

May Measurement Month 2021: an analysis of blood pressure screening results from Ghana

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KEYWORDS

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May Measurement Month (MMM) is a global campaign initiated by the International Society of Hypertension (ISH) with the aim of raising awareness of high blood pressure (BP) and serving as a catalyst for the establishment of screening programmes around the world. An opportunistic cross-sectional survey of volunteers aged ≥ 18 years was conducted. A standardized protocol for MMM was used to measure BP and collect relevant health information from participants at screening sites in four regions of Ghana. Hypertension was defined as a systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg or on antihypertensive medication. A total of 4832 people agreed to take part in the MMM21 study and were screened. After multiple imputation of missing BP readings, 1426 people (29.5%) had hypertension. 11.9% of the 1426 participants with hypertension were aware of their condition, and 8.6% reported taking antihypertensive medication. 24.2% of 123 people on antihypertensive medication had their BP under control ($<140/90$ mmHg). In addition, only 2.1% of the 1426 participants with hypertension had controlled BP. Results from this study found that almost nine out of 10 people with hypertension who were screened were unaware of their condition, most were untreated, and only 2% of those with hypertension had their BP controlled with medication. This emphasizes the importance of BP screening campaigns as a tool for identifying and referring people with high BP for treatment.

Introduction

Across the world, hypertension is the leading cause of cardiovascular disease and premature death. Global

mean blood pressure (BP) has remained constant or decreased slightly over the last four decades due to the widespread use of antihypertensive medications. However, by contrast, the prevalence of hypertension has particularly increased in low- and middle-income countries (LMICs).¹ It affects 1.04 billion (31.5%) people in LMICs, compared with 349 million (28.5%)

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people in high-income countries. The prevalence of hypertension in the adult population is expected to rise owing primarily to an increase in LMIC prevalence.^{1,2}

In Ghana, hypertension is one of the leading causes of hospitalization and death.^{3,4} It was the third leading cause of admission and the leading cause of death in Ghana in 2017, accounting for 4.7% of total admissions and 15.3% of total deaths.^{3,5} Stroke, myocardial infarction, heart failure, chronic kidney disease, and atherosclerosis all have hypertension as a major risk factor.⁶ Controlling high BP is associated with lower cardiovascular morbidity and mortality.^{6,7}

Obesity, alcohol use, physical inactivity, and poor diets, among other risk factors, have been linked to an upsurge in the prevalence of hypertension.⁸ Variations in the levels of hypertension risk factors such as high sodium intake, low potassium intake, obesity, alcohol consumption, physical inactivity, and poor diet may explain some of the geographic variation in hypertension prevalence.¹

Identifying people with high BP through screening campaigns, making them aware of their condition, and starting them on treatment is critical for population health promotion and disease burden reduction. To raise national awareness about hypertension, Ghana joined the global hypertension awareness campaign, May Measurement Month 2021 (MMM21).

Methods

For the MMM BP screening study, a convenience sampling technique was used. A group of medical professionals and volunteers from a few public and private institutions oversaw the research. Ethical approval was granted by the Ghana Health Service's ethics review committee. Approximately 40 sites were established across three regions of the country in public and private areas, health facilities, pharmacies, shopping centres, marketplaces, schools, workplaces, and community centres. A variety of media platforms were used to promote the event. Large banners were displayed in public places to help with publicity. The screening campaign made use of OMRON BP monitors donated by OMRON Healthcare. Life from 30 Ghana and ISH provided some financial assistance.

