

**Effectiveness of a Single Educational Program on Knowledge and Management of High  
Blood Pressure and Increase Motivation to Change Behavior in Adults**

By

Tatiana Kisluk, FNP-C, MSN, DNP Student

College of Health Sciences and Human Services, Pennsylvania Western University

250 University Avenue

California, PA 15419

A DNP Research Project Submitted to Pennsylvania Western University

In Partial Fulfillment of the Requirements for the Degree for Doctor in Nursing Practice

August 2024

**Effectiveness of a Single Educational Program on Knowledge and Management of High Blood Pressure and Increase Motivation to Change Behavior in Adults**

_____	_____
Date	Dr. Meg Larson, DNP, FNP-BC
_____	_____
Date	Dr. Jill Rodgers, DNP, FNP-BC, PMHNP-BC
_____	_____
Date	Dr. Craig Coleman, Associate Dean, College of Health Sciences

**Committee Signatures**

Student's Name \_\_\_\_\_

Committee Chairperson \_\_\_\_\_

Committee Member \_\_\_\_\_

Associate Dean \_\_\_\_\_

## ACKNOWLEDGMENTS

I want to thank my chairperson and members of my doctoral committee, Professors Meg Larson and Jill Rodgers, for their help and guidance throughout my DNP journey.

I especially like to thank Dr. Meg Larson for her guidance, patience, and always being available when I needed it most throughout my DNP program and my final project at Pennsylvania Western University. This project would not have been possible without her expertise, advice, and invaluable time to review and critique my work. I am beyond grateful to have been a student in your class, and I truly appreciate your support throughout this process.

**Effectiveness of a Single Educational Program on Knowledge and Management of High Blood Pressure and Increase Motivation to Change Behavior in Adults**

**Abstract**

**Background:** Hypertension, or high blood pressure, is a chronic medical condition characterized by elevated blood pressure levels persistently exceeding the normal range. Hypertension is a crucial public concern and the leading cause of kidney disease and cardiovascular diseases, including heart attacks and strokes, and is the most frequent diagnosis seen in medical treatment in the US and worldwide. Adequate education, lifestyle modifications including physical activity, heart-healthy diets, and medication adherence are essential for patients with high blood pressure to be able to manage their disease and live with the best quality of life. Many studies have indicated the effectiveness of educational programs in reducing blood pressure and improving the health status of patients with hypertension.

**Aims and Objectives:** The purpose of this evaluation is to determine whether a formal single hypertension educational program will improve knowledge of management, increase motivation to change health behavior, and improve and promote medication adherence among the senior population.

**Design:** A pre-test and post-test study were conducted.

**Methods:** In this evidence-based education program, 33 older adult patients were recruited from the senior citizen community-based center in Philadelphia, PA. The intervention included education focused on improving knowledge of blood pressure, lifestyle changes, medication adherence, and motivation for behavior change. Outcomes were measured utilizing The Hill-Bone Compliance to High Blood Pressure Therapy Scale (HB-Scale) and Hypertension Knowledge Test (HKT), a 12-item National Heart Lung & Blood Institute questionnaire.

**Results:** The program showed promising results that have positive implications for future practice and research. Of the participants that completed the study (N=33) of African descent, 27.7% were of Caucasian descent, 72.3%, 60.61 % were women, and 39.39% were men. The data collected reflected the participants' intentions regarding disease knowledge, medication adherence, and behaviors pre- and post-intervention. Findings suggest that community-based tailored education programs can successfully produce better HTN management by increasing hypertension knowledge, improving adherence to treatment regimens, and encouraging lifestyle changes among senior adult populations.

**Conclusion:** This educational intervention successfully identified improvement in senior adults' knowledge and increased motivation to change their blood pressure management health behaviors, leading to improved blood pressure control. It is hoped these results will be more widely used. Further investigation and future research would be more effective in meeting these goals in later programs to gain a more in-depth understanding of managing hypertension among senior adult communities.

**Keywords:** Blood pressure control, community-based programs, healthy diet, hypertension, knowledge, lifestyle, medication adherence, older adults.

## INTRODUCTION

Hypertension (HTN), or high blood pressure, is a chronic medical condition characterized by elevated blood pressure (BP) levels persistently exceeding the normal range. HTN is the leading cause of kidney disease and cardiovascular diseases, including heart attacks and strokes. It is the most frequent diagnosis in medical treatment in the US and worldwide (Centers for Disease Control and Prevention [CDC], 2020). HTN is called the “silent killer” because it generally has no symptoms until considerable damage has been done to the heart, arteries, and

kidneys. If left untreated, it may become a dangerous, life-threatening condition (American Heart Association [AHA], 2023). Many people are unaware they have high blood pressure (HBP), and it may take years for the condition to be severe enough that symptoms become apparent. Some people experience symptoms such as headaches, shortness of breath, dizziness, or nosebleeds, but these symptoms are not specific and may be attributed to other health issues (Oller, 2023). Therefore, early detection and management of HBP must be a part of a healthy lifelong plan.

### **Background**

Guerra et al. (2022) stated that HTN is a significant global public health issue impacting countries across all income levels. The study highlighted that HTN causes a significant health burden not only in high-income countries but also in low and middle-income countries, where healthcare resources may be limited, and the prevalence of uncontrolled HTN can be higher. According to the AHA, HBP is defined as a reading of 130/80 mm Hg or higher, which is in line with the latest guidelines released by the association (AHA, 2022). The incidence of HBP is associated with habits or practices that influence overall health, such as a healthy diet, regular physical activity, smoking cessation, motivation to modify or adopt new behaviors, and awareness regarding the importance of HTN control. Excessive salt intake can contribute to HTN and other health problems (CDC, 2024). Sodium is found in various foods, and it is essential to know how much sodium to consume in a diet. Obesity can lead to HTN and various health risks, including heart disease, diabetes, and certain cancers (World Health Organization, [WHO], 2024). Managing these comorbidities requires a comprehensive and coordinated approach.

Furthermore, environmental factors have been significantly associated with HBP and poor HTN management. The research by Li et al. (2020) identified that long-term exposure to air pollution is seriously associated with an increased risk of elevation in BP and HTN. Lower

socioeconomic status, lack of social support and transportation, racial/ethnic disparities, poor housing and living conditions, and neighborhood poverty form individuals' health behaviors, fostering unhealthy practices that contribute to HBP and can exacerbate HTN (Chaturvedi et al., 2024).

Uncontrolled HTN also has a significant impact on mental health. Anxiety, depression, and emotional distress are prevalent among patients with chronic HTN, which further complicates disease management and reduces the quality of life (Ivanusic-Pejic & Degmecic, 2022). The comorbidity of these mental health conditions with HTN presents significant challenges for both patients and healthcare providers. The authors emphasized the need for mental disorders screening and clinical psychological intervention approaches to address these mental health issues in hypertensive patients. Another study by Elsaid et al. (2021) found that chronic stress and anxiety are linked to higher incidences of HTN and have been found to have a direct impact on cardiovascular health, potentially leading to higher BP levels. Authors reported that exposure to chronic stress results in cerebrovascular dysfunction and endothelial injury with increased vessel resistance and stiffness, wall thickening, and arterial atherosclerosis. Moreover, chronic stress stimulates stress hormones and their receptors associated with disorders such as anxiety, depression, obesity, and type 2 diabetes mellitus (Stefanaki, 2018). These factors can worsen preexisting health conditions, resulting in medical management barriers and the development of medication adherence (Kvarnström et al., 2021).

Medication adherence refers to how individuals follow prescribed medication regimens and take medications as scheduled and instructed by healthcare providers. Consistent medication adherence to antihypertensive regimens is associated with remarkably lower healthcare costs, reduced cardiovascular hospitalizations, and lower emergency care (Woode et al., 2022). Poor

adherence is responsible for approximately 125,000 deaths per year and causes 10% of hospitalizations, with an annual cost of \$100-300 billion (Baryakova et al., 2023). The authors stated that the number of deaths is comparable with the number of deaths caused by breast cancer, colorectal cancer, and prostate cancer altogether. Baker-Goering et al. (2019) analysis showed that only 40% to 74% of adults diagnosed with HTN are adherent to prescribed hypertensive treatment. The study by Burnier et al. (2020) highlighted that poor adherence to prescribed antihypertensive treatment is prevalent in the general hypertensive population. This nonadherence can result in uncontrolled HTN, particularly among elderly adults. The authors underscored the need for targeted interventions to improve adherence among the elderly hypertensive population.

HTN treatment is given using medications such as angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, angiotensin II receptor antagonists (ARBs), calcium channel blockers, and diuretics. Each of these drug groups consists of several types of agents with different pharmacological and pharmacodynamic properties (Whelton et al., 2018). The authors concluded that patients who control BP can reduce the risk of damage to essential body organs such as the brain, heart, kidneys, and eyes to avoid the risk of complications that may lead to death. The success of HTN treatment is influenced by treatment adherence, such as taking regular antihypertensive medications for the long term.

Empowering patients with knowledge about HTN and its management is vital for better health outcomes. A study by Dhungana et al. (2022) demonstrated that non-pharmacological interventions involving patient education, self-monitoring, salt intake reduction, increased potassium intake, alcohol reduction, physical activity, weight control, and heart-healthy diets effectively improve BP control. Studies have indicated the effectiveness of educational programs



in reducing BP and health risks associated with HTN. Alanazi et al. (n.d.) reported that Nurse Practitioner-led care is associated with improved patient education by empowering patients to be active in their health and promoting healthy behaviors. The authors specified that Nurse Practitioners (NP) play a key role in educating people about their conditions, treatment options, and lifestyle modification strategies. It facilitates engagement in self-management activities, adherence to treatment regimens, and achieving better health outcomes. Marseille et al. (2021) found that Advanced Practice Nurses (APN) are crucial in managing HTN through patient support and education. By implementing evidence-based programs, healthcare providers can significantly enhance patient adherence to treatment, leading to improved BP control and overall health outcomes.

### **Prevalence**

The prevalence of HTN has been significantly documented and emphasizes its global significance. HTN is the most frequent diagnosis seen in medical treatment and is a leading death in the United States and globally. According to WHO (2023), close to one in four men and one in five women have HBP and accounts for approximately 1.28 billion people worldwide with HTN. Approximately 46% of adults with the disease are unaware that they have HTN (WHO, 2023). Boateng & Ampofo (2023) concluded that the prevalence of HTN worldwide is predicted to be higher in males than in females by 2040. According to the CDC (2023), it is almost half a million deaths per year, which is equal to around 1,370 deaths per day, related to HBP, and about 47% of adults in the United States have HTN or are taking medication for the disease. HTN prevalence increases with age and varies among racial/ethnic groups, with the prevalence remaining among African American adults (Moss et al., 2019). African Americans have a higher percentage of developing HTN over their lifetimes than White, Hispanic, and Asian populations (Carnethon et

al., 2017). The study by Abramowicz et al. (2023) revealed that ethnic minority adults continue to have significantly higher rates of HTN than White adults and racial and ethnic disparities in HTN prevalence and its control continue. According to the authors, Black adults not only have higher HTN prevalence, but they also have lower rates of HBP treatment and control. It highlighted the need for culturally sensitive and community-based interventions. According to the CDC (2024), the prevalence of HTN among African Americans and other racial and ethnic groups is significant and accounts for 56% of Black adults who have HTN compared to the prevalence of 48% in White adults, 46% in Asian adults, and 39% in Hispanic adults. Addressing health disparities, care access, and educational programs are important considerations.

HTN prevalence increases with age and affects more men than women before age 45. After age 45, women tend to surpass men due to the attribution to hormonal changes and a decrease in estrogen levels after menopause, which can harm cardiovascular health (Benjamin et al., 2019). The authors concluded that prevalence in women with HTN starts to increase after the age of 45, and by age 60, a higher percentage of women have HTN compared to men. CDC (2020) reported that The National Health and Nutrition Examination Survey (NHANES) data from 2017-2018 showed that approximately 66.8% of men aged 60 to 69 have HTN. For women, the prevalence of HTN was higher for the same age, which was around 70.4%, according to the same NHANES data (CDC, 2020). The prevalence of HTN increases with age for both men and women. For men aged 70 and older, about 73.5% have HTN, and for women aged 70 and above, approximately 78.6% have HTN (CDC, 2020). According to Oliveros et al. (2020), the prevalence of HTN increases from 27% in people younger than 60 years to 74% in people 80 years and older. The authors reported that almost 60% of the population affected by HTN by

60 years of age and noted that by 70 years of age, approximately 65% of men and 75% of women develop HBP.

