Practitioners' Guide

Key Tenets of Successful Lifestyle Programs for Hypertension Control and Management

NOVEMBER 2023

Evaluation of Heart Disease and Stroke Prevention Programs

Table of Contents

Practitioner's Guide for Lifestyle Interventions

Nearly one in two adults in the United States has hypertension, or high blood pressure, which increases their risk of heart disease, stroke, and death.[1] Hypertension is more common among of people with lower incomes,[2] as well as among those who do not have, or have limited, health insurance.[3]

Certain racial and ethnic groups, such as Black or African American and Hispanic or Latino populations, are also more likely to have hypertension and heart disease.[1,4] Lifestyle programs have the potential to address hypertension, especially among populations disproportionately affected by the disease.[5] Evidence shows that multifaceted lifestyle programs designed to help manage chronic conditions like diabetes may also improve hypertension and cardiovascular outcomes. However, few evidence-based programs focus primarily on hypertension control and cardiovascular disease (CVD).

The Division for Heart Disease and Stroke Prevention (DHDSP) has identified four key tenets of lifestyle programs that are successful in addressing hypertension and improving blood pressure outcomes:

Tenet 1: Implement in community settings.

Tenet 2: Engage frontline public health workers who can bridge the gap between the patient and health care systems.

Tenet 3: Use shorter program duration.

Tenet 4: Target multiple lifestyle behaviors.

This Practitioners' Guide highlights these tenets and describes ways to tailor programs to different populations and settings. The guide also spotlights examples of lifestyle programs to illustrate these key tenets and addresses health inequities and how to adapt programs to the specific needs of potential participants.

What Is the Purpose of the Practitioners' Guide?

The guide builds on how to assess the implementation, impact, sustainability, and replicability of lifestyle programs. It can be a resource for those who are considering implementing a lifestyle program for people with hypertension.

To identify the key tenets and develop this guide, DHDSP completed the following:

1. Examined existing practices and associated health outcomes through an exploratory assessment of three lifestyle programs: Community Heart Health Actions for Latinos at Risk (CHARLAR); Eskenazi Health Hypertension Group Education Program (Eskenazi); and Vida Sana Health Hypertension Group Education Program (Vida Sana).
2. Conducted a literature review and meta-analysis for lifestyle interventions.
3. Conducted a comparative analysis synthesizing findings from the exploratory assessments, literature review, and meta-analysis with the curriculum of the YMCA of the USA (Y-USA) Blood Pressure Self-Monitoring (BPSM).

Findings from these initial steps helped identify key tenets that were evaluated in practice through a mixed-methods evaluation of the Gateway Region Network YMCA BPSM program.

Under each tenet's subsection, learn more about the practice-based findings that helped develop each key tenet.

Learn more about the methodologies for identifying the key tenets.

Who Should Use the Practitioners' Guide?

This Practitioners' Guide was developed to help clinicians, other health care professionals, public health professionals, decision-makers, community organizations, and other partners in the field in identifying and implementing effective lifestyle programs to improve hypertension outcomes.

What Are the Key Tenets of Effective Lifestyle Programs?

The guide uses the four key tenets of successful lifestyle programs. It provides thoughts about, and examples for, implementing each key tenet, as well as supporting resources and literature.

Key Tenet 1: Implement in Community Settings

Implementing lifestyle programs in community settings, such as faith-based organizations and community centers, provides a way to offer activities where people already gather. Recruiting and engaging participants in these settings can build trust in and commitment to the program.[6]

Key Tenet 2: Engage frontline public health workers who can bridge the gap between the patient and health care systems

Team-based care[7-9] occurs when staff work with a clinician or other team leader to coordinate and share responsibilities, which helps deliver high-quality care with efficiency. Using a team-based approach with clinical and frontline public health workers (including community health workers [CHWs] and health coaches) increases program effectiveness.

Key Tenet 3: Use Shorter Program Duration

People often cite lack of time as a major barrier to making lifestyle changes.[10] Lifestyle programs of shorter durations (3–24 weeks with weekly sessions) allow those unable to commit to a longer program to still benefit from learning how to control blood pressure and reduce other risk factors for heart disease and stroke.

Key Tenet 4: Target Multiple Lifestyle Behaviors

Hypertension lifestyle programs target at least two lifestyle behaviors, most often diet and physical activity. Programs that target multiple behaviors can match participants' needs with activities that work best for them.[11]

KEY TENET: 1

Implement in Community Settings

Lifestyle programs implemented in community settings are effective in reducing blood pressure and improving blood pressure control.[12]

Community settings may include nonprofit organizations' facilities, YMCAs, faith-based organizations, senior and community centers, and workplaces. Recruiting and engaging participants through community settings can build trust in the program and encourage commitment.[6] These settings may offer complementary services, such as exercise classes or food pantries, that align with the lifestyle program curriculum. Finally, by offering services within the community, programs can eliminate some factors (such as lack of transportation) that make participation difficult.

To review the evidence that informed this key tenet, please click here.

Implementation Strategies and Considerations

Program staff need to make several important decisions when implementing lifestyle programs in community settings. Below, we begin with some implementation tips, followed by a brief discussion of choosing location and mode of delivery.

Implementation Tips

- **Obtain buy-in and support from program leadership.** Having support and buy-in from program leadership is key to program sustainability. For example, leaders can help identify program volunteers, promote the program beyond their organizations, and help provide in-kind support (such as pharmacy vouchers, space for program delivery).
- **Develop strong community partnerships.** Partnerships in the community are vital for program success. For example, developing relationships with health care systems and professionals can: lead to participant referrals to lifestyle programs; and offset the cost of program materials (for instance, blood pressure cuffs). Partnering with local companies—those that have on-site facilities for exercise or meditation—can provide locations to host the programs.
- **Consider adopting train-the-trainer models to extend program impact.** A train-the-trainer model can help lifestyle programs expand and multiply their effects. For example, programs can partner with organizations with community staff (such as church leaders) who can help carry out programming; such staff simply need technical assistance and resources to start a lifestyle program.
- **Consider socioeconomic and geographic factors of the communities served.** Lifestyle programs should be tailored to meet the needs of the communities they aim to serve.[12] Programs should recognize that socioeconomic and geographic factors play a role in preventing and managing hypertension for many participants. People who face discrimination are more likely to have high stress levels and need support to reduce stress.[13] Many low-income neighborhoods lack grocery stores or other retailers that carry affordable, nutritious food. To address food insecurity, Gateway BPSM program staff have a list of grocery stores that discount vegetables nearing the expiration date.
- **Provide incentives to address barriers to participation.** The exploratory assessment identified creative ways programs were meeting participants' social needs. Eskenazi offered participants pharmacy vouchers for a 90-day supply of one medication; CHARLAR and Vida Sana both provided grocery store gift cards to participants. Non-monetary incentives included allowing parents to bring their children to class sessions or providing childcare during program sessions.

