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Publication Date

2024-09-01

DOI

10.1016/j.ajpc.2024.100703

American Journal of Preventive Cardiology 19 (2024) 100703

Contents lists available at ScienceDirect

American Journal of Preventive Cardiology

journal homepage: www.journals.elsevier.com/american-journal-of-preventive-cardiology

Disparities in awareness and treatment among women with hypertension: Insights from the American Heart Association Research Goes Red Registry

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ARTICLE INFO

Keywords:
Hypertension
Disparities
Women's cardiovascular disease

ABSTRACT

Hypertension is an important modifiable risk factor for cardiovascular disease and affects nearly one-third of women in the U.S. Prior research has demonstrated declining rates of blood pressure (BP) control nationally among women, and there are significant racial and ethnic disparities in both hypertension prevalence and outcomes among U.S. women. However, national-level data on attitudes and awareness of women with hypertension are limited. To address this gap, data were analyzed from participants with self-reported hypertension enrolled in the American Heart Association's Research Goes Red Registry. Of 6170 women who responded as of February 2023, 1835 (30 %) reported a history of hypertension. The top health concerns reported among women with hypertension were weight, healthcare access and costs, and hypertension. Health concerns varied significantly by age, race, and ethnicity; younger women and Black and Hispanic women were more likely to report hypertension as their top concern. Among women with self-reported hypertension, 77 % reported knowing their BP, and 90 % reported being on an anti-hypertensive. Black and Hispanic women were less likely to know their BP compared to White women. Younger women were less likely to be treated for hypertension, and there were also disparities in treatment by employment status and among uninsured women. In this national registry of women in the U.S., gaps and disparities exist in awareness and treatment of hypertension, highlighting targets for quality improvement in hypertension care for women.

1. Introduction

Hypertension is an important modifiable risk factor for cardiovascular disease, which remains the leading cause of mortality among women in the United States.[1] Nearly one-third of U.S. women have hypertension, and over the last decade, blood pressure (BP) control declined nationally among women.[2] At the same time, racial and ethnic disparities in both the prevalence of hypertension and BP control have been described in the U.S.[2–4] Black adults have the highest prevalence of hypertension, and hypertension rates are on the rise among Hispanic young adults.[3,4] Among those treated for hypertension, BP control among non-Hispanic Black adults has declined nationally.[2,3] Understanding the reasons for suboptimal BP control among women—and the contribution of racial and ethnic disparities—is critical to developing strategies to address these gaps.

While several data sources for national hypertension surveillance exist, national-level data on the health attitudes and awareness among women with hypertension are limited.[5] To address this gap, data were analyzed from a national online registry of women. The objective was to examine the top health concerns, awareness of BP, and treatment of hypertension among women reporting a history of hypertension, and to evaluate whether these varied by age, race, ethnicity, and other sociodemographic characteristics.

2. Methods

A cross-sectional analysis was performed on data from participants enrolled in the Research Goes Red (RGR) Registry, which was launched by the American Heart Association (AHA) in collaboration with Verily's Project Baseline.[6] The objective of the RGR Registry initiative is to create a large health registry and research platform engaging women, who have historically been underrepresented in clinical studies of heart disease. The RGR is a longitudinal registry established in 2019 using a novel, participant-centered online platform. Individuals are recruited

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https://doi.org/10.1016/j.ajpc.2024.100703
Received 12 March 2024; Received in revised form 7 June 2024; Accepted 23 June 2024
Available online 24 June 2024

through several methods, including advertisements, care provider recommendations, community events, and digital campaigns. Participants register for RGR from the Project Baseline website (projectbaseline.com). Participants in RGR consented to share data with researchers, and the data are deidentified and securely stored.

Data were analyzed from 6170 women who have responded to the RGR survey as of February 2023. Among the women reporting hypertension, three self-reported outcomes from the RGR survey were examined: (1) top health concerns, (2) awareness of BP levels, and (3) treatment of hypertension. Top health concerns were elicited by asking participants, "Which topic is most important to you?" among 21 choices.[6] Awareness of BP levels was assessed using the response to the question, "Do you know your blood pressure?" Hypertension treatment was evaluated using the response to the question, "Are you currently taking medication for hypertension (high blood pressure)?"

