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Implementing Clinic-Community Partnerships to Achieve BP Control and Achieve Health Equity

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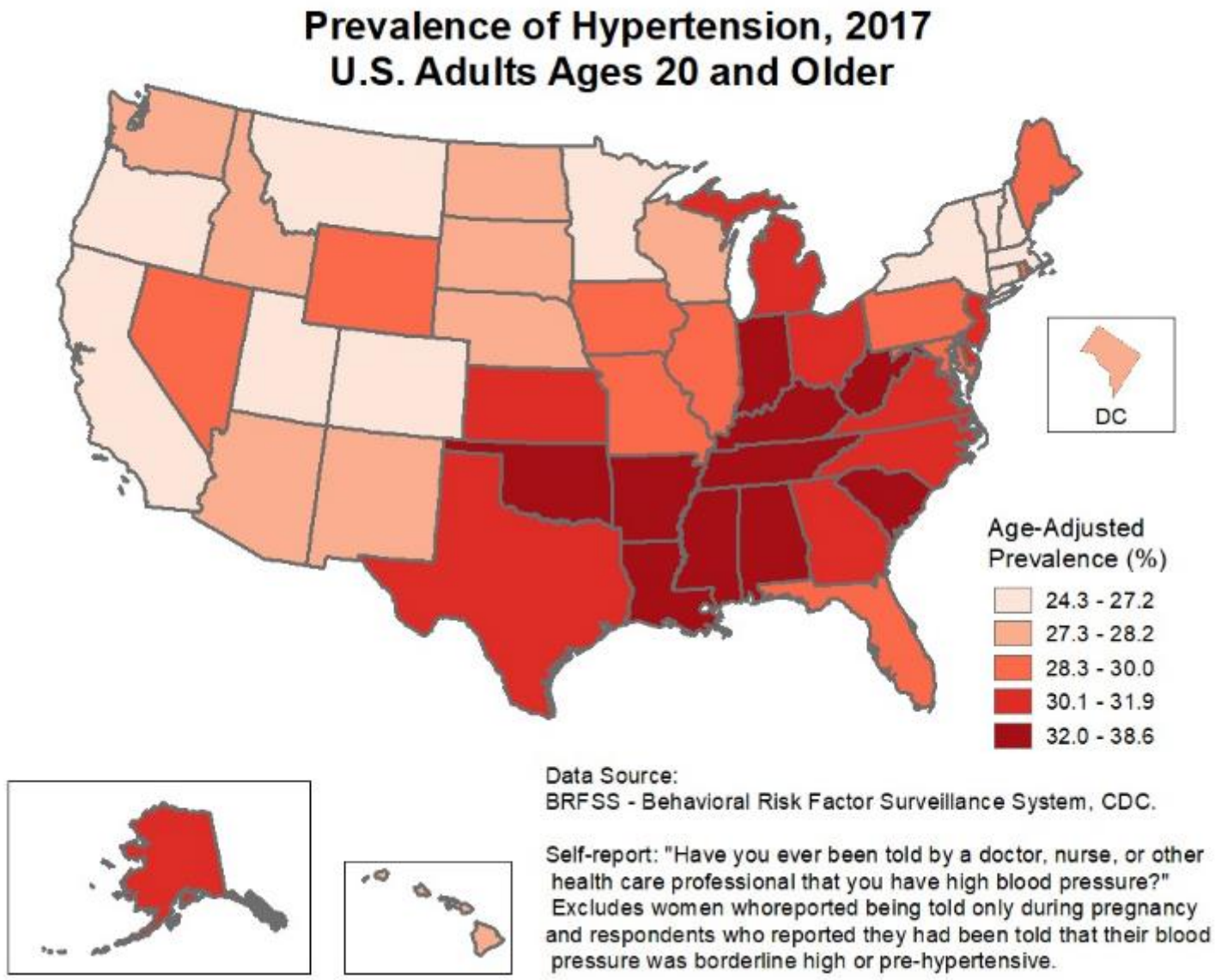
Objectives

1. Review changes in health care delivery regarding BP control that likely impact pharmacy practice
2. Describe current trends in BP management as they relate to interprofessional collaboration.
3. Discuss practice innovations designed to improve BP control and decrease health disparities.
4. Discuss role delineation for pharmacists on the interprofessional health care team as it pertains to strategies to improve BP control and achieve health equity.

Prevalence of Hypertension in US

- About half of adults (45%) with uncontrolled hypertension have a blood pressure of 140/90 mm Hg or higher. This includes 37 million U.S. adults.
  - About 70% of US adults age 65 or older have high blood pressure
- About 30 million adults who are recommended to take medication may need it to be prescribed and to start taking it. Almost two out of three of this group (19 million) have a blood pressure of 140/90 mm Hg or higher.
- A greater percent of men (47%) have high blood pressure than women (43%).
- High blood pressure was a primary or contributing cause of death for more than 494,873 people in the United States in 2018.
- High blood pressure costs the United States about $131 billion each year, averaged over 12 years from 2003 to 2014.