Program Location

Important considerations for selecting a program location include:

- **Make sure the location is easy for participants to access.** Staff can increase program access by offering the program where potential participants already go (such as workplaces, community centers). For example, the Gateway BPSM program is offered at the YMCA, where some participants already use programs and services. Programs should also consider accessible settings near public transportation, grocery stores, or places of worship. Using nontraditional venues, such as churches, may reduce disparities among people from racial and ethnic minority groups.[14]
- **Select locations where populations of focus live.** Program staff should ensure that their lifestyle programs are located where many potential participants live. For example, in metropolitan Denver, CHARLAR staff focus on working with people who speak Spanish, have lower incomes, and are immigrants. Similarly, Vida Sana staff work with Spanish-speaking individuals in Providence, Rhode Island. Both programs identify communities with sizable Hispanic or Latino populations to maximize participation from their population of focus.
- **Design programs with participants' comfort and trust in mind.** Programs should choose settings where participants feel most comfortable. Some participants may prefer to have their blood pressure readings measured by frontline public health workers in a more familiar setting.[15] CHARLAR and Vida Sana offer their programs in community-based settings to ensure comfort and accessibility. Vida Sana conducted program sessions in community centers and churches, which provided a relaxed atmosphere and allowed participants to form a support community.

Program Delivery Methods

- **Decide which method best meets participants' needs.** Lifestyle programs should consider which delivery method will best meet the needs of the populations served. Some programs may not choose a solely in-person or virtual format. They may instead choose a hybrid method (using both formats), which can allow more people to join the program, including those who face transportation and other logistical challenges to in-person attendance.
- **Ensure that infrastructure and equipment needs are met for virtual delivery.** Programs need to make sure participants have the infrastructure (internet access) and equipment (smartphone, blood pressure cuffs) for virtual delivery. For example, the Gateway BPSM program began as an in-person

program in 2013, but during the COVID-19 pandemic, it shifted to virtual delivery using a mobile app and Bluetooth-enabled blood pressure cuffs. Staff were able to track participants' blood pressure readings. And participants were able to meet with staff remotely, and progress toward program completion and weight loss.

Gateway BPSM program participants and staff noted the following benefits of virtual delivery:

- Feeling safer by participating virtually during the pandemic.
- Added flexibility in scheduling office visits and group coaching sessions.
- Reduced transportation barriers.
- Increased blood pressure tracking and accountability.

Program Spotlight

Community Heart Health Actions for Latinos at Risk

In 2009, the Colorado Prevention Center and the University of Colorado School of Medicine developed CHARLAR. This program aims to (1) build healthier lifestyles in adult Hispanic or Latino persons (age 40 years and older) in the Denver region and (2) reduce risks for CVD and diabetes. The population of focus includes people who speak Spanish, have lower incomes, and are immigrants. Since the start of the program, CHARLAR has served more than 2,500 community members and has expanded beyond Denver to provide services in northwestern Colorado.

The program is held in community-based settings and led by CHWs, or promotoras, who are recruited from the community. The program includes 11 weeks of evidence-based skill-building and education classes, CVD and risk factor screenings, physician counseling, group-based physical activity, and navigation to medical homes and other community-based services.

An exploratory assessment of CHARLAR found that, from baseline to the 12-week follow-up, systolic blood pressure decreased by 5.3 mm Hg (3.9%) and diastolic blood pressure by 2.7 mm Hg (3.2%). The program has shown improvements in both blood pressure control (from 66.2% at baseline to 71.5% at 12-week follow-up) and lifestyle behaviors. Program participants also had significant decreases in low-density lipoprotein cholesterol, weight, body mass index (BMI), and Framingham risk scores from baseline to follow-up.

For more information: CHARLAR.

Resources

Implementation guidance has been developed by several organizations, including:

- Well-Ahead guide to Blood Pressure Monitoring at Community-Based Organizations.[16]
- The Rural Health Information Hub project example of the Franklin Cardiovascular Health Program.[17]
- The CDC Practitioner's Guide on Community-Clinical Linkages for the Prevention and Control of Chronic Diseases.[18]
- Hebrew SeniorLife toolkit for community-based organizations, Formulating Strategic Business Plans for Healthy Aging Programs.[19]

Examples and best practices for implementing community-based lifestyle programs include the following:

- The Million Hearts Learning Collaborative Local Health Department and Community Toolkit for Improving Hypertension Outcomes guide's Million Hearts Learning Collaborative: Wisconsin Pilot Sites (page 9) and How to Get Started: Community-Clinical Partnerships (page 17)[20]
- The Reproductive Health National Training Center Hypertension Prevention and Control Improvement Toolkit to Integrate Hypertension into Community Participation and Program Promotion Activities.[21]

KEY TENET: 2

Engage Frontline Public Health Workers Who Can Bridge the Gap Between the Patient and Health Care Systems

A team-based approach, which includes both clinical and frontline public health workers, increases program effectiveness. In team-based care,[7-9] a group of frontline public health workers can work with a clinician or other team leader to coordinate and share responsibilities. Frontline public health workers, such as CHWs or health coaches, do not provide medical advice, prescribe medication, or perform clinical procedures. Instead, these staff can help participants by delivering health education, conducting group-based physical activity programs, and providing nutrition planning. When frontline public health workers have strong community ties and share characteristics with participants, they can act as a bridge to the health care system and allow physicians and other clinical staff to help participants move toward optimal health.[22-24]

To review the evidence that informed this tenet, please click here.

Implementation Strategies and Considerations

Programs can use several implementation strategies to use frontline public health workers in a team-based approach. Below, we begin with some implementation tips, followed by a brief discussion of how frontline public health workers can increase recruitment and build trust with participants.

Implementation Tips

Options for using frontline public health workers in a team-based approach include the following:

- **Build a program team that is representative of the communities served.** Programs should consider hiring team members from communities where participants live and work. For example, the CHARLAR and Vida Sana programs recruit frontline public health workers such as CHWs from local communities. These CHWs can help improve the program by reaching groups at higher risk for CVD, building strong community relationships, and fostering links with clinical staff.
- **Assign clear responsibilities to frontline public health workers.** Each staff member should have clearly defined roles in program implementation. For example, some staff can market the lifestyle program to potential referral partners, while other staff can enroll participants or develop participant education materials.

Participant Recruitment

Frontline public health workers can aid participant recruitment in the following ways:

- **Develop and execute a participant recruitment strategy.** Frontline public health workers can develop a recruitment strategy and create an operational plan regarding outreach to populations of focus (outreach based on race, ethnicity, socioeconomic status, geography). Frontline public health workers can also set concrete program enrollment milestones to assess how well the strategy is working.
- **Build and sustain strong participant referral networks.** Frontline public health workers can build networks for referrals in several ways. CHARLAR, Vida Sana, and the Gateway BPSM program use frontline public health workers to secure participant referrals by attending community events and engaging leaders in their communities. Staff can develop a business case for the lifestyle program and share program data with potential referral partners. This may involve sharing stories with health care professionals to show how the lifestyle program can save the clinician's time while improving patient care.