Between-group differences in self-reported outcomes by age, race and ethnicity, and other sociodemographic factors (education, income, employment status, and insurance status) were analyzed using Chi-squared tests. All sociodemographic data were based on self-report. Due to significant missingness in the social determinants of health variables, multivariable analysis was not performed. Significance was determined based on a p-value of < 0.05. RStudio (version 2022.07.1) was used for all analyses. This study was approved by the Western Institutional Review Board (#101,143) – The Project Baseline Community Study.

3. Results

Of 6170 women who responded to the RGR survey, 1835 (30 %) reported a history of hypertension. Among 1835 women with self-reported hypertension, median age was 52 years (interquartile range 46, 61). In terms of race and ethnicity, 75 % were White, 14 % were Black, and 5 % were Hispanic (Table 1). Most women (56 %) were employed or retired, 38 % had completed college, and 47 % had private or employer-sponsored insurance. Additional cardiovascular risk factors were common: diabetes 19 %, obesity 43 %, and history of tobacco use 26 %.

The top 10 ranked health concerns reported among the 1835 women with hypertension were: (1) weight, (2) access to and paying for healthcare, (3) hypertension, (4) memory/aging, (5) anxiety/stress, (6) health of family members, (7) food, healthy eating, and/or availability of healthy food, (8) sleep, (9) mental health and/or depression, (10) financial well-being (Fig. 1). Health concerns varied significantly by age, race, and ethnicity. Younger women and Black and Hispanic women

Table 1
Disparities in awareness and treatment of hypertension by sociodemographic characteristics.

	n (%) total study population	% report knowing their blood pressure	p-value	% report being on treatment for hypertension	p-value
Age			0.002		<0.001
18 to 29 years	33 (1.8 %)	75.8 %		57.6 %	
30 to 39 years	178 (9.7 %)	77.5 %		74.2 %	
40 to 49 years	498 (27.1 %)	74.8 %		90.6 %	
50 to 59 years	602 (32.8 %)	74.9 %		93.3 %	
60 years and older	524 (28.6 %)	83.9 %		94.2 %	
Race and ethnicity			0.003		0.262
American Indian or Alaskan Native	8 (0.4 %)	87.5 %		75.0 %	
Asian	18 (1.0 %)	83.3 %		94.4 %	
Hispanic	99 (5.4 %)	70.7 %		84.8 %	
Mixed	59 (3.2 %)	78.0 %		87.5 %	
Native Hawaiian or Pacific Islander	3 (0.2 %)	33.3 %		100 %	
Non-Hispanic Black	257 (14.0 %)	69.2 %		93.0 %	
Non-Hispanic White	1382 (75.3 %)	79.7 %		90.4 %	
Other	9 (0.5 %)	88.9 %		88.9 %	
Education			<0.001		0.406
Did not graduate high school	13 (0.7 %)	76.9 %		92.3 %	
High school graduate	109 (5.9 %)	65.7 %		88.1 %	
College graduate	350 (19.1 %)	83.8 %		92.3 %	
Advanced degree	351 (19.1 %)	83.1 %		93.1 %	
Employment status			0.002		0.002
Homemaker	79 (4.3 %)	75.9 %		80.8 %	
Student	11 (0.6 %)	63.6 %		81.8 %	
Unemployed	47 (2.6 %)	60.9 %		87.0 %	
Employed or self-employed	768 (41.9 %)	79.2 %		91.5 %	
Disability	118 (6.4 %)	80.3 %		94.0 %	
Retired	254 (13.8 %)	86.1 %		94.8 %	
Annual income			<0.001		0.149
Less than $25,000	160 (8.7 %)	63.7 %		85.4 %	
$25,000 to < $50,000	2339 (13.0 %)	75.6 %		90.7 %	
$50,000 to < $100,000	421 (22.9 %)	81.4 %		92.1 %	
$100,000 to < $150,000	253 (13.8 %)	87.3 %		90.5 %	
$150,000 or more	191 (9.9 %)	85.6 %		92.3 %	
Insurance					
Private or employer	864 (47.1 %)	81.5 %	0.016	90.9 %	0.711
Medicaid	123 (6.7 %)	67.2 %	<0.001	86.9 %	0.083
Medicare	291 (15.9 %)	80.4 %	0.728	93.1 %	0.309
Military	41 (2.2 %)	87.8 %	0.254	100 %	0.088
Uninsured	53 (2.9 %)	67.9 %	0.050	83.0 %	0.046

Race and ethnicity were based on participant self-report in the Research Goes Red survey.
Percentages may not add up to 100 % due to missing data for education ($n = 1012$), employment status ($n = 558$), income ($n = 581$), diabetes ($n = 15$), obesity ($n = 30$), smoking ($n = 550$), and participants could select more than one type of insurance.
Between-group differences were assessed using a Chi-squared test.

