A randomized controlled trial. *Research in Nursing & Health*, *43*(1), 68–78. https://doi.org/10.1002/nur.21994	Design: RCT Level: I Quality Grade: A	Sample: PTs from primary care clinic, age between 18 to 58 years of age, with DX HTN Sample size: 94 PTs	INT: nursing CM C: usual care Nursing CM model includes nursing consultations, telephone contact, home visits, health education, & appropriate referrals. Usual care: routine care F/U Data tabulated on Microsoft Excel® and then exported to IBM SPSS® version 20.0. Mann-	Primary outcome: BPC Secondary outcome: treatment adherence BP assessed at baseline and 6- and 12-month F/U for INT group and at baseline and 12-month F/U for usual care group. Treatment adherence assessed using validated Questionnaire on Adherence to Treatment of Systemic Hypertension. Lower	INT group BP ↓ significantly as compared to usual care group: SBP (-8.3 (INT)/1.1 (usual care) mmHg (p = .004); DBP (-7.4 (INT)/-0.6 (usual care) mmHg (p = .007), respectively. INT group had significant improvement in TX adherence (4.8/-1.1) than the usual care group (all p < .05). Nursing CM in primary care is effective to improve outcomes in PTs with HTN.

			Whitney U test was used to determine the difference between the two groups on numerical variables at the baseline time. The McNemar test was used ass the dichotomous outcome of BPC between the INT and usual care groups. *T*-test used for the differences between the baseline and 12 months within each group. Statistical significance level set $p <$ .05.	score indicates poorer adherence.	

Legend: ≥ = greater than or equal to; ≤ = less than or equal to; ↓ = decrease; ↑ = increase; # = number; % = percentage; AMD = adjusted mean difference; assoc = associated; BP = blood pressure; BPC = blood pressure control; C = comparison; CI = confidence interval; CV = cardiovascular; CKD = chronic kidney disease; DM = diabetes mellitus; DX = diagnosis; DBP = diastolic blood pressure; F/U = follow-up; GH = general hospital; GP = general practitioner; HTN = hypertension; IPAC = International Physical Activity; INT = intervention; LC = local clinics; MARS = Medication Adherence Rating Scale; MPR = Medication Possession Ratio; NNT = number needed to treat; OR = odds ratio; OP = outpatient; PT = patient; QOL = quality of life; QE = quasi-experimental; RX = medication; RCT = randomized control trial; SM = self-monitoring; SMBP = self-monitoring blood pressure; SD = standard deviation; SBP = systolic blood pressure; TM = telemonitoring; TX = treatment

Appendix D

Summary of Systematic Reviews (SR)

Citation	**Quality Grade**	**Question**	**Search Strategy**	**Inclusion/ Exclusion Criteria**	**Data Extraction and Analysis**	**Key Findings**	**Usefulness/Recommendation/ Implications**
Glynn, L.G., Murphy, A.W., Smith, S.M., Schroeder, K., & Fahey, T. (2010). Interventions used to improve control of blood pressure in patients with hypertension. *Cochrane Database of Systematic Reviews 2010, 3,* 1465-1858. https://doi.org/10.1002/14651858.CD005182.pub4	A	To determine effectiveness of interventions to improve control of BP in PT with HTN. To evaluate the effectiveness of reminders on improving the follow-up of PT with HTN.	All-language search of all articles in the Cochrane Controlled Trials Register (CCTR), Medline, and Embase databases from January 1980 to February 2008. Selected MeSH terms and free text terms relating to HTN were used. Other sources searched were: 1. reference lists of all papers and relevant reviews 2. authors of relevant papers were contacted regarding any other published or unpublished work	Inclusion criteria 1. RCT 2. Interventions included: (1) SM (2) educational INT directed to the PT (3) educational INT directed to the health professional (4) nurse or pharmacist led care (5) organizational INT that aimed to improve delivery of care (6) appointment reminder systems Exclusion criteria 1. INT not intended to ↑ BPC by organizational means (e.g., drug trials, non-pharmacological TX)	• 72 RCTs were included in the SR • Data extracted in duplicate independently by two of the authors on study design, methods, clinicians and PT, INT, outcomes, and potential sources of bias using a structured data collection form. • WMD approach used to compare BP differences from baseline to final F/U. • For BPC and clinic attendance at F/U, statistical and clinical	• Frequent F/U combined with antihypertensive drug therapy resulted in ↓ SBP (WMD -8.0 mmHg, 95% CI; -8.8 to -7.2 mmHg) and ↓ DBP (WMD -4.3 mmHg, 95% CI: -4.7 to -3.9 mmHg) • SM had moderate net ↓ SBP (WMD -2.5 mmHg, 95% CI: -3.7 to -1.3 mmHg) and ↓ DBP (WMD -1.8 mmHg, 95% CI: -2.4 to -1.2 mmHg). • Nurse or pharmacist led care associated with improved BPC and mean SBP & DBP	• A standard workflow of regular F/U with HTN PT should be implemented. • HTN drug therapy may be combined with SM and appointment reminders as strategies to improve BPC.