- **Recruit participants by engaging people in the communities.** Frontline public health workers can meet often with community leaders, attend community events, and host activities at schools and places of worship. If staff are former participants in the lifestyle program, they can also provide word-of-mouth recommendations to family members or friends.

Program Participant Rapport

Frontline public health workers can contribute in the following ways:

- **Build trust with participants.** Frontline public health workers can build trust by emphasizing strong communication skills. Evidence suggests that communication differences between patients and health care providers may contribute to racial disparities in health care and that too little information sharing occurs between patients and providers.[25] Thus, staff who share common characteristics with the population of focus (such as language or culture) can help overcome distrust and improve communication. For example, Gateway BPSM lifestyle coaches from the community, called Healthy Heart Ambassadors (HHAs), built relationships with participants by:

  For example, Gateway BPSM HHAs from the community built relationships with participants by:

  - Providing advice that supports hypertension management tailored to individual social needs and barriers to care.
  - Offering knowledge about community resources and fostering links with community resources.
  - Contributing relatable experiences about managing their health.
  - Communicating from a place of shared understanding.

- **Maintain trust by using proven participant engagement strategies.** Over time, frontline public health workers can help participants through various engagement strategies. For example, staff can develop health education that includes hands-on learning. They can check in with participants via telephone or text regarding upcoming classes and progress toward goals. To address barriers to participation, staff can connect participants to free/low-cost community resources (transportation) or offer incentives during or after each session (such as raffles, grocery or gas gift cards, pharmacy vouchers, childcare).

Program Spotlight

Y-USA Blood Pressure Self-Monitoring Program

The goal of the Y-USA BPSM program is to help adults reduce and manage their blood pressure and increase their knowledge of healthier eating habits. The program is implemented at YMCAs across the country.

Over a 16-week period, this program relies on HHAs to engage with participants in person and via telephone. (Appointment reminders for follow-up are via text and voice calls.) Participants attend two monthly consultations with HHAs, as well as monthly nutrition education seminars.

HHAs work with each participant to build skills to manage blood pressure, including reading their own blood pressure, identifying factors that raise blood pressure, and adopting healthy eating habits. Information on the participant's progress in the program is shared with referral partners such as primary care providers or nurses. The program, which is open to all community members, does not require a YMCA membership.

As part of the Million Hearts® collaboration,[26] an evaluation of the Y-USA BPSM program in 2017 found that, on average, adults ages 34–64 who completed the program reduced their systolic blood pressure by 7.3 mm Hg and their diastolic blood pressure by 5.7 mm Hg. Most program participants also reported feeling that they made progress on their health and well-being goals and planned to continue blood pressure self-monitoring after the program ends.

Learn more about BPSM from the YMCA.

Resources

Implementation guidance has been developed by the following organizations:

- The American Medical Group Foundation Provider Toolkit to Improve Hypertension Control: All Team Members Trained in Importance of BP Goals and Metrics.[27]
- The American Medical Association Team-Based Care Guide to Improve Patient Care and Team Engagement Through Collaboration and Streamlined Processes.[28]
- The Agency for Healthcare Research and Quality Practice Facilitation Handbook Trainer's Guide to Implementing Care Teams and Trainer's Guide to the Care Model.[29]
- Community Preventive Services Task Force findings and rationale statement on Cardiovascular Disease Prevention: Team-Based Care to Improve Blood Pressure Control.[30]
- The Wisconsin Nurses Association Patient-Centered Team-Based Care in Wisconsin: A Working Conceptual Model.[31]

Examples and best practices for using frontline public health workers and a team-based care approach include the following:

- The American Medical Association How Community Health Workers Can Improve Your Patients' Health.[32]
- The CDC Community Health Worker Fact Sheet on preventing high blood pressure.[33]
- The National High Blood Pressure Education Program Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.[34]
- The Wisconsin Nurses Association Hypertension Expert Clinical Panel recommendations.[35]

KEY TENET: 3

Use Shorter Program Duration

Busy schedules and competing priorities can prevent people with hypertension from managing their blood pressure. Offering shorter duration lifestyle programs (less than 6 months) allows people—those unable to commit to a longer program—to learn how to control their blood pressure and reduce other CVD risk factors. Shorter duration lifestyle programs may be as effective, regarding outcomes, as those with longer durations. Shorter programs may also reduce barriers to participation.[36-38] In fact, quickly breaking down lifestyle changes into smaller steps may improve the likelihood of success. For instance, when participants learn what triggers their high blood pressure, they can develop a habit of monitoring their own blood pressure within weeks. Additionally, program staff can offer these short programs more often, giving participants flexibility to join at a time convenient to them.

To review the evidence that informed this key tenet, please click here.

Implementation Strategies and Considerations

Programs can decide the duration of lifestyle program to best address their communities' needs. Below, we provide some implementation tips, followed by a brief discussion of retaining participants, following up post program, and financing a shorter duration lifestyle program.

General Implementation Tips

To implement programs with shorter durations, consider the following:

- **Determine the right duration for the lifestyle program.** There are benefits to shorter duration programs—such as participant convenience—and programs need to determine what minimum program duration will help participants learn the skills they need.
- **Develop a staffing plan for a shorter duration program.** Programs should assess what staffing levels will meet the demands of a shorter duration program. This may include planning for an increased number of participants or offering programs more frequently.
- **Provide activities for participants on their own schedules.** Programs need to relate to participants' specific experiences and challenges. For instance, programs can focus on activities that increase fitness when participants miss an in-person exercise group. This may include encouraging participants to count steps during their commute, and log daily exercise.
- **Offer programs that meet the needs of families.** Staff may also offer lifestyle sessions during the school year. This could help recruit participants with school-age children who may be more likely to participate when school is in session. Parents may also find a shorter duration program more feasible.[39,40] For example, some Gateway BPSM staff believed that participants preferred the shorter program over longer ones.

Participant Retention and Post-Program Follow-up

- **Engage frequently with participants (and in different ways) during the program**. In the exploratory assessments, program staff members conduct weekly phone calls and text follow-ups to maintain participants' interest in the program. Staff also often check in with participants between sessions, especially regarding any concerns raised in previous sessions.

- **Communicate with participants after program completion.** Several programs follow up with participants after program completion, to extend program impact. At Vida Sana, participants attended a follow-up session 4 weeks after program completion, where they received counseling and had their biometric measurements taken by a CHW. The CHW also provided referrals to community follow-up services. Similarly, Eskenazi participants had the option to sign up for a 30-minute follow-up visit with a registered dietician and a pharmacist for a biometric measurement, a medication review, follow-up on behavioral goals, and continued education.

Financing Lifestyle Programs with Shorter Duration

- **Consider the costs of shorter duration programs.** Staff may find it easier to secure financial support for a shorter program, but there also may be some additional costs of operating shorter programs. Staff may need to spend additional time on recruitment, given the need to recruit people more frequently (than for a longer program). Also, because shorter duration programs can be offered more often and therefore may serve more participants, budgets may need to account for more financial incentives.