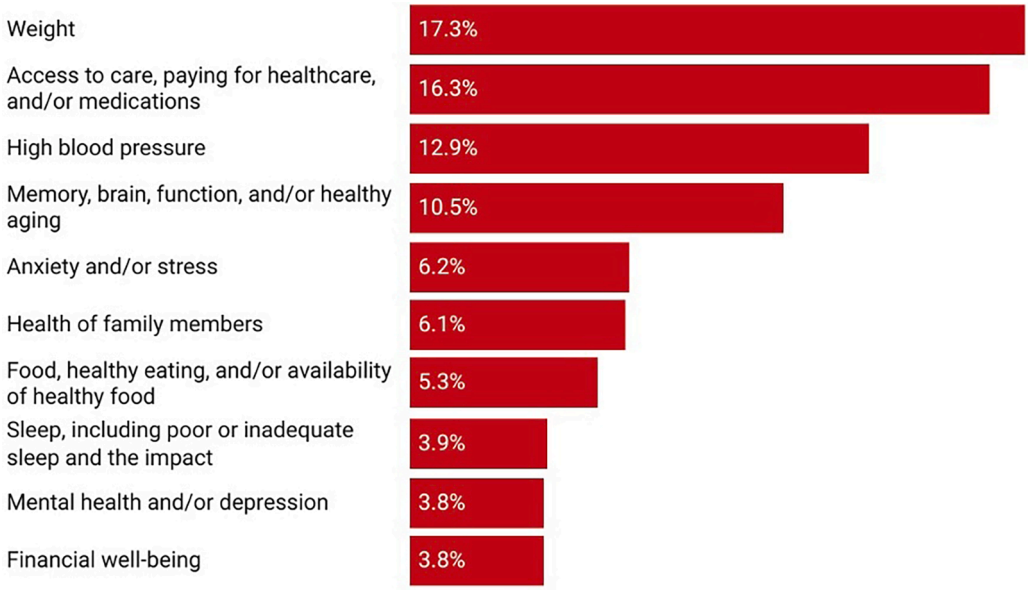

Fig. 1. Top ten reported health concerns among with women with hypertension.
Participants were asked: "Which topic is most important to you?" among 21 choices. The figure shows the percentage of participants with self-reported hypertension (n = 1835) who reported that the topic was the most important to them.

were more likely to report hypertension as their top concern (p-value <0.001). Among women without self-reported hypertension, the top 10 ranked health concerns were: (1) access to and paying for healthcare, (2) weight, (3) anxiety/stress, (4) memory/aging, (5) health of family members, (6) mental health and/or depression, (7) food, healthy eating, and/or availability of healthy food, (8) sleep, (9) menopause, (10) financial well-being. Hypertension ranked number 3 for women with self-reported hypertension but did not rank among the top 10 health concerns for women without self-reported hypertension. Otherwise the top health concerns were similar between the two groups.

Among women with hypertension, 1411 (77 %) reported knowing their BP levels. Black and Hispanic women were less likely to know their BP (p-value 0.003). There were also disparities in BP awareness across all of the sociodemographic variables studied (Table 1). Younger women (p-value 0.002), students and unemployed women (p-value 0.002), and those with high school or less education, lower income, and Medicaid insurance (p-value <0.001) were less likely to know their BP. Women with private or employer insurance were more likely to know their BP (p-value 0.016).

Of the 1835 women reporting a diagnosis of hypertension, 1648 (90 %) reported being on treatment for hypertension. Treatment for hypertension did not vary significantly by race and ethnicity (p-value 0.262), income (p-value 0.149), or education (p-value 0.406). However, younger women were less likely to be treated (p-value <0.001), and there were disparities in treatment by employment status (p-value 0.002) and among the uninsured (p-value 0.046).