The participants, recruited through the advertising campaign, were 18+-year-old adults who ideally had not had their BP measured in the previous year and who volunteered to take part in the study. Representatives from the participating regions who were trained health professionals organized training sessions using video demonstrations for all screening volunteers on how to measure BP. Hypertension was defined as having a systolic BP of 140 mmHg or more or a diastolic BP of 90 mmHg or more (based on the mean of the second and third of three recorded BP readings) or being on hypertension treatment.⁹

Data were recorded initially by local investigators using the MMM app, which incorporated new variables including previous COVID-19 test and vaccination, use of hormone replacement therapy (HRT), and hormonal contraception. The data were then cleaned by the MMM project team and analysed centrally by statisticians from the MMM project team, including the use of multiple imputation to estimate the mean of the second and third BP readings where this was missing.¹⁰ The Methods section of the MMM global paper contains information on data collection and analysis.¹⁰

Results

Of the 4832 participants screened during the study, 2642 (54.7%) were males. The mean age of participants was 39.5 years (SD = 12.3). The great majority of participants (86.5%) were of Black ethnicity with 0.3% and 0.7% of participants being on statins and aspirin, respectively. Participants with previous COVID-19-positive test and one or more previous COVID-19 vaccinations were 0.3% and 2.5%, respectively (Table 1).

After multiple imputation, we found 29.5% of the study participants had hypertension ($N=1426/4832$). The majority, 1256 (88.1%), of participants who had hypertension were unaware of their hypertensive status, with only 123/1426 (8.6%) of the total number of participants with hypertension reported to be taking antihypertensive medication. Among the 123 participants who were on medication, 24.2% had controlled BP levels (<140/90 mmHg). Of all participants with hypertension, 97.9% had uncontrolled BP levels. The prevalence of hypertension in both male and female participants was the same (29.5%) with an increasing likelihood of being hypertensive with increasing age (54.8% of those in the age range 60-69 years were hypertensive, compared with 15.3% of those in the 18- to 29-year age group).

The age and sex-standardized mean systolic/diastolic BP of all participants was 131.4/77.4 mmHg. Of those not taking antihypertensive treatment, the mean standardized BP was found to be 130.7/76.8 mmHg, whilst that for those on treatment was 146.9/89.3 mmHg.

Discussion

As a global initiative, MMM provides an opportunity and a massive platform to use inexpensive, volunteer-based, convenience sampling method to screen BP to raise national awareness of hypertension.

This MMM study in Ghana aimed to identify hypertensive individuals in the community whilst also emphasizing the importance of controlling BP.

Table 1 Total participants and proportions with hypertension, awareness, on medication, and with controlled blood pressure

Total participants	Number (%) with hypertension	Number (%) of hypertensives aware	Number (%) of hypertensives on medication	Number (%) of those on medication with controlled BP	Number (%) of all hypertensives with controlled BP
4832	1426 (29.5%)	170 (11.9%)	123 (8.6%)	30 (24.2%)	30 (2.1%)

The 2021 study found hypertension in 29.5% of the total participants. Of all hypertensive participants, 11.9% were aware of their condition, 8.6% were taking antihypertensive medication, and 24.2% of those on medication had their BP under control. The proportion of hypertension found in study participants in 2021 was lower than that for 2019 and 2018, which might be explained by under-reporting of antihypertensive medication use in some participants, which was not recorded for all participants. This may be improved in subsequent campaigns by encouraging participants to answer questions pertaining to medication use and treatment.

The findings presented here are based on an opportunistic screening campaign, with no randomized or nationally representative recruitment. As a result, the true prevalence of hypertension cannot be inferred, and data on individual outcomes are unavailable. Despite these limitations, the purpose of this study is to raise awareness. Persons with untreated hypertension or uncontrolled BP were advised and referred to health facilities for further treatment.

The high numbers of participants with untreated or inadequately treated hypertension in MMM21 in Ghana confirm the need for systematic BP screening where it does not currently exist although participants who were identified as hypertensives were given advice on how to lower their BPs and on how best to seek further treatment for their condition. The MMM campaign in 2021 also had reduced number of participants compared with previous years because of the COVID-19 pandemic. It is, however, hoped that subsequent MMM campaigns will record higher numbers.

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Conflict of interest: none declared.

Data availability

Data available upon request.

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