### **Economic Implication**

The economic burden of HTN is significant. Death rates due to HTN have increased worldwide and are associated with high healthcare costs. The aging population, increasing prevalence, advances in new medical treatment, expensive medications, and severe results of HTN lead to increased medical costs, contribute to higher spending, and have significant economic implications (Benjamin et al., 2019). According to the CDC, the cost of HBP in the US is about \$131 billion annually, averaged over 12 years from 2003 to 2014 (CDC, 2023). This significant rise emphasizes the urgency for effective prevention and management strategies to reduce the financial and health impacts of HTN. These strategies include promoting healthy lifestyles, addressing risk factors, and improving access to healthcare. The study by Mukhopadhyay et al. (2023) demonstrated evidence and the benefits of reduction of BP through effective community-based care and programs in the management and control of HTN. They identified that it could help prevent long-term complications and reduce the financial burden and patient load in tertiary healthcare systems. Efforts to manage and prevent HTN through lifestyle changes, early detection, and appropriate treatment are essential to control these rising costs and improve public health.

### **Purpose**

To examine the effectiveness of a single interactive community-based health education program for improving knowledge, autonomy, and management of HTN among senior adults. The project assesses and determines knowledge of HTN and its risk factors, emphasizing the importance of prevention, medication adherence, and lifestyle modifications. Lifestyle

modifications include a heart-healthy diet like the Dietary Approaches to Stop Hypertension (DASH) diet, potassium supplementation, regular physical activity, smoking cessation, limiting alcohol intake, maintaining a healthy weight, managing stress, and having a good quality of sleep (National Heart, Lung, and Blood Institute [NHLBI], (2020).

### **Goals and Objectives**

The rationale for implementing a community-based educational program of HTN is to empower individuals with knowledge and skills to manage their BP effectively in reducing the risk of cardiovascular diseases and other internal organ damage. Evidence-based pre-and post-intervention surveys along with PowerPoints, a poster, and flyers strategies provided by NHLBI were used to evaluate the impact of the effectiveness of the educational intervention. This pre-and post-test study had three specific, measurable aims: (1) to increase knowledge of HTN, (2) to improve medication adherence and compliance with therapy, and (3) to increase the adoption of healthy lifestyle and behavior modifications within the educational intervention.

Education programs contribute to increasing patients' understanding of HTN, its causes, symptoms, and potential complications. They empower patients to take proactive steps in managing their condition, fostering better health outcomes. The study by Xie et al. (2020) concluded that educational interventions for patients with HTN demonstrated improvement in knowledge and understanding of the condition, leading to better management and control. Such programs increase motivation to change behavior to maintain good health and improve the quality of life.

### **Research Question:**

In adult patients diagnosed with hypertension, how does participation in a one-time educational program improve their knowledge and increase their motivation to change their

behavior related to hypertension management?

### **Ethical Consideration**

This study received expedited review approval from the Pennsylvania Western University Institutional Review Board (IRB), proposal # PW23-03. I received permission from a local community center director and program coordinator for the face-to-face recruitment of participants and the display of the study poster, fliers, and a PowerPoint presentation. All participants were informed of the study objectives, research process, their rights to privacy, time used in the study, and opportunities to ask questions. The project complied with the Health Insurance Portability and Accountability Act (HIPAA) and maintained participants' confidentiality.

### **LITERATURE REVIEW**

This literature review covers the best evidence for improving knowledge, managing HTN, and increasing motivational behavior change in the adult population. It aims to synthesize current research on improving knowledge, managing HBP, and motivating behavior change in adults over 60.

A thorough literature search of reviewed articles was conducted in PubMed, MEDLINE, Cumulated Index in Nursing and Allied Health Literature (CINAHL), National Institute of Health (NIH), EMBASE, and Google Scholar databases using the keywords “community-based programs,” “healthy diet,” “hypertension management,” “knowledge,” lifestyle modifications,” “treatment adherence,” and “older adults” to identify the most recent reviews, or absence or lack of sufficient research. The inclusion criteria were studies that evaluated community-based interventions for HTN management and reported outcomes related to BP control, lifestyle changes, and adherence. Primary studies focused on lifestyle changes, dietary modifications,

weight control, pharmacological and non-pharmacological interventions for treating HTN, and the effectiveness of community-based programs. The literature articles included in this research are meta-analysis, randomized controlled clinical trials (RCT), and meta-synthesis (qualitative studies) within eight years of publication. Studies not published in English, older than eight years, or not peer-reviewed were excluded. This literature review explores the impacts of uncontrolled HBP on mortality, morbidity, and costs in the United States. Additionally, it examines the effectiveness of community-based programs in managing HTN, particularly for seniors, in improving knowledge, focusing on their impact on BP control, intentions to change behavior, and treatment adherence. This review is framed within the Theory of Planned Behavior (TPB), which helps to understand how patient education influences health behaviors.

### **Problem Identification**

Uncontrolled HTN is a leading cause of death in the United States. According to the CDC, HBP was a primary or contributing cause of more than 685,000 Americans in 2022 (CDC, 2024). The numbers have been persistently high over the past five years, with HTN being a major risk factor for heart disease and stroke, which are the leading causes of death in the country. About 45% of adults (37 million adults) with uncontrolled HBP have a BP of 140/90 mmHg or higher (CDC, 2023). The Mills et al. (2020) study emphasized that HTN significantly increases the risk of cardiovascular diseases, including heart attacks and strokes, which are significant causes of mortality. Benjamin et al. (2019) stated that it is a prevalent condition among older adults and a leading contributor to cardiovascular morbidity and mortality. Effective knowledge of the condition and management strategies are essential for this age group. The morbidity associated with uncontrolled HTN is extensive, affecting various organ systems that can lead to heart failure, chronic kidney disease, and vision loss. Muntner et al. (2018) found

that adults with uncontrolled HTN were more likely to suffer from cardiovascular events and kidney disease, which substantially reduced the quality of life and increased disability.

The economic impact of uncontrolled HTN on the US healthcare system and patients is profound. Kirkland et al. (2018) concluded that HTN is the highest cost of all cardiovascular diseases. Direct medical costs associated with HTN include medication expenses, outpatient visits, and hospitalizations. The indirect costs involve lost productivity and long-term care. The authors stated that the approximated annual direct medical cost is \$131 billion per year higher for hypertensive adults than non-hypertensive adults and is predicted to result in a total annual cost of over \$200 billion by 2030 (Kirkland et al., 2018). The study by MacLeod et al. (2022) highlighted that the indirect costs, including HTN-related absenteeism and decreased productivity, amount to over \$11 billion annually.

### **Impact of Community-Based Education**

Recent research shows that group educational interventions remarkably improve knowledge about HTN among seniors, leading to better self-management practices (Yatim et al., 2019). Studies have demonstrated that educational interventions can effectively increase understanding of HTN and promote adherence to treatment regimens. Group sessions are more effective than individual sessions (Yatim et al., 2019). Similarly, a study by Tan et al. (2019) stated that multiple education sessions also show increased information retention and adherence rates. For example, a study by Chen et al. (2020) found that older adults who participated in health educational sessions in the form of courses about HTN management showed improved knowledge and had their systolic BP (SBP) and diastolic (DBP) significantly lower compared with participants in the usual group resulting in better BP control. Daniels et al. (2023) found that the effectiveness of a health program for community-dwelling older adults aimed at introducing

and promoting physical activity helps successfully motivate older adults to engage in physical activity.

A study by Smith et al. (2017) highlighted the effectiveness of community-based educational programs in increasing awareness and self-management behaviors among older adults with HTN. The researchers noted that participants who received in-person education demonstrated a greater ability to manage their condition through lifestyle modifications and medication adherence. Moreover, Jayasvasti et al. (2021) found that individuals who participate in community programs integrating physical activity sessions, dietary education, and stress management classes significantly benefit from the program regarding getting better health, obtaining knowledge of proper foods and exercise as well as facilitated motivation of lifestyle modification. It makes it easier for individuals to adopt and maintain healthy habits.

### **Treatment Adherence**

Adherence to HTN treatment is crucial for effective management, and community-based programs have positively impacted this area because these programs contain physical activity sessions, dietary education, and stress management classes. Studies have revealed that community-based interventions not only improve behaviors and knowledge of HTN management but also remarkably increase medication adherence. Jayasvasti et al. (2021) study found that participants in a community program demonstrated greater improvements in adherence to prescribed treatments and health behaviors. A study by Suseela et al. (2022) reported that community-based interventions involving group education sessions and peer support considerably reduced SBP levels and improved BP control and medication adherence. Participants in these programs benefited from regular monitoring and personalized feedback, which enhanced their ability to manage BP effectively. Another study by Haidari et al. (2017)



specified that community programs with peer support elements demonstrated higher medication adherence rates than those without peer support. The authors concluded that the presence of peers who shared similar experiences helps overcome barriers to adherence and encourages managing medication schedules. Glanz et al. (2019) emphasized that interactive programs empower participants to share their successes and challenges, learn from one another, and create a supportive network.

### **Cost-Effectiveness**

Community-based programs and preventive measures are cost-effective and have been shown to reduce HTN-related costs. The Community Guide (2020) reported that team-based care models involving community health workers, nurses, and pharmacists improved BP control and reduced overall healthcare costs by decreasing the need for hospitalizations and emergency care. Zhang et al. (2017) conducted a cost-effectiveness analysis of community HTN interventions and found that these programs provided significant health benefits at a relatively low cost. The authors concluded that community-based programs not only improved health outcomes but also offered a cost-effective approach to managing HTN, reducing the long-term healthcare costs associated with untreated or poorly managed HTN by improving adherence to treatment, promoting healthy lifestyle changes, and enhancing overall patient well-being.

Community programs can alleviate some of the financial burdens on the healthcare system by reducing the need for emergency care and hospitalizations. The literature supports the effectiveness of community-based programs in managing HTN through lifestyle modifications, treatment adherence, the power of group dynamics, and peer support to foster feasible health behaviors. Lim et al. (2024) stressed that peer-led lifestyle interventions and biweekly group education with BP monitoring demonstrated the most promise in improving cardiovascular

health outcomes, nutritional status, and lifestyle behavior, especially among middle-aged individuals. Regular monitoring, peer feedback, and social interaction are key elements that contribute to the success of these interventions. However, there are challenges in ensuring consistent participation and addressing individual needs within a group setting. Future research should explore strategies to enhance engagement and tailor interventions to diverse populations.

### **Gaps in Literature**

Many research studies focus on the long-term effects of community-based interventions for HTN management. However, most studies evaluate short-term outcomes, leaving a gap in understanding the feasibility of BP-lowering behavior changes for an extensive period. Chen et al. (2019) specified that implementing long-term community-based HTN screening programs and encouraging people to get medical care by adopting BP-lowering behavior changes can have a significant impact on SBP at population-level health improvement. The authors pointed out that policymakers need to consider applying regular community-based BP screening projects for older adults with an unmet need for HTN diagnosis. Long-term follow-up is vital to assess the enduring impact of community programs and determine if initial improvements in HTN management and lifestyle modifications continue.

In many cases, research needs to be done to understand how community-based HTN education programs can be integrated with existing healthcare systems. Effective integration could enhance follow-up care and ensure that community interventions are supported by healthcare professionals. Promoting regular follow-up visits improves HTN control, meets patient needs, and improves patient outcomes (Chaddha et al., 2018).