4. Discussion

In this national cohort of women reporting hypertension, gaps exist in BP awareness and treatment, with significant disparities by age, race, ethnicity, and other sociodemographic factors.

In this study, 30 % of women reported a history of hypertension, which is slightly lower than the prevalence of hypertension among adults (32 %) in the National Health and Nutrition Examination Survey (NHANES) 2017–2018 and among women (37 %) in a national AHA survey in 2019.[2,5] Among women aware of their hypertension diagnosis, 90 % reported that they were on antihypertensive medications in the RGR survey, compared to 92 % in NHANES 2017–2018.[2] Similar to the NHANES data, in the RGR survey, younger women and those without insurance were less likely to be on treatment for hypertension, whereas hypertension treatment did not vary significantly by race, ethnicity, income, or education.[2]

Low awareness of BP levels or low concern about hypertension may contribute to gaps in hypertension treatment and suboptimal BP control among women. Analysis of NHANES data demonstrated that only 77 % of adults with hypertension were aware of their diagnosis.[2] A prior national AHA survey found that women with hypertension had lower knowledge that heart disease was the leading cause of death in women compared to women without hypertension.[5] However, neither of these studies reported what percentage of adults with hypertension were aware of their BP levels or considered hypertension to be a top health concern. The present analysis adds to these prior studies by including data women's top health concerns and awareness of BP levels. Among women without a self-reported history of hypertension, hypertension did not even rank among the top 10 health concerns. However, among those with a self-reported history, hypertension ranked as the number 3 health concern. Despite this concern, only 77 % of women with self-reported hypertension reported knowing their BP levels. This represents an opportunity for clinicians to empower women with hypertension to monitor and be aware of their own BP levels, which may encourage treatment initiation or adherence and improved BP control.

Importantly, there were disparities in BP awareness across all of the sociodemographic variables studied. Although younger women and Black and Hispanic women were more likely to report hypertension as their top health concern, younger women were less likely to be on antihypertensive medications, and Black and Hispanic women were less likely to know their BP levels. Given their concerns about hypertension, this is a missed opportunity to engage younger women and women of color as partners in their hypertension care.

The study has several limitations. First, this was an internet-based registry relying on self-report, which may be prone to issues such as recall bias. However, prior validation studies of NHANES suggest that self-reported hypertension is reliable, with better reliability among women compared to men.[7] Additionally, the study population responding to the online RGR survey may not be generalizable to the broader U.S. population. In particular, the high percentage of women reporting being on anti-hypertensives suggests that the study sample may have greater access to care than the general population. Finally, there were high levels of missingness for the social determinants of

health variables. Because these data were not missing at random, we did not perform multiple imputation or multivariable regression using the sociodemographic data.

Despite these limitations, this study offers several strengths. The RGR Registry is a national, patient-centric online registry eliciting women's health concerns and attitudes. In addition to awareness of BP levels and hypertension treatment, participants were also asked to rank their top health concerns, which has not previously been reported in national surveys of women with hypertension. These data highlight several important discrepancies between concerns about hypertension and awareness and treatment of hypertension among women. This analysis of national AHA registry data therefore draws attention to potential targets for quality improvement efforts in the care of women with hypertension.

CRediT authorship contribution statement

Megan M. McLaughlin: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Conceptualization. **Alexis L. Beatty:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Megan McLaughlin reports financial support was provided by National Institutes of Health. Alexis Beatty reports financial support was provided by Patient-Centered Outcomes Research Institute. American Heart Association's (AHA's) Research Goes Red is funded, in part, by the Bugher Trust Foundation, the AHA, and in-kind donations from Verily. The AHA Precision Medicine Platform (https://precision.heart.org/) was the cloud-based research platform used for the data analysis. Dr. McLaughlin received salary support from the NIH: 5T32HL007731–30. Dr. Beatty was formerly employed by (2018–2019) and held stock in (2019–2021) Apple Inc, receives consulting fees from AHRQ-funded projects related to cardiac rehabilitation, and receives grant funding from PCORI (IHS-2021C3–24147). If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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