

## Measuring the knowledge, attitude, and practice of self-measurement of blood pressure among cardiovascular patients in Pakistan

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### ABSTRACT

**Introduction:** Self-measurement of blood pressure (SMBP) is a recent technique, already studied and validated, but it is still underused in the management of hypertension. The objective of the study was to evaluate the practice of SMBP in patients in management of hypertensive patients in Pakistan.

**Materials and methods:** We conducted a descriptive prospective study during six months at the Institute of Cardiology of Pakistan Islamabad. Our study included patients aged at least 18 years old who were diagnosed with hypertension for at least six months and followed up in outpatient clinics. The analysis and processing of data were performed by SPSS software version 22.

**Results:** Our study population was consisted of 300 patients with a male predominance (sex ratio of 1.46). The mean age of the patients was 41-60 years of age group. Our study showed that 39.6% of patients said they knew about blood pressure self-measurement before the therapeutic education; however, only 23.4% had already performed it. Medical staff talked to the patient about self-monitoring in 60% and encouraged the patient to perform SMBP.

**Conclusions:** The practice of SMBP was low. However, when properly practiced, it reduced the occurrence of cardiovascular complications. The practice medical staff talked to the patient about self-monitoring have positive effects on patients' SMBP.

**Keywords:** blood pressure, cardiovascular disease, self-measurement

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### INTRODUCTION

Hypertension is the most important cardiovascular risk factor (CVRF) worldwide. The hypertension is a major modifiable CVRF that affects 14 to 15 million people [1]. The prevalence of this condition is 31% and increases with the aging of the population [2, 3]. World Health Organization (WHO) predicts that 1.56 billion individuals, or 29.2% of the world's population, would be living with hypertension by 2025, up from the current global average of around one billion [4, 5]. In a study in Côte d'Ivoire in 2017 [6], the prevalence of hypertension was 20.4%. Age, body mass index (BMI), low physical fitness, and waist-hip ratio are all risk factors for hypertension [7]. Although the clinical care

of hypertension is regularly improved by new therapies, its management is closely linked to the patient as an individual who needs to learn to live with his disease [8]. This is why the patient must be actively involved in the follow-up of his disease. Therefore, the patient adherence to treatment is an important point to improve in the management of hypertension. This requires fundamentally an improvement in knowledge [9]. Self-measurement of blood pressure (SMBP) is a recent technique, already studied and validated; however, it still not widely used. It is well-known as part of the clinical management of hypertension and of the recommendations of scientific society [2, 10]. All agree to promote ambulatory measurement and, particularly,

SMBP because the reproducibility of blood pressure (BP) measurement is better in SMBP (and in ABPM) than in the doctor's office [11]. Cardiovascular illnesses account for about 80% of mortality in low-income nations, where hypertension is more frequent [12]. Two large epidemiological studies that employed data from the national health survey (1990-1994) and the northern rural areas (2001) reported rates of hypertension prevalence in Pakistan of 19.1% and 14%, respectively [13, 14]. Another national health survey from 2010 discovered that 18% of people and 33% of those over the age of 40 in Pakistan had hypertension, and that hypertensive were three times more likely to be at risk for a wide range of illnesses [5].

Urbanization is prevalent in Pakistan, where people eat diets heavy in salt, calories, and saturated fat and low in fruits and vegetables. According to [15], these changes may be too responsible for the higher prevalence of hypertension in urban than rural populations. Pakistan has to enhance its techniques for preventing hypertension, which calls for a practical plan of action for prevention and an upgrade to the country's present anti-hypertension laws [16]. We conducted this study to evaluate the interest of practice of BP SMBP self-measurement into the care of hypertensive patients in Pakistan.

## MATERIALS AND METHODS

The descriptive prospective study was conducted between February 1, 2022, and April 1, 2022, heart, at the Islamabad Pakistan. The study included the hypertensive patients aged at least 18 years old having hypertension for at least six months and were received in outpatient consultations for their follow-up. Patients had to be in sinus rhythm on electrocardiogram. Thus, considering the prevalence of hypertension at 20.4% [4], taking a confidence level of 95% and a margin of error of 5%, the minimum sample size calculated by SPSS software should be 250 patients increased to 300 patients for our study.

Patients who had only one consultation and for whom the diagnosis of hypertension was suspected but it could not be confirmed by a second consultation and/or additional investigations and patients with permanent atrial fibrillation on the electrocardiogram were not included.

Data were collected on a simple survey form consisted of several items based on the information from the patients' medical records and their questioning. Data analysis and processing were performed using SPSS software version 22. Categorical variables, presented as numbers and percentages. For ethical considerations, the patients gave their informed consent. The results were analyzed in accordance with the laws on the protection of patients' data and with the ethical principles regarding the Declaration of Helsinki.