Source: CDC


Prevalence of Hypertension, 2017
U.S. Adults Ages 20 and Older
DC
Age-Adjusted
Prevalence (%)
24.3 - 27.2
27.3 - 28.2
28.3 - 30.0
30.1 - 31.9
32.0 - 38.6
Data Source:
BRFSS - Behavioral Risk Factor Surveillance System, CDC.
Self-report: "Have you ever been told by a doctor, nurse, or other health care professional that you have high blood pressure?" Excludes women whoreported being told only during pregnancy and respondents who reported they had been told that their blood pressure was borderline high or pre-hypertensive.

Question 1: What are the updated AHA/ACC guidelines for diagnosis of Hypertension I in adults?

A. 140/90 mmHg

B. 130 mmHg (systolic) AND 80 mmHg (diastolic)

C. 130 mmHg (systolic) OR 80 mmHg (diastolic)

D. None of the above

2017 AHA/ACC Hypertension Guidelines

Blood Pressure Category	Systolic Blood Pressure		Diastolic Blood Pressure
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120-129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130-139 mm Hg	or	80-89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

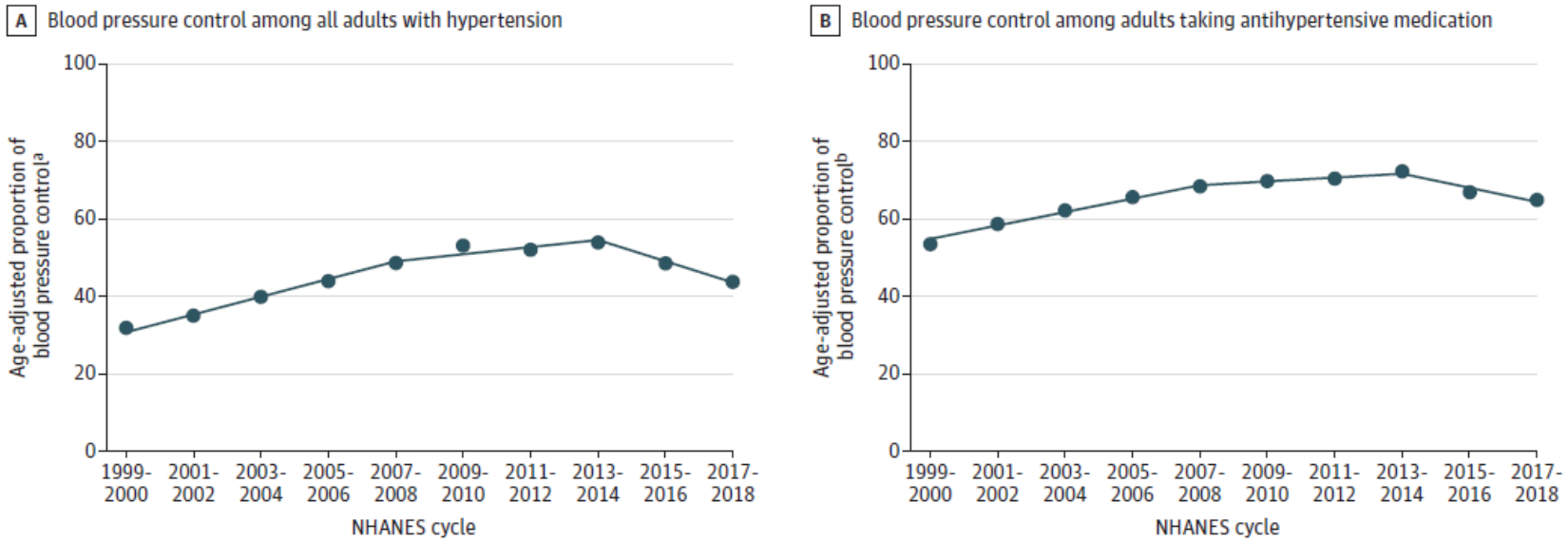
Hypertension Prevalence per new Guidelines

- Nearly half of adults in the United States (108 million, or 45%) have hypertension defined as a systolic blood pressure ≥ 130 mm Hg or a diastolic blood pressure ≥ 80 mm Hg or are taking medication for hypertension.
  - The age-adjusted estimated prevalence of hypertension was 48.6%

Question 2: What percentage of individuals with hypertension are currently have their BP under control in the US?

