

May Measurement Month 2018: an analysis of blood pressure screening results from Nepal

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Raised blood pressure (BP) is a leading risk factor for mortality globally and in Nepal. May Measurement Month (MMM) is a global initiative aimed at screening for hypertension and raising awareness on high BP worldwide. This study provides the results of the 2018 MMM (MMM18) in Nepal. An opportunistic cross-sectional survey of volunteers aged ≥ 18 years was carried out in May 2018 nationwide. The standard MMM protocol was followed for BP measurement, the definition of hypertension, and statistical analysis. The campaign was publicized through various social media for recruiting volunteers and inviting participation. A total of 15 561 (58.7% male) from 35 districts of Nepal were screened in MMM18, of which 4 321 (27.8%) had hypertension. A total of 2 633 (19.0%) of 13 873 individuals who were not on antihypertensive treatment were found to be hypertensive. Of those on medication, 799 (47.4%) had uncontrolled BP. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were significantly higher in people on antihypertensive treatment, smokers, and alcohol drinkers compared with those who were not on antihypertensive treatment, smokers, and alcohol drinkers, respectively. Likewise, SBP and DBP steadily increased across increasing body mass index categories. MMM18 was the largest BP screening campaign undertaken in Nepal. MMM has highlighted the importance of a periodic public health program at the national level to increase awareness on hypertension detection and control rate, and thus, the prevention of cardiovascular diseases.

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Introduction

Cardiovascular disease (CVD) has become the leading cause of death in Nepal.¹ Raised blood pressure (BP) has become the leading cause of CVD-related morbidity and mortality in Nepal.² The Nepal Non-communicable Disease and Poverty Commission (NCDI) 2017 reported that nearly half of the deaths of those aged less than 40 years are accounted for non-communicable diseases (NCD) like hypertension.³ Further analysis of Nepal Demographic and Health Survey 2016 showed nearly 2 of 10 Nepalese adults are hypertensive, of which only 18% were taking antihypertensive medication.⁴ Similarly, the National Burden of Disease Study 2017 showed that ischaemic heart disease causes 11.3% years of life lost (YLLs) in Nepal.⁵ The same study showed that 14% of deaths are attributed to high systolic blood pressure (SBP) and 13.0% to smoking. Despite this high burden of CVD in Nepal, more than three of five hypertensive patients are unaware of their hypertensive status.⁴

Simple measures like raising awareness on prevention and control of hypertension and educating on the negative consequence of high BP have proven to be effective.⁶ The screening of BP remains a cost-effective public health strategy to increase the awareness, prevention, detection, treatment, and control of hypertension reaching the larger undiagnosed hypertensive populations in resource-constrained settings of Nepal. May Measurement Month (MMM), initiated by International Society of Hypertension (ISH) in 2017, is a global campaign aimed at 'highlighting the importance of measuring BP, and to identify and reduce raised BP'. Nepal actively participated in MMM 2017 screening 5 968 individuals.⁷ It was the first nationwide BP screening campaign undertaken in Nepal, where 24.4% of participants screened were hypertensive, of which 16.8% were untreated at the time of screening.⁷

In this article, we summarize the findings from MMM18 in Nepal.

Methods

MMM18 is the second nationwide campaign for screening BP among individuals aged ≥ 18 years reaching 35 districts of Nepal. The campaign was led by Nepal Development Society supported by public health, nursing and medical student societies, and 12 other organizations in Nepal. The campaign was endorsed by the Ministry of Health and Population, Nepal. Ethical clearance was obtained from the Nepal Health Research Council (Reference number: 102/2018). More than 500 volunteers trained in BP measurement using the standard protocol and oriented to fill the paper-based standard questionnaire were involved in BP screening. Similarly, they were trained on counselling and use of the behaviour change communication materials. We also mobilized trained female community health volunteers (FCHVs) for screening BP. The campaign was promoted through social media for recruiting the volunteers. In addition, television and radio programs were conducted to raise the awareness and to invite for participation.