Program Spotlight

Eskenazi Health Hypertension Group Education Program

Eskenazi Health System launched the Eskenazi Health Hypertension Group Education Program in 2017. A lifestyle program in metropolitan Indianapolis, Indiana, Eskenazi focused on people with hypertension, people with lower incomes, and African Americans. The program's goal is to increase engagement between the patient and the health care team, provide educational opportunities to participants, and improve quality measures and health outcomes. Since its launch, the program has served nearly 300 participants.

Held at six Federally Qualified Health Centers, the program is led by a registered dietician with support from a registered nurse, a pharmacist, and a lifestyle coach. Staff provide education on high blood pressure, nutrition, and medication management through weekly 2-hour sessions over 3 weeks. Sessions include cooking demonstrations, food samples, and an opportunity for participants to develop a healthy lifestyle plan. The curriculum is based on materials from the American Heart Association, the American College of Cardiology, and the Academy of Nutrition and Dietetics.

The exploratory assessment of Eskenazi found that systolic blood pressure decreased by 18.2 mm Hg (12.1%) and diastolic blood pressure by 8.1 mm Hg (9.4%) from baseline to 12 months. The program showed improvements in both lifestyle behaviors and blood pressure control (control rates increased from 28.4% at baseline to 61.3% by the program's end). Program participants reduced their BMI and increased their health knowledge and confidence. A majority of participants also met their healthy eating goals, and one in three participants met their physical activity goals.

Learn more about the Eskenazi Health Hypertension Group Education Program.

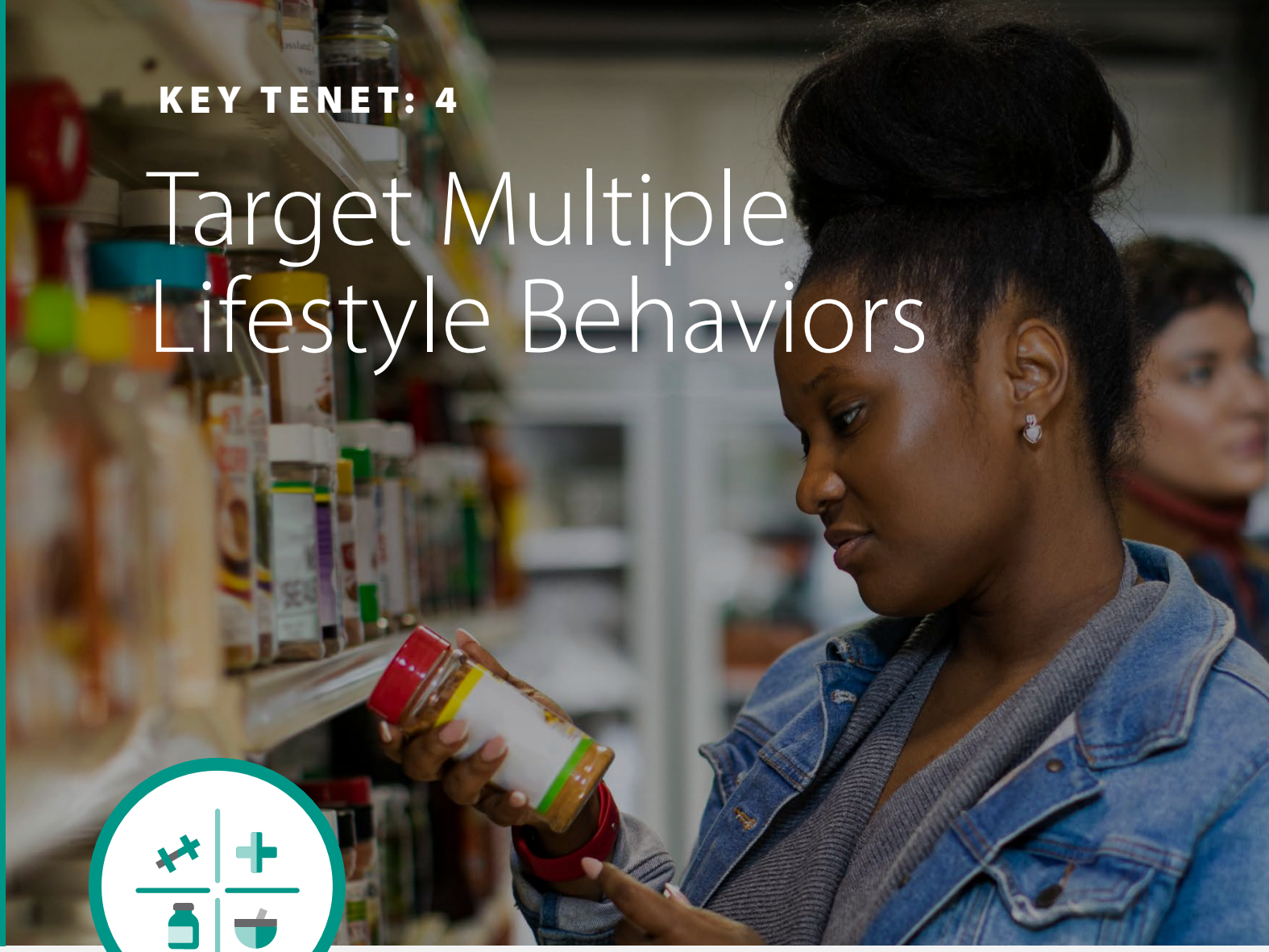
Resources

Implementation guidance has been developed by the following organizations:

- Well-Ahead guide for Blood Pressure Monitoring at Community-Based Organizations.[16]
- The Rural Health Information Hub project example of the Franklin Cardiovascular Health Program.[17]
- The CDC Practitioner's Guide on Community-Clinical Linkages for the Prevention and Control of Chronic Diseases.[18]
- Hebrew SeniorLife Formulating Strategic Business Plans for Healthy Aging Programs: A Toolkit for Community-Based Organizations.[19]

Examples and best practices for implementing lifestyle programs, include:

- The Million Hearts Learning Collaborative Local Health Department and Community Toolkit for Improving Hypertension Outcomes guide Million Hearts Learning Collaborative: Wisconsin Pilot Sites (page 9) and How to Get Started: Community Clinical Partnerships (page 17).[20]
- The Reproductive Health National Training Center Hypertension Prevention and Control Improvement Toolkit to Integrate Hypertension into Community Participation and Program Promotion Activities.[21]



KEY TENET: 4

Target Multiple Lifestyle Behaviors

Multicomponent hypertension lifestyle programs target at least two lifestyle behaviors, most often diet and physical activity. Programs also commonly target tobacco and/or alcohol use, medication adherence and management, stress, and depression. Lifestyle programs that target multiple lifestyle behaviors can closely match participant needs with activities that work best for them.11

Existing literature, exploratory assessments, and evaluation suggest that targeting multiple lifestyle behaviors is a promising approach for improving hypertension outcomes. Several studies41,42 have shown the connection between dietary patterns and hypertension. Changes in diet (such as reducing sodium and alcohol intake) can also positively affect hypertension outcomes and reduce risk of related complications. Stress management techniques can also benefit patients with high blood pressure, given the association between stress and increased cardiovascular risk.