More research is needed that especially addresses the cultural and socioeconomic hurdles to HTN management in community-based settings. Jayasvasti et al. (2021) indicated the

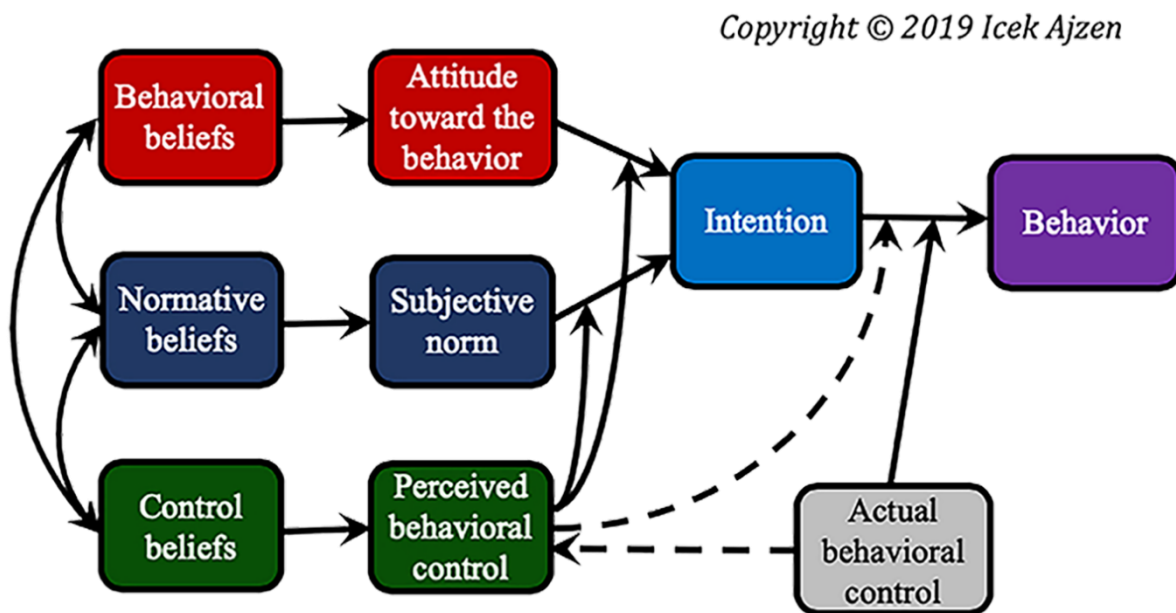
importance of culturally sensitive approaches in community programs. The study noted the need for more research to develop and evaluate these specialized interventions to meet the unique needs of different populations and ensure their effectiveness.

### **Theoretical Framework**

Ajzen (2020) stated that interventions grounded in a theoretical framework, such as the Theory of Planned Behavior (TPB), are more effective in changing health-related behaviors compared to those that do not utilize a theory-based approach. Audthiya et al. (2021) reported that patient-centered programs effectively improve autonomy and self-management behaviors among older adults with HTN. Patient education programs grounded in the TPB are especially effective in assessing HTN prevention actions and perceived behavioral control. The TPB is a valuable framework for understanding and predicting patients' health behaviors related to HTN management. Studies by Glanz et al. (2019) indicate that education programs that enhance patients' confidence in managing their health and provide social support are more successful in promoting adherence and behavior change. Pourmand et al. (2020) claimed that the use of TPB helps determine important variables that affect self-care behaviors in the control of HTN. A study was conducted to assess the importance of an educational program based on the TPB in the reduction of salt intake as a benefit in individuals at risk of HTN. Rahimdel et al. noted that TPB demonstrated effectiveness in identifying determinants of salt consumption and the effectiveness in changing behavior healthy eating and salt intake behaviors such as low Na diet self-management and Na restriction. Researchers utilized TPB-based questionnaires to test the advantages and disadvantages of salt intake reduction and behaviors and to facilitate factors for salt consumption reduction. This emphasizes the importance of integrating structured, evidence-based strategies aimed at improving health outcomes.

According to TPB, behavior is driven by three key factors: attitude, subjective norms, and perceived behavioral control. Attitude involves patients’ positive or negative evaluations of HTN management. Subjective norms refer to the perceived social pressure to perform or not perform the behavior. Perceived behavioral control indicates the perceived ease or difficulty of performing the behavior, which reflects both experience and anticipated obstacles (Ajzen, 2020). For example, programs that highlight the benefits of BP control (attitude), provide peer support (subjective norms), and enhance self-efficacy through activities (perceived behavioral control) are more likely to succeed in changing behaviors. TPB can be used to identify specific behaviors, normative beliefs, and control factors that influence an individual’s intention and ability to perform a desired behavior. By understanding these components, healthcare practitioners can design targeted interventions that effectively address the factors that facilitate behavior change (Bosnjak et al., 2020). Overall, TPB provides a comprehensive framework for planning behavior change interventions.

**Figure 1.** Graphical depiction of the theory of planned behavior (Ajzen, 2019)



Note: Adapted from [Photograph], <https://people.umass.edu/aizen/tpb.diag.html>  
In the public domain

## **METHODOLOGY**

### **Setting**

The project was implemented in the Senior Citizen Community Center in Philadelphia. This center offers a variety of health, recreational, and cultural programs, including exercises, nutrition classes, health education workshops, and lectures. The site also offers injury and fall prevention programs, health screenings, social services, and annual health fairs. The centers help older residents to have independent lives in their communities, support them through life's challenges, and improve their quality of life. The center serves a diverse population, including African, Hispanic, and White origins, many of whom have been noted to have HTN.

### **Participants and Sample Size**

A convenient sample of individuals (N=33) was enrolled in this evidence-based education program focused on awareness, improving knowledge, and managing HTN. Participants were recruited during center visits between January and March, and two individuals declined to participate. Included participants identified as African descent 27.7% and Caucasian descent 72.3%, of whom 60.61 % were women and 39.39% were men. The DNP project inclusion criteria included 1) all participants aged 60 and after, 2) participants with a diagnosis of HTN, 3) those able to read, write, and sign the consent form, 4) all ethnic groups, and 5) males and females. The exclusion criteria were participants who could not take part in completing a survey.

### **Study Design**

Pre-test and post-survey educational intervention.

**Intervention**

The intervention included two 60-minute educational sessions with senior participants. The NHLBI's standardized "What is High Blood Pressure," "Taking the First Step Toward a Healthy Blood Pressure", "Steps to Lower your Blood Pressure," and " Small Steps to Take Control," fact sheets were used for each education session along with informed consent. PowerPoints were utilized in each session with information about the definition of HTN, its causes and complications, understanding systolic and diastolic BP, risk factors for cardiovascular disease, treatment, prevention, and management of the condition supported by educational videos from NHLBI. These educational materials were specifically designed to educate the adult population about HTN. During these sessions, the importance of a heart-healthy diet, physical activity, medication adherence, reducing stress, and a healthy lifestyle was emphasized in achieving optimal at-home BP control. Additional cultural considerations were made when using NHLBI standardized education materials.

Dietary education was based on understanding the DASH diet dietary pattern. Promoted by NHLBI DASH diet helps to prevent and control HTN as well as reduce LDL "bad cholesterol". It emphasizes on reduction of sodium intake with a maximum of 2,300 mg of sodium per day, red meats, sweets, sugar-sweetened beverages, and proper consumption of fruits, vegetables, whole grains, and lean proteins (NHLBI, 2021). The DASH diet also facilitates achieving a desirable weight.

For medical treatment, when healthy lifestyle changes alone do not control or lower high BP, classes of high BP medications were provided, including beta-blockers, angiotensin-converting enzyme inhibitors (ACE inhibitors), angiotensin II receptor blockers (ARB), calcium channel blockers, diuretics. For medication adherence, considerations regarding the

acknowledgment of HTN as a disease and the regular use of prescribed medications were assessed and discussed. After the educational session, each participant was given a complimentary “My Blood Pressure Wallet Card” pamphlet and a “Self-measured Blood Pressure” fact sheet. They were advised to measure and record their BP once a day to promote self-monitoring. Participants were evaluated on their progress in meeting the goals of increasing knowledge of HTN, decreasing SBP and DBP within the pre- and post-intervention periods, following a healthy diet and healthy lifestyle, how to reduce stress, and improving medication adherence.

### **Data Collection**

The potential participants who met the inclusion criteria were informed of the purpose of the study and received informed consent. The participants were asked to complete the pre- and post-questionnaire survey for the Adapted Hypertension Knowledge Test (HKT) and Hill-Bone Medication Adherence Scale (HB-MAS) test to identify existing barriers, the ability to modify them and determine any significant changes in HTN knowledge and medication adherence. The questionnaires were collected two times, at baseline before program implementation and at the program end.

### **Data Analysis**

Descriptive statistics was used to analyze the participants’ demographic characteristics, questions on the HKT and HB-MAS scales pre- and post-intervention, and to summarize the data. Paired t-tests were used to compare the pre-and post-survey scores on the HKT and HB-MAS scales to assess the statistical significance of the changes and evaluate an educational intervention’s effectiveness. It helped determine if there was a statistically significant difference in scores before and after the intervention. The paired t-tests indicate significant improvements in

HKT for several questions post-intervention. The knowledge regarding “Young adults do not get High Blood Pressure,” “High Blood Pressure always has symptoms,” “Blood Pressure is high when it is at or over 140/90 mm Hg,” and “BP gets lower in cold weather” showed significant improvement, with p-values < 0.05. This suggests that the educational intervention was effective in improving knowledge of these aspects of HTN.

**RESULTS**

**Pre- and Post-Survey Data Presentation**

Pre-and Post Survey Responses (N = 33)

**Table 1. Participants Demographics**

<b>Participants Answers</b>	<b>Yes</b>	<b>No</b>
High Blood Pressure is a medical problem affecting myself	23	10
High Blood Pressure is a medical problem affecting my family	17	16
High Blood Pressure is a medical problem affecting my friends	11	22
I am currently at least age 60	33	0
Women	20	13
Men	13	20
Non-Hispanic White	24	
Black	9	
Hispanic or Latino	0	
Asian	0	
Native Americans	0	
Pacific Islanders	0	

Participants in the HKT survey responses (N=33) Table 2. indicated varying levels of exposure and personal experience with high BP among participants. Specifically, 23 participants identified high BP as a medical problem affecting them, suggesting that a significant proportion of the sample experienced this condition. Seventeen respondents reported that high BP affects their family members, highlighting the familial prevalence of this medical issue. Additionally, 11 participants noted that their friends suffer from high BP, indicating broader social awareness and impact. All 33 respondents confirmed they are at least 60 years old. This age demographic is



particularly relevant, as older adults are generally at higher risk for developing high BP. The data underscore the importance of targeted health interventions and education for this age group to manage and mitigate the risks associated with HBP.

**Table 2. HKT PRE-and POST Survey Results**

Question	Pre-Survey		Post-Survey	
	Correct	Incorrect	Correct	Incorrect
If your mother or father has High Blood Pressure, your chance of getting it is higher	33	0	33	0
Young adults do not get High Blood Pressure	25	8	33	0
High Blood Pressure always has symptoms	26	7	33	0
High Blood Pressure is not life-threatening	33	0	33	0
Blood Pressure is high when it is at or over 140/90 mm Hg	29	4	33	0
If you are overweight, you are two to six times more likely to develop High Blood Pressure	29	4	32	1
Regular exercise can help in reducing Blood Pressure	31	2	33	0
Drinking alcohol lowers BP	33	0	33	0
High Blood Pressure is a men's problem	33	0	33	0
BP gets lower in cold weather	21	12	33	0
Can one have High Blood Pressure without any signs and symptoms?	32	1	32	0

Participants in the HB-MAS survey responses (N=33) Table 3. indicated the effectiveness of an intervention aimed at HTN management and improving medication adherence. The surveys assessed changes in behaviors related to HTN medication and lifestyle habits. Paired t-tests were conducted to compare the frequencies of responses before and after the intervention. The improvements in medication adherence and HTN management indicated that the number of participants who reported “None of the Time” for negative behaviors such as forgetting to take medication, deciding not to take medication, and missing doses increased post-intervention. In addition, fewer participants showed risky behaviors such as running out of medication and taking someone else’s medication.