**Table 1.** Patients demographic information

Variables	n (%)
<b>Age</b>	
20-40	70 (23.3)
41-60	155 (51.6)
>61	75 (25.0)
<b>Gender</b>	
Male	165 (55.0)
Female	135 (45.0)
<b>Educational level</b>	
Primary	75 (25.0)
Secondary	34 (11.3)
Higher education	6 (2.0)
No education	185 (61.6)
<b>Marital status</b>	
Single	105 (35.0)
Married	195 (65.0)
<b>Residency</b>	
Urban	145 (48.3)
Rural	155 (51.6)
<b>Family history of hypertension</b>	
Present	215 (71.6)
Absent	85 (28.4)
<b>Duration of hypertension</b>	
≤2 years	130 (43.3)
>3 years	270 (56.7)

## RESULTS

### Sociodemographic Data

The study recruited 300 patients. The participants' average age was 41-60 group of age followed by above 61 years of age group 75 (25%). There were, 55% male participants the total and the majority (65%) were married. Only 25% of the interviewees had completed elementary school. Nearly half of the respondents (51%) reported living in rural areas.

Besides the high BP, the other CVRF were dyslipidemia (35%), overweight (30.3%), obesity (24.7%) and diabetes (15%). Patients with arterial hypertension presented complications in 39.3% of cases. The heart failure (14.7%) was the most common complication, followed by obliterative arterial disease of the lower limbs (8.3%) (Table 1).

According to the findings of this study, around 33.3% of participants recalled their most recent BP reading and 30% of the participants were inconsistent in monitoring their BP. Furthermore, 18.6% had no specific schedule for measuring their BP. While self-monitoring their BP, 41.6% did not retain a record of their data (Table 2).

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**Table 2.** Characteristic of self-monitoring of blood pressure users among hypertensive patients

Variables	n (%)
Did you remember your last blood pressure reading?	
Yes	100 (33.3)
No	200 (66.7)
Number of time of blood pressure need to measure	
Twice a day	100 (33.4)
Once a weak	71 (23.6)
Twice a weak	25 (8.3)
Irregular	90 (30.0)
Do not know	14 (4.6)
What time of the day do you measure your blood pressure?	
In the morning	86 (28.6)
In the evening	90 (30.0)
In the night	25 (8.3)
Both in morning and evening	43 (14.3)
No specific time	56 (18.6)
Do you maintain a record of your measurement?	
Yes	75 (25.0)
No	125 (41.6)
Do not know	100 (33.3)
Which precautions do you take when measuring your BP?	
During having stress	35 (11.6)
Within caffeine intake	25 (8.3)
During noisy environment	90 (30.0)
No precautions	150 (50.0)

Less than a third of respondents (39.6%) are aware of BP self-checking. Self-monitoring BP is necessary, according to (43.6%) of respondents; 29 (9.6%) disagreed and (46.6%) do not know whether the self-monitoring BP is important or not. Overall (55.5%) of the participants agreed that the self-monitoring of BP is beneficial. Participants agreed that self-monitoring BP is inaccurate (63.4%) and of the respondents concurred with this recommendation (50%) (Table 3).

### Barriers for Non-Use of Self-Monitoring of Blood Pressure

Respondents were asked to agree or disagree with suggested justifications for not monitoring their BP on their own (83.3%) of respondents did not know how to use the device, (62.3%) could not afford it price, and 33% did not think it was vital to check their BP on their own. Self-monitoring BP devices were unknown to 83.3% of respondents, and 54% thought that their result was not used by health care professionals as reasons or barriers for not using self-monitoring BP. And 50% cannot read and write (Table 4).

**Table 3.** Knowledge & attitude related information

Variables	n (%)
<b>Knowledge</b>	
Knowledge questions know about self-monitoring of BP	
Yes	119 (39.6)
No	181 (60.4)
Have performed self-monitoring of blood pressure	
Yes	70 (23.4)
No	230 (76.6)
Do you have electronic blood pressure monitor	
Yes	65 (21.6)
No	235 (78.4)
<b>Attitude</b>	
Think that self-monitoring of blood pressure is important	
Yes	131 (43.6)
No	29 (9.6)
Do not know	140 (46.6)
Think that self-monitoring of blood pressure is beneficial	
Yes	160 (55.4)
No	50 (16.6)
Do not know	90 (30.0)
Think that self-monitoring of blood pressure is not accurate	
Yes	190 (63.4)
No	30 (10.0)
Do not know	80 (26.6)
Recommend others to use self-monitoring of blood pressure	
Yes	150 (50.0)
No	60 (20.0)
Do not know	90 (30.0)

**Table 4.** Reason for not using SMBP among hypertensive

Reasons	n (%)
Unable to afford device	187 (62.3)
SMBP among hypertensive not important	99 (33.0)
Unaware SMBP among hypertensive	230 (76.6)
Do not understand SMBP device	250 (83.3)
Cannot write & understand	150 (50.0)
Result of SMBP results are not used by doctors	270 (54.0)

### Reason for Using Self-Monitoring of Blood Pressure

The objective of this analysis was to provide probable reasons for participants to self-monitor their hypertension. The majority (60%) of individuals who have said they self-monitored their BP mentioned a healthcare professional's recommendation as the primary reason; 15% stated they did so out of self - motivation; and 25% said they done it on the recommendation of family members (Figure 1).