To review the evidence that informed this key tenet, please click here.

Implementation Strategies and Considerations

Below, we begin with some implementation tips, followed by a brief discussion of using technology for program delivery.

General Implementation Tips

- **Determine which behaviors to target.** Program staff need to decide how many and which behaviors to focus on. For example, based on the needs of the community, one program's staff may choose to focus on diet and physical activity, while another's may add medication management to the program.
- **Tailor the program curriculum to meet the needs of participants.** In addition to developing a curriculum that addresses multiple behaviors, tailoring the curriculum to the population served is important for accessibility and health equity. Some populations may have specific needs (for instance, limited health literacy) that require supplemental materials or additional support. In the exploratory assessment, the programs tailored curriculums to include culturally appropriate and interactive activities. For example, these programs offered cooking demonstrations with foods readily accessible to participants. They also provided materials and facilitated sessions in participants' native languages.
- **Focus on helping participants by beginning with small, practical changes.** Improving diet and exercise and reducing stress can reduce an individual's blood pressure, but people may not have the resources or time to make several lifestyle changes at once. By first focusing on achievable gains, participants can eventually meet their goals. Gateway BPSM program staff provide coaching on nutrition even to participants who cannot change their diets entirely.

Technology Use

- **Leverage information technology to target multiple lifestyle behaviors.** Program staff can use technology in various ways to engage participants. For example, the Gateway BPSM program offers virtual exercise classes to complement coaching consultations. Staff also post online recordings of monthly nutrition education seminars, which cover the DASH (Dietary Approaches to Stopping Hypertension) diet, ways to reduce sodium intake, food preparation to manage hypertension, and ways to sustain healthy habits long term. Participants unable to attend the live seminars can then view the videos at their convenience.

- **Consider the potential challenges of information technology.** Staff need to ensure that participants can navigate the technology used in the lifestyle program. For example, some Gateway BPSM participants faced technology challenges in downloading and navigating the program's mobile app. If participants lack internet access or smartphones/tablets/computers, staff can find alternative ways of working with participants (for instance, landline phone check-ins).

Program Spotlight

Vida Sana Health Hypertension Group Education Program

In Providence, Rhode Island, the Clínica Esperanza/Hope Clinic (CEHC) developed Vida Sana, a lifestyle program that targets prevention and treatment of metabolic syndrome among people who speak Spanish and have low literacy. Since the program began in 2012, it has served more than 1,000 participants.

The program is held at CEHC in community-based settings and led by CHWs, or navegantes, who live in the communities and represent the cultural backgrounds of participants. Participants attend an orientation session, followed by eight 90-minute weekly classes. The first five classes follow the low-literacy Thumbs Up® curriculum, developed by the Institute for Education on Health and Research. Classes 6 and 7 consist of small group discussions of previous sessions, check-ins on progress toward goals, and interactive activities that reinforce learning. Activities may include Zumba, walking groups, bingo, and cooking demonstrations. During the final class, participants complete a post-test survey, retake their biometric measures, and receive a certificate of completion.

The exploratory assessment of Vida Sana found decreases in systolic blood pressure by 7.6 mm Hg (5.8%) and in diastolic blood pressure by 5.0 mm Hg (6.1%) from baseline to the 12-week follow-up. The program has shown improvements not only in blood pressure control (control rates increased from 76.9% at baseline to 82.2% by the end of the program) but also in lifestyle behaviors. Program participants showed improvements in total cholesterol, weight, BMI, waist circumference, and hemoglobin A1c levels.

For more about the Vida Sana program.

Resources

Implementation guidance has been developed by several organizations, including:

- CDC guide to Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners.[43]
- The American Medical Group Foundation Provider Toolkit to Improve Hypertension Control: Prevention, Engagement, and Self-Management Program in Place (page 45).[29]
- US Pharmacist Implementing Lifestyle Medicine in Hypertensive Patients.[44]
- The American Heart Association and American Medical Association Target: BP activity on Partnering With Patients Using Lifestyle Modification and Motivational Interviewing.[45]

Examples strategies and programs for lifestyle behaviors include:

- The Franklin Cardiovascular Health Program[17] (diet, physical activity, and alcohol and tobacco use).
- Health Coaches for Hypertension Control[46] (diet, physical activity, tobacco use, medication management, and stress).
- Healthy IDEAS[47] (depression).
- CDC Hypertension Management Program Toolkit[48] (medication adherence and management).
- Tu Salud ¡Si Cuenta![49] (diet and physical activity).

Appendix A: Methodology

Methodologies for Identifying Key Tenets

One of DHDSP's main functions is to evaluate programs, policies, and interventions to ensure they are producing the intended results. Beginning in 2018, DHDSP began an exploratory assessment project, Rapid Evaluations of Lifestyle Intervention Programs that Address Hypertension Control and Cardiovascular Health. The project adapted two established evaluation methods, Systematic Screening and Assessment and Evaluability Assessment (EA),[50] to rapidly identify and evaluate three lifestyle programs that demonstrated a potential to improve hypertension control: CHARLAR, Eskenazi, and Vida Sana. Findings from this assessment guided the next phase of the project.

In September 2020, DHDSP contracted with NORC at the University of Chicago to identify key tenets of lifestyle programs that address hypertension management and control through behavioral and lifestyle changes. This phase included a literature review and meta-analysis, a comparative analysis, and a rigorous, mixed-methods evaluation of a local YMCA BPSM program.

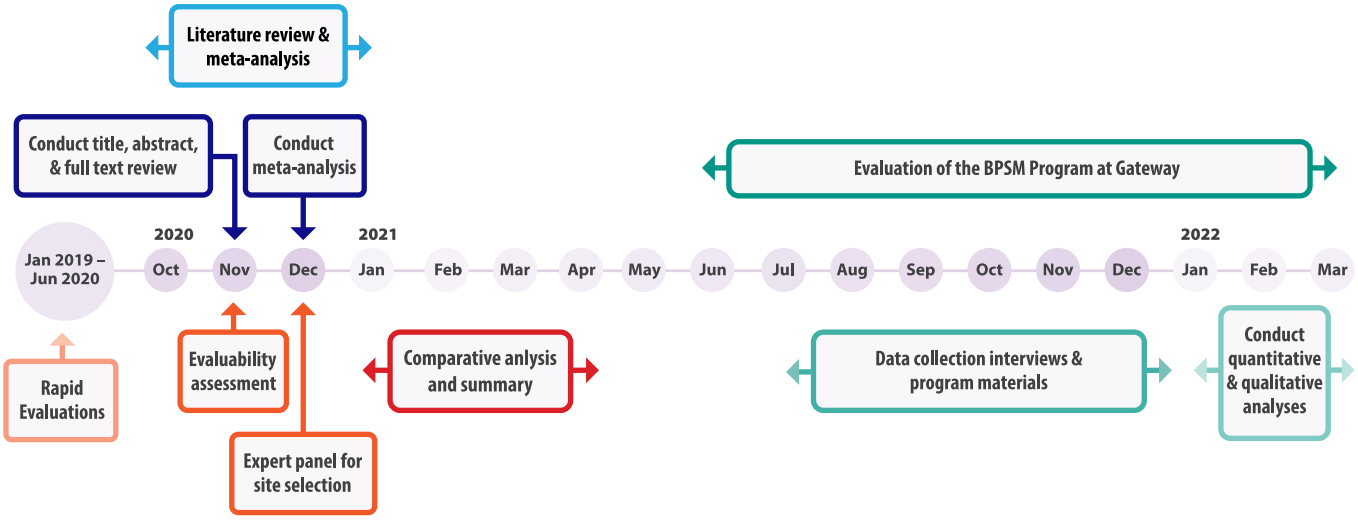
Exploratory Assessment
Assess the landscape of lifestyle programs demonstrating the potential to improve HTN to quickly identify characteristics of hypertension-related programs

