

Improving Health through Knowledge and Intervention: Promoting Hypertension Management
with Early Screening, Self-Care, and Hypertension Literacy in an Occupational Setting

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PART I: DNP PROJECT PROPOSAL

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Abstract

Introduction/Purpose: Hypertension (HTN) is one of the leading causes of cardiovascular events. This project aims to increase blood pressure (BP) management, hypertension health literacy, and self-care awareness by providing early awareness in an occupational setting.

Methods: 33 consented participants' BP was measured and were given the Hypertension Knowledge Literacy survey (HK-LS), Brief Illness Perception questionnaire, and Hypertension self-care activity level effect (H-SCALE) questionnaire. They were seen in an occupational clinic from October 31, 2023-December 31, 2023. Each participant's BP and survey/questionnaires were scored and reviewed. Participants with elevated systolic >130 mm Hg and/or diastolic >85 mm Hg BP received education from the American Heart Association (AHA) and required follow-up. During follow-up, each questionnaire and survey was redistributed, scored, and reviewed with repeated BP measurements, which was completed within two weeks after initial visit.

Results: Out of 33 participants, sixteen required follow-ups. Of those requiring follow up eleven were African American (AA). Concerning effect size, systolic and diastolic BP showed a positive significance related to Brief Illness scores (systolic 41 (.023)^b and diastolic 37 (.039)^b). In returning follow-up patients ($n=11$), post-education HK-LS scores ($M = 20.82$, $SD = 1.25$) were significantly higher than pre-education ($M = 19.64$, $SD = 1.43$), $t(10) = 3.99$, $p = .003$, $d = 1.20$, and this effect was very large. Pre-education systolic BP ($M = 150.73$, $SD = 16.38$) had significantly lower post education systolic BP ($M = 145.09$, $SD = 22.10$), $t(10) = -2.47$, $p = .033$, $d = -.74$, and a large effect. There was no significant significance in BP in relation to the H-SCALE survey.

Discussion: Based on data analysis, the presence of an OH clinic supported preventive health promotion and early BP management. In the clinic, there was a significant decrease in BP and

increase in hypertension (HTN) literacy in those that required follow-up post-education. Early screening for hypertension, assessing hypertension literacy, and providing interventions in Occupational Health (OH) helps to bridge gaps in care.

Keywords: Hypertension, Elevate blood pressure, Occupational Health, Occupational clinic, H-SCALE, Hypertension literacy

Improving Health through Knowledge and Intervention: Promoting Hypertension Management with Early Screening, Self-Care, and Hypertension Literacy in an Occupational Setting

Introduction

Occupational medicine was formally known as a branch of medicine that involved only the treatment of work-related injuries and illnesses, however, it has developed significantly over the years (Harrison & Dawson, 2015). Occupational health (OH) evolution now includes health management and promotion for healthier employees which increases productivity by decreasing disability and absences related to illnesses (Guidotti, 2016). At a manufacturing facility located in a rural city in South Carolina approximately half of patients seen in the OH clinic monthly for annual physicals and new hire physicals have a noted elevation in blood pressure (BP). The employer requires employees to maintain a BP <140 mm Hg/90 mm Hg, to operate industrial machinery. These patients have readings of a systolic in the mid to high 130s and diastolic in the high 80s to mid-90s (mm Hg). Early intervention of elevated systolic reading ≥ 130 mm Hg is recommended in those without a diagnosis and help decrease development of comorbidities from chronic diseases (Carey et al., 2018; CDC, 2019).

Background

According to the World Health Organization [WHO] (2021), there are approximately 1.28 billion people with HTN between the ages of 30 and 79 years, which has doubled since the 1990s. The average normal BP is systolic pressure ≤ 130 mm Hg and diastolic pressure < 85 mm Hg (Unger et al., 2020). HTN is a systolic blood pressure (SBP) reading ≥ 140 mm Hg and a diastolic pressure reading ≥ 90 mm Hg (Beevers et al., 2001; Carey et al., 2018; Unger et al., 2020). Diagnosis is made with two to three visits within a span of a week to a month as an in-office diagnosis but can also be compared with the outer office for accurate diagnosis (Tebelu et al., 2023; Unger et al., 2020). Undiagnosed HTN or untreated HTN accounts for approximately 46,000 deaths annually (Carey et al., 2018). A study conducted by Seibt et al. (2018) compared twenty-four-hour BP monitoring to manual monitoring at specified time intervals. It noted that 24-hour monitoring and manual monitoring showed undiagnosed HTN in approximately 36% of participants (Seibt et al., 2018). Misdiagnosed or under-management of HTN increases the risk of cardiovascular diseases such as stroke and heart attacks (“Health Threats,” 2022; “High Blood Pressure,” 2022; “Understanding Blood Pressure,” 2023). According to the Centers for Disease Control and Prevention [CDC] (2019), in 2010 approximately 76.6 billion dollars was spent on issues related to HTN.

Early intervention of elevated systolic reading ≥ 130 mm Hg is recommended in those without a diagnosis (Carey et al., 2018; CDC, 2019). Early blood pressure readings and interventions decrease comorbidities from chronic disease. Decreased HTN management is related to a lack of adherence to medications, untrusting of medical professionals, socioeconomic class, lack of insurance, and ineffective treatment regimens (“High Blood Pressure,” 2022). In the OH clinic, there are approximately one-third to one-half of employees seen monthly with an

elevated BP. These visits are not limited to work-related injuries or illness. They include annual physicals and new hire physicals, acute illness, and wellness screenings as well. Employees are sometimes unaware of their elevated BP. Employees can be seen in the clinic at no cost and initial management can be started. OH, allows access to resources, screenings, and interventions, to reduce an employee's risk for cardiovascular events. Decrease in cardiovascular events decreases risk of disabilities, missed work, and health costs (Guidotti, 2016).

Setting

This study took place in an OH clinic onsite of a steel mill in rural South Carolina located between Lancaster and Chester. According to the CDC (n.d.), HTN shows a national prevalence of 32.2%, a state (South Carolina) prevalence of 38%, and a county (Lancaster, Chester) prevalence of 40-44%. One-third to one-half of patients presenting have an elevated BP of at least 130 mm Hg/mid-80s-high 90s mm Hg including new hires.

In current practice employees who have elevated BP reading of systolic > 140 mm Hg and diastolic > 90 mm Hg are placed on a recertification list. These employees are then seen every three months until two consecutive BPs with a systolic reading less than or equal to 140 mm Hg and/or diastolic readings less than or equal to 90 mm Hg are recorded. The current recertification list has more than 20 current employees with several reoccurring because of the continued elevation. Those who have continuous monitoring blame an elevation on the lack of treatment plans, access to care, and availability of care. Current employees who have elevated systolic BP (SBP) > 180 mm Hg and diastolic BP (DBP) > 110 mm Hg are sent home and must be seen by their medical provider for clearance before they are allowed to return. Also, in new hire physicals if elevated SBP > 160 mm Hg and/or DBP > 100 mm Hg is noted they are required a medical clearance before their job offer.

Problem Statement

According to the National Heart, Lung, and Blood Institute (2017), a 27% reduction in deaths is noted when BP has a systolic reading <120mm Hg. Studies have shown that addressing self-awareness of HTN knowledge, medication adherence, diet, tobacco cessation, and exercise can increase the likelihood of controlled BP (Fukai et al., 2020; Ma, 2018; Nagata et al., 2022; Reif et al., 2020). Due to a high population of patients seen in the clinic with elevated BP, this study aims to increase BP awareness and management in an occupational setting, which was done by measuring BP and using surveys and questionnaires to assess self-awareness related to HTN and HTN literacy. A participant with elevation will follow-up and receive additional education from the American Heart Association (AHA).

Organizational “Gap” Analysis of Project Site

There are many studies regarding HTN, but limited studies are complete in an occupational health setting. The United States Preventive Services Task Force [USPSTF] (2021), recommends individuals greater than 40 years of age and with increased risk for HTN be screened annually. In addition, individuals between the ages 18-39 without a prior hypertensive reading be screened between three to five years (USPSTF, 2021). In the clinic, employees are required to be seen for yearly physicals which includes BP measurement. During these visits it is important to address those with an elevation. A Strengths, Weakness, Opportunities, and Threat (SWOT) analysis (see Appendix Figure 2) accessed a need for BP screenings, HTN self-care awareness, and HTN literacy in OH.

The biggest gap in the OH clinic was BP management. Clinicians are only allowed to initiate treatment and cannot provide medication maintenance if needed. Another gap is buy-in from the employees on the importance of HTN. Weaknesses seen are treatment plans not being

completed. There are many opportunities available for employees by utilizing the OH clinic. Increasing HTN literacy and education with BP screenings can help to reduce chronic disease and cardiovascular risks. Even if the intervention is lifestyle modifications, employees are not adhering. Some employees do not see the need for change even after being educated on the importance of early interventions.

Review of the Literature

A literature review was conducted in Pubmed using a mixture of terms and phrases: occupational health, hypertension screening, early hypertension screening, workplace, occupational, H-SCALE, Hypertension Literacy, elevated blood pressure, and hypertension. Search results with the phrase combination using Boolean terms and/or yielded over 1390 results. Articles were then filtered to the last five years and included full text and free full text.

Inclusion criteria were articles that supported HTN screenings, HTN literacy, occupational studies with HTN screening, and support of occupational health with HTN screenings. Articles excluded were those without screening discussions, needing more research to conclude the importance of occupational health screening in HTN, and articles without mention of occupational or HTN.

OH screenings for HTN allow those undiagnosed, misdiagnosed, or nonadherent to treatment to have treatment outside primary care screenings. Early HTN screening allows for early diagnosis and treatment modifications which decrease the risk of cardiovascular events due to many individuals with HTN being asymptomatic or undiagnosed (Carey et al., 2018; CDC, 2019; Fukai et al., 2021; Nagat et al., 2022; Ndione et al., 2021; Siebt et al., 2018; Silva et al., 2022; Unger et al., 2020). Screenings in rural areas or outside of primary offices decrease the challenges of location for screening and management (Silva et al., 2022). The presence of OH

versus nonoccupational health (nonOH) supports an increase in treatment to control blood pressure in OH clinics (Hashiguchi et al., 2019; Nagata et al., 2022).

Support for OH clinics can be seen in employee programs, these programs included interviews as methods to address psychological stress, which showed a decreased risk of HTN (Ndione et al. (2021); Michaelis et al, (2021); Lu et al. (2020)). Surveys which measured HTN literacy, providing education related to HTN, healthy behaviors, employee beliefs, and the presence of full-time occupational health physicians and nurses helped promote control of blood pressure (Nagata et al., 2022; Reif et al., 2020). By also addressing HTN literacy and self-care through the HTN literacy test and H-SCALE a control of BP was also noted (Warren-Findlow & Seymour, 2011; Erkoc et al., 2012; Fukai et al., 2020; Ma, 2018; Nagata et al., 2022; Niriayo et al., 2019; Reir et al., 2020; Warren-Findlow et al., 2020; Tebelu et al., 202

Limitations in the literature review noted: accuracy of question (survey) data, the presence of health promotion, no completed evaluation of use of health promotion program, meeting time with employees not recorded, job stress influences not recorded, low participation rate, medication compliance not measured, no treatment statistics included, and self-reporting data. Sample sizes from articles reviewed ranged from small with approximately 30 participants to large sizes at approximately 60,000 participants. Some articles were case studies, randomized control studies, retrospective cohorts, and reviews. Each article reviewed was noted to have contrasting implementation methods and data collection.

Articles chosen supported the use of outside centers for BP screenings such as the use of occupational health clinics. Also, a decrease in hypertension was noted with wellness programs and clinics (Hashiguchi et al., 2019; Nagata et al., 2022; Reif et al., 2020; Silva et al., 2022). Each article stressed the importance of HTN screening, self-care behavior, literacy, compliance,

and education (Warren-Findlow & Seymour, 2011; Erkoc et al., 2012; Fukai et al., 2020; Ma, 2018; Nagata et al., 2022; Niriayo et al., 2019; Reir et al., 2020; Warren-Findlow et al., 2020; Tebelu et al., 2023). Early screening and interventions decrease the risk of cardiovascular events which in the end help support the use of OH clinics especially in rural areas and manufacturing facilities.

Evidence-based Practice: Verification of Chosen Option

An educational quality improvement approach was used in this project. The project's aim was to determine if BP control was achieved by improving HTN literacy and HTN self-care in an OH setting. Measurements of scoring from questionnaires and surveys were compared with BP measurements to determine correlations. Correlation in the importance of BP control, improved health literacy, and improved self-care was supported in the literature review.

Theoretical Framework

Health Belief Model (HBM) is a theoretical framework based on the relationship between beliefs and a person's behavior (Butts & Rich, 2021; Ma, 2018; Washburn, 2020). In this model, if a person believes they may have a severe consequence their behavior will be to prevent the consequence from occurring. It allows assessment of the patient's willingness to change based on their perceived understanding of hypertension (Butts & Rich, 2021; Ma, 2018; Washburn, 2020). It also allows for the patient to be a significant part of their treatment, develop a treatment plan with the provider, and participate in educational activities provided by the clinic.

