

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

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May Measurement Month (MMM) is a global initiative to screen high blood pressure (BP) in the community and increase awareness at the population level. High BP is the leading risk factor for mortality worldwide and in Nepal. This study presents the results of the 2019 MMM in Nepal. Opportunistic BP screening was conducted in 30 out of 77 districts across Nepal and aged ≥ 18 years at the community and public places. BP was measured three times in a seated position. A total of 74 205 individuals

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participated in the study, mean age 39.9 years, and 58% were male. BP measurements for the second and third readings were available for 69 292 (93.3%) individuals. The proportion of the population that were hypertensive was 27.5% ($n=20\,429$). Among those hypertensives, 46.3% were aware of their hypertensive status and of these, 37.5% were on antihypertensive medication. Only 54.3% of those on antihypertensive medication had their BP controlled. Of the community screened, those self reporting to have diabetes, current tobacco users, and current alcohol drinkers were 6.7%, 23.6%, and 31.9%, respectively; 20.6% of the participants were overweight, and 6.5% were obese. Since the first BP screening campaign, MMM 2017 in Nepal, the number of participants screened has largely increased over the years. MMM's success in Nepal is through a coordinated mobilization of trained health science students and volunteers in the communities. The Nepal MMM data demonstrates that large community-based BP screening campaigns are possible in low resource settings.

Introduction

In 2016, the International Society of Hypertension (ISH) initiated an international framework designed to raise awareness of the importance of opportunistic blood pressure (BP) screening in communities from both developed and developing nations. In Nepal, the proportion of individuals with high BP has been consistently over 20.0% of the population.^{1,2} According to the Non-communicable Disease Risk Factors: STEPS Survey Nepal 2019, the prevalence of hypertension was 24.5%.² A community-based survey in a semiurban area of western Nepal reported 28% of age- and sex-adjusted prevalence of hypertension.³

Nepal has been a part of the May Measurement Month (MMM) initiative since its inception screening 5968 people in 2017 and 15 561 individuals in 2018. MMM in 2017 revealed that 24.4% of participants were hypertensive.⁴ Similarly, MMM in 2018 found 27.8% hypertensive individuals, and among the hypertensive participants, half (49.9%) were aware of their hypertensive status, and 39.1% were on medication.⁵ It also showed that only 20.6% of hypertensives had controlled BP, and 14.3% of participants had their BP measured for the first time during MMM 2018. This article aims to present the results of MMM 2019 in Nepal.

Methods

MMM 2019 in Nepal was implemented in close collaboration and coordination with the Department of Health Services of the Ministry of Health and Population. Provincial governments were also actively involved and supported field level activities. Nepal Development Society was responsible for the overall coordination of the campaign. Along with the trained students of different medical, nursing, pharmacy, and public health societies, some professional organizations also provided additional support to the campaign. In each province, MMM 2019 campaign coordinators were recruited for project management, logistics, and auditing the data quality.

Opportunistic screening of BP of individuals aged ≥ 18 years attending screening sites was carried out in May

2019. Data were collected from all the seven provinces reaching 30 out of 77 districts using a structured questionnaire developed by ISH adapted in the local language and context. Participants were recruited voluntarily describing the approach, objective and importance of BP measurement and MMM 2019. Television, radio, online, and print media covered the news, aired and published the articles and interviewed volunteers and coordinators promoting the campaign and inviting participation.

Volunteers were recruited by public calls through social media and networks of student societies. They were trained using the standard package of BP measurement, data collection and counselling. On-site monitoring and support were provided to improve the effectiveness and quality of the data. Educational banners and pamphlets in the Nepali language were designed containing messages about the raised BP prevention and control. Leaflets were distributed to screened individuals. Similarly, a policy brief was distributed to the political leaders regarding the planning and the intention to conduct the campaign and to request their leadership to scale up and integrate it into the national system. The house of representatives in Nepal noted this. More than 700 volunteers, including trained Female Community Health Volunteers, contributed to the campaign by screening the BP of the participants.