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
			3. authors of trials contacted regarding missing information 4. ISI Web of Science was searched for papers that cite studies included in the review		significance was evaluated by estimating OR with 95% CI. • Pooled OR and 95% CI were calculated with The Cochrane Collaboration RevMan5 software.		
Mantovanil, M. de F., Puchalski Kalinke, L., Mattei da Silva, Â. T., Perez Arthur, J., Trindade Radovanovic, C. A., & Bortolato-Major, C. (2021). Effectiveness of nursing case management versus usual care for blood pressure control in adults with hypertension: A systematic	B	Analyzed the effectiveness of nursing case management in primary health care, compared to usual care, in improving blood pressure in adults over 18 years with hypertension	Databases used for the literature search were PubMed, CINAHL, Lilacs, Web of Science, Academic Search Premier, Cochrane Library, WHO Trials. for both published studies. For unpublished studies, databases searched were Directory of Open Access Journal, CAPES System Portal, Open Gray, European Union Clinical Trial,	<u>Inclusion criteria</u> 1. Adult PTs (+18 y/o) DX of HTN, with or without other chronic diseases 2. F/U by RN case manager as part of multi-professional team 3. Techniques involving F/U, monitoring, and health interventions using call centers, tele-nursing, home visits and/or nursing consultations. <u>Exclusion criteria</u>	• 6 RCTs evaluated (1963 PTs) • Data extracted using standardized Joanna Briggs Institute data extraction tool • JBI-SUMARI tool used to synthesize results as means and SDs.	• Significant ↓ SBP in 2 studies and ↓ DBP in 3 studies in INT group. • All studies with 6-month F/U showed statistical significance • Due to heterogeneity of studies, there was limitations in comparing the findings	• CM can help in planning of health actions, health promotion activities, and managing chronic conditions. • CM activities identified were home visits, email/phone contact, motivational interviews, counseling with culturally adapted

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
review. *Investigacion & Educacion En Enfermeria, 39*(1), 37–56. https://doi.org/10.17533/udea.iee.v39n1e04			Proquest Dissertations and Theses, DART Europe E-thesis Portal, World Cat and Elctronic Thesis Online System (Ethos). Analysis of the text words in the title and abstract was conducted.	1. Studies with more than 2 arms			educational materials, and monthly meetings with nurses.
Tucker, K. L., Sheppard, J. P., Stevens, R., Bosworth, H. B., Bove, A., Bray, E. P., Earle, K., George, J., Godwin, M., Green, B. B., Hebert, P., Hobbs, F. D. R., Kantola, I., Kerry, S. M., Leiva, A., Magid, D. J., Mant, J., Margolis, K. L., McKinstry, B., … McManus, R. J. (2017). Self-	A	Examined effectiveness of SM to ↓ clinic BP and HTN control	Databases used for the literature search were Medline, EMBASE, and the Cochrane Library.	Inclusion criteria 1. Studies published since 2000 with at least 6 months of F/U data 2. SBPM in HTN PTs Exclusion criteria 1. Studies where lower home BP was not used	• 36 RCTs • IPD provided from 25 trials, including 1 unpublished study • Total of 10,487 PTs • IPD requested from corresponding authors for PT demographics, antihypertensive medications, lifestyle factors, & BP end points.	• SM assoc with ↓SBP as compared to usual care at 12 months (-3.2 mmHg, [95% CI -4.9, 1.6 mmHg]) • Strong correlation level of intensity of co-intervention: no effect with SM alone (-1.0 mmHG [-3.3, 1.2]); ↓ when SM combined with intensive support (6.1 mmHg [-9.0, -3.2])	• Blood pressure control is associated when SM is combined with co-interventions from a nurse such as SM, medication titration, education, or lifestyle coaching.