Health Belief Model in Hypertension (Appendix Figure 1)

HBM is based on six components (Figure 1): Perceived Susceptibility, Perceived Severity, Perceived Benefits, Perceived Barriers, Cue to Action, and Self-Efficacy (Ma, 2018; Washburn, 2020).

Perceived Susceptibility

Example: What is the chance it is true hypertension?

This component is defined as a person's belief that they may be at risk for HTN (Ma, 2018). HTN is a systolic blood pressure (SBP) reading ≥ 140 mm Hg and diastolic pressure reading ≥ 90 mm Hg (Beevers et al., 2001; Carey et al., 2018; Unger et al., 2020). Participants' BP was measured. If SBP was greater than or equal to 130mm Hg and/or Diastolic greater than or equal to 85 mm Hg, participants were educated about elevated BP, risk of diagnosis of HTN, and required follow-up. Previously diagnosed hypertensive participants were also educated and required follow-up.

Perceived Severity

Example: I do not have symptoms so I must not have hypertension.

This component is defined as a person's belief on how severe the disease is or can be (Ma, 2018). Questionnaires and surveys assessing participants' HTN literacy, HTN self-care, and HTN perceptions were used. The scoring of the Brief Illness questionnaires determined the perception of the severity of HTN (Broadbent et al., 2006).

Perceived Benefits

Example: Do I need to measure my blood pressure?

This component is defined as a person's belief that if they take certain actions, it will decrease the consequence of becoming hypertensive or decrease the disease process (Ma, 2018).

This component was addressed with scores from the questionnaires and surveys as well.

Education was also provided to those who met inclusion criteria for follow-up.

Perceived Barriers

Example: How will I monitor my blood pressure if I don't have the time to see a medical provider?

This component is defined as the person's belief that benefits outweigh barriers (Ma, 2018). This component was also addressed with scores from the questionnaires and surveys. High scoring in self-care and literacy was noted with awareness of BP and interventions needed for follow-up. The presence of the OH clinic also allowed the participants to be seen during working hours.

Cue to Action

Example: Education from occupational staff to decrease blood pressure.

This component is defined as the person being exposed that causes a change (Ma, 2018). All participants were educated regarding their BP measurement through the review of the questionnaires and surveys. Those also meeting follow-up criteria were provided additional education handouts to review prior to follow-up. Some participants that returned for follow-up voiced modifications to their lifestyle. These participants also showed better BP control after follow-up.

Self-efficacy

Example: Increasing awareness and understanding of hypertension and decrease in blood pressure noted

This component is defined as the person's self-awareness and confidence that they can prevent the development of disease or decrease the consequences of untreated hypertension (Ma, 2018). With the help of the occupational clinic, those requiring follow-up showed BP control with increase literacy, self-care, and perceived severity related to BP. These individuals were more aware of modifications needed to support continued BP control.

Goals, Objectives, and Expected Outcomes

The overall objective of this project was to increase BP management by increasing hypertension knowledge with the use of questionnaires for hypertension health literacy, hypertension self-care, and education during physical exams in an OH setting and to demonstrate that BP management is seen with high HTN health literacy, high HTN self-care, and high severity awareness of HTN. Data was drawn from consented participants during the implementation of the program from October 31, 2023-December 31, 2023. Follow-up was required for those with a SBP >130s mm Hg and/or DBP >85 mm Hg.

Employees who were seen for physicals, recertifications, and new hire physicals during the implementation stage were recruited for participation. Informed consent was obtained. Developed with HBM theory components in mind, participants received questionnaires, surveys, and those requiring follow-up received additional education. The project goal was to increase participants' understanding of hypertension evidenced by an increase in hypertension control and elevations in scores on the H-SCALE, HK-LS, and Brief Illness questionnaires. Also, in those

requiring follow-up an expected outcome was a decrease in blood pressure and an increase in hypertension literacy and self-care.

Setting Facilitators and Barriers

The main facilitator of the project was the sole provider a Nurse Practitioner (NP) at the clinic. Completion of a SWOT analysis allowed the presentation of possible barriers (Figure 3). The barriers encountered were lack of returning for follow-up appointments, clinic closures during the two-week follow-up criteria, and participant participation in treatment plan.

Methods

Project Design

Adult manufacturing employees between the ages of 18-65 being seen in the clinic for annual (yearly) physicals, recertifications, and new hire physicals were recruited for project participation, informed consent was obtained. In those that consented in participation, the surveys and interviews were conducted at baseline and after in those who required follow-up. Participants with a systolic reading >130mm Hg and/or diastolic reading >85mm Hg measured required follow-up. Those who met these inclusion criteria were documented in a spreadsheet, educated on results from questionnaires and surveys, and given extra education from American Heart Association (AHA) (those who required follow-up).

The project's focus was on BP screenings, self-care related to HTN, perception of illness, and HTN literacy. Quantitative measures were systolic and diastolic BP measurements. Qualitative data measurements were data from the Brief Illness Questionnaire, H-SCALE, and the HK-LS interviews.

Project Site and Population

This study took place at an onsite Occupational health clinic located at a Manufacturing facility in Richburg, SC, in a rural community. The implementation period was October 31, 2023-December 31, 2023. Approximately 350 employees are located at this site. There were 48 employees seen in the clinic during the implementation. The predominant population in the facility is African American non-Hispanic. African American non-Hispanic individuals are more at risk for severe disease and decreased management (“High Blood Pressure,” 2022).

The services provided in the clinic are yearly physicals, work-related injuries, new employee physicals, and acute illnesses for all manufacturing employees. The clinic is a sole provider clinic consisting of one Nurse practitioner (NP). Working hours vary in the clinic. It has staggered hours to cover all shifts, the facility is open 24 hours seven days a week.

Measurement Instruments

Outcomes of the project were retrieved from the Brief Illness Questionnaire, H-SCALE, and the HK-LS questionnaires to address hypertension literacy and self-care. H-SCALE and Brief Illness Questionnaires use a Likert-scale for scoring. HK-LS used a true or false scale to which correct answers were tallied and a high number of correct answers equaled high HTN literacy. BP pressure measurements were taken pre interventions in all participants and post interventions for those requiring follow-up. Statistical tests used in Excel were paired and independent t-test, effect size (Cohen’s).

Brief Illness Perception Questionnaire

The Brief Illness questionnaire is used to determine an individuals’ perceived threat of severity of an illness. The word illness can be interchangeable to high BP/HTN which is noted to be valid in the scale itself. It contains eight questions regarding perception of illness that are scored on a Likert scale from 0 (no effect at all) to 10 (severely affects my life). It is scored by

adding all the points of the scale and determining threat of the disease. A score <42 is considered a low threat and >50 is a high level of threat (Kuiper et al., 2022).

Hypertension Knowledge Literacy Scale (HK-LS)

HK-LS questionnaire is a 22-question questionnaire that uses true and false answers regarding HTN literacy. High correct answer scoring equals high hypertension literacy (Baliz Erkoc et al., 2012).

Hypertension Self-Care Activity Level Effects (H-SCALE)

H-SCALE is a six-dimension questionnaire regarding medication usage, diet, physical activity, smoking, weight management, and alcohol (Warren-Findlow, 2011). Dimension scoring was determined by the number of days in a seven-day period regarding questions related to medication usage, diet, physical activity, smoking, and alcohol. Adherence for Medication is a score of 21 or at least 80% of use (if on medication). Diet scoring is based on the intake of a heart healthy diet. A score < 32 equals a low-quality diet, 33-51 is a medium quality diet, and >52 is adherent to a healthy diet. A score >8 in physical activity equals adherent. Smoking subcategory any score greater than 0 is nonadherent. Alcohol consumption was a multiplier of number of drinks and how many drinks in a week. Scoring of alcohol was different for men versus women. In men a score of less than 14 is adherent and in women a score less than 7 is adherent (Warren-Findlow et al., 2013). Dimension weight management was scored on Likert-scale from 1 (strongly disagree) to 5 (strongly agree) regarding weight management over a 30-day period. Scoring of weight management ranges from 10-50 with a score >40 equals adherent to weight management.

Data Collection Procedures

Preintervention

Project proposal topic planning was started in August 2022. Final development of proposal was completed in July 2023. Clinical site approval was obtained in February 2023 with Institutional Review Board (IRB) approval in October 2023. Project implementation and Data collection was obtained from October 2023 to January 2024. Data analysis was done from January 2024-February 2024. Project presentation was completed March 2024. Final project submission was April 2024.

Intervention

The following script was used prior to consent:

“I am working on a study for my Doctorate degree in Nursing at the University of Alabama. I would like to have you as a participant in my study. My study aims to increase blood pressure management by increasing self-literacy and self-care related to blood pressure. At any time, you may withdraw from the study. You may also consent not to be included in the study. There are very minimal risks to no risks involved in this study. Once consent is agreed I will have you fill out questionnaires related to health literacy and self-care regarding hypertension. I will discuss the process of obtaining your blood pressure. We will then review your questionnaire answers. If your systolic blood pressure is > 130mm Hg and/or diastolic >85mm Hg I will have you return in two weeks for follow-up. You will be given education at the end of the visit to review. During the follow-up, we will repeat questionnaires and review answers. I will also measure blood pressure. We will discuss the benefits of increased literacy and self-care regarding blood pressure. The risks and benefits are also noted in the consent. “

Next, consent from participants was received for participation and use of data. Data was obtained from the employees seen in the clinic that met the inclusion criteria of annual (yearly)

physicals, recertifications, and new hire physicals. Data was stored in a password-protected Excel spreadsheet in addition to the required electronic medical record. Each participant's consent, questionnaires, and surveys were scanned into a password-protected folder. Once consent received and questionnaires completed blood pressure measurements were obtained on left arm elevated at heart level. Questionnaires were next reviewed with the participant. Exclusion from follow-up were those with a measurement of a systolic reading <130 mm Hg and/or diastolic reading <85 mm Hg and those that did not consent. If follow-up was required (SBP > 130 mm Hg and/or DBP >85 mm Hg), the participant received education from the AHA regarding hypertension ("How can I Reduce," 2021; "Health Threats," 2022; "Why High Blood Pressure," 2023; "Understanding Blood Pressure," 2023). The participant returned to the OH clinic in two weeks for follow-up. During the follow-up visit, questionnaires were re-administered, BP was measured, and questionnaires were reviewed with the participant.

Blood Pressure Measurement. A participant with a BP measurement of a systolic reading >130 mm Hg and/or diastolic reading >85 mm Hg required follow-up. Those that meet the follow-up criteria were documented and educated to return in two weeks for repeat BP measurement.

Interviews and Questionnaires. Questionnaires assessed the basic understanding of hypertension, previous diagnosis, elevated blood pressure in the past without diagnosis or education and addressed risk factors. To allow determination of understanding of the disease, the Brief Illness Perception Questionnaire was used. The Brief Illness Questionnaire allows the word hypertension or high blood pressure to replace the word illness to be more understood. To determine self-care practice Hypertension Self-Care Activity Level Effects (H-SCALE) questionnaire was used. Also, the Hypertension Knowledge-Level Scale (HK-LS) was used to

address hypertension literacy. Each questionnaire was given by the provider on staff during the trial period.

Education. Fact sheets from the AHA were used to provide education for follow-up and given to patient to review prior to return. Fact sheets used were titled: *Why High blood pressure is a silent killer; Understanding Blood pressure Readings, Health threats from high blood pressure, the facts about high blood pressure, and How can I reduce high blood pressure?*

Follow-up. Patients were included for follow-up if they had an elevation in blood pressure. They were reassessed in a two-week time frame after educational interventions were given.

Outcomes. In those that required follow-up a large correlation in effect size was seen with pre- and post-education in relation to SBP $t(10) = -2.47, p = .033, d = -.74$. SBP was lower in post education ($M = 145.09, SD = 22.10$) than pre- ($M = 150.73, SD = 16.38$). Also, higher HK-LS literacy scores were noted in those with required follow-up ($M = 20.82, SD = 1.25$) in comparison to those without ($M = 19.38, SD = 2.06$).

Limitations

Participants with follow-up did not make the changes suggested from the education handouts given or review from questionnaires. Those requiring follow-up did not return. Some that did not consent had elevated blood pressure. Lastly, more correlations could be identified if a longer study was available.

Data Analysis

Of the 44 employees meeting inclusion criteria, 33 consented to participate in the project. Also, only 11 of 16 participants who met follow-up criteria followed up. Seventy-three percent (11 of the 15) of African American participants required follow-up due to blood pressure

elevations. See Table 1 and Table 2 using Cohen (1988) benchmarks: benchmarks: $d \leq .20$ is small, $.20 < d < .50$ is moderate, $.50 < d < .80$ is large, and $d \geq 1.00$ is very large, effect sizes and significance for paired-samples t-tests.

