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

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There is a need to constantly assess the awareness, treatment, and control of hypertension in Nigeria. This study determined the frequency of undiagnosed hypertension across the six geopolitical zones of Nigeria. We conducted an opportunistic screening of adults aged at least 18 years in the month of May 2021. Participants were recruited by trained volunteers using the May Measurement Month protocol. Blood pressure (BP) was measured using validated digital sphygmomanometers. We defined hypertension as systolic BP $\geq$ 140 and/or diastolic BP $\geq$ 90 mmHg and/or the use of BP-lowering medications. A total of 9361 participants (51.5% females) with a mean age of 40.7 $\pm$ 15.5 years were screened. Hypertension was present in 3192 (34.1%) of the participants. About half (1491, 46.7%) of the hypertensives were unaware of the diagnosis. Among the 3192 participants with hypertension, less than half (1540, 48.2%) were on antihypertensive medications, while only 36.4% of those on antihypertensive medications had their BP controlled (<140/90 mmHg). About one-third of Nigerians in this opportunistic screening had hypertension, with about half of them being unaware of their diagnosis while only about two out of every five on antihypertensive medications had controlled BP. Urgent health actions are needed in Nigeria to reduce the burden of hypertension and its complications.

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Introduction

Hypertension is a significant cause of global morbidity and mortality, which remains largely undiagnosed, untreated, or undertreated and poorly controlled in low and middle-income countries.[1] It remains the leading modifiable risk factor for major cardiovascular diseases like stroke, heart failure, ischaemic heart disease, and chronic kidney disease.[2] In 2017, a National Survey in Nigeria reported a hypertension prevalence of 38.1%.[3]

May Measurement Month (MMM) is a global initiative of the International Society of Hypertension (ISH), which provides an opportunity to conduct surveys to elucidate the burden of undiagnosed and inadequately treated hypertension. In the previous MMM campaigns in Nigeria, we reported hypertension frequencies of 36.2%, 36.4%, and 39.2% in 2017, 2018, and 2019, respectively.[4-6] Although the opportunistic screening through the annual MMM campaign has shown a similar frequency of hypertension in the previous campaigns, it is an eye-opener to everyone involved in the hypertension care pathway that a more proactive way of tackling the various problems is required. The unanticipated COVID-19 pandemic prevented the 2020 campaign from taking place, because of the need for physical distancing to limit the spread of the virus.

Methods

As in previous campaigns, MMM21 was coordinated by the secretary-general of the Nigerian Hypertension Society. A call for expression of interest by potential volunteers was sent out through the national secretariat of the Nigerian Hypertension Society. We secured a coordinator for each state participating in the campaign while we used trained volunteers comprising medical doctors, nurses, physiotherapists, research assistants, and other healthcare workers for data collection from the participants who were spread across the six geopolitical zones of the country. Part of the training included how to collect data with the MMM application online and offline. The MMM21 campaign was funded by the Nigerian Hypertension Society, leveraging on the previous year's support from ISH with the supply of blood pressure (BP) monitors.

Participants who volunteered to take part in the screening were recruited from public places, hospitals, places of worship, and markets. Trained volunteers collected necessary information from the participants and measured their BPs three times after a minimum of 5-min rest using the upper-arm cuff Omron M3® digital sphygmomanometer (HEM-7131-E) supplied by the ISH. The MMM application was used as much as possible for direct real-time entry of participant's data. Other data obtained were the use of aspirin and statins, the use of hormonal replacement therapy or hormonal contraception, in addition to any history of previous COVID-19 test or vaccination, and the perceived impact of COVID-19 on the treatment of hypertension. The means of the second and third BP readings were computed and used in the analyses. Hypertension was defined as a systolic BP $\geq$ 140 mmHg and/or diastolic BP $\geq$ 90 mmHg and/or self-reported history of being on treatment for hypertension. The screening was approved by the National Health Research Ethics Committee and each participant's consent to participate was obtained after necessary explanation of the programme. Data were analysed centrally by the MMM project team and multiple imputation was performed to impute the mean of Readings 2 and 3 where this was missing.[9]

Results

We screened a total of 9361 participants (51.5% females) with a mean (SD) age of 40.7 (15.5) years. Only 232 (2.5%) participated in previous MMM campaigns while 2612 (27.9%) never had a BP check before this screening. Of the participants, 121 (1.3%) had a previous positive COVID-19 test, while 1307 (14.0%) had at least one COVID-19 vaccination. Baseline characteristics of the study participants are shown in Supplementary material online, *Table S1*.