Literature Review and Meta-analysis
Achieve a comprehensive, in-depth understanding of lifestyle programs for hypertension management through a scan of peer-reviewed literature

Comparative Analysis
Understanding commonalities–as well as differences–among characteristics of four lifestyle programs and programs identified in the literature review

Evaluation of the BPSM Program at Gateway
Understand how key aspects of the BPSM program connect with program outcomes and how they could be replicated in other settings

- **Identify key tenets of lifestyle programs** that address hypertension management and control
- **Disseminate key tenets and strategies** to the broader public health and cardiovascular disease prevention community



The formal and comprehensive literature review assessed published and non-published work on lifestyle programs for chronic disease prevention, specifically lifestyle programs focused on improving blood pressure and managing hypertension. A meta-analysis of the literature followed. The guide included studies published only in English and did not include every strategy found to be effective in lifestyle programs. Additionally, the review was limited by the small number of studies that examined the impact of lifestyle programs on disproportionately affected populations (Black or African American persons, Hispanic or Latino persons, people with lower income, those who live in rural areas).

To develop the key tenets, a comparative analysis was done to assess and synthesize findings from the Rapid Evaluations of Lifestyle Intervention Programs that Address Hypertension Control and Cardiovascular Health project, factors found in the literature, and those defined in the curriculum for the Y-USA BPSM program.

After key tenets were identified, a rigorous, mixed-methods evaluation of a local YMCA BPSM program was done to assess the tenets in practice. The CDC team conducted an adapted EA and convened an expert panel to identify a local YMCA BPSM program to evaluate. The Gateway YMCA, which serves the St. Louis metropolitan area in Missouri, was selected for evaluation for the following reasons:

- High recruitment numbers.
- Evidence of improved blood pressure outcomes prior to the start of the COVID-19 pandemic.
- Virtual option to participate in the program.
- Focus on serving residents of a Promise Zone (a federally funded initiative with the aim of increasing economic prosperity and achieving better health, education, and well-being within the communities and neighborhoods in the zone).

The evaluation of the Gateway BPSM included a process evaluation that described their implementation experience, including participant recruitment and program adaptations in response to the COVID-19 pandemic. In addition, an outcomes evaluation assessed the impact of BPSM program participation on hypertension outcomes and lifestyle behaviors. Data sources included implementation interviews with program participants, staff, and program partners.

Program materials and correspondence from regular meetings with the Gateway YMCA provided more data sources along with quantitative program data related to registration, baseline and follow-up measurement, program service use, and participant demographic and hypertension-related characteristics. These data were analyzed with a mixed-methods approach to characterize the BPSM program and assess the Gateway YMCA's manner of implementing the program to achieve their intended goals. These methodologies identified the key tenets of effective lifestyle programs for hypertension management and control.

Appendix B: Practice-Based Findings

Key Tenet #1: Implement in Community Settings

Health Outcomes Impact

Three of the four evaluated programs hold their programs in community settings. The BPSM program is through a community YMCA, and CHARLAR classes meet at local churches. Vida Sana usually meets in a clinic conference room, but some sessions occur in churches and other community centers.

These three programs reported improvements in blood pressure control rates:

- Increased from 66% at baseline to 72% at 12-week follow-up for CHARLAR participants.
- Increased from 77% at baseline to 82% by the end of the program for Vida Sana participants.
- Increased from 46% at baseline to 53% at program completion for Gateway BPSM participants.

The meta-analysis looked at variation in hypertension outcomes by implementation setting. Pooled estimates showed that all settings were associated with decreased systolic blood pressure, as in the table below. Similarly, participants' diastolic blood pressure decreased overall in all settings. The meta-analysis also found that blood pressure control improved in all settings but reached statistical significance only in community-based settings.

Implementation Setting	Change in Systolic Blood Pressure Estimates (95% CI) (mm Hg)	Change in Diastolic Blood Pressure Estimates (95% CI) (mm Hg)	Blood Pressure Control Estimates (95% CI)
Clinical	-4.68 (-7.47 to -1.90)	-1.74 (-3.07 to -0.41)	0.10 (-0.05 to 0.24)
Community-based	-8.02 (-11.01 to -5.03)	-3.63 (-5.45 to -1.82)	0.27 (0.10 to 0.44)
Both	-7.54 (-9.75 to -5.33)	-3.73 (-5.19 to -2.27)	0.10 (-0.01 to 0.22)

Key Tenet #2: Engage frontline public health workers who can bridge the gap between the patient and health care systems

Health Outcomes Impact

Findings from the evaluation and exploratory assessments suggest that a team-based care approach using frontline public health workers can be effective in reducing blood pressure and improving blood pressure control. All four lifestyle programs that underwent exploratory assessment (CHARLAR, Eskenazi, Vida Sana, and BPSM) have shown improvements in blood pressure control while using frontline public health workers to administer parts of the programs.

These improved outcomes occur via different pathways. For example, frontline public health workers can facilitate trust among participants and promote programs within the communities they serve. CHARLAR and Vida Sana use CHWs from within the community. These CHWs have an established relationship with their communities and a thorough understanding of their participant populations. Both programs noted that engaging community members helps increase participants' comfort and trust with the programs.

Eskenazi and the BPSM program use lifestyle coaches to complement traditional medical care for hypertension management. Gateway BPSM uses HHAs to implement its program. HHAs work with participants to build skills to manage blood pressure: how to collect and interpret their blood pressure readings, identify factors that raise blood pressure, and adopt healthy eating habits. Gateway HHAs recruit program participants from their families, friends, faith-based organizations, or other close community connections. For Eskenazi, a nurse provides education on managing hypertension, while a wellness coach teaches participants tailored exercises and physical activities that can be performed at home.