Table 1 discusses correlation of the whole sample ($n=31$) between initial H-SCALE, HK-LS, and Brief Illness scores and systolic and diastolic blood pressure. Systolic ($r(p) = .41 (.023)^{31}$) and diastolic ($r(p) = .37 (.039)^{31}$) BP were significantly positive with a large effect size in the severity of perception related to the Brief Illness scores. H-SCALE subcategories medication and alcohol intake were negatively moderately related to SBP ($r(p) = -.19 (.478)^{16}$) ($r(p) = -.11 (.559)^{31}$) and DBP ($r(p) = -.27 (.310)^{16}$) ($r(p) = -.13 (.490)^{31}$). SBP ($r(p) = -.34(.062)^{31}$) and DBP ($r(p) = .34 (.059)^{31}$) were largely positive in relation to H-SCALE subcategory weight management. DBP ($r(p) = .17 (.359)^{31}$) was positively moderate related to H-SCALE physical activity subcategory and moderately positive ($r(p) = .20 (.291)^{31}$) to tobacco exposure.

Table 1

Initial H-Scale, HK-LS, and Brief Illness Score Correlations with Systolic and Diastolic Blood Pressure

	Systolic blood pressure	Diastolic blood pressure
	$r(p)$	$r(p)$
H-Scale subscale		
Medication	-.19 (.478) ^a	-.27 (.310) ^a
Weight management	.34 (.062) ^b	.34 (.059) ^b
Physical activity	-.01 (.977) ^b	.17 (.359) ^b
Tobacco exposure	-.03 (.988) ^b	.20 (.291) ^b

Alcohol intake	-.11 (.559) ^b	-.13 (.490) ^b
DASH diet	-.05 (.796) ^b	-.01 (.956) ^b
HK-LS	.10 (.578) ^b	-.09 (.615) ^b
Brief Illness	.41 (.023) ^b	.37 (.039) ^b

Note. ^a $n = 16$, ^b $n = 31$

Of the 33 participants that consented almost half (16) required follow-up. Participants with pre-education SBP (>130 mm Hg, $n=16$) paired sample t-test ($M = 149.88$, $SD = 16.74$) had significantly lower post education SBP ($n=11$) ($M = 145.09$, $SD = 22.10$), $t(10) = -2.47$, $p = .033$, $d = -.74$, which showed a large effect (Table 2). Participants with pre-education DBP (>85mm Hg, $n=16$) ($M = 85.88$, $SD = 13.53$) did not have significantly lower post-education diastolic ($n=11$) ($M = 86.73$, $SD = 17.12$) blood pressure, $t(5) = -0.17$, $p = .875$, $d = -.07$, and the effect was small. Returning follow-up patients ($n=11$) post-education HK-LS scores ($M = 20.82$, $SD = 1.25$) were significantly higher than pre-education ($n=16$) ($M = 19.67$, $SD = 1.29$), $t(10) = 3.99$, $p = .003$, $d = 1.20$, and the effect was very large.

Noted in Table 2 the independent sample t-test of a moderate correlation effect between elevated BP and non-elevated BP in the H-SCALE subcategories of physical activity $df=29$, $t(p) = .99$ (.332), $d = .35$ and tobacco exposure $df=29$, $t(p) = 1.07$ (.295), $d = .38$. There was a moderately large effect in the H-SCALE subcategory weight management $df=29$, $t(p) = -2.90$ (.007), $d = -1.04$.

Table 2 also contains data of paired sample t-test of participants with elevated BP and participants with elevated BP that returned for follow-up. A large correlation was noted in post-education SBP $df=10$, $t(p) = -2.47$ (.033), $d = -.74$. A moderate correction seen in the H-SCALE subcategories medication adherence $df=7$, $t(p) = 1.02$ (.342), $d = .36$, physical activity $df=10$, $t(p)$

= 1.35 (.208), $d = .41$, and tobacco exposure $df=10$, $t(p) = -1.00 (.341)$, $d = -.30$. A moderate correlation of severity of perception of hypertension was noted as well in paired sample t-test $df=10$, $t(p) = 1.51 (.162)$, $d = .46$. A very large correlation was noted in Table 2 in the paired sample t-test related to the HK-LS scores $df=10$, $t(p) = 3.99 (.003)$, $d = 1.20$.

Table 2

Sample Means and Standard Deviations of BP measurement, and T-Tests Comparing H-SCALE, Brief Illness Perception, and HK-LS Scores

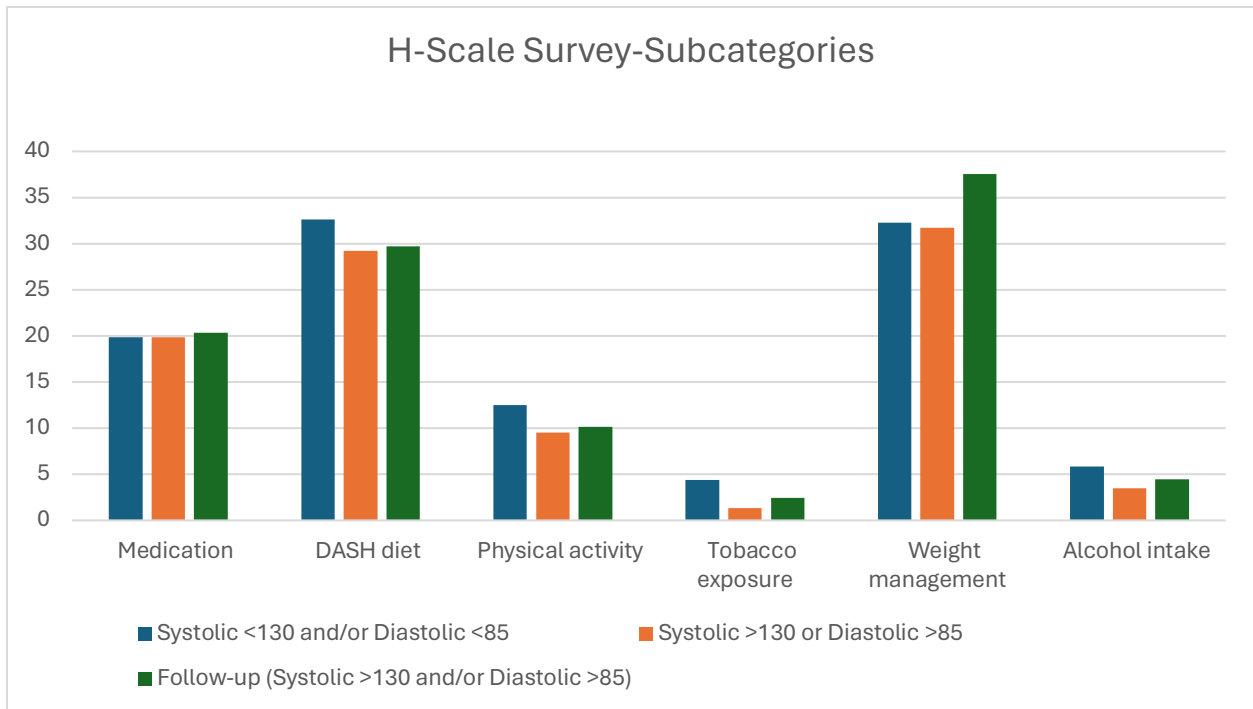
	Non-Elevated BP (<i>n</i> = 17)	Elevated BP (<i>n</i> = 16)	T-test: Non-Elevated vs. Elevated BP			Follow-up (<i>n</i> = 11)	T-test: Follow-up vs. Elevated BP		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>t</i> (<i>p</i>)	<i>d</i>	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>t</i> (<i>p</i>)	<i>d</i>
Systolic	115.18 (9.44)	149.88 (16.74)	-	-	-	145.09 (22.10) ^c	10	-2.47(.033)	-.74
Diastolic	67.53 (8.20)	85.88 (13.53)	-	-	-	86.73 (17.12) ^c	10	-.25 (.810)	-.07
H-SCALE									
<i>Medication</i>	20.00 (1.26)	19.80 (2.90)	14	.16(.876)	.08	20.50 (.926) ^c	7	1.02(.342)	.36
<i>DASH diet</i>	31.00 (13.83)	31.87 (9.86)	29	-.20(.843)	-.07	32.55 (12.05) ^c	10	.59(.566)	.18
<i>Physical activity</i>	12.50 (4.84)	10.33 (7.23)	29	.99(.332)	.35	10.73 (5.57) ^c	10	1.35(.208)	.41
<i>Tobacco exposure</i>	3.94 (4.54)	2.13 (4.88)	29	1.07(.295)	.38	2.82 (5.60) ^c	10	-1.00(.341)	-.30
<i>Weight management</i>	28.75 (7.86)	36.67 (7.32)	29	-2.90(.007)	-1.04	38.18 (7.78) ^c	10	2.07(.066)	.62
<i>Alcohol intake</i>	5.56 (8.66)	4.13 (6.25)	29	.52(.604)	.19	3.36 (6.99) ^c	10	.00(1.00)	.00
Brief Illness	16.13 (17.94)	32.00 (18.82)	29	-2.41(.023)	-.86	41.27 (10.02) ^c	10	1.51(.162)	.46
HK-LS	19.38 (2.06)	19.67 (1.29)	29	-.47(.643)	-.17	20.82 (1.25) ^c	10	3.99(.003)	1.20

Note. Non-Elevated BP = systolic < 130 and/or diastolic < 85; Elevated BP = systolic > 130 or diastolic > 85.

Graph 1 shows H-SCALE subcategories medication adherence and physical activity was noted more in those with non-elevated BP (SBP < 130mm Hg and/or Diastolic < 85 mm Hg) than those who required follow-up. Related to the Brief Illness survey there was also seen a lower perception of severity of disease in those with a systolic with SBP < 130mm Hg and/or Diastolic < 85 mm Hg than those who required follow-up (Graph 2). Hypertension literacy using HK-LS noted which determines increased knowledge was noted with follow-up after education from AHA in those that required follow-up and in those who returned for follow-up (Graph 3).