A. 60%
B. 45%
C. 30%
D. 25%

Figure. Age-Adjusted Estimated Proportion of Adults With Hypertension and Controlled Blood Pressure



NHANES indicates National Health and Nutrition Examination Survey. The data markers represent the age-adjusted estimated proportion (the numbers and 95% CIs appear in Table 3 and eTable 1 in the Supplement). Hypertension was defined as systolic blood pressure (SBP) level of 140 mm Hg or higher, diastolic blood pressure (DBP) level of 90 mm Hg or higher, and antihypertensive medication use. Controlled blood pressure was defined as SBP level lower than 140 mm Hg and DBP level lower than 90 mm Hg. Treatment was defined by self-reported antihypertensive medication use. Among all adults with hypertension, blood pressure control from 1999-2000 through 2007-2008 yielded $P < .001$ for trend; from 2007-2008 through 2013-2014, $P = .14$ for trend; and from 2013-2014 through 2017-2018, $P = .003$ for trend. Among adults taking antihypertensive medication, blood pressure control from 1999-2000 through 2007-2008 yielded $P < .001$ for trend; from 2007-2008 through 2013-2014, $P = .12$ for trend; and from 2013-2014 through 2017-2018, $P = .005$ for trend. Age adjustment was performed using direct standardization with the standard being all adults across the entire period (1999-2018); the age categories used for standardization were 18 to 44 years (15.5%), 45 to 64 years (45.4%), 65 to 74 years (21.5%), and 75 years or older (17.7%). The line segments were generated using Joinpoint (National Cancer Institute).

[a] Among all adults with hypertension.

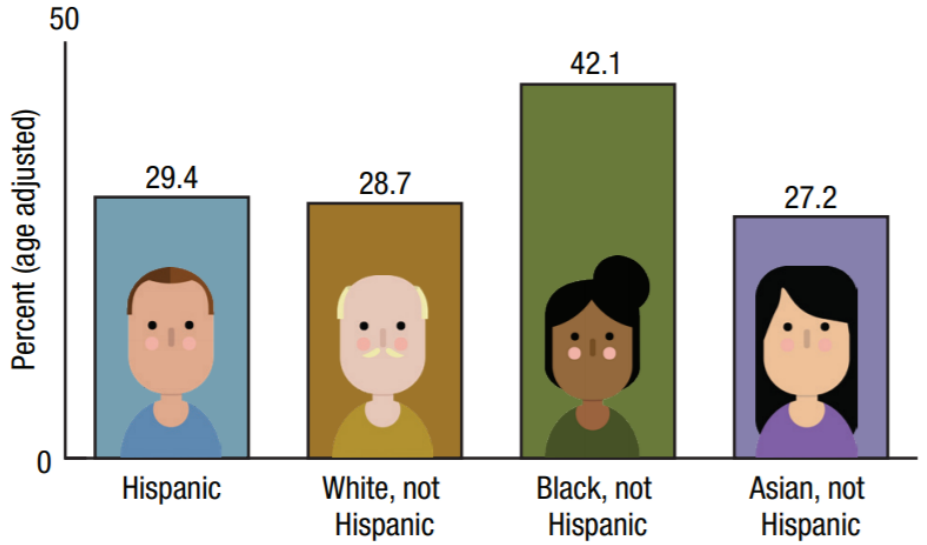
[b] Among adults who self-reported taking antihypertensive medication.

Muntner, et al, *JAMA*, 2020

Racial/Ethnic Disparities in Hypertension

HYPERTENSION

Non-Hispanic black adults aged 20 and over were most likely to have hypertension in 2015–2016.



SOURCE

NCHS, National Health and Nutrition Examination Survey (NHANES).

NOTES

Hypertension is measured high blood pressure (systolic pressure ≥ 140 mm Hg or diastolic pressure ≥ 90 mm Hg) or taking medication to lower high blood pressure. Estimates may differ from others based on the same data due to different analytic methodology.

TABLE. Percentage of noninstitutionalized U.S. adults with hypertension* and, among those with hypertension, estimated percentage of persons who are aware of†, treated for§, and in control of¶ their condition, by sex, race/ethnicity, and age group — United States, 1999–2002