Three BP measurements were taken on each participant in the sitting position using either the digital (OMRON) or manual sphygmomanometers depending on the availability. Analyses were based on the mean of the 2nd and 3rd BP readings. Where mean BPs were standardized for age and sex, this used the World Health Organization (WHO) world age-standard population. To provide a comparable BP reading for all individuals, multiple imputation was used to estimate the average of the 2nd and 3rd readings where either reading was not documented. Hypertension was defined as a SBP ≥ 140 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg or in those on antihypertensive treatment. The majority of data on height and weight were estimated self-reported figures. Incomplete questionnaires were discarded, and data were entered centrally in the epidata v3.1, cleaned locally, and sent to the central MMM team for final analysis. The details of the methods and statistical analysis of global MMM18 have been published earlier.⁸

Results

A total of 15 561 (58.7% male) individuals from 35 districts of Nepal participated in the screening campaign. The mean age of the participants was 38.4 ± 15.8 years. Among them, 1 688 (10.8%) were taking antihypertensive medications, 997 (6.4%) were diabetic, 3 399 (21.8%) were current smokers, and 3 707 (23.8%) were alcohol drinkers. During the campaign, 198 (1.3%) participants reported a history of myocardial infarction and 173 (1.1%) had a history of stroke. The average body mass index (BMI) was 29.0 ± 4.9 kg/m². About 5% of female participants were pregnant. Out of the total participants, 14.3% had their BP measured for the first time, and nearly 4% had participated in MMM17.

No substantial difference was observed in crude mean SBP and DBP while comparing the 2nd reading vs. the 3rd reading. The crude mean SBP and DBP of 2nd readings were 135.8 and 82.5 mmHg, respectively, while the crude mean SBP and DBP of 3rd readings were 135.9 and 82.6 mmHg, respectively. The age- and sex-standardized mean SBP and DBP were 125.1 and 78.7 mmHg, respectively.

After imputation, of the 15 561 individuals, 4 321 (27.8%) individuals were found to be hypertensive of which half (49.9%) were aware of their hypertensive status and 39.1% were on medication. A total of 2 633 (19.0%) of 13 873 individuals who were not on antihypertensive treatment were detected as hypertensive, and 799 (47.4%) of 1 688 individuals who were taking antihypertensive medication were found to have uncontrolled hypertension. In total, 20.6% of hypertensives were controlled.

Blood pressure associations

The SBP and DBP were significantly higher in participants who were previously diagnosed as hypertensive compared to those without a previous diagnosis of hypertension, with a mean difference of $\sim 9.6/5.3$ mmHg. Higher BP was also seen in those taking antihypertensive medications as compared to those not taking the medications by a mean difference of $\sim 8.3/3.6$ mmHg. Similarly, smokers had higher BPs ($\sim 1.8/0.9$) compared to non-smokers, and alcohol drinkers

one or more times per week (~4.6/3.5) as compared to those that never/rarely drink were positively correlated with BP levels. Likewise, in the regression model, SBP and DBP steadily increased across increasing BMI categories.

Discussion

MMM18 is the largest ever BP screening program globally as well as in Nepal. In 2018, we included more than 15 000 individuals. The program is growing in strength with wider interest from stakeholders and the Government of Nepal for this noble, cost-effective public health strategy to try to reduce the burden of CVDs.

Of the 15 561 participants screened in Nepal, more than a quarter had hypertension, and about a fifth of them not on treatment were hypertensive. The proportion of hypertension in Nepal during MMM18 was lower than that of worldwide MMM18's average of 33%, and almost similar to a previously reported nationally representative cross-sectional survey.^{8,9} Nonetheless, during the MMM18 BP screening, the BP of more than 14% of participants was screened for the first time in their lifetime; and nearly half of hypertensive participants were unaware of their raised BP status. Those found to have uncontrolled BP were then counselled for lifestyle modifications, and given short consultations with physicians with the aim of trying to reduce elevated BP and related morbidity and mortality.

MMM18 has strengthened the awareness on the increasing burden of hypertension in Nepal and encourages more efforts in health promotion, detection, and effective management of people with the condition, to prevent its negative health impact. For it to be effective, the capacity building of primary healthcare personnel is vital, so as to ensure that the peripheral level of health facilities is able to diagnose and manage hypertension effectively. The Package of Essential Interventions for NCDs (PEN) approach implemented by the Government of Nepal is an effective step in this regard.¹⁰ The MMM program shows that opportunistic screening can identify significant numbers of people with elevated BP. Therefore, we recommend incorporating MMM into the existing health system. Engaging volunteers for BP screening is imperative for reducing the associated burden on the health system.

Similarly, training of community health workers like FCHVs for routine BP screening and basic health education on hypertension is valuable in reaching those hitherto not reached by BP screening. The MMM program in Nepal emphasizes the necessity for more routine, extensive, low-cost population-based surveys using standardized methodology not only to facilitate comparison between countries and regions but also to transfer best practices to address the burgeoning burden of hypertension and other cardiovascular conditions.

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