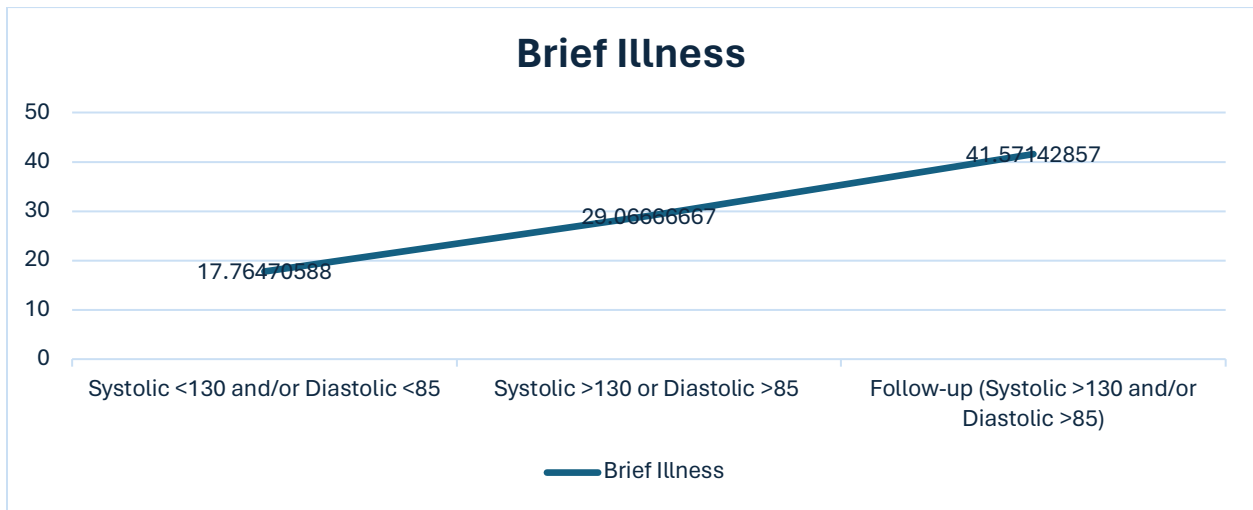
Graph 1

Mean samples of H-SCALE Subcategories



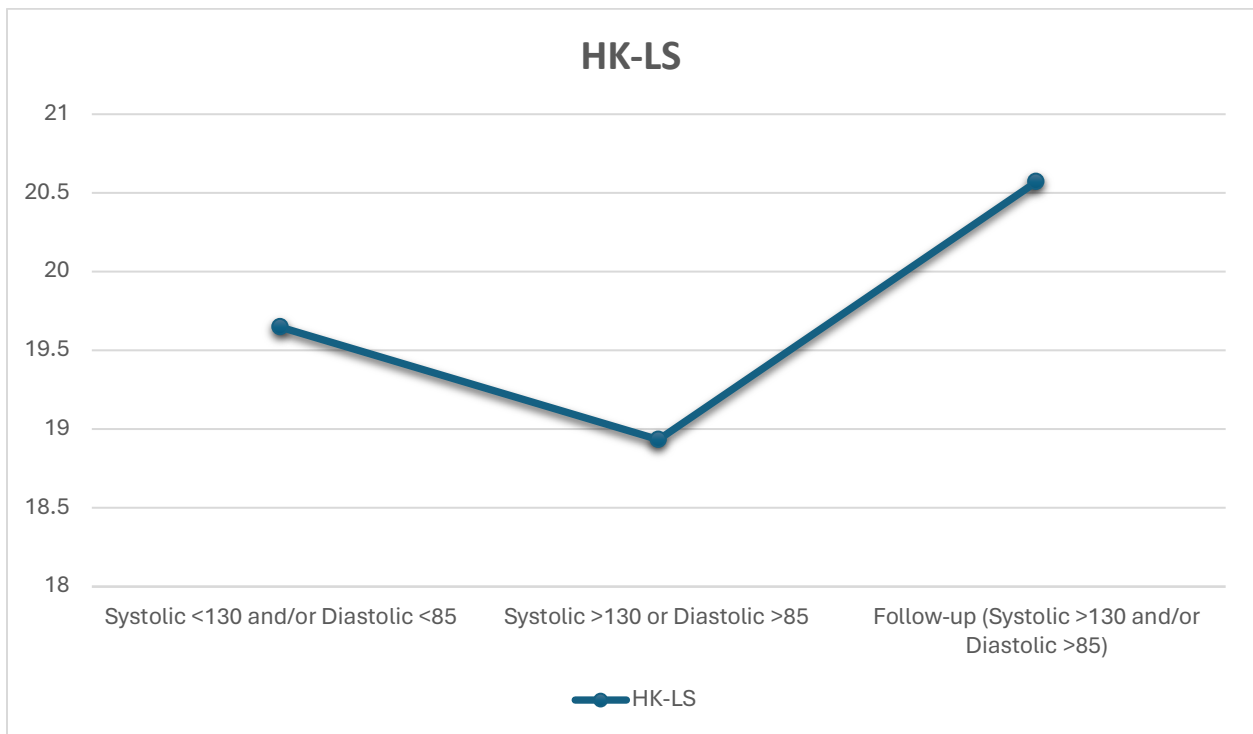
Graph 2

Mean scores of Brief Illness Perception Survey



Graph 3

Mean scores of HK-LS



Cost-Benefit Analysis/Budget (Table 1)

This project was a no cost project. The participants and staff were volunteers. In the clinic, the participants are required yearly to have a physical, and those that consented were used for the study at no extra cost. Since staff worked during their regular scheduled hours, no overtime was paid. Questionnaires were at no cost as well as permission of usage requests. Data collection was done during the scheduled physicals which equals no additional cost. Data analysis help was done by an assistant with the UA Graduate nursing department. Data was inputted into an Excel software. Data storage at no cost via the University of Alabama (UA) lockbox.

Timeline (Table 2)

The projected timeline is located in the Appendix in Table 2. Initial project proposal topic was started in August 2022. Clinical agreement was completed February 2023. IRB completed October 2023. Project proposal development stage one was completed in May 2023. Parts two and three of proposal development were completed in June 2023. Parts four, five, and Final were completed in August 2023. Project implementation started in October 2023 and is set was completed in January 2024. Data collection was ongoing from October 2023 to the end of January 2024. Data analysis was started at the end of data collection in January 2024 and finished February 2024. Project dissemination was February 2024. Final writing submission with edits due April 2024.

Ethical Considerations/Protection of Human Subjects

The University of Alabama (UA) Institutional Review Board (IRB) approval was obtained prior to initiating the project. There was no to very minimal risk noted. To protect

patient identity according to the Health Insurance Probability and Accountability Act of 1996 (HIPAA) only a numerical number was used for identification. Written informed consent was obtained prior to assessment and stored in the UA box. Questionnaires were scanned and stored in an electronic data box provided by UA. Blood pressure was stored in a password-protected Excel sheet. All electronic data was password protected. All hard data copies were stored in a locked drawer in a locked office. Only staff had access to locked drawer and a log was used to keep access. The proper standard of care was used to prevent any unethical issues.

Conclusion

Hypertension is a major concern in the United States. The purpose of this project was to determine those at risk for HTN as well as to provide education to decrease elevated BP, increase BP management, increase disease severity perception, self-care, and literacy in an Occupational setting. Participants who required follow-up were not aware of prehypertension and the risks it can cause. 33 participants consented to participate in the project of 16 who fell into follow-up inclusion. 11 of 16 followed up post education from AHA and a large correlation in effect size was seen with pre- and post-education in relation to SBP. SBP decreased in those with post education. The understanding of HTN and its effects showed a large correlation in post education. This was noted with higher HK-LS literacy scores during follow-up. Systolic and diastolic BP was positively related to Brief Illness scores with also a large effect size, post education participants' perceptions of severity of HTN increased. SBP and DBP were largely positive in relation to H-SCALE subcategory weight management, higher scores indicated more awareness and activity to control weight. Follow-up participants also had increased habit changes. The evidence provided supports knowledgeable and high-scoring questionnaires

showing a highly controlled HTN project. Data analysis supports the presence of OH clinics for early HTN awareness.

Also noted 45% of participants in the study were African American. 73% of the 45% required follow-up due to elevated blood pressure. African Americans also have an increased risk of hypertension. The elevated number of African Americans that participated with elevated BP helps support early screening in OH due to population in manufacturing facilities being predominantly African Americans. Further recommendations for this study are longer implementation period, increase follow-up participation, and addressing more at-risk populations. Overall habits and lifestyle changes were made with this improvement and the clinic problem was addressed and favorable outcomes were noted.

References

American Heart Association. (2021). *How can I Reduce High Blood Pressure?*

<https://www.heart.org/-/media/Files/Health-Topics/Answers-by-Heart/How-Can-I-Reduce-High-Blood-Pressure.pdf>

American Heart Association. (2022, March 4). *High Blood Pressure Among Black People.*

<https://www.heart.org/en/health-topics/high-blood-pressure/why-high-blood-pressure-is-a-silent-killer/high-blood-pressure-and-african-americans>

American Heart Association. (2022, March 4). *Health Threats from High Blood Pressure*

<https://www.heart.org/en/health-topics/high-blood-pressure/health-threats-from-high-blood-pressure>

American Heart Association. (2023, May 31). *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>

American Heart Association. (2023, May 30). *Understanding Blood Pressure Readings.*

<https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings>

Beevers, G., Lip, G. Y. H., & O’Brien, E. (2001). The pathophysiology of hypertension. *BMJ*.

322(7291), 912–916. doi.org/10.1136/bmj.322.7291.912

Broadbent, E., Petrie, K. J., Main, J., & Weinman, J. (2006). *The Brief Illness Perception*

Questionnaire. 60(6), 631–637. doi.org/10.1016/j.jpsychores.2005.10.020

Butts, J. B., & Rich, K. L. (2021, August 30). *Philosophies and Theories for Advanced Nursing*

Practice. Jones & Bartlett Learning

- Carey, R.M, Muntner ,P., Bosworth, H.B., Whelton,, P.K. (2018). Prevention and control of hypertension: JACC health promotion series. *Journal of the American College of Cardiology*.72(11):1278-1293. doi: [10.1016/j.jacc.2018.07.008](https://doi.org/10.1016/j.jacc.2018.07.008)
- Centers for Disease Control and Prevention. (n.d). Interactive Atlas of Heart Disease and Stroke. <http://nccd.cdc.gov/DHDSAtlas>.
- Centers for Disease Control and Prevention (2019, July 23). Workplace health strategies-Blood pressure. <https://www.cdc.gov/workplacehealthpromotion/health-strategies/blood-pressure/index.html>.
- Erkoc, S. B., Isikli, B., Metintas, S., & Kalyoncu, C. (2012). Hypertension Knowledge-Level Scale (HK-LS): a study on development, validity and reliability. *International Journal of Environmental Research and Public Health*, 9(3), 1018–1029. doi.org/10.3390/ijerph9031018
- Fukai, K., Nagata, T., Mori, K., Ohtani, M., Fujimoto, K., Nagata, M., & Fujino, Y. (2020). Validation of self-reported medication use for hypertension, diabetes, and dyslipidemia among employees of large-sized companies in Japan. *Journal of Occupational Health*, 62(1), 12138. doi.org/10.1002/1348-9585.12138
- Fukai, K., Furuya, Y., Nakazawa, S., Kojimahara, N., Hoshi, K., Toyota, A., & Tatemichi, M. (2021). A case control study of occupation and cardiovascular disease risk in Japanese men and women. *Scientific reports*, 11(1), 23983. doi.org/10.1038/s41598-021-03410-9
- Hashiguchi, K., Nagata, T., Mori, K., Nagata, M., Fujino, Y., & Ito, M. (2019). Occupational Health Services Improve Effective Coverage for Hypertension and Diabetes Mellitus at Japanese Companies. *Journal of UOEH*, 41(3), 271–282. doi.org/10.7888/juoeh.41.271

- Kuiper, H., van Leeuwen, C. M. C., Stolwijk-Swüste, J. M., & Post, M. W. M. (2022). Reliability and validity of the Brief Illness Perception Questionnaire (B-IPQ) in individuals with a recently acquired spinal cord injury. *Clinical Rehabilitation*, 36(4), 550–557. <https://doi.org/10.1177/02692155211061813>
- Lu, Y., Yan, H., Yang, J., & Liu, J. (2020). Occupational stress and psychological health impact on hypertension of miners in noisy environment in Wulumuqi, China: a case-control study. *BMC Public Health*, 20(1), 1675. doi.org/10.1186/s12889-020-09760-9
- Ma, C. (2018). An investigation of factors influencing self-care behaviors in young and middle-aged adults with hypertension based on a health belief model. *Heart & Lung*, 47(2), 136–141. doi.org/10.1016/j.hrtlng.2017.12.001
- Michaelis, M., Witte Née Farian, C., Schüle, B., Frick, K., & Rieger, M. A. (2021). Can Motivational Interviewing Make a Difference in Supporting Employees to Deal with Elevated Blood Pressure? A Feasibility Study at the Workplace. *International Journal of Environmental Research and Public Health*, 18(8), 4179. doi.org/10.3390/ijerph18084179
- Nagata, M., Nagata, T., Takahashi, H., & Mori, K. (2022). Association of organizational factors with the proportion of healthy behaviours and control of blood pressure at a company level. *Journal of Occupational and Environmental Medicine*, 64(1), 34–38
- National Heart, Lung and Blood Institute. (2017, December 13). *NIH's SPRINT trial plays a key role in the evolution of the new blood pressure guidelines.* [https://www.nhlbi.nih.gov/news/2017/nihs-sprint-trial-played-key-role-evolution-new-blood-pressure-guidelines.](https://www.nhlbi.nih.gov/news/2017/nihs-sprint-trial-played-key-role-evolution-new-blood-pressure-guidelines)

- Ndione, I., Aerts, A., Barshilia, A., Boch, J., Rosiers, S. D., Ferrer, J. M. E., Saric, J., Seck, K., Sene, B. N., Steinmann, P., Venkitachalam, L., & Shellaby, J. T. (2021). Fostering cardiovascular health at work - case study from Senegal. *BMC Public Health*, *21*(1), 1108. doi.org/10.1186/s12889-021-11109-9
- Niriayo, Y. L., Ibrahim, S., Kassa, T. D., Asgedom, S. W., Atey, T. M., Gidey, K., ... & Kahsay, D. (2019). Practice and predictors of self-care behaviors among ambulatory patients with hypertension in Ethiopia. *PLoS One*, *14*(6). doi.org/10.1371/journal.pone.0218947
- Reif, J., Chan, D., Jones, D., Payne, L., & Molitor, D. (2020). Effects of a workplace wellness program on employee health, health beliefs, and medical use: a randomized clinical trial. *JAMA Internal Medicine*, *180*(7), 952–960. doi.org/10.1001/jamainternmed.2020.1321
- Seibt, R., Hunger, B., Stieler, L., Stoll, R., & Kreuzfeld, S. (2018). Early detection of undiagnosed hypertension based on occupational screening in the hotel and restaurant industry. *BioMed Research International*, *2018*, 6820160. doi.org/10.1155/2018/6820160
- Silva, B. V., Sousa, C., Caldeira, D., Abreu, A., & Pinto, F. J. (2022). Management of arterial hypertension: Challenges and opportunities. *Clinical Cardiology*, *45*(11), 1094–1099. doi.org/10.1002/clc.23938
- Tebelu, D. T., Tadesse, T. A., Getahun, M. S., Negussie, Y. M., & Gurara, A. M. (2023). Hypertension self-care practice and its associated factors in Bale Zone, Southeast Ethiopia: A multi-center cross-sectional study. *Journal of Pharmaceutical Policy and Practice*, *16*(1), 20. doi.org/10.1186/s40545-022-00508-x