Characteristic**	Hypertension prevalence %	(95% CI††)	Awareness of condition %	(95% CI)	Under current treatment %	(95% CI)	Condition controlled %	(95% CI)
Sex								
Men	27.8	(24.9–29.7)	59.4	(55.8–63.1)	45.2	(40.9–49.6)	27.5	(23.7–31.3)
Women	29.0	(27.3–30.8)	69.3	(61.7–77.0)	56.1	(29.2–63.1)	35.5	(28.4–42.7)
Race/Ethnicity								
White, non-Hispanic	27.4	(25.3–29.5)	62.9	(57.3–68.5)	48.6	(44.1–53.1)	29.8	(25.7–34.0)
Black, non-Hispanic	40.5	(38.2–42.8)	70.3	(64.9–75.8)	55.4	(51.2–59.6)	29.8	(25.2–34.5)
Mexican American	25.1	(23.1–27.1)	49.8	(40.4–59.2)	34.9	(27.5–42.3)	17.3	(10.7–23.8)§§
Age group (yrs)								
20–39	6.7	(5.3–8.2)	48.7	(38.8–58.7)	28.1	(20.1–36.1)	17.6	(11.6–23.7)
40–59	29.1	(25.9–32.4)	73.5	(69.1–77.9)	61.2	(57.1–65.2)	40.5	(36.4–44.5)
≥60	65.2	(62.4–68.0)	72.4	(70.0–74.7)	65.6	(61.9–69.3)	31.4	(28.7–34.2)
Total¶¶	**28.6**	**(26.8–30.4)**	**63.4**	**(59.4–67.4)**	**45.3**	**(45.3–52.8)**	**29.3**	**(26.0–32.7)**

* Had a blood pressure measurement ≥140 mm Hg systolic or ≥90 mm Hg diastolic or took antihypertensive medication.
† Told by a health-care professional that blood pressure was high.
§ Took antihypertensive medication.
¶ Hypertension levels <140 mm Hg systolic and <90 mm Hg diastolic.
** All characteristic estimates (excluding age group) are age adjusted.
†† Confidence interval.
§§ Estimate should be used with caution; relative standard error is 20%–29%.
¶¶ Total population estimates (including sex and age group) include only non-Hispanic whites, non-Hispanic blacks, and Mexican Americans.

Source: CDC

Question 3: What are some approaches to improving health equity in hypertension control?

A. Community engagement
B. Team-based approaches
C. Systems-level interventions
D. A & B only
E. All of the above

Recommended Actions to Reduce Health Disparities

1. Increase community awareness of disparities as persistent problems that represent some of the most pressing health challenges in the U.S.
2. Set priorities among disparities to be addressed at the federal, state, tribal, and local levels
3. Articulate valid reasons to expend resources to reduce and ultimately eliminate priority disparities
4. Implement the dual strategy of universal and targeted intervention strategies based on lessons learned from successes in reducing certain disparities (e.g., the virtual elimination of disparities in certain vaccination rates among children)
5. Aim to achieve a faster rate of improvement among vulnerable groups by allocating resources in proportion to need and a commitment to closing gaps in health, longevity, and quality of life

The Achieving Control Together (ACT) Study

Intervention: African American patients with uncontrolled hypertension receiving health care in an urban primary care clinic will be randomly assigned to receive

- An educational intervention led by a community health worker alone
- The community health worker intervention plus a patient and family communication activation intervention
- The community health worker intervention plus a problem-solving intervention.

Results: BP control improved in all groups from baseline (36%) to 12 months (52%) with significant declines in SBP − 9.1 CHW , − 7.4 DoMyPART, and − 11.3 Problem Solving and DBP (− 4.8 CHW, − 4.0 DoMyPART, and − 5.4 Problem Solving.

Reducing Inequities in Care of Hypertension: Lifestyle Improvement for Everyone (RICH LIFE)

Intervention: RICH LIFE is a two-arm, cluster-randomized trial for improving blood pressure (BP) control and patient activation and reducing disparities in BP control

- Standard of Care Plus (SCP): Enhanced education, care management, and usual care
- Collaborative Care/Stepped Care (CC/SC): Patients “step up” through nurse case manager to additional engagement with community health workers or specialists care as needed

Primary Outcomes: BP control (<140/90 mm Hg) at 12 months; self-reported patient activation at 12 months

Cooper, et al, *Am Hear J*, 2020

RICH Life Project

PIs: Lisa A. Cooper, Jill Marsteller

Association of Psychosocial Stressors with Medication Adherence in RICH LIFE

	Blacks		Whites		Hispanic	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Interpersonal Stressors						
Perceived Stress	**0.89 (0.86 – 0.94)**	**0.93 (0.88 – 0.98)**	**0.91 (0.86 – 0.96)**	0.94 (0.87 – 1.00)	0.97 (0.87 – 1.07)	0.96 (0.85 – 1.10)
Discrimination	**0.57 (0.47 – 0.77)**	**0.63 (0.49 – 0.82)**	0.89 (0.64 – 1.25)	1.05 (0.73 – 1.52)	**0.33 (0.15 – 0.75)**	**0.36 (0.14 – 0.89)**

Alvarez, Hines, et al, *Eth Dis*, in press

Main Findings

Using the social determinants of health framework, we identified associations between stress, everyday discrimination and medication adherence among non-Hispanic Blacks and Hispanics that were independent of health status and other social determinants.