**Table 3. NB-MAS Pre and Post Surveys**

<b>Question</b>	<b>Response</b>	<b>Pre-Survey Frequency</b>	<b>Post-Survey Frequency</b>
How often do you forget to take your high blood pressure medicine?	All of the Time	0	0
	Most of the Time	1	0
	Some of the Time	16	11
	None of the Time	7	14
	I am not prescribed	9	8
How often do you decide NOT to take your high blood pressure medicine?	All of the Time	1	0
	Most of the Time	0	0
	Some of the Time	3	1
	None of the Time	20	24
	I am not prescribed	9	8
How often do you forget to get prescriptions filled?	All of the Time	1	0
	Most of the Time	0	0
	Some of the Time	7	3
	None of the Time	16	22
	I am not prescribed	9	8
How often do you run out of high blood pressure pills?	All of the Time	0	0
	Most of the Time	0	0
	Some of the Time	5	2
	None of the Time	19	23
	I am not prescribed	8	8
How often do you skip your high blood pressure medicine before you go to the doctor?	All of the Time	0	0
	Most of the Time	0	0
	Some of the Time	7	1
	None of the Time	17	24
	I am not prescribed	9	8
How often do you miss taking your high blood pressure pills when you feel better?	All of the Time	0	0
	Most of the Time	0	0
	Some of the Time	16	5
	None of the Time	8	20
	I am not prescribed	9	8
How often do you miss taking your high blood pressure pills when you feel sick?	All of the Time	0	0
	Most of the Time	0	0
	Some of the Time	3	2
	None of the Time	21	23
	I am not prescribed	9	8
How often do you take someone else's high blood pressure pills?	All the Time	0	0
	Most of the Time	0	0
	Some of the Time	0	0
	None of the Time	24	25
	I am not prescribed	8	8
	All of the Time	0	0

How often do you miss taking your high blood pressure pills when you are careless?	Most of the Time	0	0
	Some of the Time	7	2
	None of the Time	17	23
	I am not prescribed	9	8
I have a history of high blood pressure	Yes	24	24
	No	9	9
How often do you eat salty food?	All of the time	0	0
	Most of the time	0	0
	Some of the time	24	24
	None of the time	0	1
How often do you shake salt on your food before you eat it?	All of the time	0	0
	Most of the time	0	1
	Some of the time	15	8
	None of the time	9	16
How often do you eat fast food?	All of the time	0	0
	Most of the time	0	0
	Some of the time	22	22
	None of the time	2	3
I forget to schedule my next appointment	All of the time	0	0
	Most of the time	0	0
	Some of the time	5	3
	None of the time	19	22
How often do you miss scheduled appointments?	All of the time	0	0
	Most of the time	0	0
	Some of the time	1	0
	None of the time	23	25
How often do you forget to get prescriptions filled?	All of the time	0	0
	Most of the time	0	0
	Some of the time	7	1
	None of the time	17	24
	I am not prescribed	0	0
How often do you run out of high blood pressure pills?	All of the time	16	4
	Most of the time	7	4
	Some of the time	2	3
	None of the time	10	15
	I am not prescribed	0	0
How often do you skip your high blood pressure medicine before you go to the doctor?	All of the time	2	0
	Most of the time	0	1
	Some of the time	9	0
	None of the time	13	24
	I am not prescribed	0	0
How often do you miss taking your high blood pressure pills when you feel better?	All of the time	1	0
	Most of the time	0	1
	Some of the time	16	5
	None of the time	7	19

	I am not prescribed	0	0
How often do you miss taking your high blood pressure pills when you feel sick?	All of the time	19	4
	Most of the time	4	2
	Some of the time	0	0
	None of the time	17	2
	I am not prescribed	0	0
How often do you take someone else's high blood pressure pills?	All of the time	5	0
	Most of the time	0	0
	Some of the time	0	0
	None of the time	6	19
	I am not prescribed	0	0

Table 4. shows that many respondents are committed to managing their HBP effectively through medication adherence. Most participants consistently plan to avoid running out of medication and to take their medication even when feeling unwell. Furthermore, a significant portion of respondents have a strong intention not to use someone else's medication and not miss their prescribed doses. Most participants (16 out of 25, or 64%) plan to avoid running out of HBP pills all the time. This indicates a strong commitment to medication adherence among most participants. However, a notable 28% (7 participants) plan to avoid running out of medication most of the time, suggesting a potential risk for medication gaps. The majority (19 out of 25, or 76%) plan to consistently take their medication even when they feel sick, demonstrating good adherence. However, 8% (2 participants) do not intend to take their medication when feeling sick, which could negatively impact their health outcomes. Most respondents (19 out of 25, or 76%) will not take someone else's HBP medication, which is positive behavior. However, 24% (6 participants) still consider taking others' pills, indicating a gap in understanding the risks of such actions. The significant majority (23 out of 25, or 92%) plan to consistently take their BP medication without missing doses, indicating a high level of adherence and understanding of the importance of regular medication.

**Table 4.** Behavior Change

<b>Question</b>	<b>Response</b>	<b>Frequency</b>
I plan to take steps to avoid running out of high-blood-pressure pills	All of the time	16
	Most of the time	7
	Some of the time	2
	None of the time	0
	I do not take Blood Pressure pills	0
I plan to take my Blood Pressure medication when I feel sick	All of the time	19
	Most of the time	4
	Some of the time	0
	None of the time	2
	I do not take Blood Pressure pills	0
I will not take someone else's high blood pressure pills in the future	All of the time	19
	Most of the time	0
	Some of the time	0
	None of the time	6
	I do not take Blood Pressure pills	0
I plan NOT to miss my Blood Pressure pills	All of the time	23
	Most of the time	2
	Some of the time	0
	None of the time	0
	I do not take Blood Pressure pills	0

## DISCUSSION

This study pursued to evaluate an education program focused on improving HTN knowledge, medication adherence, and motivation for lifestyle changes among seniors at a community-based center in Philadelphia. A significant increase in HTN knowledge, medication adherence, and lifestyle behavior changes was found after the intervention. Findings from this study suggest that community-based tailored education programs can successfully increase HTN knowledge, improve medication adherence, and improve HTN management among senior adult populations. However, efforts to promote effective HTN management remain a challenge among seniors due to factors including salt intake and a lack of understanding of the condition's factors and risks. High salt intake is directly linked to elevated BP levels, which can lead to an increased risk of cardiovascular diseases (National Institute for Health and Care Excellence [NICE], 2019).

Seniors may not fully understand the significant impact of salt on BP and how to effectively manage their salt intake. Seniors often struggle to adhere to dietary recommendations due to habitual tastes, lack of awareness, or difficulty understanding food labels (Cogswell et al., 2016). This lack of awareness can contribute to higher rates of HTN and associated cardiovascular diseases among older adults. Danielson et al. (2019) noted that a lack of knowledge about the condition and its risks frequently leads to delayed recognition and action among adults. The authors specified that notice of problems, willingness, and motivation can influence adherence to treatment plans and improve health outcomes.

The results of this project align with the literature's support for effective and improved behavioral approaches such as the DASH diet and regular physical activity, particularly for seniors who are at the greatest risk for HBP. This study suggests that many respondents are committed to managing their HBP effectively through medication adherence, lifestyle modification, and behavior change. Most participants consistently plan to avoid running out of medication and to take their medication even when feeling unwell. Furthermore, a significant portion of respondents have a strong intention not to use someone else's medication and not miss their prescribed doses. The data indicates a generally high level of awareness and intention to adhere to HBP medication among the participants. However, some gaps remain, particularly regarding the consistent availability of medication and the understanding of the risks associated with taking someone else's medication. These gaps highlight the need for targeted educational interventions to reinforce the importance of strict adherence to prescribed medication regimens and the dangers of non-adherence or misuse of medication. The findings also reveal areas where further education and support are needed to ensure optimal management of HBP.

The findings highlight a strong intention among participants to adhere to their HTN medication regimen, which is promising for managing HP effectively. However, ongoing education and support are necessary to ensure these intentions translate into long-term behavior changes. Community-based programs and follow-up interventions could be beneficial in sustaining these positive behaviors and addressing any potential barriers to adherence.

### **Strength**

The data indicates a strong overall increase in the commitment to medication adherence, vital for effective HTN management. The questions target specific behavioral intentions related to medication adherence, providing detailed insights into participants' plans. The findings highlight a strong intention among participants to adhere to their HTN medication regimen, which is promising for managing HBP effectively. However, ongoing education and support are necessary to ensure these intentions translate into long-term behavior changes. Community-based programs and follow-up interventions could be beneficial in sustaining these positive behaviors and addressing any potential barriers to adherence.

### **Limitations and Barriers**

The limitations of this project are:

1. a small sample, which may limit the generalizability of the findings
2. one treatment group and no comparison group
3. intervention over a short period of 8 weeks due to organizational constraints
4. lack of evidence for the long-term sustainability of the intervention
5. lack of monitoring of health behavior changes among seniors
6. the sample only included non-Hispanic White and Black

7. the data relies on self-reported intentions, which may not always represent actual behavior
8. the data does not include long-term follow-up to assess whether intentions are maintained over time

A healthy lifestyle and heart-healthy diet, including sodium intake reduction, physical activity, and weight reduction, are effective, but there is insufficient evidence regarding their feasibility and acceptability in community-based settings. Community-based programs face challenges such as participant engagement and adherence, which can affect the success of these interventions. Additionally, evidence on the effectiveness of potassium intake and heart-healthy diets is limited and inconsistent. Some studies suggest that potassium can help lower BP, but there is no agreement on the optimal level of intake or its effectiveness among different populations (Whelton et al., 2018).

The most common barriers to healthcare providers' attempt to effect behavioral change include resources, a lack of clear, standardized guidelines for implementing non-pharmacological interventions in community settings, and lack of time, knowledge, self-confidence, resources, and financial incentives (Dhungana et al., 2022). This makes it difficult for healthcare providers to design and provide consistent and effective programs. The authors stated that the most common barriers related to patients include a lack of educational resources and motivation. Educational interventions targeted at older adults have been shown to improve their understanding of HTN and its management significantly; however, sustaining these educational efforts and ensuring long-term adherence remains challenging.

Despite these limitations, the study still showed promising results that have positive implications for future practice and research.



## CONCLUSION

HTN is a global public health problem that affects an estimated 1.38 billion people around the world (Guerra et al., 2022). HTN was a leading cause of death in the United States or contributing cause of more than 685,000 Americans in 2022 (CDC, 2024). The cost of HBP in the US is about \$131 billion a year, averaged over 12 years from 2003 to 2014 (CDC, 2023). Evidence-based research supports implementing community-based education programs to prevent and control HTN as a cost-effective method and can reduce healthcare costs over time (Wan Ibadullah et al., 2023).

The evidence-based project successfully improved knowledge of HTN, medication adherence, and lifestyle modifications among older adults. However, further efforts are needed to address dietary and lifestyle behaviors and long-term follow-ups in community education. The results suggest that healthcare professional-led interventions on lifestyle modifications should be implemented in daily practice. Future research should consider larger sample sizes and objective adherence measures to corroborate these findings. Continued education and support are essential to ensure these intentions carry into actual behavior. Therefore, future DNP projects and educational interventions to be beneficial for improving health outcomes and reducing the impact of HTN-related complications through community-based education programs. These projects can address various needs and gaps in current healthcare practices, thereby enhancing the effectiveness of HTN management.

### References

- Abrahamowicz, A. A., Ebinger, J., Whelton, S. P., Commodore-Mensah, Y., & Yang, E. (2023). Racial and ethnic disparities in hypertension: Barriers and opportunities to improve blood pressure control. *Current Cardiology Reports*, 25(1), 17-27. <https://doi.org/10.1007/s11886-022-01826-x>
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), 314-324. <https://doi.org/10.1002/hbe2.195>
- Alanazi, H. H. N., Mathkur, M. A., Alqarni, A. S. A., Al Asiri, A. S., Mashpari, N. M., & Alamri, M. O. S. (n.d.) Exploring the role of Nurse Practitioners in improving chronic disease management. <https://sjr-publishing.com/wp-content/uploads/2019/03/Exploring-the-Role-of-Nurse-Practitioners-in-Improving-Chronic-Disease-Management.pdf>
- American Heart Association (2023). Why high blood pressure is a “Silent Killer”. <https://www.heart.org/en/health-topics/high-blood-pressure/why-high-blood-pressure-is-a-silent-killer>
- Baker-Goering, M. M., Roy, K., & Howard, D. H. (2019). Peer reviewed: Relationship between adherence to antihypertensive medication regimen and out-of-pocket costs among people aged 35 to 64 with employer-sponsored health insurance. *Preventing Chronic Disease*, 16. <https://doi.org/10.5888/pcd16.180381>
- Baryakova, T. H., Pogostin, B. H., Langer, R., & McHugh, K. J. (2023). Overcoming barriers to patient adherence: The case for developing innovative drug delivery systems. *Nature Reviews Drug Discovery*, 22(5), 387-409. <https://doi.org/10.1038/s41573-023-00670-0>
- Benjamin, E. J., Muntner, P., Alonso, A., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Chan, A. R., Cheng S., Das, S. R., Delling, F. N., & Virani, S. S. (2019).