- Unger, T., Borghi, C., Charchar, F., Khan, N., Poulter, N., Prabhakaran, D., Ramirez, A., Schiaich, M., Stergiou, G., Tomaszewski, M., Wainford, R., Williams, B., Shutte, A. (2020). 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*, 75(6), 1334-1357.
doi.org/10.1161/HYPERTENSIONAHA.120.15026
- U.S. Preventive Services Task Force (2021, April 27). *Hypertension in Adults: Screening*.
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/hypertension-in-adults-screening#bootstrap-panel--9>
- Warren-Findlow, J., & Seymour, R. B. (2011). Prevalence rates of hypertension self-care activities among African Americans. *Journal of the National Medical Association*, 103(6), 503–512. doi.org/10.1016/s0027-9684(15)30365-5
- Warren-Findlow, J., Krinner, L. M., Vinoski Thomas, E., Coffman, M. J., Gordon, B., & Howden, R. (2020). Relative and cumulative effects of hypertension self-care behaviors on blood pressure. *Western Journal Of Nursing Research*, 42(3), 157-164.
doi:[10.1177/0193945919851111](https://doi.org/10.1177/0193945919851111)
- Washburn, L. (2020). Understanding the Health Belief Model. *Tennessee: Department of Family and Consumer Sciences, University of Tennessee [Internet]*
- World Health Organization. (25, August 2021). *More than 700 people with untreated hypertension*. <https://www.who.int/news/item/25-08-2021-more-than-700-million-people-with-untreated-hypertension>

Appendix

Figure 1

Health Belief Model in Hypertension

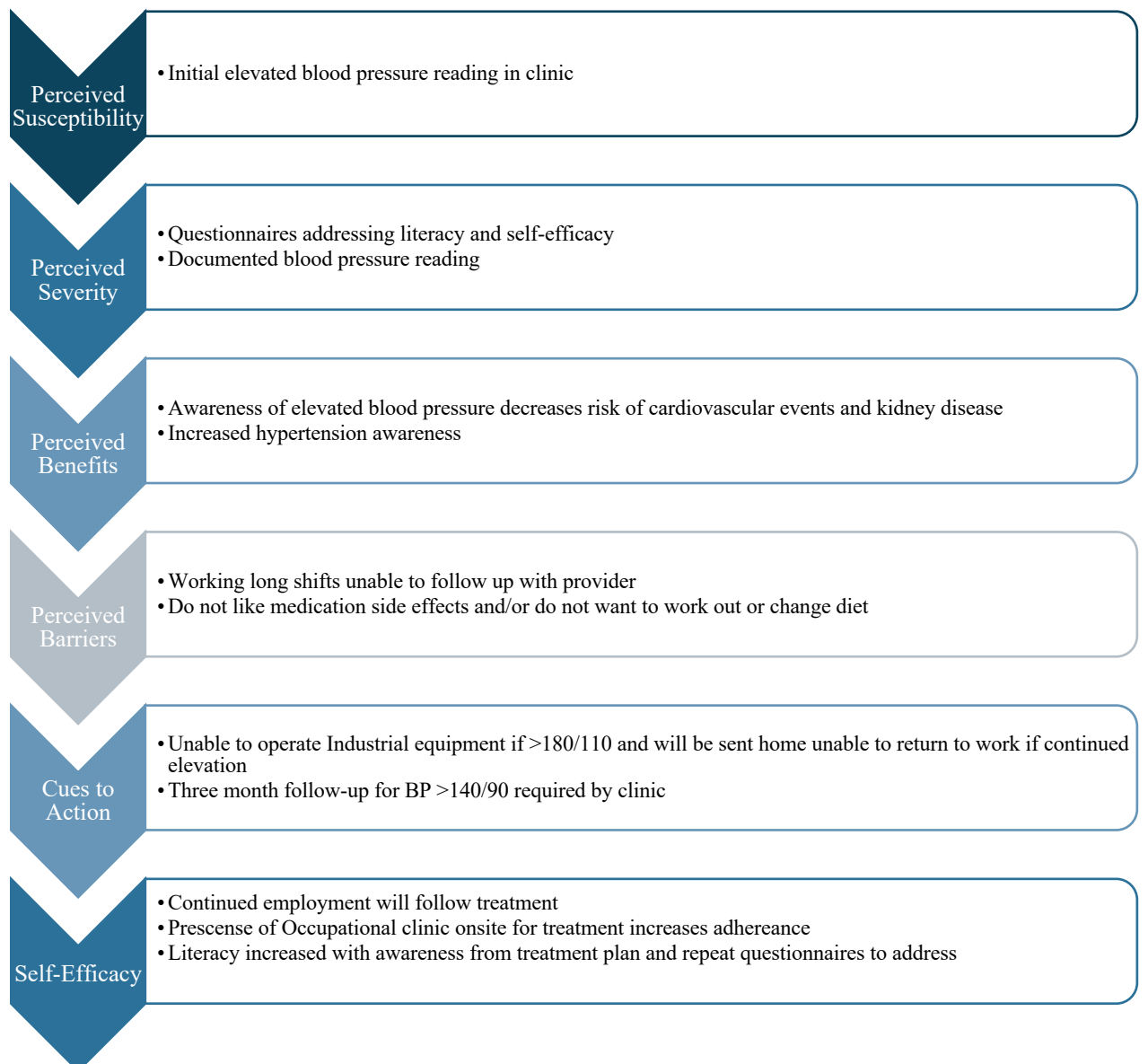
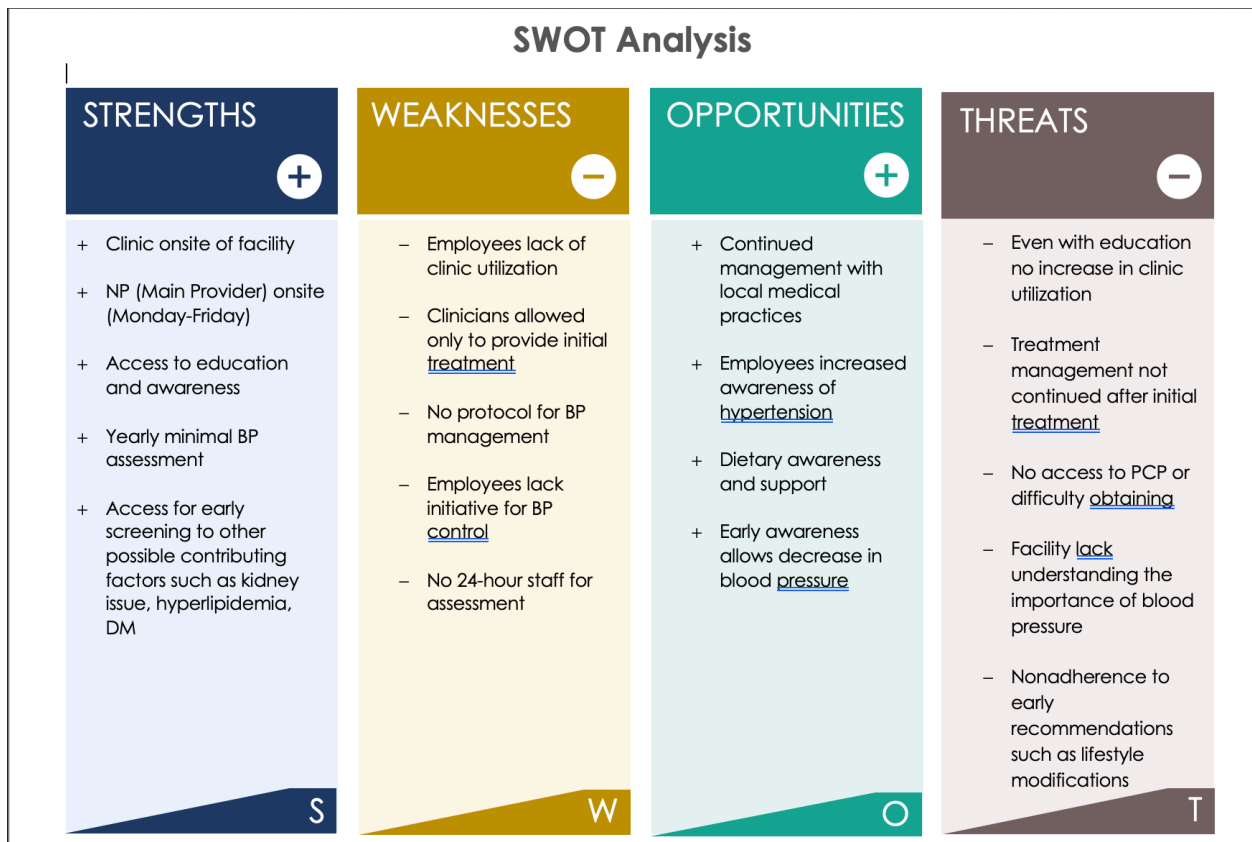


Figure 2

SWOT Analysis



Brief Illness Use Permission

9/13/23, 1:48 PM

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1/8

H-SCALE Permission

Dear Kira,

Thank you for your interest in using the H-SCALE in your research. I'm happy to discuss its development at any time. You have my permission to use the scale in your research and to translate it into your native language, if appropriate. Let me know if you need the Spanish version.

The self-administered form of the H-SCALE is attached as a word document along with the scoring instructions.

NOTE: This version is slightly different than what was published in the original JNMA article. Please read the attached scoring instructions carefully so that you understand how to score the scales and their limitations.

If you are planning on collecting the H-SCALE data in an online survey such as with a software tool like Qualtrics or Survey Monkey, that is permitted. However, permission does not include embedding the survey questions and the scoring into any kind of mobile app or mHealth application that you may be developing without my prior permission in writing. The H-SCALE is my intellectual property and is copyrighted. The H-SCALE is not available for commercial use.

The *Journal of the National Medical Association* article (Warren-Findlow & Seymour) best describes the original development of the H-SCALE. The *Journal of Clinical Hypertension* article describes the original subscales and their correlations with blood pressure. The article published in the *Journal of Nutrition Education and Behavior* describes the revised diet scale (the DASH-Q) and its validation. The most recent publication (2019) in the *Western Journal of Nursing Research* presents the current subscales and their correlations with blood pressure as well as adherence to the subscales and their association with control of blood pressure. Please cite the appropriate publication (with the correct spelling of my name “Warren-Findlow”). I understand that in some areas of the world this is not common practice to reference other works, but this is a condition of your being able to use the H-SCALE. Please indicate that you have the researcher’s permission to use the scale.

Keep me informed of how your work progresses. I am always interested in hearing what others are doing in relation to hypertension self-care and blood pressure.

Please confirm that you understand and agree to the above restrictions in an email response. Let me know if you have any questions.

Sincerely, Jan Warren-Findlow

Jan Warren-Findlow, PhD [@DrJanWF](#)

Pronouns: she/her/herself

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HK-LS Permission

Disclaimer: Articles for use of HK-LS were retrieved by Open access on Pubmed. Attempts to contact S.B. Erkoç for permission to use scale were unsuccessful. Erkoç's email is no longer valid. Comparison of original HK-LS scale and scale used in article by Alshammari et al., 2022 is noted as the same.

Alshammari, S. A., Alshathri, A. H., Aldharman, S. S., Alshathri, A. H., Abukhlaled, J. K.,

Alabdullah, D. W., & Aleban, S. (2022). Construct Validity and Reliability of the Arabic

Version of Hypertension Knowledge-Level Scale Among Saudi

Population. *Cureus*, 14(12), e33182. <https://doi->

[org.libdata.lib.ua.edu/10.7759/cureus.33182](https://doi-org.libdata.lib.ua.edu/10.7759/cureus.33182)


Erkoç, S. B., Isikli, B., Metintas, S., & Kalyoncu, C. (2012). Hypertension Knowledge-Level

Scale (HK-LS): a study on development, validity and reliability. *International Journal of*

Environmental Research and Public Health, 9(3), 1018–1029.

doi.org/10.3390/ijerph9031018

Letter of Agreement



Date 2/27/2023

Hollie Ottinger
Area Manager, RN
Oracle-Cerner/ATI Richburg
4374 Lancaster Highway
Richburg, SC 29729

Student: Kira Robinson
Clinical Advisor/Preceptor: Dr. George Brvan
Associate Dean of Graduate Programs: Dr. Patricia Carter
Academic Year: Summer 2023, Fall 2023, Spring 2024
Course Name and Number: NUR 796/797/798 DNP Project Immersion

Dear Administrator:

We are requesting permission for the above referenced student from the University of Alabama Capstone College of Nursing to engage in a learning experience with the indicated preceptor at your agency. A faculty member will be assigned to guide the student's learning experience. **The College of Nursing must have your agency's permission prior to the student engaging in the clinical experience.** Please complete and sign one copy of this letter and return to the *student* for submission via Clinical Placement Request Survey.

The College of Nursing agrees that:

- 1) the student is in good health, has licensure as appropriate, professional liability insurance and CPR certification;
- 2) faculty members will take appropriate administrative action relative to student behavior in the agency, including removing the student if necessary; and
- 3) the student will be expected to adhere to agency policies and procedures.