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
monitoring of blood pressure in hypertension: A systematic review and individual patient data meta-analysis. *PLoS Medicine, 14*(9), e1002389. https://doi.org/10.1371/journal.pmed.1002389					• Study level data was extracted from published articles. • 2-stage IPD meta-analysis was conducted using linear regression for continuous outcomes (change in SBP & DBP) and logistic regression for proportions (odds of uncontrolled BP at F/U). • Data presented as proportions of total study population, means with SD with 95% CI unless otherwise stated.		

Legend: ↓ = decrease; ↑ = increase; ≥ = greater than or equal to; # = number; assoc = associated; BP = blood pressure; BPC = blood pressure control; CM = case management; CI = confidence interval; CHD = coronary heart disease; CKD = chronic kidney disease; DBP = diastolic blood pressure; DM = diabetes mellitus; F/U = follow-up; HTN = hypertension; INT = intervention; IPD = individual patient data; OR = odds ratio; PT = patient; RCT = randomized control trial; SBP = systolic blood pressure; SM = self-monitoring; SMBP = self-monitoring blood pressure; SD = standard deviation; SR = systematic review; TX = treatment; WMD = weighted mean difference

Appendix E

Citation	Level of Evidence	Quality Grade
Primary Research Evidence		
Kravetz, J.D. & Walsh, R.F. (2016).	II	A
Mattei da Silva, Â. T., de Fátima Mantovani, M., Castanho Moreira, R., Perez Arthur, J., & Molina de Souza, R. (2020).	I	A

Citation	Quality Grade
Systematic Reviews	
Glynn, L.G., Murphy, A.W., Smith, S.M., Schroeder, K., & Fahey, T. (2010).	A
Mantovanil, M. de F., Puchalski Kalinke, L., Mattei da Silva, Â. T., Perez Arthur, J., Trindade Radovanovic, C. A., & Bortolato-Major, C. (2021).	B
Tucker, K. L., Sheppard, J. P., Stevens, R., Bosworth, H. B., Bove, A., Bray, E. P., Earle, K., George, J., Godwin, M., Green, B. B., Hebert, P., Hobbs, F. D. R., Kantola, I., Kerry, S. M., Leiva, A., Magid, D. J., Mant, J., Margolis, K. L., McKinstry, B., … McManus, R. J. (2017).	A

Appendix F

SWOT Analysis

Strengths	**Weaknesses**
• Improve quality of care and reduce uncontrolled BP rates • Reduce number of unplanned encounters to office, urgent care, and/or ED • Leadership support for DNP project • Skilled registered nurses (RN) within department	• Current RN workload • Resistance to change from RNs • Less referral of patients to program
Opportunities	**Threats**
• Underserved market for nurse-led blood pressure program • Increase marketing to patients and members of program • Improve staff training	• Rising competition from nearby hospitals • Patient dissatisfaction from access to provider and services • Economic decline impacts patients' adherence to treatment plan • COVID-19 pandemic may impact and delay DNP project implementation