Heart disease and stroke statistics-2019 update: A report from the American Heart Association. *Circulation*, 139(10), e56-e528. <https://doi.org/10.1161/CIR.0000000000000659>

Boateng, E. B., & Ampofo, A. G. (2023). A glimpse into the future: Modeling global prevalence of hypertension. *BioMed Central Public Health*, 23(1), 1906. <https://doi.org/10.1186/s12889-023-16662-z>

Bosnjak, M., Ajzen, I., & Schmidt, P. (2020). The Theory of Planned Behavior: Selected recent advances and applications. *Europe's Journal of Psychology*, 16(3), 352–356. <https://doi.org/10.5964/ejop.v16i3.3107>

Burnier, M., Polychronopoulou, E., & Wuerzner, G. (2020). Hypertension and drug adherence in the elderly. *Frontiers in Cardiovascular Medicine*, 7, 49. <https://doi.org/10.3389/fcvm.2020.00049>

Carnethon, M. R., Pu, J., Howard, G., Albert, M. A., Anderson, C. A., Bertoni, A. G., Mujahid, M. S., Palaniappan, L., Taylor, H. A., Willis, M., & Yancy, C. W. (2017). Cardiovascular health in African Americans: A scientific statement from the American Heart Association. *Circulation*, 136(21), e393-e423. <https://doi.org/10.1161/CIR.0000000000000534>

Centers for Disease Control and Prevention. (2023). High blood pressure. [https://www.cdc.gov/high-blood-pressure/?CDC\\_AAref\\_Val=https://www.cdc.gov/bloodpressure/facts.html](https://www.cdc.gov/high-blood-pressure/?CDC_AAref_Val=https://www.cdc.gov/bloodpressure/facts.html)

Centers for Disease Control and Prevention. (2024). High blood pressure facts. <https://www.cdc.gov/high-blood-pressure/data-research/facts-stats/index.html>

Centers for Disease Control and Prevention. (2024). Health and economic benefits of high blood pressure interventions. <https://www.cdc.gov/nccdphp/priorities/high-blood-pressure.html>

Centers for Disease Control and Prevention. (2024). Preventing high blood pressure. <https://www.cdc.gov/bloodpressure/prevent.htm>

- Centers for Disease Control and Prevention. (2020). Hypertension prevalence in adults aged 18 and over: United States, 2017-2018. <https://www.cdc.gov/nchs/products/databriefs/db364.htm>
- Centers for Disease Control and Prevention. (2023). National Health and Nutrition Examination. *Survey Data*. <https://www.cdc.gov/nchs/nhanes/index.htm>
- Chaddha, A., Smith, M. A., Palta, M., & Johnson, H. M. (2018). Hypertension control after an initial cardiac event among Medicare patients with diabetes mellitus: A multidisciplinary group practice observational study. *The Journal of Clinical Hypertension*, 20(5), 891-901. <https://doi.org/10.1111/jch.13282>
- Chaturvedi, A., Zhu, A., Gadela, N. V., Prabhakaran, D., & Jafar, T. H. (2024). Social determinants of health and disparities in hypertension and cardiovascular diseases. *Hypertension*, 81(3), 387-399. <https://doi.org/10.1161/HYPERTENSIONAHA.123.21354>
- Chen, Y., Li, X., Jing, G., Pan, B., Ge, L., Bing, Z., Yang, K., & Han, X. (2020). Health education interventions for older adults with hypertension: A systematic review and meta-analysis. *Public Health Nursing*, 37(3), 461-469. <https://doi.org/10.1111/phn.12698>
- Chen, S., Sudharsanan, N., Huang, F., Liu, Y., Geldsetzer, P., & Bärnighausen, T. (2019). Impact of community-based screening for hypertension on blood pressure after two years: Regression discontinuity analysis in a national cohort of older adults in China. *Biomedical Journal*, 366. <https://doi.org/10.1136/bmj.l4064>
- Cogswell, M. E., Mugavero, K., Bowman, B. A., & Frieden, T. R. (2016). Dietary sodium and cardiovascular disease risk measurement matters. *New England Journal of Medicine*, 375(6), 580-586. <https://doi:10.1056/NEJMs1607161>
- Daniels, K., Lemmens, R., Knippenberg, E., Marinus, N., Vonck, S., Baerts, J., Bergs, J., Spooren, A., Hansen, D., & Bonnechère, B. (2023). Promoting physical activity and a healthy active lifestyle

in community-dwelling older adults: A design thinking approach for the development of a mobile health application. *Frontiers in Public Health*, 11, 1280941.

<https://doi.org/10.3389/fpubh.2023.1280941>

Danielson, E., Melin-Johansson, C., & Modanloo, M. (2019). Adherence to treatment in patients with chronic diseases: From alertness to persistence. *International Journal of Community Based Nursing and Midwifery*, 7(4), 248. <https://doi:10.30476/IJCBNM.2019.81303.0>

Dhungana, R. R., Pedisic, Z., & de Courten, M. (2022). Implementation of non-pharmacological interventions for the treatment of hypertension in primary care: A narrative review of effectiveness, cost-effectiveness, barriers, and facilitators. *BioMed Central Primary Care*, 23(1), 298. <https://doi.org/10.1186/s12875-022-01884-8>

Elsaid, N., Saied, A., Kandil, H., Soliman, A., Taher, F., Hadi, M., Giridharan, G., Jennings, R., Casanova M., Keynton, R., & El-Baz, A. (2021). Impact of stress and hypertension on the cerebrovascular. *Frontiers in Bioscience-Landmark*, 26(12), 1643. <https://doi.org/10.52586/5057>

Guerra C, Conte E, Del Rio AI, Motta J, Moreno Velásquez I, Quintana HK. Medication adherence in hypertensive individuals in Panama 2019: A national cross-sectional study. *Healthcare*. 2022; 10(11):2244. <https://doi.org/10.3390/healthcare10112244>

Haidari, A., Moeini, M., & Khosravi, A. (2017). The impact of peer support program on adherence to the treatment regimen in patients with hypertension: A randomized clinical trial study. *Iranian Journal of Nursing and Midwifery Research*, 22(6), 427.

[https://doi.org/10.4103/ijnmr.IJNMR\\_16\\_16](https://doi.org/10.4103/ijnmr.IJNMR_16_16)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5684788/pdf/IJNMR-22-427.pdf>

- Ivanušić-Pejić, J., & Degmečić, D. (2022). Hypertension in association with anxiety and depression: A Narrative Review. *Southeastern European Medical Journal: SEEMEDJ*, 6(1), 31-43.  
<https://doi.org/10.26332/seemedj.v6i1.216>
- Jayasvasti, I., Jayasvasti, M., Pengpid, S., Peltzer, K., & Nanthananate, P. (2021). Participants' views on lifestyle intervention program enhancing long-term health-related behaviors improvement among prehypertension and/or prediabetes mellitus older adults: A qualitative study examined in Thailand at health promoting hospitals. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 58, 00469580211025209. <https://doi.org/10.1177/00469580211025209>
- Kirkland, E. B., Heincelman, M., Bishu, K. G., Schumann, S. O., Schreiner, A., Axon, R. N., Mauldin, P. D., & Moran, W. P. (2018). Trends in healthcare expenditures among US adults with hypertension: National estimates, 2003–2014. *Journal of the American Heart Association*, 7(11), e008731. <https://doi.org/10.1161/JAHA.118.008731>
- Kvarnström, K., Westerholm, A., Airaksinen, M., & Liira, H. (2021). Factors contributing to medication adherence in patients with a chronic condition: A scoping review of qualitative research. *Pharmaceutics*, 13(7), 1100. <https://doi.org/10.3390/pharmaceutics13071100>
- Li, N., Chen, G., Liu, F., Mao, S., Liu, Y., Liu, S., Mao, Z., Lu, Y., Wang, C., Guo, Y., Xiang, H., & Li, S. (2020). Associations between long-term exposure to air pollution and blood pressure and effect modifications by behavioral factors. *Environmental Research*, 182, 109109.  
<https://doi.org/10.1016/j.envres.2019.109109>
- Lim, G. P., Appalasamy, J. R., Ahmad, B., Quek, K. F., & Ramadas, A. (2024). Peer-led lifestyle interventions for the primary prevention of cardiovascular disease in community: A systematic review of randomized controlled trials. *BioMed Central Public Health*, 24(1), 812.  
<https://doi.org/10.1186/s12889-024-18328-w>

- MacLeod, K. E., Ye, Z., Donald, B., & Wang, G. (2022). A literature review of productivity loss associated with hypertension in the United States. *Population Health Management*, 25(3), 297-308. <https://doi.org/10.1089/pop.2021.020>
- Marseille, B. R., Commodore-Mensah, Y., Davidson, P. M., Baker, D., D'Aoust, R., & Baptiste, D. L. (2021). Improving hypertension knowledge, medication adherence, and blood pressure control: A feasibility study. *Journal of Clinical Nursing*, 30(19-20), 2960-2967. <https://doi.org/10.1111/jocn.15803>
- Mills, K. T., Stefanescu, A., & He, J. (2020). The global epidemiology of hypertension. *Nature Reviews Nephrology*, 16(4), 223-237. <https://doi:10.1038/s41581-019-0244-2>
- Moss, K. O., Still, C. H., Jones, L. M., Blackshire, G., & Wright, K. D. (2019). Hypertension self-management perspectives from African American older adults. *Western Journal of Nursing Research*, 41(5), 667-684. <https://doi.org/10.1177/0193945918780331>
- Mukhopadhyay, P., De, M., Lahiri, S., Sarkar, M., & Haldar, A. (2023). Evaluation of community-based care delivered by primary healthcare providers in management of hypertension in a rural area of West Bengal. *Journal of Family Medicine and Primary Care*, 12(8), 1685-1691. [https://doi.org/10.4103/jfmpe.jfmpe\\_2435\\_22](https://doi.org/10.4103/jfmpe.jfmpe_2435_22)
- Muntner, P., Carey, R. M., Gidding, S., Jones, D. W., Taler, S. J., Wright Jr, J. T., & Whelton, P. K. (2018). Potential US population impact of the 2017 ACC/AHA high blood pressure guideline. *Circulation*, 137(2), 109-118. <https://doi.org/10.1161/CIRCULATIONAHA.117.032582>
- National Heart, Lung, and Blood Institute. (2021). DASH Eating Plan. <https://www.nhlbi.nih.gov/health-topics/dash-eating-plan>

- NICE. (2019). Hypertension in adults: Diagnosis and management. *National Institute for Health and Care Excellence*. <https://www.nice.org.uk/guidance/ng136>  
<https://www.gov.uk/government/publications/salt-reduction-targets-for-2024>
- Oliveros, E., Patel, H., Kyung, S., Fugar, S., Goldberg, A., Madan, N., & Williams, K. A. (2020). Hypertension in older adults: Assessment, management, and challenges. *Clinical Cardiology*, 43(2), 99-107. <https://doi.org/10.1002/clc.23303>
- Oller, B. (2023). High blood pressure. *Familydoctor.org* <https://familydoctor.org/condition/high-blood-pressure/>
- Smith, M. L., Towne Jr, S. D., Herrera-Venson, A., Cameron, K., Kulinski, K. P., Lorig, K., Horel, S. A., & Ory, M. G. (2017). Dissemination of chronic disease self-management education (CDSME) programs in the United States: Intervention delivery by rurality. *International Journal of Environmental Research and Public Health*, 14(6), 638.  
<https://doi.org/10.3390/ijerph14060638>
- Stefanaki, C., Pervanidou, P., Boschiero, D., & Chrousos, G. P. (2018). Chronic stress and body composition disorders: Implications for health and disease. *Hormones*, 17, 33-43.  
<https://doi.org/10.1007/s42000-018-0023-7>
- Suseela, R. P., Ambika, R. B., Mohandas, S., Menon, J. C., Numpelil, M., Vasudevan, B. K., Ved. R., Danaei, G., & Spiegelman, D. (2022). Effectiveness of a community-based education and peer support led by women's self-help groups in improving the control of hypertension in urban slums of Kerala, India: A cluster randomized controlled pragmatic trial. *British Medical Journal Global Health*, 7(11), e010296. <https://doi.org/10.1136/bmjgh-2022-010296>
- Tan, J.P., Cheng, K.K.F., & Siah, R.C. (2019). A systematic review and meta-analysis on the effectiveness of education on medication adherence for patients with hypertension,



hyperlipidaemia, and diabetes. *Journal of Advanced Nursing*, 75, 2478-2494.