The agency agrees that:

- 1) the preceptor will orient the student to the agency, policies and procedures;
- 2) the preceptor will facilitate student learning consistent with the course and student learning objectives;
- 3) the preceptor will collaborate with the College faculty member in evaluating the student's performance in the learning experience; and
- 4) the same emergency treatment will be provided to the student as that extended to its employees for injury or illness while fulfilling activities of the agency at the expense of the student.

THE UNIVERSITY OF ALABAMA*

Box 870358 | Tuscaloosa, AL 35487-0358 | 205-348-6639 | Fax 205-348-5559 | <http://nursing.ua.edu>

The preceptor will be given a copy of the student's learning objectives, clinical skills checklist, and a preceptor packet.

Please contact me if you have any questions regarding this request or if you need further information. My email is clinicals@ua.edu and my phone number is (205) 348-0678.

Sincerely,

Michele Montgomery

Michele Montgomery, PhD, MPH, RN
Senior Associate Dean for Academic Programs

LETTER OF AGREEMENT PERMISSION

I hereby GRANT permission for the above referenced student to engage in a learning experience at our agency.

I DO NOT GRANT permission for the above referenced student to engage in a learning experience at our agency.

Signature: Hollie Ottiges, Sr Mgr. Date: 9/19/2023

Printed Name: Hollie Ottiges

Title: Sr Manager, Workforce Health Services

Form: Fillable LOA Graduate

IRB Approval



Recruitment Script

I am working on a study for my Doctorate degree in Nursing at the University of Alabama. I would like to have you as a participant in my study. My study aims to increase blood pressure management by increasing self-literacy and self-care related to blood pressure. At any time, you may withdraw from the study. You may also consent not to be included in the study. There are very minimal risks to no risks involved in this study. Once consent is agreed I will have you fill out questionnaires related to health literacy and self-care regarding hypertension. I will discuss the process of obtaining your blood pressure. We will then review your questionnaire answers. If your systolic blood pressure is > 130mm Hg and/or diastolic >85mm Hg I will have you return in two weeks for follow-up. You will be given education at the end of the visit to review. During the follow-up, we will repeat questionnaires and review answers. I will also measure blood pressure. We will discuss the benefits of increased literacy and self-care regarding blood pressure. The risks and benefits are also noted in the consent

Participation Consent

Informed Consent

Please read this informed consent carefully before you decide to participate in the study.

Consent Form Key Information:

- Participation in three questionnaires related to elevated blood pressure, blood pressure measurement, post-education intervention for elevated blood pressure, and a return visit for repeated blood pressure measurement.
- Take 3 surveys- Brief Illness Questionnaire, H-SCALE, and the HK-LS questionnaires to address hypertension literacy and self-care.
- Hypertension education provided by the American Heart Association entitled: Why High bloodpressure is a silent killer; Understanding Bloodpressure Readings, Health threatsfrom high bloodpressure, the facts about high bloodpressure, and How can I reduce high blood pressure?
- No information collected will connect identity with responses.

Purpose of the research study: The purpose of this quality improvement project is to increase healthy literacy through questionnaires and education to decrease the risk of cardiovascular events related to hypertension by providing screenings in an Occupational setting.

What you will do in the study: Upon arrival at the clinic, you will review this consent and sign for permission to participate or verbally decline participation. If you consent to participate you will complete a Hypertension literacy questionnaire, the Brief Illness questionnaire, and the H-SCALE questionnaire. You may skip any questions that you may not understand or do not want to answer. Your score will be scaled according to the amount of answered questions. In the next step, I will measure your blood pressure. I will then review your blood pressure and questionnaires with you. If an elevated blood pressure reading is >130 mm Hg/ 85 mm Hg I will provide you with education for review. If you have elevated blood pressure readings > 130 mm Hg/ 85 mm Hg you will return for follow-up in two weeks. During this follow-up, you will complete questionnaires again and your blood pressure measured. Postintervention blood pressure and questionnaires will be reviewed with you and all data will be documented in a password protected file. Your blood pressure will be documented in your medical record per company policy. You will be given a unique identifier to keep your information private and no identifying factors. Your questionnaire scores as well as blood pressure if follow-up is required will be documented pre- and post-education. Data from questionnaires will determine literacy and understanding of hypertension. There will be no use of photography or voice-recorded data.

Time required: The study will require about an hour initially and thirty minutes if you require follow-up.

Risks: There are no anticipated risks in this study

Benefits: There may be no direct benefits to you for participating in this research study though you may see a lower blood pressure from the study. The study may help the researcher understand if hypertension literacy helps in decreasing blood pressure and self-blood pressure control.

Confidentiality: Your data will be stored in the University of Alabama box which is password-protected. Only the investigator, faculty advisor, and clinical advisor will have access to this information. You will be assigned a code number as a patient identifier. All data will be documented under the unique patient identifier. If follow-up is required, you be given an appointment card with the appointment day and time and your participation number. Each consent, questionnaire, and blood pressure measurement will be scanned and stored according to the patient identifier in the UA box and then shredded. Only your blood pressure reading will be stored in the medical record as this is a requirement by the company and part of your physical. An Excel password-protected data sheet will also be used for data analysis. Your name will not be used in any report.

Voluntary participation: Your participation in the study is completely voluntary. Your participation will not affect your employment or services in the clinic.

Right to withdraw from the study: You have the right to withdraw from the study at any time without penalty.

How to withdraw from the study: If you want to withdraw from the study, please inform the researcher with a brief statement in writing via email, letter, voicemail, in-person, or phone call. There is no penalty for withdrawing. If you would like to withdraw after your materials have been submitted, please contact the researcher via the above methods.

Compensation/Reimbursement: There is no compensation or reimbursement for your participation.

Using data beyond this study: The researcher would like to make the information collected in this study available to other researchers after the study is completed. Your information will be stored, used, and shared for future research studies, including but not limited to a literature review, data support for

Occupational clinics, and data supporting early screenings for high blood pressure. Researchers of future studies will not ask your permission for each new study. However, the information you provide will be combined with the information provided by others to create a large data set. Your name and other information that could potentially identify you will not be connected to the information shared with other researchers nor will they attempt to identify you.

If you have questions about the study or need to report a study-related issue please contact, contact:

Name of Principal Investigator: Kira Robinson

Title: Doctor of Nursing Practice student

Department Name: Occupational Health Center

Telephone: 803-789-4381

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Faculty Advisor's Name: Dr. Letisha Schott

Department Name: Capstone College of Nursing

Telephone: 205-348-6665

Email address: Isscott2@ua.edu

If you have questions about your rights as a participant in a research study, would like to make suggestions or file complaints and concerns about the research study, please contact: The University of Alabama Office for Research Compliance (205) -348-8461 or toll-free at 1-877-

8203066. You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach Website at <https://research.ua.edu/compliance/irb/>. You may email the Office for Research Compliance at rscompliance@ua.edu.

Agreement:

I agree to participate in the research study described above.

I do not agree to participate in the research study described above.

Signature of Research Participant

Date

Print Name of Research Participant

Signature of Investigator or other Person Obtaining Consent

Date

Print Name of Investigator or Other Person Obtaining Consent

Brief Illness Questionnaire

E. Broadbent et al. / Journal of Psychosomatic Research 60 (2006) 631 – 637

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Appendix A. The Brief Illness Perception Questionnaire

For the following questions, please circle the number that best corresponds to your views:

How much does your illness affect your life?	0	1	2	3	4	5	6	7	8	9	10
no affect at all											severely affects my life
How long do you think your illness will continue?	0	1	2	3	4	5	6	7	8	9	10
a very short time											forever
How much control do you feel you have over your illness?	0	1	2	3	4	5	6	7	8	9	10
absolutely no control											extreme amount of control
How much do you think your treatment can help your illness?	0	1	2	3	4	5	6	7	8	9	10
not at all											extremely helpful
How much do you experience symptoms from your illness?	0	1	2	3	4	5	6	7	8	9	10
no symptoms at all											many severe symptoms
How concerned are you about your illness?	0	1	2	3	4	5	6	7	8	9	10
not at all concerned											extremely concerned
How well do you feel you understand your illness?	0	1	2	3	4	5	6	7	8	9	10
don't understand at all											understand very clearly
How much does your illness affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)	0	1	2	3	4	5	6	7	8	9	10
not at all affected emotionally											extremely affected emotionally

Please list in rank-order the three most important factors that you believe caused your illness.

The most important causes for me:-

1. _____
2. _____
3. _____

HK-LS

HYPERTENSION KNOWLEDGE-LEVEL SCALE (HK-LS)		TRUE	FALSE
1)	Increased diastolic blood pressure also indicates increased blood pressure		
2)	High diastolic or systolic blood pressure indicates increased blood pressure		
3)	Drugs for increased blood pressure must be taken everyday		
4)	Individuals with increased blood pressure must take their medication only when they feel ill		
5)	Individuals with increased blood pressure must take their medication throughout their life		
6)	Individuals with increased blood pressure must take their medication in a manner that makes them feel good		
7)	If the medication for increased blood pressure can control blood pressure, there is no need to change lifestyles		
8)	Increased blood pressure is the result of aging, so treatment is unnecessary		
9)	If individuals with increased blood pressure change their lifestyles, there is no need for treatment		
10)	Individuals with increased blood pressure can eat salty foods as long as they take their drugs regularly		
11)	Individuals with increased blood pressure can drink alcoholic beverages		
12)	Individuals with increased blood pressure must not smoke		
13)	Individuals with increased blood pressure must eat fruits and vegetables frequently		
14)	For individuals with increased blood pressure, the best cooking method is frying		
15)	For individuals with increased blood pressure, the best cooking method is boiling or grilling		
16)	The best type of meat for individuals with increased blood pressure is white meat		
17)	The best type of meat for individuals with increased blood pressure is red meat		
18)	Increased blood pressure can cause premature death if left untreated		
19)	Increased blood pressure can cause heart diseases, such as heart attack, if left untreated		
20)	Increased blood pressure can cause strokes, if left untreated		
21)	Increased blood pressure can cause kidney failure, if left untreated		

22) Increased blood pressure can cause visual disturbances, if left untreated		
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H-SCALE

The following questions ask about your hypertension (high blood pressure) self-care activities during the past 7 days. For each question, <u>circle</u> the number of days that you performed that activity.	
<u>Medication Usage</u>	
<i>How many of the past 7 days did you:</i>	<u>Number of Days</u>
1. Take your blood pressure pills?	0 1 2 3 4 5 6 7 <input type="checkbox"/> I have not been prescribed blood pressure pills.
2. Take your blood pressure pills at the same time everyday?	0 1 2 3 4 5 6 7 <input type="checkbox"/> I have not been prescribed blood pressure pills.
3. Take the recommended number of blood pressure pills?	0 1 2 3 4 5 6 7 <input type="checkbox"/> I have not been prescribed blood pressure pills.
<u>Diet</u>	
<i>How many of the past 7 days did you:</i>	<u>Number of Days</u>
4. Eat nuts or peanut butter?	0 1 2 3 4 5 6 7 <input type="checkbox"/> I am allergic to nuts.
5. Eat beans, peas, or lentils?	0 1 2 3 4 5 6 7
6. Eat eggs?	0 1 2 3 4 5 6 7

7. Eat pickles, olives, or other vegetables in brine?	0	1	2	3	4	5	6	7
8. Eat five or more servings of fruits and vegetables?	0	1	2	3	4	5	6	7
9. Eat more than one serving of fruit (fresh, frozen, canned or fruit juice)?	0	1	2	3	4	5	6	7
10. Eat more than one serving of vegetables?	0	1	2	3	4	5	6	7
11. Drink milk (in a glass, with cereal, or in coffee, tea or cocoa)?	0	1	2	3	4	5	6	7
12. Eat broccoli, collard greens, spinach, potatoes, squash or sweet potatoes?	0	1	2	3	4	5	6	7
13. Eat apples, bananas, oranges, melon or raisins?	0	1	2	3	4	5	6	7
14. Eat whole grain breads, cereals, grits, oatmeal or brown rice?	0	1	2	3	4	5	6	7
<u>Physical Activity</u>								
<i>How many of the past 7 days did you:</i>	<u>Number of Days</u>							
15. Do at least 30 minutes total of physical activity?	0	1	2	3	4	5	6	7
16. Do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work?	0	1	2	3	4	5	6	7

17. Engage in weight lifting or strength training (other than what you do around the house or as part of your work)?	0	1	2	3	4	5	6	7
18. Do any repeated heavy lifting or pushing/pulling of heavy items either for your job or around the house or garden?	0	1	2	3	4	5	6	7
<u>Smoking</u> <i>How many of the past 7 days did you:</i>	<u>Number of Days</u>							
19. Smoke a cigarette, e-cigarette, vape, cigar or hookah, even just one puff?	0	1	2	3	4	5	6	7
20. Stay in a room or ride in an enclosed vehicle while someone was smoking?	0	1	2	3	4	5	6	7
<p>The following questions ask about your efforts to manage your weight <u>during the last 30 days</u>. If you were sick during the past month, please think back to the previous month that you were not sick. <u>Circle the one answer</u> that best describes what you do to lose weight or maintain your weight.</p>								
<u>Weight management</u> <i>In order to lose weight or maintain my weight...</i>	Strongly Disagree		Disagree	Sure	Agree	Strongly Agree		
21. I am careful about what I eat.	1	2	3	4	5			
22. I read food labels when I grocery shop.	1	2	3	4	5			

23. I exercise in order to lose or maintain weight.	1	2	3	4	5
24. I have cut out drinking sugary sodas and sweet tea.	1	2	3	4	5
25. I eat smaller portions or eat fewer portions.	1	2	3	4	5
26. I have stopped buying or bringing unhealthy foods into my home.	1	2	3	4	5
27. I have cut out or limit some foods that I like but that are not good for me.	1	2	3	4	5
28. I eat at restaurants or fast food places less often.	1	2	3	4	5
29. I substitute healthier foods for things that I used to eat.	1	2	3	4	5
30. I have modified my recipes when I cook.	1	2	3	4	5

The next three questions are about alcohol consumption. A drink of alcohol is defined as:

One, 12 oz. can or bottle of beer;

One, 4 ounce glass of wine;

One, 12 oz. can or bottle of wine cooler;

One mixed drink or cocktail;

Or 1 shot of hard liquor.

