

May Measurement Month 2019: an analysis of blood pressure screening results from Lebanon

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Hypertension is an important public health concern of high prevalence among adults. It is associated with an increased mortality rate. The prevalence of hypertension in Lebanon has increased during the last decades, affecting around one-third of the Lebanese population. Since diagnosis and treatment of hypertension is associated with a better prognosis, annual screening and raising awareness about this 'silent killer' disease is of extreme value. We conducted a cross-sectional survey in various Lebanese cities in 2019. We recruited adults (≥ 18 years old) from different sites, through an opportunistic sampling method. For each participant, three blood pressure (BP) readings were recorded and the average of the last two was analysed. In addition, data on lifestyle factors and comorbidities were collected. Participants were considered hypertensive if they had at least one of the following: systolic or diastolic BP ≥ 140 and/or ≥ 90 mmHg, respectively, or taking antihypertensive medication. Blood pressure was measured in 7019 participants. The mean age was 46.0 (SD 16.6) years. In total, 2572 participants (36.6%) had hypertension among whom only 64.1% were aware of their disease and 62.3% were on treatment. Blood pressure was controlled in 62.6% of participants taking antihypertensive medications. This study is the largest on hypertension prevalence in Lebanon. The results demonstrated that around one-third of the hypertensive population were not aware of their disease, and that a high percentage was not being treated. These results suggest the need for rapid interventions aimed at raising awareness regarding hypertension in the Lebanese population.

Introduction

The burden of hypertension is increasing tremendously, affecting 1.4 billion people all over the globe.¹ Uncontrolled

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hypertension is directly linked to an increase in all-cause and cardiovascular disease (CVD) mortality in adults.²

Prevalence of hypertension varies worldwide and was found to be 29.5% in the Arab world.³ Lebanon, a country in the Arab world and the Middle East, has an estimated population of ~6.8 million. The prevalence of hypertension in Lebanon increased from 23.1% as reported in 2005 to 36.4% in 2018.^{4,5} Moreover, CVD such as stroke and myocardial infarction was found in 2.4% and 4.3%, respectively, of hypertensive patients.⁴

Since only around half of patients with hypertension in Lebanon are aware of their disease as reported previously, screening for hypertension and increasing awareness is of tremendous importance for the population in Lebanon.⁶ After successful participation in the May Measurement Month (MMM) 2018 campaign, Lebanon participated again in the MMM 2019 campaign, which is an initiative led by the International Society of Hypertension and endorsed by the World Hypertension League. In this article, we will report the main results of MMM 2019 campaign in Lebanon.

Methods

May Measurement Month 2019 was led by the Lebanese Society of Nephrology and Hypertension in partnership with the Lebanese Society of Cardiology and the Lebanese Ministry of Public Health. Clearance was obtained from the Ministry of Public Health, with ethical/administrative approval granted by individual institutions as applicable, coupled with individual verbal consent to share anonymized data. Twenty Lebanese cities were covered by the campaign. Blood pressure (BP) screening took place at outdoors public areas. Members of the teams were mainly from the medical field (nurses, medical students, doctors, pharmacists) with experience of measuring BP.

May Measurement Month is a cross-sectional survey that included adults (≥ 18 years) who agreed to have their BP measured. Participants filled an anonymous, simple questionnaire including demographic and medical information. All participants provided oral informed consent. In addition, weight and height were measured if resources permitted; otherwise, these were estimated by screeners. The screening period lasted for ~3 weeks. We used a validated automatic oscillometric sphygmomanometer as a tool for BP measurement. Three BP readings were taken in the sitting position, with 1-min interval between each reading, from the same arm either from the right or left. The average of the last two readings was used for analysing the results.

Participants were considered hypertensive if they had at least one of the following: systolic or diastolic BP ≥ 140 and/or ≥ 90 mmHg, respectively, or taking antihypertensive medication. Data were collected using pre-prepared paper forms before sharing it online with the MMM project team for analysis. The mean of the 2nd and 3rd BP readings was estimated by multiple imputations using chained equations if either was missing as described elsewhere.⁷

Results

The total number of participants over the 3 weeks was 7019 with $< 4\%$ having participated in the 2018 campaign. The mean age of the population was 46.0 (SD ± 16.6) years. 57.5% of participants were male. Prevalence of smoking was high, at 51%. In total, 1602 (22.8%) participants reported taking antihypertensive medication, 5185 (73.9%) were not taking any, and 232 (3.3%) had an unknown status. 13.7% of the participants had never had their BP measured. Around 12.6% and 9.6% were using aspirin or a statin, respectively. The overall mean of the 2nd and 3rd BP measurements taken was 121.2/78.9 mmHg. Of all participants, 2572 (36.6%) had hypertension. Among these, 64.1% were aware of their disease, 62.3% were on one or more antihypertensive medications, and 39.0% had controlled BP (systolic BP < 140 mmHg and diastolic BP < 90 mmHg) (Table 1). Out of 1602 participants on antihypertensive medication, 62.6% had controlled BP. Of all participants, 5417 were not taking antihypertensive medication or had an unknown status. Out of these participants, 17.9% had uncontrolled BP.

After adjusting for age, sex, and antihypertensive medication use, participants with diabetes mellitus (11.1%) had a significantly higher systolic BP (by 2.34 mmHg) as compared with participants without diabetes ($P = 0.002$). Moreover, body mass index was 26.7 ± 4.7 kg/m² and correlated with BP readings. In fact, overweight (38.0%) and obese participants (22.2%) had a higher mean SBP/DBP of 3.6/2.0 and 7.0/3.9 mmHg, respectively, as compared with participants with a healthy weight.

Discussion

As part of the global MMM 2019 campaign, 36.6% of the 7019 Lebanese participants were found to be hypertensive, 64.1% of them were aware of it, and only 62.6% of treated participants had controlled BP.

Our results are in accordance with a recent study conducted in Beirut that included a representative sample of 501 participants, and reported a prevalence of hypertension of 36.4% with around 65.4% awareness of hypertension.⁵ Our results also suggest an apparent increase in prevalence of hypertension in Lebanon when compared with previous data, as prevalence of hypertension was 23% in 2005, 31% in 2010, and up to 35.9% in 2015.^{4,6,8}

In contrast to MMM 2018 global results, our population showed an increase in systolic BP in participants with diabetes.⁹ Notably, our results revealed a similar percentage of BP control and hypertension awareness, but they remain inadequate. These results emphasize the urgent need for efficient interventions to address these issues. Such interventions require the co-ordinated efforts of awareness campaigns, official health authorities, and health-care workers.

May Measurement Month has become a major yearly campaign aiming to raise awareness and screen for hypertension in Lebanon. In addition, it establishes a continuous annual tool for assessing these areas of concern. Compared with other screening campaigns, it is the largest campaign so far including participants older than 18 years from

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

Total participants	Percentage with hypertension	Percentage of hypertensives aware	Percentage of hypertensives on medication	Percentage of those on medication with controlled BP	Percentage of all hypertensives with controlled BP
7019	36.6	64.1	62.3	62.6	39.0

BP, blood pressure.

various Lebanese cities.¹⁰ This cross-sectional screening study enrolled around 0.1% of the Lebanese population, but it is not considered to be a nationally representative sample as recruitment of participants was opportunistic and not randomized.

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