<https://doi.org/10.1111/jan.14025>

The Community Guide. (2020). Heart disease and stroke prevention: Team-based care to improve blood pressure control. <https://www.thecommunityguide.org/findings/cardiovascular-disease-team-based-care-improve-blood-pressure-control>

Wan Ibadullah, W. A. H., Safian, N., Manaf, M. R. A., Zamzuri, A., Mansor, J., & Shah, S. A. (2023). Cost-effectiveness of community-based hypertension prevention programs: A systematic review. *International Medical Journal*, 30(2).

<https://research.ebsco.com/c/356ple/viewer/pdf/nitdokd34v>

Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., DePalma, S. M., Gidding S., Jamerson, K. A., Jones, D. W., MacLaughlin, E. J., Muntner, P., Ovbigele, B., Smith, S. C., Spencer, C. C., Stafford, R. S., Taler, S. J., Thomas, R. J., Williams, K. A., Williamson, J. D., & Wright, J. T. (2018). 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Hypertension*, 71(6), e13-e115. <https://doi.org/10.1161/HYP.0000000000000065>

World Health Organization (2024). Obesity and overweight. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>

World Health Organization. (2023). Hypertension.

<https://www.who.int/news-room/fact-sheets/detail/hypertension>

Woode, E., Boakye-Gyasi, E., Obirikorang, Y., Adu, E. A., Obirikorang, C., Acheampong, E., & Odame-Anto, E. (2022). Predictors of medication non-adherence among hypertensive clients in a

Ghanaian population: Application of the Hill-Bone and perceived barriers to Treatment Compliance Scale. *Health Science Reports*, 5(3), e584. <https://doi.org/10.1002/hsr2.584>

Yatim, H.M., Wong, Y.Y., Neoh, C.J., Lim, S.H., Hassali, M.A., & Hong, Y.H. (2019). Factors influencing patients' hypertension self-management and sustainable self-care practices: A qualitative study. *Public Health*, 173, 5-8. <https://doi:10.1016/j.puhe.2019.04.020>

Zhang, D., Wang, G., & Joo, H. (2017). A systematic review of economic evidence on community hypertension interventions. *American Journal of Preventive Medicine*, 53(6), S121-S130. <https://doi.org/10.1016/j.amepre.2017.05.008>

Appendix A

Hypertension Education Flyers

**DASH EATING PLAN**

# What is High Blood Pressure?

**HEALTHY EATING, PROVEN RESULTS**

The DASH eating plan can help you control high blood pressure and achieve and maintain a healthy weight.



Every time your heart beats, it pumps blood through vessels, called arteries, to the rest of your body. Your blood pressure is how hard your blood pushes against the walls of the arteries. If your blood flows at higher than normal pressure, you may have high blood pressure, also known as hypertension.

If you have high blood pressure, you aren't alone. High blood pressure affects nearly half of U.S. adults. Many people don't even know they have it, which is why it's so important to have your blood pressure checked at least once a year.

**Understanding high blood pressure**

Blood pressure rises and falls during the day. But when it stays elevated over time, it's called high blood pressure. It's dangerous because the heart is working too hard, and the force of the blood flow can harm arteries and organs. High

blood pressure is a major risk factor for heart disease, which is the leading cause of death in the United States.

High blood pressure often has no warning signs or symptoms. That's why it's called a "silent killer." If uncontrolled, it harms your heart and contributes to kidney disease, stroke, blindness, and dementia.

**Managing high blood pressure**



Sometimes health care providers prescribe medication to manage high blood pressure, which should be taken as directed. If your blood pressure isn't too high, you may be able to control it entirely by following the DASH eating plan, losing even just a little weight, getting regular physical activity, mindfully managing stress, cutting down on alcohol, and not smoking.

Learn more about high blood pressure at [www.nhlbi.nih.gov/hypertension](http://www.nhlbi.nih.gov/hypertension).

**RISK FACTORS FOR HIGH BLOOD PRESSURE**

<p><b>Age:</b> Blood pressure tends to get higher as we get older. Our blood vessels naturally thicken and stiffen over time. But many younger people, including children and teens, develop high blood pressure, too.</p>	<p><b>Sex:</b> Before age 60, more men than women have high blood pressure. After age 60, more women than men have it.</p>	<p><b>Race or ethnicity:</b> While anyone can have high blood pressure, African Americans tend to get it at a younger age. Among Hispanic adults, people of Cuban, Puerto Rican, and Dominican backgrounds are at higher risk.</p>	<p><b>Lifestyle habits:</b> Eating unhealthy foods, especially those with too much salt, drinking too much alcohol or caffeine, being obese, smoking, and not getting enough exercise can raise blood pressure.</p>
--	--	--	---

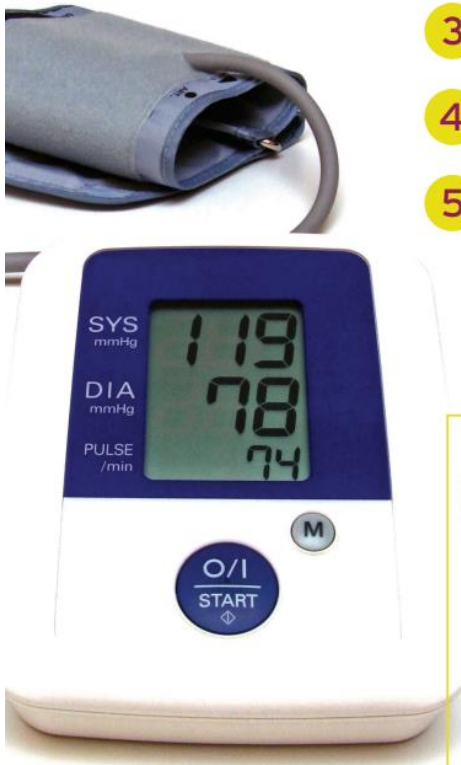
**DASH EATING PLAN** | The DASH Eating Plan is a heart healthy approach that has been scientifically proven to lower blood pressure and have other health benefits. To learn more, go to [www.nhlbi.nih.gov/DASH](http://www.nhlbi.nih.gov/DASH).

National Heart, Lung, and Blood Institute

1

# Steps to Lower Your Blood Pressure



- 1 **Set targets.** Work with your doctor to set blood pressure numbers that are realistic for you.
- 2 **Take control.** Start the DASH eating plan gradually, set activity goals, and eliminate unhealthy habits.
- 3 **Work together.** Studies show that you have a better chance of staying motivated when you tackle healthy goals with friends and family.
- 4 **Change gradually.** You don't have to make big changes all at once. Even small steps make you healthier and get you where you want to go.
- 5 **Manage stress.** Over time, stress contributes to high blood pressure and other health issues. Practicing mindful meditation for even 10 minutes a day helps relieve stress.

The DASH eating plan along with other lifestyle changes can help you keep your blood pressure in a healthy range—whether you have high blood pressure or you're trying to prevent it.

## BLOOD PRESSURE LEVELS FOR ADULTS

Blood pressure is measured in units of millimeters of mercury (mmHg). The readings are always given in pairs, with the upper (systolic) value first, followed by the lower (diastolic) value.

**Systolic pressure** is the pressure when the ventricles pump blood out of the heart—when the heart beats.

**Diastolic pressure** is the pressure between heartbeats, when the heart is filling with blood. The diastolic pressure is always lower than the systolic pressure.

**Overall blood pressure status** is determined by the higher number. For example, if your systolic is in the normal range and your diastolic is in the high range, your overall blood pressure is considered high.

**Healthy blood pressure** for most adults is usually less than 120/80 mmHg.

**High blood pressure** is when you have consistent systolic readings of 140 mmHg or higher or diastolic readings of 90 mmHg or higher. Based on research, your doctor may also determine that you have high blood pressure if you consistently have systolic readings of 130 to 139 mmHg or diastolic readings of 80 to 89 mmHg and you have other risk factors for heart or blood vessel disease.

**Note that readings above 180/120 mmHg are dangerously high and require immediate medical attention.**

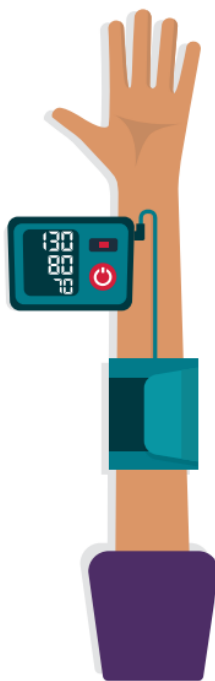
# Healthy Blood Pressure for Healthy Hearts

## Small Steps To Take Control



Every time your heart beats, it pumps blood through vessels, called arteries, to the rest of your body. Your blood pressure is how hard your blood pushes against the walls of the arteries. If your blood flows at higher than normal pressures, you may have high blood pressure, also known as hypertension.

High blood pressure is a major risk factor for heart disease, which is the leading cause of death in the United States. Millions of Americans have high blood pressure, but many people who have it don't know it. That's why it is important to have your blood pressure checked at least once a year.








### High blood pressure is a "silent killer."

It doesn't usually cause symptoms, but it can damage your body over time.

- If your blood pressure stays higher than 130/80 mm Hg for a period of time, it can cause serious health problems such as:
  - Heart disease
  - Stroke
  - Kidney disease
  - Dementia
- The only way to know whether you have high blood pressure is to have your blood pressure measured—a process that is simple and painless.
- If you find out you have high blood pressure, a health care professional can tell you how to prevent serious complications, including disability and premature death.

### Some things put us at greater risk for high blood pressure.

-  **Age:** Blood pressure tends to get higher as we get older. But it can affect many of us when we're younger too.
-  **Genes:** High blood pressure often runs in families.
-  **Sex:** Before age 60, more men than women have high blood pressure. After age 60, more women than men have it.
-  **Race or ethnicity:** While anyone can have high blood pressure, African Americans tend to get it at a younger age. Among Hispanic adults, people of Cuban, Puerto Rican, and Dominican backgrounds are at higher risk.
-  **Lifestyle habits:** Eating too much salt, drinking too much alcohol, being obese, smoking, and not getting enough exercise can raise our blood pressure.

## What steps can you take to lower your blood pressure?

### Set targets

Work with your doctor to set blood pressure numbers that are healthy for you. Use our worksheet at [nhlbi.nih.gov/hypertension](http://nhlbi.nih.gov/hypertension) to track your progress.

### Take control

Make lifestyle changes such as eating healthy, staying active, and watching your weight. If you smoke, quitting can help prevent heart disease and other complications of high blood pressure.

### Work together

Studies show that if you engage in heart healthy activities with people at home, at work, in your community, or online, you have a better chance of staying motivated.






## Taking the first step toward a healthy blood pressure.





**Making lifestyle changes now** can help keep your blood pressure in a healthy range—whether you have high blood pressure or you’re trying to prevent it. You don’t have to make big changes all at once. Small steps can get you where you want to go. Here are some ideas to start. If you have elevated blood pressure and your doctor prescribes medications, make sure to take them as directed.


**Why should I change?**


**How can I change?**

 **Eat Healthy Foods**  
A diet **low in sodium and saturated fat**—like the DASH eating plan—can lower your blood pressure as effectively as medicines.

 **Move More**  
**Get at least 2½ hours of physical activity a week** to help lower and control blood pressure. That’s just 30 minutes a day, 5 days a week.

 **Aim for a Healthy Weight**  
**Losing just 3 to 5 percent of your weight** can improve your blood pressure. If you weigh 200 lbs., that’s a weight loss of 6 to 10 lbs.

 **Manage Stress**  
**Stress can contribute** to high blood pressure and other heart risks. If it goes on for a long time, it can make your body store more fat.

 **Stop Smoking**  
The **chemicals in tobacco smoke** can harm your heart and blood vessels. Quitting is hard. But many people have done it, and you can, too.