Programs to enhance self-management for African American and Latino patients with uncontrolled blood pressure should include a specific focus on addressing social stressors.

Parent Study: 5+ Nuts and Beans for Kidneys

The primary objective of the parent grant is to assess the impact of a community-based dietary intervention on kidney damage reduction and blood pressure control among socioeconomically disadvantaged African Americans with chronic kidney disease (CKD) and hypertension.

PIs: Drs. Deidra Crews and Pete Miller

Miller, et al, *Am J Prev Med*, 2016

Food Desert and Swamp

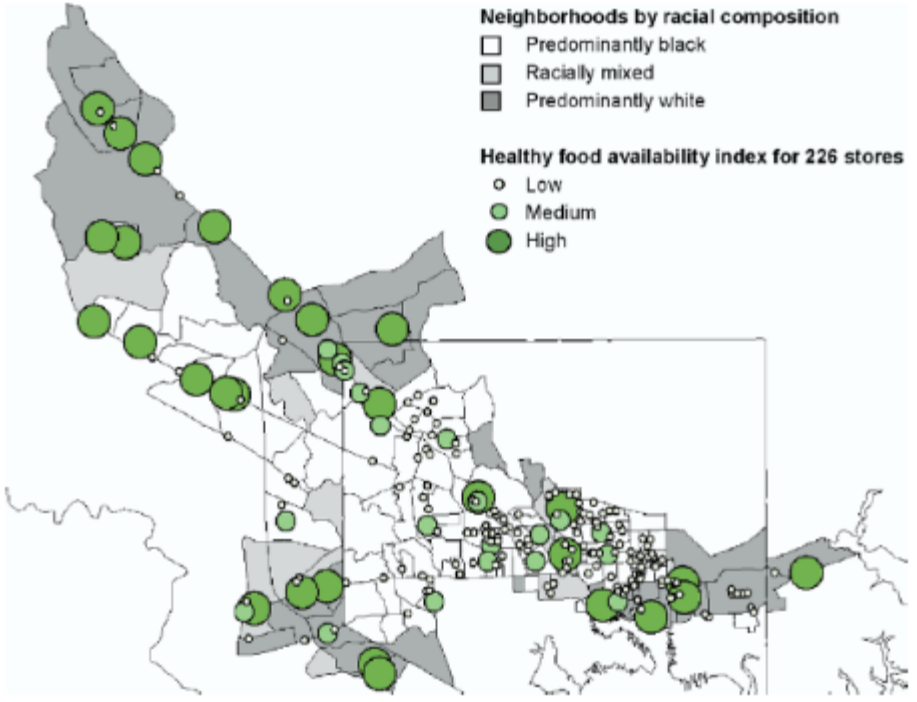


Figure 1. Racial composition of study neighborhoods and healthy food availability index of the 226 food stores in the study

Franco M, Diez Roux AV, Glass TA, Caballero B, Brancati FL. Neighborhood characteristics and availability of healthy foods in Baltimore. *Am J Prev Med*. 2008.

Five, Plus Nuts and Beans *for Kidneys* Trial

12 month, community-based dietary RCT in 150 low income African Americans with hypertension plus albuminuria

- Usual care
- Coaching

Hypothesis: coaching to adopt the DASH diet and $30 per week worth of potassium-rich foods (fruits, vegetables, nuts and beans) from a local grocer, will reduce urinary albumin excretion

- BP reduction is secondary outcome

Community-Based Dietary Approach for Hypertensive African Americans with Chronic Kidney Disease.
1U01MD010550-01, National Institute for Minority Health and Health Disparities.
PIs: Deidra Crews and Edgar ‘Pete’ Miller.

Five, Plus Nuts and Beans *for Kidneys* Trial: Ancillary Study

The ancillary study will provide a critical psychosocial component to the parent study, which may further explain variation in outcomes of the intervention and contribute to its broader population applications.

- Among African Americans, psychosocial stressors have been associated with hypertension and kidney disease.

- Psychological stress is related to dietary consumption of sodium and other unhealthy dietary behaviors.

Ancillary Study

PI: Dr. Anika L. Hines

Upstream Intervention/Downstream Impact: Does Reducing Food Insecurity as a Stressor Enhance Psychological and Physiological Outcomes of a Dietary Intervention?
3U01MD010550-03S1, National Institute on Minority Health and Health Disparities

Methods

Photovoice is a community-based participatory research tool that uses photography to engage participants in reflection and dialogue regarding their community's strengths, needs, and capacity for social change.