Appendix G

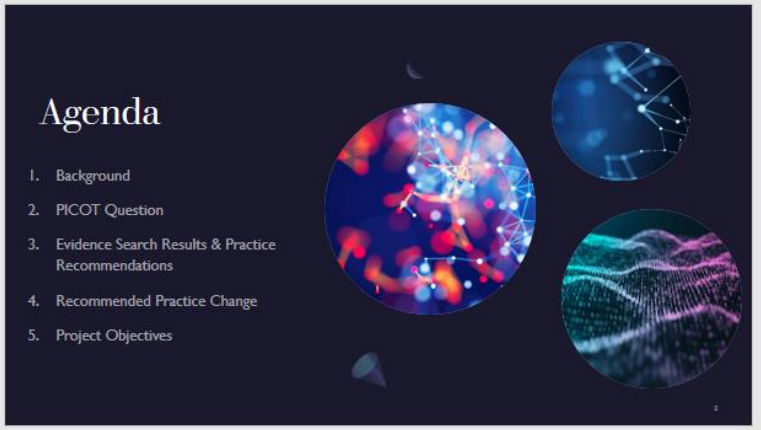
Project Schedule

	NUR7801								NUR7802								NUR7803							
Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
Meet with preceptor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Prepare project proposal	X	X	X	X	X	X	X	X																
Present project to preceptor for approval	X																							
Interview key stakeholders (Complete Care department manager, RN case managers, physician leader, pharmacy, health educator, IT, labor union steward)				X	X	X	X	X	X	X														
Assess organization's readiness to change using IHI Improvement Capability Assessment Tool (n.d.)							X	X																
Create Gantt chart timeline						X																		
Obtain approvals from key stakeholders for project scope & budget								X																
Form interprofessional team										X	X													
Kickoff meeting with team and stakeholders											X													
Meet with department staff, including RN case managers, in staff in Complete Care department regarding project											X													

	NUR7801								NUR7802								NUR7803							
Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
Meet with RN case managers regarding refining standardized documentation in EMR												X												
Review IRB process, discuss protection of human rights, and PHI										X														
Obtain IRB approval											X													
Bi-weekly meetings with project team													X	X	X	X	X	X						
Develop communication (flyers, emails, text messages) for patient outreach											X	X												
Key Stakeholder monthly status update													X		X		X		X					
Weekly touchpoints with RN case managers													X	X	X	X	X	X	X					
Go Live with RN-led program											X													
Gather data from EMR (baseline and project data)	X			X							X							X	X					
Project end date																X								
Analyze data and review outcomes with preceptor																				X	X			
Key Stakeholder final status update																						X		
Final team meeting, debrief, and project close																						X		

Appendix H

1



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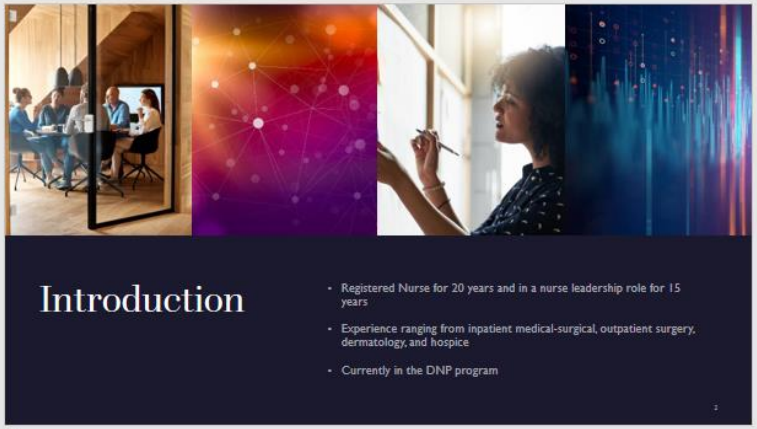