31. On average, how many days per week do you drink alcohol?	0 1 2 3 4 5 6 7
32. On a typical day that you drink alcohol, how many drinks do you have?	0 write in # _____
33. What is the largest number of drinks that you've had on any given day within the last month?	0 write in # _____

Notes on using the H-SCALE – June 28, 2018

As of June 2014, two studies have been conducted and published examining the validity and reliability of all 6 subscales of the H-SCALE (Warren-Findlow & Seymour, 2011; Warren-Findlow, et al., 2013). Researchers using the H-SCALE should be advised that the full scale has currently only been administered in English to Americans in the Southern United States. Both of these samples were predominantly Black/African Americans. We strongly encourage you to conduct reliability statistics at a minimum with your study sample.

The most recent study using the full H-SCALE assessed the concurrent validity of the HSCALE subscales against clinical blood pressures in a primary care setting (Warren-Findlow et al., 2013). That sample included both Blacks and Whites. This study also tested the H-SCALE in a self-administered questionnaire format. In the original study (Warren-Findlow & Seymour, 2011), participants were interviewed face-to-face. We are providing you with the self-administered format of the H-SCALE.

More recently, we have translated the H-SCALE into Spanish using a rigorous forward and backward translation process. Pilot data from 124 Hispanic, primary care patients has been collected; findings are published in *Ethnicity and Health*. Please contact me if you are interested in using the Spanish H-SCALE.

Updates to the H-SCALE regarding the diet subscale

Prior to 1/1/15, the diet subscale contained 12 items. This subscale had poor internal consistency based on Cronbach's alphas and better adherence was positively associated with higher blood pressure (Warren-Findlow, Dulin, et al., 2013); the exact opposite of what we hypothesized. In 2013-2014, we conducted a two-phase study to better understand issues with the diet subscale, make necessary revisions to items, and to conduct further psychometric tests.

The new subscale, which we term "DASH-Q" for DASH-Quality contains 11 items which are solely focused on respondents' frequency of food consumption (Warren-Findlow, Reeve & Racine, *pub 2016 – Journal of Nutrition Education & Behavior*). The foods specified are less about high sodium foods and are more based on the nutritional balance outlined in the DASH diet: emphasis on eating fruits and vegetables; consuming alternate forms of protein as opposed to meat-based protein; and increasing consumption of foods with potassium, fiber and whole grains. The attached measure includes the DASH-Q with associated scoring instructions.

The DASH-Q is a more robust self-report measure of diet quality than the previous diet scale embedded in the H-SCALE. Further, because it focuses on specific foods and food sources, it is also easier to translate. We urge H-SCALE users to field this new measure in place of the previous one in all future studies.

Using the H-SCALE

Please reference the relevant articles for the scale and/or subscale in any published articles, presentations or theses/dissertations when using the H-SCALE or the DASH-Q. You must also include a statement indicating that you have the permission of the scale developer (Dr. Jan Warren-Findlow) to use this scale. The primary description of the scale and its development is in the *Journal of the National Medical Association* by Warren-Findlow and Seymour (2011).

Correlations between subscale scores and systolic and diastolic blood pressure are reported in the *Journal of Clinical Hypertension*. The DASH-Q is available in the *Journal of Nutrition Education & Behavior*. Individuals using the self-efficacy to manage hypertension measures should cite the *Journal of Community Health* article.

Follow H-SCALE Research and Development

We would love to be informed of your results! Please let us know about your prevalence rates, reliability statistics for your sample, additional analyses or validity tests, and any problems you encounter with using the scale (jwarren1@uncc.edu). You can learn more about current projects using the H-SCALE on ResearchGate (www.researchgate.net), just search on “Warren-Findlow.” Thank you for your interest in our research.

Scoring the H-SCALE

The H-SCALE contains items related to six, hypertension self-care activities recommended by the JNC7: taking medication, following a low-salt diet, engaging in physical activity, avoiding tobacco smoke, using strategies to maintain or lose weight, and reducing alcohol consumption. Each of these subscales is scored and then cutpoints are applied to determine the individual’s adherence to the activity.

Medication (3 items) – To calculate medication adherence, add the responses for items 1-3 (range 0-21). Participants who score a 21 are considered adherent. Other measures of medication adherence use 80% adherence as the cutpoint as opposed to 100%. **Note:** some respondents may not have been prescribed anti-hypertensive medications.

DASH-Q (11 items; items 4-14) – These items assess intake of healthy foods associated with the nutritional composition of the DASH diet. Item #7 (“Eat pickles, olives, or other vegetables in brine?”) should be reverse coded. Responses for all items are then summed. The range should be 0 to 77. Scores of 32 and below are considered low diet quality; scores between 33 and 51 are medium diet quality; and scores of 52 or greater should be considered adherent. For researchers outside the US, these items will need additional effort to determine the culturally

relevant foods. We recommend allowing for 1-2 missing items per respondent. For samples with missing items that exceed 10%, researchers may opt to lower the cut points by 1 point.

Physical Activity (2 items; 15 and 16) – Responses are summed (range 0-14). Participants who score an 8 or better are considered adherent to physical activity recommendations; all others are non-adherent. This designation was chosen to ensure that participants have to report some combination of both physical activity and exercise in order to be considered adherent. There are 2 additional items related to isometric or strength training; these are currently being piloted. No scoring instructions are currently available but these items should reflect the US Surgeon General’s recommendations to do strength training at least 2 days a week.

Smoking (2 items; 19 and 20) – Responses are summed (range 0 to 14). Respondents who score zero would be considered adherent.

Weight Management (10 items; 21-30) – These ten items assess activities undertaken to manage weight through dietary practices such as reducing portion size and making food substitutions as well as exercising to lose weight. Items assessed agreement with weight management activities during the past 30 days. Response categories range from strongly disagree (1) to strongly agree (5). Sum the responses to calculate the score with a range from 10-50. Participants who reported that they agreed or strongly agreed with all 10 items (score ≥ 40) are considered to be adherent to good weight management practices.

Alcohol (3 items; 31-33) - Alcohol intake is assessed using an existing measure, the 3item, National Institute on Alcohol Abuse and Alcoholism (NIAAA) Quantity and Frequency Questionnaire. Originally, adherence was deemed to be alcohol abstinent. The scale was validated using Southern African Americans who were very religious and had a correspondingly high prevalence of alcohol abstinence. Participants who reported not drinking any alcohol in the last 7 days (item #31), or who indicated that they usually did not drink at all, were considered adherent. *Currently, we recommend using one of two methods. For a continuous variable, multiply item #31 by item #32 which would indicate the total number of alcoholic drinks consumed per week* (range from zero to unknown; Warren-Findlow et al., 2013. This form is useful if you are interested in doing a dose-response analysis of alcohol consumption or trying to determine the prevalence of binge drinking. To determine adherence in the form of a dichotomous variable, we recommend scoring men and women differently. According to JNC7 guidelines, adherence to moderate alcohol consumption among men is considered ≤ 2 drinks/day for men (scores of 14 or less) and ≤ 1 drink/day for women (scores of 7 or less). Categorize the continuous form of the variable into adherent/non-adherent based on the above gender guidelines (14 or less is adherent for men and 7 or less is adherent for women). Our most recent research indicates that these adherence cutpoints are significantly correlated with systolic and diastolic blood pressure.

American Heart Association Education

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>

Why High Blood Pressure is a "Silent Killer"



High blood pressure is often called the “silent killer”

Most of the time, [high blood pressure](#), or hypertension, has no obvious symptoms to indicate that something is wrong. The best ways to protect yourself are being aware of the [risks](#) and [making changes that matter](#).

A few facts to be aware of:

- Many people with high blood pressure don’t even know they have it. Often the [signs and symptoms](#) are misunderstood.
- High blood pressure develops slowly over time and can be related to many [causes](#).
- High blood pressure cannot be cured. But it can be managed effectively through [lifestyle changes](#) and, when needed, [medication](#).

Know your numbers

Know where you stand by [measuring your blood pressure](#).

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)	and/or	DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
<u>HYPERTENSIVE CRISIS</u> (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Download this chart: [English \(PDF\)](#) | [Spanish \(PDF\)](#) | [Traditional Chinese \(PDF\)](#)

Recognize your risks

Be aware of your [risk factors](#) – the physical and lifestyle attributes that can make you more likely to develop high blood pressure.

Awareness of your risks can help you identify positive changes that you can make. Do all you can to avoid the serious problems that can result from your blood pressure being too high for too long.

Written by American Heart Association editorial staff and reviewed by science and medicine advisors. [See our editorial policies and staff.](#)

Last Reviewed: May 31, 2023

Understanding Blood Pressure Readings- <https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings>

Understanding Blood Pressure Readings

What do your blood pressure numbers mean?

The only way to know if you have [high blood pressure](#), also known as hypertension, is to have your blood pressure tested. Understanding your results is key to controlling high blood pressure.

Healthy and unhealthy blood pressure ranges

Learn what is considered normal, as recommended by the American Heart Association.

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)	and/or	DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
<u>HYPERTENSIVE CRISIS</u> (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Note: A diagnosis of high blood pressure must be confirmed with a medical professional. A health care professional should also evaluate any unusually [low blood pressure readings](#).

Download this chart: [English Jpeg](#) | [English PDF](#) | [Spanish Jpeg](#) | [Spanish PDF](#) | [Traditional Chinese Jpeg](#) | [Traditional Chinese \(PDF\)](#)

Blood pressure categories

The five blood pressure ranges as recognized by the American Heart Association are:

Normal

Blood pressure numbers of less than 120/80 mm Hg (millimeters of mercury) are considered within the normal range. If your results fall into this category, stick with heart-healthy habits like following a balanced diet and getting regular exercise.

Elevated

Elevated blood pressure is when readings consistently range from 120-129 systolic and less than 80 mm Hg diastolic. People with elevated blood pressure are likely to develop high blood pressure unless steps are taken to control the condition.

Hypertension Stage 1

Hypertension Stage 1 is when blood pressure consistently ranges from 130 to 139 systolic or 80 to 89 mm Hg diastolic. At this stage of high blood pressure, health care professionals are likely to prescribe lifestyle changes and may consider adding blood pressure medication based on your risk of atherosclerotic cardiovascular disease, or ASCVD, such as heart attack or stroke.

Hypertension Stage 2

Hypertension Stage 2 is when blood pressure consistently is 140/90 mm Hg or higher. At this stage of high blood pressure, health care professionals are likely to prescribe a combination of blood pressure medications and lifestyle changes.

Hypertensive crisis

This stage of high blood pressure requires medical attention. If your blood pressure readings suddenly exceed 180/120 mm Hg, wait five minutes and then test your blood pressure again. If your readings are still unusually high, contact your health care professional immediately. You could be experiencing a [hypertensive crisis](#).

If your blood pressure is higher than 180/120 mm Hg or you are experiencing signs of possible organ damage such as chest pain, shortness of breath, back pain, numbness/weakness, change in vision or difficulty speaking, do not wait to see if your pressure comes down on its own. **Call 911.**

Your blood pressure numbers and what they mean

Your blood pressure is recorded as two numbers:

- **Systolic blood pressure** (the first number) – indicates how much pressure your blood is exerting against your artery walls when the heart contracts.
- **Diastolic blood pressure** (the second number) – indicates how much pressure your blood is exerting against your artery walls while the heart muscle is resting between contractions.

Which number is more important?

Typically, more attention is given to systolic blood pressure (the first number) as a major risk factor for cardiovascular disease for people over 50. In most people, systolic blood pressure rises steadily with age due to the increasing stiffness of large arteries, long-term buildup of plaque and an increased incidence of cardiac and vascular disease.