Sample: 22 residents of Baltimore who: 1) were 21 years or older; 2) self-identified as African American or Black; and 3) were hypertensive

After training in basic photography skills, participants were asked to respond to statement, **“Photograph everything related to food in your neighborhood”** in images (at least 5 photos per session).

Participants discussed their images in small groups over 4 sessions.

Sample Characteristics (N=22)

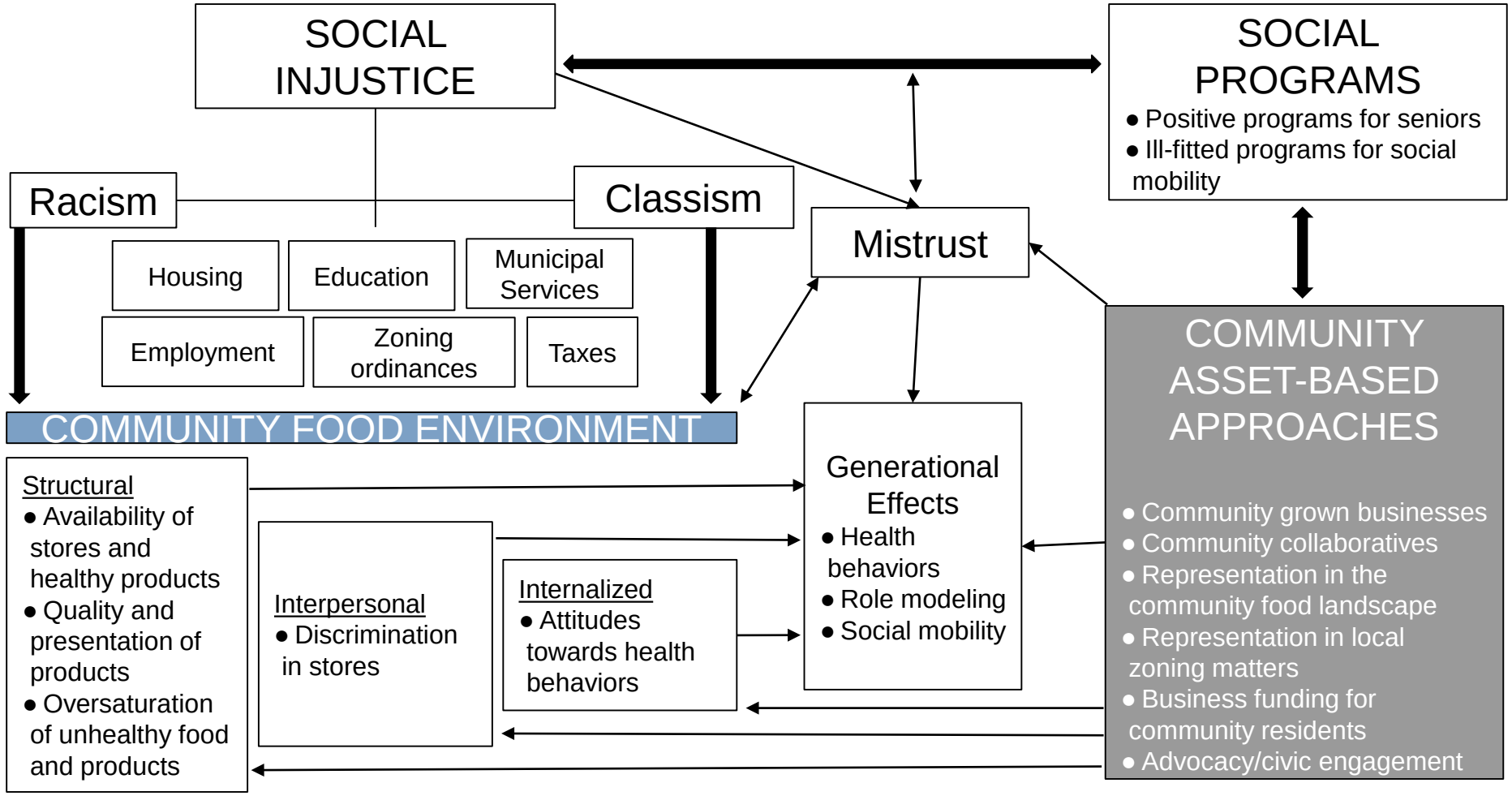
Age(mean, years)	65.1
Female	68%
Educational attainment	
Less than high school	18%
High school or GED	36%
More than high school	41%
Annual income	
<$25,000	59%
≥$25,000	32%
Employment status	
Looking for work	14%
Not working due to health	23%
	9%
Working part-time	50%
Retired	
Insured	91%

There were 8 groups of 3-4 members.

Participants made 1,437 photographs.