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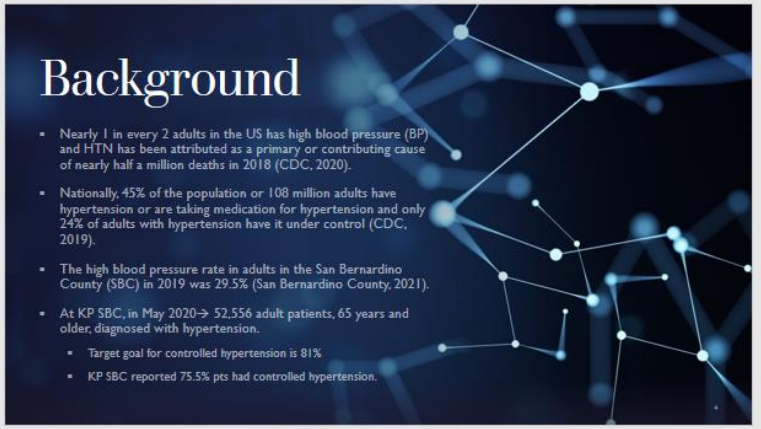

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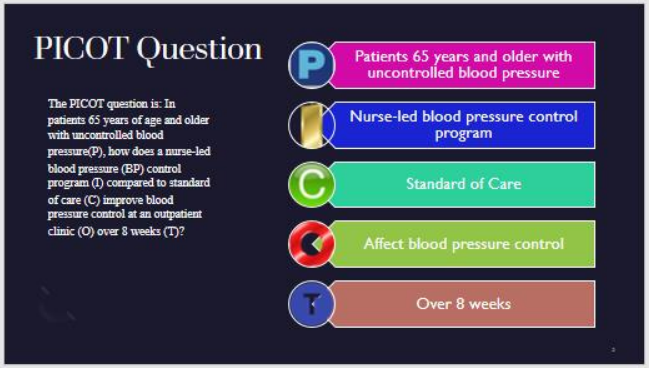
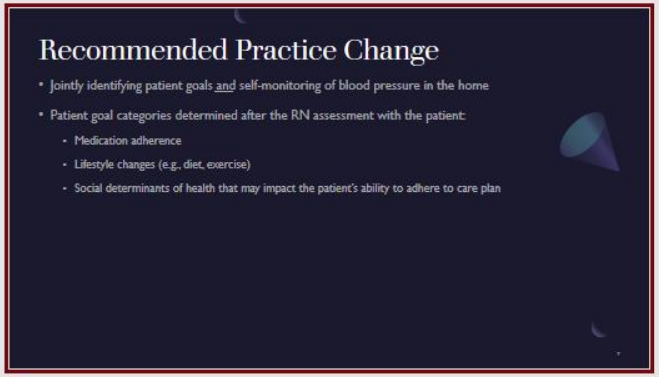

PICOT Question
The PICOT question is: In patients 65 years of age and older with uncontrolled blood pressure(P), how does a nurse-led blood pressure (BP) control program (I) compared to standard of care (C) improve blood pressure control at an outpatient clinic (O) over 8 weeks (T)?
P
Patients 65 years and older with uncontrolled blood pressure
I
Nurse-led blood pressure control program
C
Standard of Care
O
Affect blood pressure control
T
Over 8 weeks

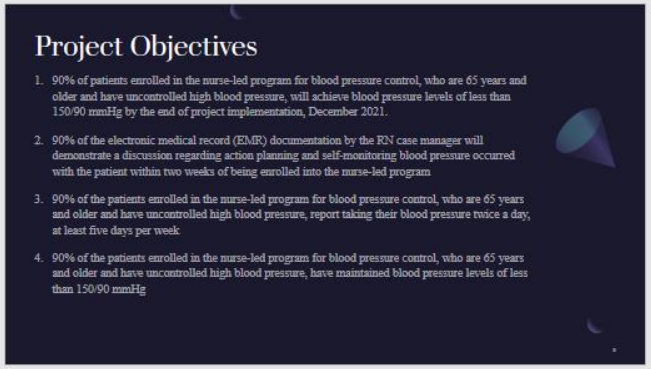
5


Evidence Search Results & Practice Recommendations
EVIDENCE SEARCH RESULTS
Literature search resulted in 345 citations and 2 ancestry searches
After in-depth review, 5 research articles remained → 2 quantitative research articles and 3 systematic reviews
PRACTICE RECOMMENDATIONS
Strong evidence with consistent results that supported the practice change of implementing a nurse-led blood pressure control program for patients 65 years and older to improve blood pressure control at an outpatient clinic
With nurse-led programs, blood pressure values and/or blood pressure control exemplified significant improvement across all five studies

