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

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The May Measurement Month (MMM) screening campaign initiated by the International Society of Hypertension aimed to assess the prevalence of hypertension and associated risk factors to increase and improve population awareness of raised blood pressure (BP) and methods of prevention. The MMM is a cross-sectional survey of adults aged 18 years and over of both sexes who gave informed consent to participate in the survey and to have their BP measured. Kazakhstan participated in the campaign for the first time in 2021. Blood pressure was measured three times on a single occasion, and data on cardiovascular risk factors were collected. A total of 1763 respondents from 4 regions participated in the screening. The mean age was 41 ± 14.4 years; 31.5% of all participants were found to have hypertension, of whom 41.8% were aware, 34.0% on treatment, and only 15.8% controlled (<140/90 mmHg). Significant differences in these rates were found between age and sex groups. The screening campaign confirms low levels of awareness of hypertension and associated risk factors in the population in Kazakhstan and the need for annual screening and implementation of national hypertension control programmes.

Introduction

Hypertension is the most prevalent risk factors for cardiovascular diseases (CVDs) worldwide. The prevalence of hypertension is estimated at ∼34% worldwide according to data from May Measurement Month (MMM) 2019.[1] There are limited data in Kazakhstan about the prevalence of hypertension; however, according to a study performed by the Scientific Research Institute of Cardiology and Internal Medicine in 2017, the prevalence of hypertension in Almaty, one of the biggest cities of Kazakhstan, was estimated to be about 35.8%.[2] This was a cross-sectional population-based study with 730 participants aged between 18 and 69 years. In one of the latest cross-sectional studies conducted in Nur-Sultan, capital of Kazakhstan, the prevalence of hypertension was 70% in those aged 50–75 years.[3] However, the study had several limitations, such as the small sample size, older age of the population, and locations (only outpatient departments were included).

There was an increase in the incidence of CVD from 2004–10 to 2011–17 in large regions of Kazakhstan.

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In 2014, 84% of deaths were caused by non-communicable diseases, with more than half (54%) due to CVD.[4] While the mortality from coronary heart disease accounts for 47.7%, the mortality from cerebrovascular disease (stroke) accounts for 36.4%.[4]

Kazakhstan was due to be involved in the 2020 MMM campaign; however, this was cancelled due to the COVID-19 pandemic. The MMM campaign resumed in 2021, and Kazakhstan took an active part; in this paper, we report on the findings from the campaign.

Methods

The campaign was coordinated in Kazakhstan by the Kazakh Society of Specialists on Hypertension and Cardiovascular Prevention. Ethical approval was received on 30 June 2021 by decision number №8 (114). Screening took place in four regions of Kazakhstan: Almaty (south-eastern region), Nur-Sultan (northern region), Aktobe (western region), and Karaganda (central region). The main types of screening sites were workplaces and hospitals; however, screening was also conducted in public areas and other places, including participants' homes. The local coordinating centre trained volunteers and provided oversight for the screening sites. Screening was financially supported by Les Laboratoires Servier (Kazakhstan affiliate). In order to recruit participants, social media campaigns were undertaken, and we also carried out an e-mail distribution to various companies, including the largest airline in Kazakhstan, 'Air Astana', whose employees took an active part in the screening.

Due to COVID-19 restrictions, the screening window for MMM was prolonged from 1 May to 30 November. OMRON machines were used to measure blood pressure (BP): validated upper-arm BP devices, model number BP7100 (HEM-7121-Z2) with standard medium cuff (22–32 cm) and large cuff (32–42 cm). All three measurements were performed on participants in the sitting position. Hypertension was defined as systolic BP $\geq$ 140 mmHg and/or diastolic BP $\geq$ 90 mmHg based on the mean of the second and third BP readings or in participants receiving antihypertensive treatment. A questionnaire was also administered, with new data variables in the MMM21 campaign including previous COVID-19 test or COVID-19 vaccination, use of hormone replacement therapy, and hormonal contraception. All data were collected via the MMM app. Data were analysed centrally by the MMM project team, and multiple imputations were performed to impute the mean of Readings 2 and 3 where this was missing, based on global data and as described previously (*Table 1*).[5]

Results

In MMM21, a total of 1763 participants were screened. The mean age of participants was 41 $\pm$ 14.4 years. Most of the respondents were females (60.5%). The main ethnicity of respondents was Kazakh (76.7%, defined as 'Other' in the ethnicity classification), followed by White (21.5%) and mixed (1.5%).

Of all participants, 555 (31.5%) had hypertension, of whom 232 (41.8%) were aware of their condition. In males, the prevalence of hypertension was higher (39.0% of 697 men vs. 26.6% of 1066 women; *Table 2*). Hypertension was also more common in participants older than 50 years. However, hypertension was also frequent in respondents aged 18–29 years, at 16.1%; 34.0% of participants with hypertension were on antihypertensive therapy. Less than half (46.6%) of those on medication had controlled BP levels (<140/90 mmHg).

A small number of participants were taking statins (6.6%) or aspirin (14.9%).

Data related to COVID-19 were also collected: 21.5% of participants reported having had a positive COVID-19 test in the past and the majority of respondents (75.6%) had received at least one COVID-19 vaccination.

Discussion

The MMM screening was conducted in Kazakhstan for the first time in 2021; however, the ongoing COVID-19 pandemic, albeit now less severe, had an influence on screening numbers due to associated restrictions and general hesitation of participants. The percentage of

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

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
1763	31.5	41.8	34.0	46.6	15.8

Table 2 Participants and proportions with hypertension, awareness, on medication, and with controlled blood pressure by sex

	Total	Female	Male
Participants with hypertension, *n* (%)	555 (31.5)	283 (26.6)	272 (39.0)
Participants with hypertension aware about the diagnosis, *n* (%)	232 (41.8)	142 (50.2)	90 (33.1)
Participants with hypertension on medication, *n* (%)	189 (34.0)	126 (44.5)	63 (23.2)
Those on medication with controlled BP, *n* (%)	88 (46.6)	63 (50.0)	25 (39.7)
All people with controlled hypertension, *n* (%)	88 (15.8)	63 (22.2)	25 (9.2)
Of participants not on treatment, those with raised BP, *n* (%)	366 (23.3)	157 (16.7)	209 (33.0%)

participants with hypertension in our sample was 31.5%, and less than half (41.8%) were aware about their diagnosis. Of those aware, only 34% were on antihypertensive therapy, and 46.6% of those with hypertension on antihypertensive medications were found to have controlled BP levels.

There are limited data on hypertension prevalence in Kazakhstan with few screening campaigns aimed at assessing the prevalence using a cross-sectional design. According to a recent cross-sectional study conducted in the Nur-Sultan, the prevalence of hypertension was estimated about 70%; however, the participants of the study were older than 50 years, and the study took place only in outpatient departments.[3]

There are several limitations of this study. Firstly, the majority of respondents were screened in medical places (hospitals) and workplaces, and stress at work or white coat hypertension could result in an overestimation of the true population prevalence of hypertension. Screening only took place in four regions, with a variable number of participants in each region. However, the MMM screening had a positive impact in our country due to an increased awareness at population level about hypertension and its associated risk factors. Annual screening for hypertension will be useful for receiving dynamic data about hypertension in Kazakhstan.

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Conflict of interest: none declared.

Data availability

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

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