Key Tenet #3: Use Shorter Program Duration

Health Outcomes Impact

The analysis of program duration, as part of the meta-analysis, looked at the literature reporting differences in hypertension outcomes between interventions lasting less than 3 months, 3–6 months, and more than 6 months. The analysis found no subgroup differences by program duration on changes in blood pressure. This suggests that hypertension outcomes improved regardless of program length; programs running less than 3 months produced estimated impacts similar to those achieved by programs longer than 6 months. Pooled program impacts were comparable between interventions of less than 3 months and of more than 6 months for change in hypertension outcomes, as in the table below. Given the similarity between groups on hypertension outcomes, these findings suggest that programs with shorter durations are as effective as longer ones, while eliminating barriers to longer participation.

Program Duration	Change in Systolic Blood Pressure Estimates (95% CI) (mmHg)	Change in Diastolic Blood Pressure	Blood Pressure Control Estimates (95% CI)
< 3 months	-6.60 (-8.58 to -4.63)	-3.10 (-4.41 to -1.78)	0.01 (-0.20 to 0.21)
≥ 3, ≤ 6 months	-5.63 (-9.26 to -2.00)	-2.83 (-4.06 to -1.60)	0.17 (0.06 to 0.29)
> 6 months	-6.54 (-10.20 to -2.88)	-1.93 (-3.33 to -0.53)	0.21 (0.05 to 0.37)

Exploratory assessment findings also support the use of shorter program durations. Although all three programs in the exploratory assessment showed improvements in lowering blood pressure, the program with the shortest duration (Eskenazi) showed the largest decreases in systolic and diastolic blood pressure readings. In 3 weeks, Eskenazi reduced systolic blood pressure by 9% and diastolic blood pressure by 6%; in 12 weeks, CHARLAR reduced systolic blood pressure by 4% and diastolic blood pressure by 3%; and in 8 weeks, Vida Sana reduced systolic blood pressure and diastolic blood pressure by 3% each.

Key Tenet #4: Target Multiple Lifestyle Behaviors

Health Outcomes Impact

All three programs included in the exploratory assessment target multiple lifestyle behaviors. The programs' primary focus is preventing and managing hypertension through dietary changes. Each program also offers a physical activity component. For example, both Vida Sana and Eskenazi show participants how to eat healthier by offering cooking classes and teaching a healthy eating curriculum. CHARLAR and Vida Sana programs also conduct group-based physical activity.

In addition to improved blood pressure control, all three programs demonstrated improved lifestyle behaviors. CHARLAR participants saw significant decreases in cholesterol, weight, and BMI. Similarly, Eskenazi participants reduced their BMI and improved their health knowledge and confidence. For Vida Sana, participants showed improvements in total cholesterol, weight, BMI, waist circumference, and A1c levels.

The exploratory assessment findings align with the literature review, which found that most programs target both diet and physical activity. The literature review showed no discernable difference in impact between interventions that focused on specific behaviors and those that adopted a broader approach to behavior change. However, studies that focused on more than three lifestyle behaviors had the highest decrease in systolic blood pressure with a 7.96 mm Hg decrease (95% CI: 12.8 to –3.1) in systolic blood pressure, while studies that had fewer than three lifestyle behaviors were associated with a 6.56 mm Hg decrease (95% CI: –10.1 to –3.1) in systolic blood pressure.

References

[1] Centers for Disease Control and Prevention. *Hypertension Cascade: Hypertension Prevalence, Treatment, and Control Estimates Among U.S. Adults Aged 18 Years and Older Applying the Criteria From the American College of Cardiology and American Heart Association's 2017 Hypertension Guideline—NHANES 2015–2018.* Centers for Disease Control and Prevention; 2021.

[2] Anstey ED, Christian J, Shimbo D. Income inequality and hypertension control. *J Am Heart Assoc.* 2019;8(15):e013636.

[3] Schober S, Makuc DM, Zhang C, Kennedy-Stephenson J, Burt V. Health insurance affects diagnosis and control of hypercholesterolemia and hypertension among adults aged 20–64: United States, 2005–2008. *NCHS Data Brief.* 2011;(57):1–8.

[4] Centers for Medicare & Medicaid Services Office of Minority Health. *Data Snapshot: Heart Failure Disparities in Medicare Fee-for-Service Beneficiaries.* Centers for Medicare & Medicaid Services; 2016.

[5] Boulware LE, Ephraim PL, Hill-Briggs F, Roter DL, Bone LR, Wolff JL, et al. Hypertension self-management in socially disadvantaged African Americans: the Achieving Blood Pressure Control Together (ACT) randomized comparative effectiveness trial. J Gen Intern Med. 2020;35(1):142–52. doi:10.1007/s11606-019-05396-7.

[6] Cooney SM, Small SA, O'Connor C. Strategies for recruiting and retaining participants in prevention programs. *What Works, Wisconsin—Research to Practice Series.* 2007;2.

[7] The Community Guide. Heart Disease and Stroke Prevention: Team-Based Care to Improve Blood Pressure Control. The Community Guide website. Updated May 15, 2023. Accessed June 8, 2023.

[8] Centers for Disease Control and Prevention. Promoting team-based care to improve high blood pressure control. Centers for Disease Control and Prevention website. Updated February 23, 2023. Accessed June 8, 2023.

[9] Proia KK, Thota AB, Njie GJ, Finnie RKC, Hopkins DP, Mukhtar Q, Pronk NP, Zeigler D, Kottke TE, Rask KJ, Lackland DT, Brooks JF, Braun LT, Cooksey T. Team-based care and improved blood pressure control: a Community Guide systematic review. *Am J Prev Med*. 2014;47(1):86–99.

[10] Seguin R, Connor L, Nelson M, LaCroix A, Eldridge G. Understanding barriers and facilitators to healthy eating and active living in rural communities. *J Nutr Metab*. 2014;2014:146502.

[11] Fu J, Liu Y, Zhang L, ZhouL, Li D, Quan H, Zhu L, Hu F, Li X, Meng S, Yan R, Zhao S, Onwuka JU, Yang B, Sun D, Zhao Y. Nonpharmacologic interventions for reducing blood pressure in adults with prehypertension to established hypertension. *J Am Heart Assoc. 2020*;9(19):e016804.

[12] Coupe N, Cotterill S, Peters S. Tailoring lifestyle interventions to low socio-economic populations: a qualitative study. *BMC Public Health.* 2018;18(1):967.

[13] Forde AT, Sims M, Muntner P, Lewis T, Onwuka A, Moore K, Diez Roux AV. Discrimination and hypertension risk among African Americans in the Jackson Heart Study. *Hypertension*. 2020;76(3):715–23.

[14] Campbell MK, Hudson MA, Resnicow K, Blakeney N, Paxton A, Baskin M. Church-based health promotion interventions: evidence and lessons learned. *Ann Rev Public Health.* 2007;28:213–34.

[15] Green BB, Anderson ML, Cook AJ, Ehrlich K, Hall YN, Hsu C, Joseph D, Klanja P, Margolis KL, McClure JB, Munson SA, Thompson MJ. Clinic, home, and kiosk blood pressure measurements for diagnosing hypertension: a randomized diagnostic study. *J Gen Intern Med.* 2022;37(12):2948–56.