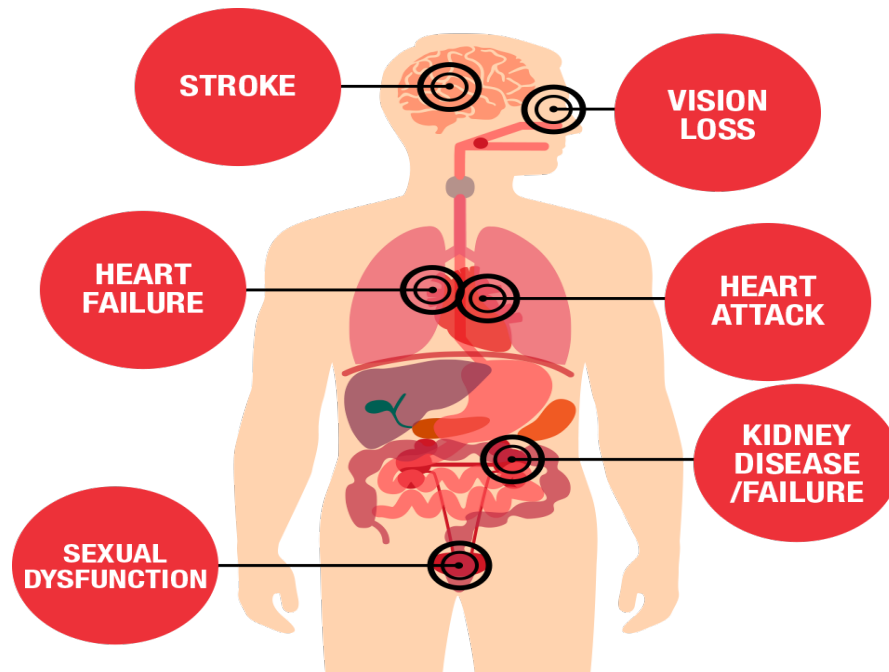
However, either an elevated systolic or an elevated diastolic blood pressure reading may be used to make a diagnosis of high blood pressure.

Written by American Heart Association editorial staff and reviewed by science and medicine advisors. [See our editorial policies and staff](#).

Last Reviewed: May 30, 2023

Health Threats from High Blood Pressure- <https://www.heart.org/en/health-topics/high-blood-pressure/health-threats-from-high-blood-pressure>

Health Threats from High Blood Pressure



High blood pressure threatens your health and quality of life

In most cases, damage done from high blood pressure (HBP or hypertension) occurs over time. Left undetected or uncontrolled, high blood pressure can lead to:

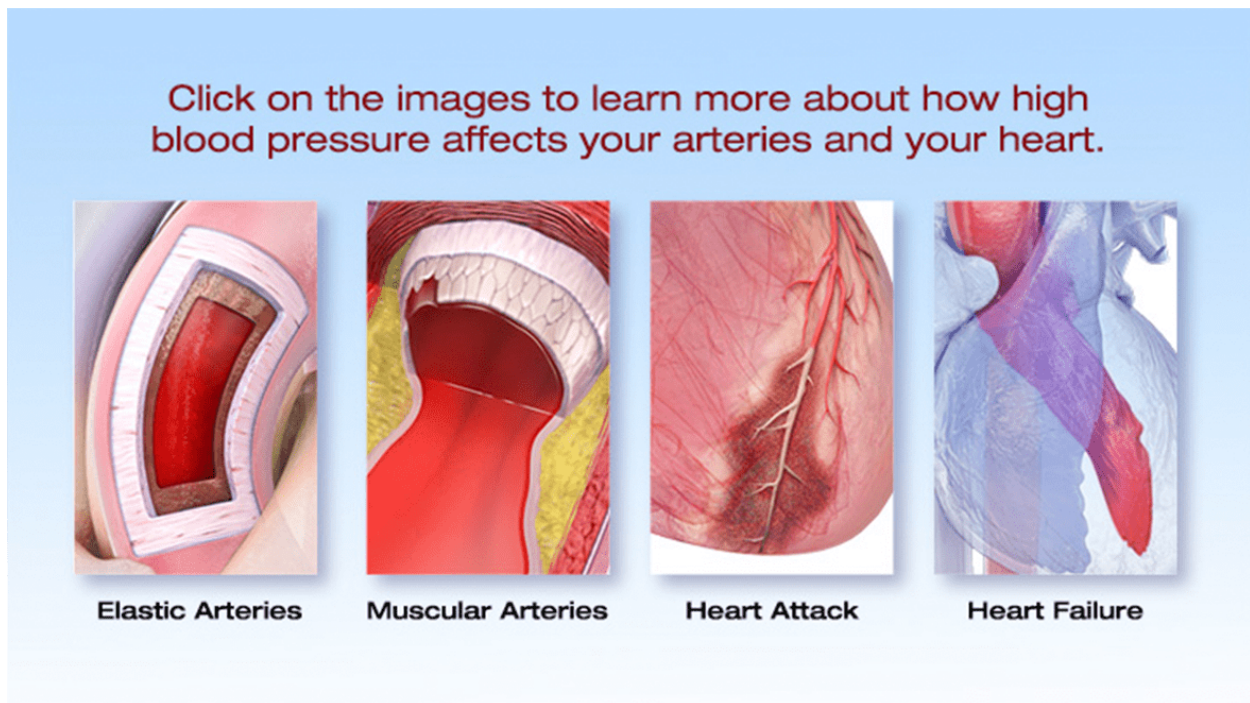
- [Heart attack](#) — High blood pressure damages arteries that can become blocked and prevent blood flow to the heart muscle.
- [Stroke](#) — High blood pressure can cause blood vessels that supply blood and oxygen to the brain to become blocked or burst.
- [Heart failure](#) — The increased workload from high blood pressure can cause the heart to enlarge and fail to supply blood to the body.
- [Kidney disease or failure](#) — High blood pressure can damage the arteries around the kidneys and interfere with their ability to filter blood effectively.
- [Vision loss](#) — High blood pressure can strain or damage blood vessels in the eyes.
- [Sexual dysfunction](#) — High blood pressure can lead to erectile dysfunction in men and may contribute to lower libido in women.
- [Angina](#) — Over time, high blood pressure can lead to heart disease including [microvascular disease \(MVD\)](#). Angina, or chest pain, is a common symptom.
- [Peripheral artery disease \(PAD\)](#) — Atherosclerosis caused by high blood pressure can lead to narrowed arteries in the legs, arms, stomach and head, causing pain or fatigue.

Download the consequences of HBP infographic: [English \(PDF\)](#) | [Spanish \(PDF\)](#) | [Traditional Chinese \(PDF\)](#)

Can hypertension cause other problems?

When your blood pressure is high for too long, it damages your blood vessels – and [LDL \(bad cholesterol\)](#) begins to accumulate along tears in your artery walls. This leads to narrowed arteries and increases the workload of your circulatory system while decreasing its efficiency.

As a result, high blood pressure puts you at greater risk for developing life-changing and life-threatening conditions.



Your best protection is knowledge, management and prevention

- [Know your numbers.](#) The best way to know if you have high blood pressure is to [have your blood pressure checked](#).
- [Understand the symptoms and risks.](#) Learn what factors could make you more likely to develop high blood pressure and put you at risk for serious medical problems.
- [Make changes that matter.](#) Take steps to reduce your risk and manage your blood pressure. Make heart-healthy lifestyle changes, take your medication as prescribed and work in partnership with your health care professionals.

High blood pressure and hypertensive crisis

If your blood pressure readings exceed 180/120 mm Hg and you have any symptoms such as headache, chest pain, nausea/vomiting or dizziness, call 911 immediately. If you don't have any symptoms, wait five minutes and then test your blood pressure again.

Also contact your health care professional immediately if your readings are still unusually high and you aren't experiencing any other symptoms of target organ damage such as chest pain, shortness of breath, back pain, numbness/weakness, change in vision or difficulty speaking. You could be experiencing a [hypertensive crisis](#).

High blood pressure and metabolic syndrome (insulin resistance syndrome)

[Metabolic syndrome](#) is a cluster of risk factors, including high blood pressure, that raises the risk of heart disease, diabetes, stroke and other health problems. It's diagnosed when you have any three of these risk factors:

- High blood glucose (sugar)
- Low levels of HDL (good) cholesterol in the blood
- High levels of triglycerides in the blood
- Large waist circumference or “apple-shaped” body
- High blood pressure

[Download the metabolic syndrome fact sheet \(PDF\)](#).

Written by American Heart Association editorial staff and reviewed by science and medicine advisors. [See our editorial policies and staff](#).

Last Reviewed: Mar 4, 2022

How Can I reduce High Blood Pressure? - <https://www.heart.org/-/media/Files/Health-Topics/Answers-by-Heart/How-Can-I-Reduce-High-Blood-Pressure.pdf>



American
Heart
Association.

ANSWERS
by heart



Lifestyle + Risk Reduction
High Blood Pressure

How Can I Reduce High Blood Pressure?

By treating high blood pressure, you can help reduce your risk for a stroke, heart attack, heart failure and kidney failure.

These are steps you can take now:

- Reach and maintain a healthy weight.
- Eat a heart-healthy diet that includes vegetables, fruits, whole grains, low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils and nuts. It should also limit sodium, sweets, saturated fats, sugar sweetened beverages and red meats.
- Be more physically active.
- Don't smoke and avoid secondhand smoke.
- Limit alcohol to no more than one drink per day for women or two drinks a day for men.
- Take your medication as prescribed.
- Know what your blood pressure should be and work to keep it at that level.



How can I lose weight?

In order to lose weight, you need to use up more calories than you eat and drink every day. Talk with your health care professional about a healthy eating and physical activity plan that will help you reach your weight loss goals. When you lose weight, your blood pressure often goes down! An initial weight loss goal of at least 5% will help reduce your blood pressure.

How do I limit sodium?

Aim for an ideal limit of less than 1,500 milligrams (mg) per day of sodium. Even cutting back by 1,000 mg a day can help improve your blood pressure and heart health.

You can reduce your sodium intake by:

- Reading the Nutrition Facts label on foods so you know how much sodium is in food products. Foods with 140 mg or less sodium per serving are considered low in sodium.
- Avoiding prepackaged, processed and prepared foods, which tend to be higher in sodium.

- Reducing salt in cooking and at the table. Learn to use herbs and salt-free spices instead.

How do I limit alcohol?

Ask your health care professional if you're allowed to drink alcohol, and if so, how much.

If you drink more than two drinks a day if you're male or more than one drink a day if you're female, it may add to high blood pressure. One drink is equal to 12 ounces of beer, 5 ounces of wine, 1.5 ounces of 80-proof distilled spirits or 1 ounce of 100-proof spirits.

If cutting back on alcohol is hard for you to do on your own, ask about groups that can help.

How can I be more active?

Regular physical activity helps to reduce blood pressure, control weight and reduce stress. It's best to start slowly

(continued)



How Can I Reduce High Blood Pressure?

and do something you enjoy, like taking brisk walks or riding a bicycle.

Aim for at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity (or a combination of both) per week. Talk to your health care professional about a good plan for you.

What should I know about medication?

Depending on your risk and blood pressure levels, you may need one or more types of medication to keep your blood pressure at a healthy level. You may need a trial period before your doctor finds the best medication, or combination of medications, for you.

What's most important is that you take your medication exactly as prescribed. Never stop treatment on your own. If you have problems or side effects from your medication, talk to your health care professional.



HOW CAN I LEARN MORE?

- 1 Call 1-800-AHA-USA1 (1-800-242-8721), or visit heart.org to learn more about heart disease and stroke.
- 2 Sign up for our monthly *Heart Insight* e-news for heart patients and their families at HeartInsight.org.
- 3 Connect with others sharing similar journeys with heart disease and stroke by joining our Support Network at heart.org/SupportNetwork.

Do you have questions for your doctor or nurse?

Take a few minutes to write down your questions for the next time you see your health care professional.

For example:

Can I drink any alcohol?

How often should I check my blood pressure?

MY QUESTIONS:

We have many other fact sheets to help you make healthier choices to reduce your risk for heart disease, manage your condition or care for a loved one. Visit heart.org/AnswersByHeart to learn more.

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Table 1-Cost Benefit Analysis

Expenses	Cost
Salary	\$0
Services	\$0
Statistician	\$0
Office Supplies	\$0
Software (SPSS, Excel)	\$0
Participants	\$0
Questionnaires	\$0
Total	\$0

Table 2: Timeline

	Due Date
Initial Proposal topic	August 2022
IRB	October 2023
Clinical Agreement	February 2023
Proposal Development	Part One: May 2023 Part Two & Three: June 2023 Part Four, Five, and Final: July 2023

Project Implementation	October 2023-January 2024
Data Collection	October 2023-January 2024
Data Analysis	January 2024-February 2024
Final Project Submission (including edits)	April 2024
Project Presentation	February 2024