6


Recommended Practice Change
Jointly identifying patient goals and self-monitoring of blood pressure in the home
Patient goal categories determined after the RN assessment with the patient:
Medication adherence
Lifestyle changes (e.g., diet, exercise)
Social determinants of health that may impact the patient's ability to adhere to care plan

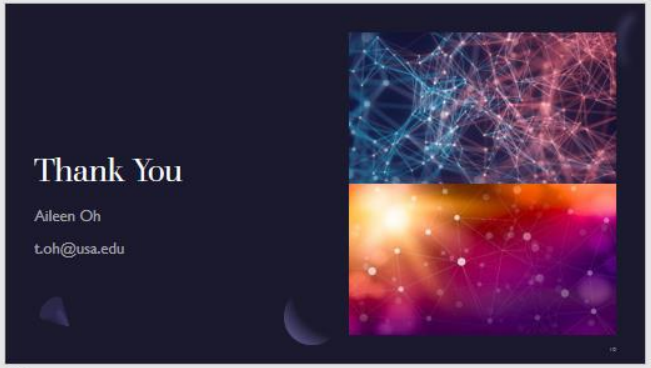
7


Project Objectives
1. 90% of patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, will achieve blood pressure levels of less than 150/90 mmHg by the end of project implementation, December 2021.
2. 90% of the electronic medical record (EMR) documentation by the RN case manager will demonstrate a discussion regarding action planning and self-monitoring blood pressure occurred with the patient within two weeks of being enrolled into the nurse-led program
3. 90% of the patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, report taking their blood pressure twice a day, at least five days per week
4. 90% of the patients enrolled in the nurse-led program for blood pressure control, who are 65 years and older and have uncontrolled high blood pressure, have maintained blood pressure levels of less than 150/90 mmHg

8


Timeline
Meet with department staff & introduce project
Weekly calls to check in with RN identified for project
Analyze data and review outcomes with stakeholders
Kickoff
Project Planning
RN touchpoints
Data Collection
Analyze Data
Final Team Meeting
Bi-weekly meetings to discuss patient outreach & communication, reviewing nursing smartphrase documentation, and review data collection tool
Gather data from EMR during 8 weeks for project
Debrief and review project outcomes

9


Thank You
Aileen Oh
t.oh@usa.edu

10

Appendix I

Data Collection Tool

Nurse-Led Blood Pressure Control Program: Data Collection Tool

	MRN	DOB	Enrollment Date	Patient Goals Identified	Patient Goal Identified	Patient Goal Identified	Patient Goal Identified	Patient Goal Identified	Baseline BP	BP @ 4wks	BP @ 8wks	Pt reports taking BP 2x/day	Pt reports taking BP how many days/week
1				1	2							3	4
2													
3													
4													
5													
6													
7													
8													
9													
10													

Legend:

1. Patient Goals Identified: Select Yes or No
2. Patient Goals Identified: Select category for each goal identified (Medication Adherence, Diet, Exercise, Other)
3. Patient reports taking BP 2x/day: Select most appropriate percentage (100%, 75%, 50%, 25%, 0%)
4. Patient takes BP how many days per week: Select most appropriate number of days (0-7)

Appendix J

Instructions to Complete My Blood Pressure Action Plan

Review document with patient and write in information as instructed below.