Of the 9361 participants, 3192 (34.1%) had hypertension with 1702 (53.3%) of them being aware of their status before the screening; 1540 (48.2%) were on antihypertensive medications while 36.4% of those on antihypertensive medications had their BP controlled (<140/90 mmHg). The frequency of BP control in all participants with hypertension was 17.6%. The prevalence of hypertension increased with age, with the lowest in the 18–29 years age group. Of those with hypertension who were on antihypertensive medications, the highest frequency of those with controlled BP was among the 18–29 years age group (*Table 1*).

Discussion

May Measurement Month 2021 revealed that about one-third of Nigerians are hypertensive but control is

Table 1 Hypertension, awareness, antihypertensive medication use, and blood pressure control

	Total	Number with hypertension	Participants with hypertension (%)	Hypertensives aware (%)	Hypertensives on medication (%)	Hypertensives on medication with controlled BP (%)	Hypertensives controlled (%)
All participants	9361	3192	34.1%	53.3%	48.2%	36.4%	17.6%
Stratified by age							
18–29 years	2617	288	11.0%	22.6%	17.0%	75.4%	12.8%
30–39 years	2151	455	21.1%	33.9%	28.6%	49.4%	14.1%
40–49 years	1885	750	39.8%	43.3%	38.1%	39.0%	14.9%
50–59 years	1376	785	57.0%	64.8%	59.1%	34.3%	20.3%
60–69 years	819	562	68.6%	70.1%	65.5%	31.8%	20.8%
≥70 years	495	344	69.6%	72.6%	70.3%	29.3%	20.6%

abysmally poor as only 17.6% of those with hypertension have their BP within the guideline target of <140/<90 mmHg for uncomplicated cases.

The frequency of hypertension reported in this screening is similar to that reported in previous MMM campaigns (36.2%, 36.4%, and 39.2% in 2017, 2018, and 2019 respectively.[4-6]) The frequency of hypertension increased with advancing age, which is in keeping with previous studies.[7] In this screening exercise, about 1 in 10 individuals within the 18–29 years age range have hypertension, although only 22.6% of them are aware of their hypertension status; however, the proportion of those with hypertension who are treated and controlled is highest in the age group (75.4%). This could have implications for the prevention of complications of hypertension, especially stroke that has been demonstrated to be the most frequent modifiable risk factor among young adults in Nigeria and Ghana. In the design of programmes to prevent the complications of stroke, targeting the young population will contribute significantly because of the tendency to have good control once treated in that age group. This could be driven by fewer comorbid conditions and more reversible BP elevation among the young compared with older patients.

The opportunistic nature of MMM screening could have introduced a potential bias because of the non-probability nature of the sampling. However, the screening programme has been able to elucidate the burden of undiagnosed and untreated hypertension and the abysmal control among those treated for this silent killer in Nigeria. In view of the poor control of hypertension that has been consistently reported, efforts to improve this through implementation research will go a long way to improving the control and thereby reduce complications. A potential area to look at would be the use of mobile health, as all the patients with hypertension in a cross-sectional study in Nigeria had mobile phones and almost all of them were willing to receive and pay for mobile health services to receive periodic information on prevention and treatment of their condition.[8]

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Supplementary material

Supplementary material is available at *European Heart Journal Supplements* online.

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Data availability

The data underlying this article will be shared on reasonable request to the corresponding author.

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