[16] Well-Ahead. Blood Pressure Monitoring at Community-Based Organizations. Well-Ahead website. Accessed June 8, 2023.

[17] Rural Health Information Hub. Franklin Cardiovascular Health Program. Rural Health Information Hub website. Updated February 7, 2023. Accessed June 8, 2023.

[18] Centers for Disease Control and Prevention. *Community-Clinical Linkages for the Prevention and Control of Chronic Diseases: A Practitioner's Guide.* Centers for DIsease Control and Prevention; 2016.

[19] Hebrew SeniorLife. Formulating Strategic Business Plans for Healthy Aging Programs: A Toolkit for Community-Based Organizations. Harvard Medical School website. Accessed June 8, 2023.

[20] Association of State and Territorial Health Officals Million Hearts Learning Collaborative. Set Your Heart on Health Toolkit. Association of State and Territorial Health Officals; 2018.

[21] Reproductive Health National Training Center. Hypertension Prevention and Control Improvement Toolkit. Reproductive Health National Training Center. Updated August 2022. Accessed June 8, 2023.

[22] Ursua RA, Aguilar DE, Wyatt LC, Katigbak C, Islam NS, Tandon SD, Nur PTMQ, Van Devanter N, Rey MJ, Trinh-Shevrin C. A community health worker intervention to improve management of hypertension among Filipino Americans in New York and New Jersey: a pilot study. *Ethn Dis.* 2014;24(1):67–76.

[23] Balcazar HG, Byrd TL, Ortiz M, Tondapu SR. A randomized community intervention to improve hypertension control amoung Mexican Americans: using the promotoras de salud community outreach model. *J Health Care Poor Underserved.* 2009;20(4):1079–94.

[24] Lu Y, DiPierro M, Chen L, Chin R, Fava M, Yeung A. The evaluation of a culturally appropriate, community-based lifestyle intervention program for elderly Chinese immigrants with chronic diseases: a pilot study. *J Public Health*. 2013;36(1):149–55.

[25] Shen MJ, Peterson EB, Costas-Muñiz R, Hernandez MH, Jewell ST, Matsoukas K, Bylund CL. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities.* 2018;5(1):117–40.

[26] Centers for Disease Control and Prevention, Million Hearts. Million Hearts Partner Call: Priority Populations. Centers for Disease Control and Prevention; 2018.

[27] American Medical Group Association. *Measure Up/Pressure Down Provider Toolkit to Improve Hypertension Control.* American Medical Group Association; 2013.

[28] Sinsky C, Rajcevich E. Team-Based Care: Improve Patient Care and Team Engagement Through Collaboration and Streamlined Processes. American Medical Association STEPS Forward website. Accessed June 8, 2023.

[29] Knox L, Brach C. The Practice Facilitation Handbook: *Training Modules for New Facilitators and Their Trainers.* Agency for Healthcare Research and Quality; 2013.

[30] Community Prevantative Services Task Force. Cardiovascular Disease Prevention: Team-Based Care to Improve Blood Pressure Control. The Community Guide website. Update May 15, 2023. Accessed June 8, 2023.

[31] Dennick-Champion G, Schmelzer M. *Patient-Centered Team-Based Care in Wisconsin: A Working Conceptual Model*. Wisconsin Department of Health Services; 2016.

[32] American Medical Association. How Community Health Workers Can Improve Your Patients' Health. Updated August 3, 2015. Accessed June 8, 2023.

[33] Million Hearts. "Community Health Workers and Million Hearts Fact Sheet."

[34] Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA Jr, Izzo JL, Jones DW, Materson BJ, Oparil S Jr, Wright JT, Roccella EJ. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension.* 2003;42(6):1206–52.

[35] Wisconsin Nurses Association Panel. Hypertension Expert Clinical Panel: Recommendations for Hypertension Management in Wisconsin. Wisconsin Nurses Association; 2017.

[36] Meredith AH, Schmelz AN, Dawkins E, Carter A. Group education program for hypertension control. *J Clin Hypertens (Greenwich)*. 2020;22(11):2146–51.

[37] Yun YH, Kang E, Cho YM, Park SM, Kim Y-J, Lee H-Y, Kim KH, Lee K, Koo HY, Kim S, Rhee YE, Lee J, Min JH, Sim J-A. Efficacy of an electronic health management program for patients with cardiovascular risk: randomized controlled trial. *J Med Internet Res.* 2020;22(1):e15057.

[38] Gong J, Chen X, Li S. Efficacy of a community-based physical activity program KM2H2 for stroke and heart attack prevention among senior hypertensive patients: a cluster randomized controlled Phase II trial. *PLoS One.* 2015;10(10):e0139442.

[39] Nomaguchi KM, Milkie MA, Bianchi SM. Time strains and psychological well-being: do dual-earner mothers and fathers differ? *J Fam Issues*. 2005;26(6):756–92.

[40] Mailey EL, Huberty J, Dinkel D, McAuley E. Physical activity barriers and facilitators among working mothers and fathers. *BMC Public Health*. 2014;14:657.

[41] Blumenthal JA, Babyak MA, Hinderliter A, Watkins LL, Craighead L, Lin P-H, Caccia C, Johnson J, Waugh R, Sherwood A. Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: the ENCORE Study. *Arch Intern Med*. 2010;170(2):126–35.

[42] Rocha-Goldberg MD, Corsino L, Batch B, Voils CI, Thorpe CT, Bosworth HB, Svetkey LP. Hypertension Improvement Project (HIP) Latino: results of a pilot study of lifestyle intervention for lowering blood pressure in Latino adults. *Ethn Health*. 2010;15(3):269–82.

[43] Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners*. Centers for Disease Control and Prevention; 2013.

[44] Lenz T, DeSimone E II, Pomeroy J. Implementing lifestyle medicine in hypertensive patients. *U.S. Pharmacist*. 2011;36(2):44–50.

[45] Target: BP. CME Course: Partnering with Patients Using Lifestyle Modification and Motivational Interviewing. American Heart Association and American Medical Association website. Updated August 10, 2022. Accessed June 8, 2023.

[46] Rural Health Information Hub. Health Coaches for Hypertension Control. Rural Health Information Hub website. Updated December 9, 2019. Accessed June 8, 2023.

[47] Evidence-Based Leadership Collaborative. Healthy IDEAS. Evidence-Based Leadership Collaborative website. Accessed June 8, 2023.

[48] Centers for Disease Control and Prevention Division for Heart Disease and Stroke Prevention. Hypertension Management Program Implementation Toolkit. Centers for Disease Control and Prevention website. Updated March 22, 2021. Accessed June 8, 2023.

[49] Tu Salud ¡Si Cuenta! Your Health Matters. University of Texas Health Science Center at Houston website. Accessed June 8, 2023.

[50] Leviton LC, Gutman MA. Overview and rationale for the Systematic Screening and Assessment Method. *New Dir Eval*. 2010;2010(125):7–31.