<table>
<tr>
<td>1. Write patient's name and today's date.
2. Write blood pressure reading from today's visit.</td>
<td>
My Blood Pressure Action Plan
Patient name: _____ 1 Date: _____
Current blood pressure _____/_____ 2
The table below shows what your Blood Pressure (BP) numbers mean.
<table>
<tr><td>Normal blood pressure</td><td>120/80</td></tr>
<tr><td>Elevated blood pressure</td><td>120-129/80</td></tr>
<tr><td>High blood pressure/Stage 1</td><td>130-139/80-89</td></tr>
<tr><td>High blood pressure/Stage 2</td><td>135/85*</td></tr>
</table>
*65 years old and older: BP goal is less 150/90; Chronic kidney disease: BP goal is less than 140/90
</td>
</tr>
<tr>
<td>3. The first box already has an X in it. The patient should agree to checking their blood pressure at home AND at least one more action plan or goal to help improve their blood pressure. Check another box based on the patient's response and agreement.</td>
<td>
<u>My personal action plan</u>: (Focus on 2 goals each week)
X Monitoring my blood pressure
☐ Taking medications daily
☐ Follow a low sodium DASH diet 3
☐ Monitoring my weight
☐ Move More
</td>
</tr>
<tr>
<td>4. The first action has all of the boxes with an X in it. Review the steps in this section with patient.</td>
<td>
<table>
<tr><th>My Personal Action Plan</th><th>Resources</th></tr>
<tr><td>Monitor my BLOOD PRESSURE
To keep track of my blood pressure I will: 4
X Measure my blood pressure 2 sets of 2-3 readings each day (morning and evening) at least 3 days each week
X Record my blood pressure in a log</td><td>Checking Your Blood Pressure at Home: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-checking-your-blood-pressure-at-home.zp2624</td></tr>
</table>
</td>
</tr>
<tr>
<td>5. Review each of the sections (Medications, Diet, Monitoring Weight, or Exercise). The patient should select one of these categories and agree to a goal within that section.</td>
<td>
<table>
<tr><td>Take my MEDICATIONS
To help me remember to take my pill(s) daily, I will:
☐ Use a medication reminder (pillbox, alarm)
☐ Take my pill(s) at meals or bedtime</td><td>High Blood Pressure: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-should-i-take-medicine.zx1768</td></tr>
<tr><td>Follow a low sodium DASH diet 5
To reduce my salt (sodium) intake, I will:
☐ Eat a healthy diet of vegetables, fruits, and whole grains
☐ Choose heart-healthy proteins</td><td>Using the DASH Diet: https://healthy.kaiserpermanente.org/southern-california/health-wellness/health-encyclopedia/he.high-blood-pressure-using-the-dash-diet.zp3284</td></tr>
</table>
</td>
</tr>
</table>

Appendix K

Secure Messaging Script:

Option 1:

Your physician would like you to come in to have your blood pressure checked at the nurse clinic. We would like to schedule an appointment for you to come in to see one of our nurses. Please call us at (909) 477-3853 and leave a message with your name, medical record number, and a phone number you can be reached at. A nurse will call you back to schedule an appointment with you.

Sincerely,

The Rancho Cucamonga Medical Office Building Care Team

Option 2:

Your physician is recommending that you have your blood pressure checked at the nurse clinic. We would like to schedule an appointment for you to come in to see one of our nurses. Please call us at (909) 477-3853 and leave a message with your name, medical record number, and a phone number you can be reached at. A nurse will call you back to schedule an appointment with you.

Sincerely,

The Rancho Cucamonga Medical Office Building Care Team

Phone Call Script (speaking with patient/caregiver)

Option 1:

Hello, my name is _____. I'm am a nurse from your doctor's office at the Rancho Cucamonga Medical Office Building. Your physician would like you to come in to have your blood pressure checked at the nurse clinic. We would like to schedule an appointment for you now.

Option 2:

Hello, my name is _____. I'm am a nurse from your doctor's office at the Rancho Cucamonga Medical Office Building. Your physician is recommending for you to have your blood pressure checked at the nurse clinic. We would like to schedule an appointment for you now.

Secure Messaging Template (when sending patient completed My Blood Pressure Action Plan" document and "How to Take Your Blood Pressure at Home" form)

You recently had a visit with the nurse at the Rancho Cucamonga Medical Office Building and discussed steps to take to help improve your blood pressure at home. Your personalized blood pressure action plan is attached and has the goals you agreed to work on. There is also another document attached called "How to Take Your Blood Pressure at Home" which has the instructions on how to take your blood pressure and also a log to record the readings. If you have questions, please call us at xxx.