Note: Participants who preferred not to answer were excluded from calculations

Overview of Thematic Findings



Thematic Findings

<u>Social Injustice</u>: “But I'm just saying, it's this equitable distribution of food, I think that's how it relates to our health. I feel like when you go to certain markets, **if they got a lot of processed food, that's killing us**.”


“I Wish”

“…you look at the fruits and vegetables in the picture, and **everybody should be able to have fruits and vegetables that look this fabulous**, and they should be able to eat those most nights.”

Thematic Findings

<u>Community Asset-Based Approaches</u>: “Find a couple people who like to **cook…because one of the brothers who come to the program, he grows his own food**. We can get with somebody who can cook, got a good recipe or something. And open up a health kit.”

"Health kitchen in our community. That thing we can do on our own, really. **Because we got the talent and the skill**.”

<u>Advocacy/Civic engagement:</u>
“You think that your vote isn't important. Your vote is important. I say, but for some reason **we will survive** regardless. You know what I'm saying? We are in doing so much stuff that we will survive, **but I just want more for us**.”

BP Control Performance Gap

The NCQA estimates a performance gap between 36-43 percent for controlling high blood pressure among adults aged 18 to 85 years with a diagnosis of hypertension.

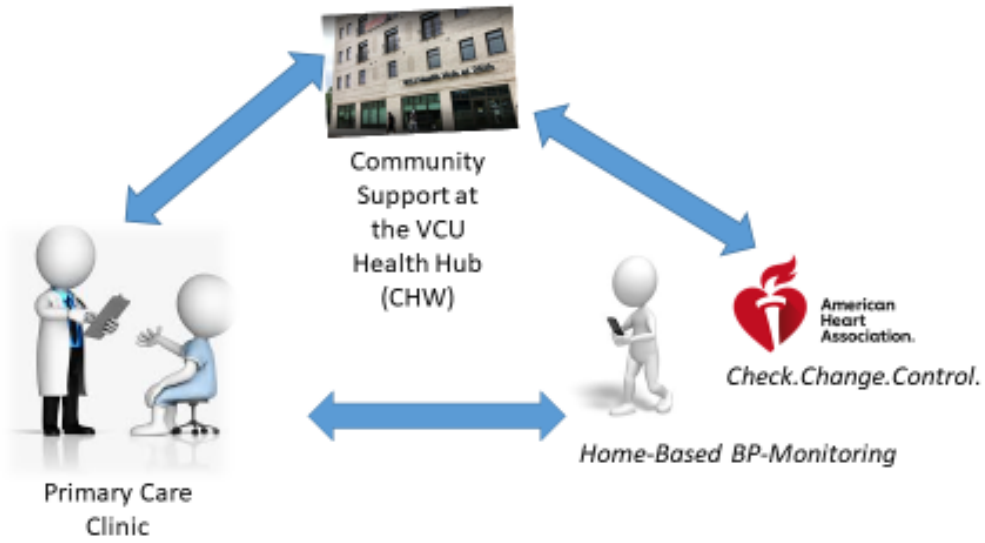
Table 1. Estimated cases of CVD-related disease averted annually as a result of hypertension control among young adults aged 18 to 39 years

Subgroup	Myocardial infarction	Stroke	Heart failure	Total
African American men (n=1,209,120)	2,021,225	3,233,961	4,042,451	9,297,637
African American women (n=1,248,440)	2,398,441	3,837,505	4,796,881	11,032,827
White men (n=2,512,938)	2,500,373	4,000,597	5,000,747	11,501,717
White women (n=3,400,603)	3,129,830	5,007,728	6,259,660	14,397,218
Total	10,049,869	16,079,791	20,099,739	46,229,399

Patient-Centered Care for Health Equity (PACE) for Young Adults

Intervention: a patient-centered, patient-activated approach community intervention

- Home-based BP monitoring
- Interface with a community health worker (CHW) at the VCU Health Hub (“the Hub”) for hypertension education and referral to primary care for abnormal readings
- Interface with primary care clinicians (PCPs) who will review patterns of abnormal BP readings with patients and discuss options for treatment as appropriate.



Primary Outcomes: Feasibility, acceptability, preliminary efficacy in achieving BP control and patient activation at 4 months

Point of discussion:
What are some barriers to improving BP control among young adults?

Question 4: What is the role of the pharmacist on the interprofessional healthcare team to achieve BP control?