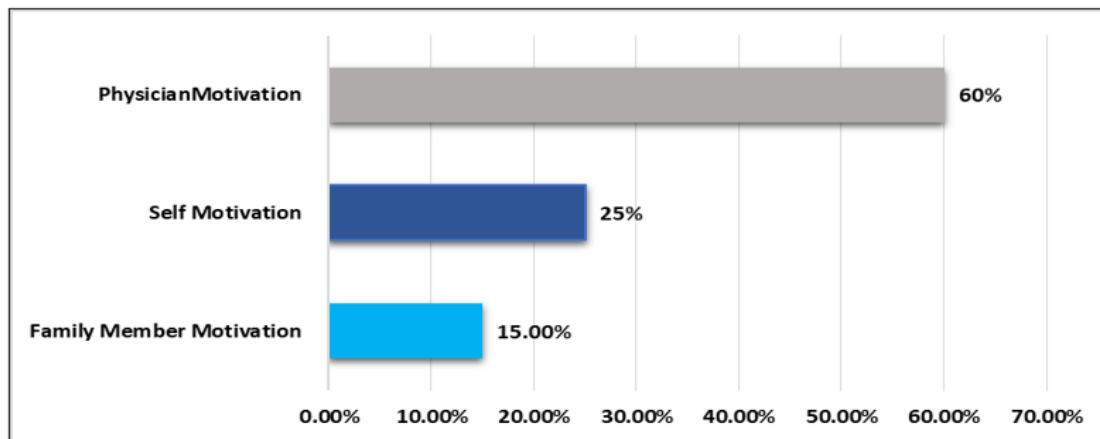


Figure 1. Reason for using SMBP (Source: Authors' own elaboration)

## DISCUSSION

The general objective of our study was to evaluate the practice of BP self-measurement and on the compliance of antihypertensive treatment. Our study showed that 39.6% of patients said they knew about BP self-measurement before the therapeutic education; however, only 23.4% had already performed it. The medical staff talked to the patients about SMBP in 60% of cases and encouraged them to perform it. And 23.4% of the patients had self-measurement devices at the time of the survey.

The result of this study is comparable with the previous studies [17, 18]. During the interviews conducted during our survey, 39.3% of the patients reported having knowledge about SMBP. Only 21.6% of our study population had an electronic BP monitor, 23.4% of whom performed SMBP. This figure is lower than the 54.7% found in a research. This difference might be attributed to differences in the study setting, as the Nigerian trial was done in a cardiology clinic [19]. These proportions were lower than those observed in [20] and [21, 22], where more than 31.5%, 24%, and 43.1% of hypertensive patients, respectively had self-measurement device. This variation might be due to the differences in a study setting, where a study was conducted. The involvement of paramedical staff could help increase the practice of self-measurement, especially in rural and semi-rural areas, where the proportion of physicians is low. The pharmacist can play an important role at this stage by providing only validated devices, advising the patient on the correct use of the device, and proposing a periodic check of the device. Annual Belgian statistics show that the majority of self-measurement monitors sold in pharmacies are validated tools [23].

According to the findings of this study, around 33.3% of participants recalled their most recent BP reading and 30% of the participants were inconsistent in monitoring their BP. Furthermore, 18.6% had no specific schedule for measuring their BP. While self-monitoring their BP, 41.6% did not retain a record of their data. The result of this study is similar to the studies previously conducted [18, 19, 21]. Furthermore, this study provides critical data for boosting

community health and preventative intervention programs in Pakistan. Finally, we suggest educational programs on BP self-monitoring, including teaching by example, because they may be necessary to improve the problem and complications of BP.

## CONCLUSIONS

The different results found in our work show that few patients had self-measurement devices. SMBP was not widely practiced, although several patients reported having some knowledge of it; however, when it was practiced correctly, it reduced the occurrence of cardiovascular complications. The practice of the therapeutic education has had a positive effect on both the realization of SMBP by patients and the promotion of therapeutic observance. Given the benefits of therapeutic education, practitioners should take more interest in it and integrate it into a large program of hypertension management.

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**Declaration of interest:** No conflict of interest is declared by authors.

**Data sharing statement:** Data supporting the findings and conclusions are available upon request from the corresponding author.

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