- Add **one fruit or vegetable** to every meal.
- If you get fast food, ask for a **salad instead of fries**.
- Give **Meatless Monday** a try.
- Commit to **one salt-free day a week**. Use herbs for flavor instead.
- Invite a colleague for **regular walks or an exercise class**.
- Give the elevator a day off and **take the stairs**.
- Take a break to **play outside** with your kids.
- March in place** during commercial breaks while watching television with your family.
- Join a **weight loss program** with a buddy.
- Sign “social support” agreements** with three family members or friends.
- Practice **mindful meditation** for 10 minutes a day.
- Share a **funny video, joke, or inspirational quote** with a friend.
- Talk with your doctor** if you have trouble managing stress on your own
- Visit **Smokefree.gov** or **BeTobaccoFree.hhs.gov** to connect with others trying to quit.
- Sign up for a **support group** at work or your local clinic.
- Join a **sewing, knitting, or woodworking group** to keep your hands busy when you get urges.

**Take control of your blood pressure today! Learn more at [www.nhlbi.nih.gov/hypertension](http://www.nhlbi.nih.gov/hypertension)**

**NIH** National Heart, Lung, and Blood Institute

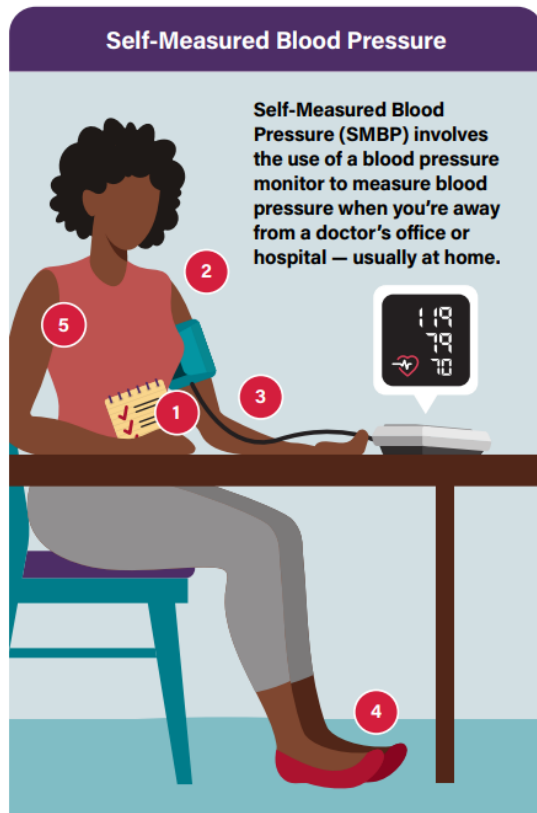
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

# Self-Measured Blood Pressure



**Blood pressure** is the force of blood pushing against the walls of your arteries as your heart pumps blood. When blood flows through your arteries at higher than normal pressures, you may have **high blood pressure**, also known as **hypertension**. High blood pressure is a major risk factor for heart disease, which is the leading cause of death in the United States.

Half of all Americans have high blood pressure and many don't even know it. Adults should have their blood pressure checked by a healthcare provider. If your numbers are high, your healthcare provider may suggest self-measuring your blood pressure outside of the doctor's office. Blood pressure is measured using two numbers. Systolic is the first number and is the pressure when blood is pumped out of the heart. Diastolic is the second number and is the pressure between heartbeats when the heart is filling with blood.



## Follow these tips to measure your blood pressure at home.

- 1 Prepare for your blood pressure reading:
  - **Avoid exercising, eating a meal, drinking caffeine, or smoking** for 30 min before.
  - If you are on **blood pressure medication**, measure your blood pressure **before** you take your medication.
  - **Go to the bathroom** and empty your bladder beforehand.
  - **Find a quiet space** with a table and chair and no distractions.
  - **Sit and relax for 5 minutes** before taking your blood pressure reading.
- 2 **Uncover your upper arm** and put the blood pressure cuff above the elbow and mid-arm. Do not put the cuff over your clothing.
- 3 **Rest your arm on the table** so it's supported and the blood pressure cuff around your upper arm is located at heart level. Keep your arm supported and your palms up.
- 4 While taking your reading, make sure your **feet are uncrossed** and **flat on the floor**.
- 5 **Sit up straight in a chair**—make sure your back is supported. **Stay calm and relaxed**. Don't talk or watch TV while taking your reading.





**Measuring your blood pressure at home is simple and effective.**  
 Studies have shown that self-measured blood pressure along with clinical support can help people with hypertension lower their blood pressure.



**Take more than one measurement**

To make sure your results are the same, **take two to three measurements 1 minute apart each time.**

Also, try taking your blood pressure at **the same time(s) each day.**



**Set targets**

Work with your doctor to set blood pressure numbers that are healthy for you.

**Typically, a healthy blood pressure is less than 120/80 mm Hg.**

If your reading is **higher**, talk with your doctor about how to **lower or control it.**

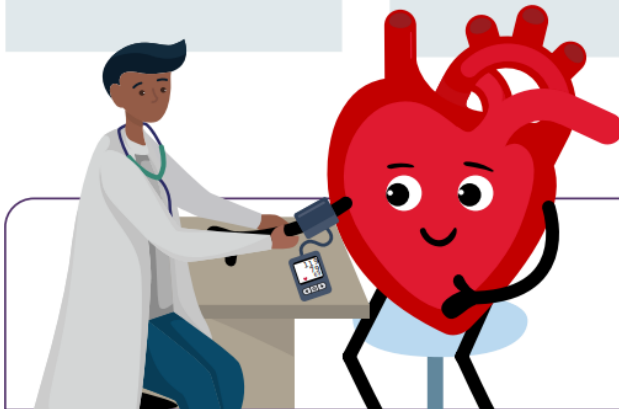


**Record and track your measurements**

You may be diagnosed with high blood pressure **based on your medical history** and if your blood pressure readings are **consistently higher than 130/80 mm Hg.**

Ask your doctor what your target numbers should be and how often to check it.

Use the [Blood Pressure Tracker](#) to record your numbers.



**There's a lot you can do to control your blood pressure.**  
 Learn more from *The Heart Truth*® at [nhlbi.nih.gov/hypertension](https://nhlbi.nih.gov/hypertension)






**Appendix B**

**Blood Pressure Wallet Card**

It is important to take prescribed blood pressure medicine

Questions to ask your doctor



*Ask your provider to help you fill out the information below.*

**Blood Pressure Medicine:**

.....

.....

.....

**Special Instructions:**




.....

.....

.....

- What is my blood pressure reading in numbers?
- What is my goal blood pressure?
- Is there a healthy eating plan that I should follow to help lower my blood pressure and lose weight?
- Is it safe for me to do regular physical activity?
- What is the name of my medicine? What is the generic name?
- What are the possible side effects of my medicine?
- What time of day should I take my blood pressure medicine?
- Should I take it with or without food?
- What should I do if I forget to take my blood pressure medicine at the recommended time?

**My Blood Pressure Wallet Card**






U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health  
National Heart, Lung, and Blood Institute  
NIH Publication No. 20-HL-8136 | October 2020

You can control your blood pressure

My blood pressure diary

Lifestyle changes to help reduce high blood pressure



*Work with your healthcare provider.*

**Provider's Name:**

.....

**Provider's Phone Number:**

.....

For most adults, healthy blood pressure is usually less than 120/80 mm Hg.

Date/Time:	Blood Pressure:
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

**My Blood Pressure Goal:**

Talk with your doctor about the lifestyle changes that are appropriate for you. Check off the lifestyle changes you are going to use to help lower your blood pressure.

**My Lifestyle Changes:**

- Follow the NHLBI's DASH eating plan. Choose heart-healthy foods that are low in sodium (salt).
- Aim for a healthy weight.
- Get regular physical activity.
- If you drink alcohol, have no more than one drink a day for women, two drinks a day for men.
- Remember to take your blood pressure medicine.


Learn more at [www.nhlbi.nih.gov/hypertension](http://www.nhlbi.nih.gov/hypertension).

# Appendix C

## PowerPoints

**EDUCATIONAL PROGRAM FOR HYPERTENSION KNOWLEDGE AND MANAGEMENT IN ADULTS**

Tatiana Kiskis, FNP-C, Doctor of Nursing Practice Student  
Pennsylvania Western University



1

**LEARN ABOUT BLOOD PRESSURE**

- High blood pressure is a growing public problem in the United States and the world
- Approximately 1.28 billion people worldwide have hypertension
- High blood pressure is a major factor for heart disease which is the leading cause of death in the United States and stroke
- About 1 in 3 U.S. adults have high blood pressure
- High blood pressure is highest among men with a prevalence among African-Americans



2

**LEARN ABOUT BLOOD PRESSURE**

- High blood pressure is known as a "silent killer"
- You may not be aware you have it and is not being treated to control your blood pressure
- Blood pressure changes throughout the day based on your activities
- It is important to control high blood pressure by adopting a heart-healthy lifestyle and healthy food
- May also need to take medicines



3

**WHAT IS HIGH BLOOD PRESSURE?**

- Known as **Hypertension**
- High blood pressure develops when blood flows through your arteries at higher-than-normal pressures
- Blood pressure is made up of two numbers: **Systolic and Diastolic**
- Systolic Pressure** (Upper Number) is the pressure when the ventricles pump blood out of the heart – when the heart beats
- Diastolic Pressure** (Lower Number) is the pressure between heartbeats when the heart is filling with blood. It is always lower than systolic blood pressure.



4

**LEARN ABOUT BLOOD PRESSURE**

- VIDEO: <https://www.youtube.com/watch?v=EDctwQokrk&list=PL>

© 2015 ADAPTED FROM...

5

**LEARN ABOUT BLOOD PRESSURE**

**Complications of Hypertension: Target-Organ Damage**



© 2015 ADAPTED FROM...

6

**WHY HIGH BLOOD PRESSURE IS SUCH A PROBLEM**

• VIDEO: [https://www.youtube.com/watch?v=1\\_B4vPTqWkIc4s](https://www.youtube.com/watch?v=1_B4vPTqWkIc4s)

NOTE: SHARED KNOWLEDGE

7

**SCREENING TESTS**

- It is important to have regular blood pressure readings taken
- It is important to **know numbers** because high blood pressure usually does not cause symptoms until it has caused serious problems
- Have your blood pressure checked at least once a year
- A blood pressure test is easy and painless
- Your provider uses a gauge, stethoscope, or electronic sensor and a blood pressure cuff to measure your blood pressure and see if you have higher-than-normal blood pressure readings
- Prepare for the test you need to follow a few simple steps



8

**PREPARING FOR BLOOD PRESSURE TEST**

- Do not exercise, drink coffee, or smoke cigarettes for 30 minutes before the test
- Go to the bathroom before the test
- For at least 5 minutes before the test, sit in a chair and relax.
- Make sure your feet are flat on the floor
- Do not talk while you are relaxing or during the test.
- Uncover your arm for the cuff
- Rest your arm on a table so it is supported and at the level of your heart
- You may have blood pressure readings taken on both arms

BLOOD PRESSURE

9

**BLOOD PRESSURE MAY NOT BE ACCURATE FOR REASONS**

- You are excited or nervous:  
**"White Coat Hypertension"** refers to blood pressure readings that are higher in a doctor's office than readings at home or in a pharmacy
- Blood pressure tends to be lower when measured at a doctor's office:  
 This is called **masked high blood pressure**. When this happens, it is difficult to detect high blood pressure. Your doctor can recognize this type of high blood pressure by looking at readings taken at the office and home
- The wrong blood pressure cuff is used:  
 Your readings can be different if the cuff is too small or too big. Your blood pressure readings need to be monitored over time and ensure the correct pressure cuff is used for your sex and age

BLOOD PRESSURE

10

**SMALL STEPS FOR THE HEART  
KNOW YOUR NUMBERS**

• VIDEO: <https://www.youtube.com/watch?v=4B0Kjks9Y>

NOTE: SHARED KNOWLEDGE

11

**BLOOD PRESSURE LEVELS AND CLASSIFICATION**

IT IS DETERMINED BY THE HIGHER NUMBER. FOR EXAMPLE, IF YOUR SYSTOLIC IS IN THE NORMAL RANGE AND YOUR DIASTOLIC IS IN THE HIGH RANGE, YOUR OVERALL BLOOD PRESSURE IS CONSIDERED HIGH

Blood Pressure	Normal Blood Pressure	Elevated Blood Pressure	High Blood Pressure
<b>Systolic</b> (Upper Number)	Less than 120 mm Hg	120-129 mm Hg	130 mm Hg or higher Consistent 140 mm Hg or higher
<b>Diastolic</b> (Lower Number)	Less than 80 mm Hg	Less than 80 mm Hg	80 mm Hg or higher Consistent 90 mm Hg or higher