A. Assisting with out-of-office monitoring
B. Education
C. Identifying non-adherence
D. Resolving non-adherence
E. Titrating BP medications
F. B, C, & E
G. All of the above

Journal of Human Hypertension (2020) 34:487–494
https://doi.org/10.1038/s41371-020-0331-7

REVIEW ARTICLE

Pharmacist's role in hypertension management: a review of key randomized controlled trials

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Received: 9 December 2019 / Revised: 12 March 2020 / Accepted: 13 March 2020 / Published online: 1 April 2020

Abstract

Hypertension (HTN) is a leading cause of death and disability throughout the world. Yet, despite widely available treatment options, blood pressure (BP) control rates have remained relatively stagnant. One approach to address this issue is through collaborative care models, particularly those employing pharmacists. Numerous randomized controlled trials (RCT) have demonstrated the effectiveness of pharmacist interventions to improve BP control across primary care, community-based, and telemedicine models. A meta-analysis of 39 RCTs has demonstrated that pharmacist interventions significantly reduce both systolic and diastolic BP compared with controls across diverse patient populations. Pharmacists can contribute to HTN management in a variety of ways, including assisting with out-of-office monitoring, providing education, identifying and resolving nonadherence, and titrating antihypertensive therapy to achieve BP control. In this review, we discuss key trials conducted in recent years that support the role of pharmacists in HTN management and provide guidance on practical considerations for working collaboratively with pharmacists to improve BP control.

Background

Hypertension (HTN) is the leading risk factor for global disease burden because of its concomitant risks of cardiovascular disease (CVD) and chronic kidney disease (CKD) [1]. In the United States (USA), midlife mortality from hypertensive diseases increased by 78.9% between 1999 and 2017 [2]. With a blood pressure (BP) goal of <130/80 mmHg introduced in recent guidelines, more than half of Americans currently being treated for HTN are estimated to require therapy intensification [3]. Thus, there remains an urgent need for strategies to improve BP control and reduce adverse clinical outcomes.

Team-based care is one strategy recommended by current clinical practice guidelines to improve BP control [4]. In an analysis of 100 randomized controlled trials (RCT), Mills et al. reported that team-based care with medication titration by a nonphysician had the greatest reduction in systolic BP (SBP) (–7.1 mmHg, 95% CI, –8.9 to –5.2; $P < 0.001$) and diastolic BP (DBP) (–3.1 mmHg, 95% CI, –4.1 to –2.2 mmHg; $P < 0.001$) compared with usual care [5]. Pharmacist-led interventions, in particular, are an effective strategy to improve BP control, as well as other chronic diseases (e.g., diabetes and hyperlipidemia) [6]. A 2014 meta-analysis of 39 RCTs demonstrated that pharmacist's interventions reduced SBP by −7.6 mmHg (95% CI, −9.0 to −6.3) and DBP by −3.9 mmHg (95% CI, −5.1 to −2.8) compared with control [7].

In more recent years, multiple RCTs have evaluated the effect of pharmacist interventions on BP outcomes across various models of care, including primary care, community-based, and telemedicine. Thus, the aim of this review is to discuss recent RCTs that support the expanding role of pharmacists in HTN management and provide general guidance on collaborating with pharmacists. Table 1 summarizes the RCTs discussed in this review.

Primary care models

In 2016, there were 481.6 million visits to primary care providers (PCP) in the USA [8]. As the nation's population

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CAPTION: Cluster-Randomized Trial of a Physician/Pharmacist Collaborative Model to Improve Blood Pressure Control

Intervention: Physician/pharmacist collaborative management model

- Primary care practices grouped based on low and high pharmacist services
  - Medical record review and interview with the pharmacist
    - Medication history
    - Assessment of patient's knowledge of their BP medication
    - Discussion of barriers to achieving BP control
  - Creation of care plan
  - Education of patients regarding medications, adherence and lifestyle modifications

Results:

- Clinically significant reduction in systolic (-6.1 mmHg) and diastolic (-2.9 mmHg)
- Statistically significant improvement in BP control rates among minority patients at 18 months (39% versus 18%) and 24 months (36% versus 19%)

Community-Based Intervention—Barbershop-2

Intervention: Barbers checked BP for all black clients

- Used role model stories of other clients as peer-to-peer motivation to follow-up with their physicians

Revised intervention: Pharmacists facilitated BP measurement and changes to BP medications; barbers encouraged clients to measure BP and follow-up with physicians

- 4 Intervention visits
  - Measured BP
  - Reconciled medications
  - Worked with patients on goal-setting and activation tools
  - Prescribed and intensified anti-hypertensives

Results:

- Average SBP reduction (-21.6 mmHg); Average DBP reduction (-14.9 mmHg) sustained at 12 months
- 68% of intervention group achieved BP <130/80 mmHg

Acknowledgements

Johns Hopkins Center for Health Equity

- RICH LIFE Project and Study Team
- Five Plus for Kidneys Project and Study Team

Dr. Lisa A. Cooper

Dr. Jill Marsteller

Dr. Deidra C. Crews

Dr. Edgar R. “Pete” Miller

Dr. Jessica LaRose

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