The screening sites were selected purposively by the volunteers, and the majority of the sites were public places like supermarkets, hospitals, religious centres, government and private offices, and academia. BP was measured by using the digital (OMRON) machine, and manual sphygmomanometers in healthcare settings. Three BP measurements were taken from each participant in the sitting position and the mean of the second and third BP readings were used to classify the participant as either hypertensive or normotensive. Systolic BP (SBP) ≥ 140 mmHg or diastolic BP (DBP) ≥ 90 mmHg or those who self-reported taking anti-hypertensive treatment were defined as hypertensive. A paper-based questionnaire was used for the data collection. Data were entered into Epidata version 4.2 and cleaned before sending to the ISH. Data were analysed centrally by the MMM project team, and multiple imputations

were performed to impute the mean of readings when second and/or third readings of BP were missing.⁶

Ethical approval was obtained from the ethical review board of Nepal Health Research Council (approval no. 102/2018) and written informed consent was taken from all participants.

Results

A total of 74 205 individuals were included in the study. The mean [standard deviation (SD)] age of the participants was 39.9 (15.4) years, and 41.9% were female. Among the female participants, 995 (3.2%) were pregnant. After imputation, out of the total participants, 20 429 (27.5%) were found to be hypertensive. Of the total hypertensive individuals, 37.5% (7663) were taking antihypertensive drugs. Among those taking medications, 54.3% had their BP controlled (SBP <140 mmHg and DBP <90 mmHg). Among total participants, 9231 (12.4%) reported that they have never had their BP measured. Of the participants with hypertension, 46.3% (9456) were aware of their hypertensive status. After excluding the people who were taking antihypertensive medication, it was found that 19.2% (12 766) were hypertensive.

Of the participants, 22.2% reported alcohol intake one to three times per month and one in every 10 drank alcohol once or more per week. The mean SBP and DBP were significantly higher among the participants whose alcohol intake was one to three times per month and those taking alcohol once or more per week compared to those who rarely or never drank. One in four (23.6%) of the population screened were current smokers. Current smokers had significantly higher SBP and DBP compared to non-smokers. The mean (SD) body mass index (BMI) of the participants was 23.9 kg/m² (4.3) and 6.7% participants reported that they had diabetes. Among the total participants, 20.6% and 6.5% of the participants were overweight and obese, respectively. As compared to those of normal weight (BMI: 18.5–24.9 kg/m²), those who were overweight and obese had significantly higher SBP and DBP.

Discussion

MMM 2019 in Nepal was a coordinated large-scale opportunistic BP screening programme of 74 205 adults aged ≥18 years. MMM 2019 found that 27.5% of the population screened were hypertensive. Most participants with hypertension were unaware of their status. Only about half of hypertensive individuals being treated reached their BP targets.

Our results suggest a high prevalence of hypertension among the adult population of Nepal. The proportion of high BP is slightly higher than the 2019 STEPS survey (prevalence = 24.5%).² Additionally, our data confirm the previous hypertension prevalence rate of 24.4% observed in the MMM 2017.⁴ The MMM 2019 finding is concurrent with that of MMM 2018 findings which found 27.8%.⁵ Likewise, the MMM 2019 data aligns with population-based studies, reporting a similar percentage of hypertension in Nepal.³

The 2019 MMM in Nepal increased its coverage both in terms of a significant increase in the number of

participants and geographical coverage. The 2019 campaign reached more than five times the number of participants compared to MMM in 2018. It also increased the level of engagement of federal, provincial, and local government.

With the increasing socioeconomic and public health burden of non-communicable diseases in Nepal, the Government of Nepal has been making different preventive and curative efforts to curb the hypertension but to date, this remains insufficient.⁷ We believe that public health campaigns like MMM play a crucial role in generating evidence and raising public awareness and political interest in hypertension prevention and management. From a logistics point of view, significant buy-in by the local government in MMM 2019 to take responsibility for promoting screening was encouraging. The coordinated efforts of non-governmental organizations like the Nepal Development Society and its academic collaborators and networks and partners like the ISH also played a significant role in promoting awareness on raised BP.

We acknowledge that a limitation of random opportunistic screening may not be representative of the National burden of hypertension. On the other hand, we did have a large study population. This MMM campaign over a short time window, represents one of the largest blood pressure screening studies, in Nepal or other developing countries. There was large geographical terrain coverage and screening offered free of cost to the community. The low proportions of awareness, treatment and control of high BP detected highlights the need to implement programmes and policies for the better management of hypertension in Nepal.

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