12

### HOW WILL MY DOCTOR FIND OUT IF I HAVE HIGH BLOOD PRESSURE?

You may be diagnosed with high blood pressure based on:

- Your medical history
- If your blood pressure readings are consistently at high levels
- Your Risk Factors
- Your general information about your health such as eating patterns and your physical activity level
- Your family's health history

1. May need more tests to look for health problems that could cause high blood pressure or to see if high blood pressure has affected your kidneys

2. To diagnose high blood pressure, you will need two or more blood pressure readings at a separate time



13

### SYMPTOMS

Usually there are no symptoms from high blood pressure until it has caused serious health problems

Controlling blood pressure can help prevent or delay serious health problems such as:

- Chronic Kidney Disease
- Aneurysm - balloon-like bulges that occur in the aorta
- Heart Attack and Heart Failure
- Stroke
- Eye Damage
- Vascular Dementia
- Peripheral Artery Disease or Carotid Artery Disease



14

### WHAT ARE THE RISK FACTORS?

<b>AGE</b> Blood pressure tends to get higher when we get older. Our blood vessels naturally thicken and stiffen over time. But many children and teenagers develop blood pressure too, they because of being overweight or obese.	<b>SEX</b> Before age 45, more men than women have higher blood pressure. After age 45, both men and women have higher blood pressure than men.	<b>GENES</b> High blood pressure often runs in families. Many different genes can lead to an increase in blood pressure. If several relatives in your family have high blood pressure, you may be at a higher risk of high blood pressure than most.	<b>RACE or Ethnicity</b> African-American tend to have high blood pressure at younger ages. Hispanic adults from Cuba, Puerto Rico, and Dominican Republic are at higher risk.	<b>LIFESTYLE</b> Eating unhealthy foods, sitting too long, not enough potassium, drinking too much alcohol, using tobacco, smoking, being overweight, not getting enough sleep, not moving enough, and not getting enough sleep can raise blood pressure. Have these things.
---	--	---	---	---

15

### CAUSES THAT CAN INCREASE THE RISK OF HIGH BLOOD PRESSURE

- Medicines:** Some prescription and over-the-counter medicines can make it more difficult for your body to control your blood pressure. Antidepressants, decongestants (medicines to relieve a stuffy nose), and non-steroidal anti-inflammatory drugs (NSAIDs) such as Aspirin or Ibuprofen (Motrin) can all raise your blood pressure.
- Medical Issues or Conditions:** Certain tumors, chronic kidney disease, overweight/obesity, coronary heart disease, diabetes, high cholesterol, stroke, sleep apnea, and thyroid problems.
- Social and Economic Factors:** Income, education, where you live, the type of job, and working early or late shifts/night shifts may contribute to the risk of high blood pressure.



16

### CAN HIGH BLOOD PRESSURE BE PREVENTED?

<b>Heart-Healthy Lifestyle</b> <ul style="list-style-type: none"> <li>Fruits, apples, bananas, oranges, pears, grapes, and prunes</li> <li>Vegetables, spinach, collard greens, kale, cabbage, broccoli, and carrots</li> <li>Whole grain, oatmeal, oatmeal bran, rice, and whole-grain bread</li> <li>High Potassium Food: Spinach, Swiss chard, potatoes, beans, white beans, peas, mushrooms</li> <li>Low-fat Dairy milk, cheese, or yogurt</li> <li>Protein-rich foods like, skinned chicken, turkey, fish, poultry, and legumes</li> <li>Only Canada can, olive, safflower, sesame, sunflower, and soybean oils (the exception is palm oil)</li> </ul>	<b>Regular Physical Activities</b> <ul style="list-style-type: none"> <li>Even modest amounts can make a difference: 15 hours a week, or 30 minutes a day 5 days a week.</li> <li>Help to lose excess weight. Losing just 7% to 10% of your weight can improve blood pressure.</li> <li>Lower many heart disease risk factors such as "bad" LDL cholesterol and increase "good" HDL cholesterol</li> <li>Lower stress and improve mental health</li> <li>Lower risk type 2 diabetes, depression, and cancer</li> <li>Quit smoking - chemicals in tobacco smoke can harm your heart and vessels</li> <li>Limit alcohol</li> </ul>	<b>Manage Stress and Have Good Quality of Sleep</b> <ul style="list-style-type: none"> <li>Emotionally upsetting events can trigger a heart attack and other health issues in some people</li> <li>Stress can contribute to high blood pressure</li> <li>Consider healthy stress-reducing activities such as talking with friends, family, and community or religious support systems, and relaxation techniques</li> <li>Not getting enough quality sleep can raise the risk of high blood pressure, obesity, diabetes, stroke, and heart disease.</li> <li>7 to 9 hours of sleep per day</li> <li>Keep your bedroom cool and dark</li> </ul>
---	--	--

17

### DASH Eating Plan

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

<b>Eat This</b>	<b>Limit This</b>
Vegetables	Fatty meats
Fruits	Full-fat dairy
Whole grains	Sweets (sugar, candy, etc.)
Low-fat dairy	Sodium
Protein	Alcohol
Beans	Saturated fats
Nuts & seeds	Trans fats
Unsaturated oils	

www.nhlbi.nih.gov/DASH

18

**CAN HIGH BLOOD PRESSURE BE PREVENTED?**

**Heart-Healthy Lifestyle**

- Fruits: apples, bananas, oranges, pears, grapes, and pomegranates
- Vegetables: spinach, collard greens, kale, cabbage, broccoli, and carrots
- Whole Grains: plain oatmeal, brown rice, and whole-grain bread or tortilla
- Low Fat Dairy: milk, cheese, or yogurt
- Protein-rich foods: fish, skinless chicken or turkey eggs, nuts, avocados, and legumes
- Oils: Canola, corn, olive, safflower, sesame, sunflower, and soybean oils (not coconut or palm oil)

**Regular Physical Activities**

- Even modest amounts can make a difference: 2.5 hours a week, or 30 minutes a day 5 days a week.
- Help to lose excess weight. Losing just 1% to 5% of your weight can improve blood pressure.
- Lower many heart disease risk factors such as "bad" LDL-cholesterol and increase "good" HDL-cholesterol
- Lower stress and improve mental health
- Lower risk type 2 diabetes, depression, and cancer
- Quit smoking – chemicals in tobacco smoke can harm your heart and vessels
- Limit alcohol

**Manage Stress and Have Good Quality of Sleep**

- Emotionally upsetting events can trigger a heart attack and other heart disease in some people
- Stress can contribute to high blood pressure
- Consider healthy stress-reducing activities such as talking with friends, family and community or religious support systems, and relaxation techniques
- Not getting enough quality sleep can raise the risk of high blood pressure, obesity, diabetes, stroke, and heart disease.
- 7 to 9 hours of sleep per day
- Keep your bedroom cool and dark

ADAPTED FROM NIAH

**BE ACTIVE – KEEP YOUR HEART HEALTHY**

- VIDEO: <https://www.youtube.com/watch?v=7KrG6T3szA>

ADAPTED FROM NIAH

**OBESITY: THE LITTLE THINGS**

- VIDEO: <https://www.youtube.com/watch?v=D-AaATgYfM>

ADAPTED FROM NIAH

**CAN HIGH BLOOD PRESSURE BE PREVENTED?**

**Heart-Healthy Lifestyle**

- Fruits: apples, bananas, oranges, pears, grapes, and pomegranates
- Vegetables: spinach, collard greens, kale, cabbage, broccoli, and carrots
- Whole Grains: plain oatmeal, brown rice, and whole-grain bread or tortilla
- Low Fat Dairy: milk, cheese, or yogurt
- Protein-rich foods: fish, skinless chicken or turkey eggs, nuts, avocados, and legumes
- Oils: Canola, corn, olive, safflower, sesame, sunflower, and soybean oils (not coconut or palm oil)

**Regular Physical Activities**

- Even modest amounts can make a difference: 2.5 hours a week, or 30 minutes a day 5 days a week.
- Help to lose excess weight. Losing just 1% to 5% of your weight can improve blood pressure.
- Lower many heart disease risk factors such as "bad" LDL-cholesterol and increase "good" HDL-cholesterol
- Lower stress and improve mental health
- Lower risk type 2 diabetes, depression, and cancer
- Quit smoking – chemicals in tobacco smoke can harm your heart and vessels
- Limit alcohol

**Manage Stress and Have Good Quality of Sleep**

- Emotionally upsetting events can trigger a heart attack and other heart disease in some people
- Stress can contribute to high blood pressure
- Consider healthy stress-reducing activities such as talking with friends, family, and community or religious support systems, and relaxation techniques
- Not getting enough quality sleep can raise the risk of high blood pressure, obesity, diabetes, stroke, and heart disease.
- 7 to 9 hours of sleep per day
- Keep your bedroom cool and dark

ADAPTED FROM NIAH

**SMALL STEPS TO REDUCE STRESS**

- VIDEO: <https://www.youtube.com/watch?v=WVdXGyy6AA8>

ADAPTED FROM NIAH

**MEDICINES**

- When healthy lifestyle changes alone do not control or lower high blood pressure you may take blood pressure medicines
- To manage high blood pressure, many people need to take two or more medicines. This is more likely in African American adults.
- **Aware of the side effects of the medicines you take**
- **Angiotensin-converting enzyme (ACE) inhibitors** - keep your blood vessels from narrowing as much
- **Angiotensin II receptor blockers (ARBs)** keep blood vessels from narrowing
- **Calcium channel blockers** prevent calcium from entering the muscle cells of your heart and blood vessels. This allows blood vessels to relax.
- **Diuretics** remove extra water and sodium (salt) from your body and reduce the amount of fluid in your blood.
- **Beta blockers** help your heart beat slower and with less force. As a result, your heart pumps less blood through your blood vessels.







**MANAGE YOUR CONDITION**



**Keep Healthy Weight**



**Keep Moving**



**Eat Healthy**



**Take Your Medicine**

31

**THANK YOU!**



32



**REFERENCES**

American Heart Association. (2017). *What high blood pressure is a "new label"*. <https://www.heart.org/health-topics/high-blood-pressure/the-high-blood-pressure-is-a-new-label>

Barnes, M., Nijikawaguchi, S., & Rosman, C. (2018). *Appetitive and satiating influence in the obese*. *Frontiers in Endocrinology*, *9*, 291. <https://doi.org/10.3389/fendo.2018.00291>

Centers for Disease Control and Prevention. (2017). *High blood pressure*. <https://www.cdc.gov/high-blood-pressure/about/>

Centers for Disease Control and Prevention. (2018). *Physical Activity and Health: Recommendations*. <https://www.cdc.gov/physicalactivityandhealth/recommendations/>

National Heart, Lung, and Blood Institute. (2017). *SMART Family Plan*. <https://www.nhlbi.nih.gov/health-topics/smart-family-plan>

National Heart, Lung, and Blood Institute. (2018). *Diagnosis*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818>

National Heart, Lung, and Blood Institute. (2018). *Causes and risk factors*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#causes-and-risk-factors>

National Heart, Lung, and Blood Institute. (2018). *Diagnosis, physical activity*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#diagnosis-physical-activity>

National Heart, Lung, and Blood Institute. (2018). *Living with high blood pressure*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#living-with-high-blood-pressure>

National Heart, Lung, and Blood Institute. (2018). *Manage stress*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#manage-stress>

National Heart, Lung, and Blood Institute. (2018). *Prevention*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#prevention>

National Heart, Lung, and Blood Institute. (2018). *When to see your doctor*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#when-to-see-your-doctor>

National Heart, Lung, and Blood Institute. (2018). *What is high blood pressure?*. <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure/180818#what-is-high-blood-pressure>

Shin, B. (2018). *High blood pressure: Facts and figures*. <https://www.heart.org/health-topics/high-blood-pressure/180818#facts-and-figures>

Wu, L.H., Cheng, H.S.H., & Hsu, R.C. (2018). *Is treatment, surgery, and gene therapy in the management of diabetes an evidence-based alternative to insulin, hypoglycemics, and diet?*. *Journal of Clinical Nursing*, *29*, 2478-2491. <https://doi.org/10.1111/jocn.14511>

World Health Organization. (2017). *Hypertension*. <https://www.who.int/news-room/fact-sheets/detail/hypertension>

33