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Risk Factors of Hypertension among Cardiac Patients in Bangladesh- A Single Center Study

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Background: Hypertension, commonly known as high blood pressure, is a pervasive health issue worldwide, and its prevalence is particularly concerning among cardiac patients in Bangladesh. Cardiovascular diseases are a leading cause of morbidity and mortality in the country, and hypertension is a well-established risk factor for these conditions.
Aim of the Study: The aim of the study was to assess the risk factors of hypertension among cardiac patients in Bangladesh.
Methods: This cross-sectional observational study took place at the Department of Cardiology, Mugda Medical College & Hospital, Dhaka, Bangladesh, from January 2022 to December 2022. A total of 180 cases of hypertension lasting more than a year enrolled in this study as study population. A purposive sampling method was applied, and data collection utilized a semi-structured, pre-designed questionnaire. MS Office tools SPSS version 23.0 were used for data analysis.

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Results: Approximately 27% of participants had hypertension for less than 5 years, while 19% for 5 to 10 years, and 16% for 10 to 14 years. Remarkably, 28% managed hypertension for over 20 years. The most frequent risk factors were hyperlipidemia (34%), physical inactivity (24%), family history of hypertension (20%), obesity (19%), smoking (17%), and diabetes (12%).
Conclusion: Among the cardiac patients in Bangladesh, the most potential risk factors for hypertension are hyperlipidemia, physical inactivity, family history of hypertension, obesity, smoking, and diabetes.

Keywords: Risk factors; hypertension; cardiac patients; family history; physical activity.

1. INTRODUCTION

"Hypertension or high blood pressure is a leading modifiable risk factor for cardiovascular disease and accounts for more than 10% of the population-attributable fraction (PAF) for mortality worldwide" [1]. "Mortality and morbidity rates due to cardiovascular diseases are escalating worldwide, with disproportionately significantly worse outcomes in developing countries, due to rapid health and nutrition transitions caused by urbanization and globalization. More than 17.92 million people died in 2015 due to cardiac diseases, with the highest death rate of 9.4 million recorded in men and 8.5 million in women" [2]. "The management of HTN and HTN-related diseases, including CHD, usually varies from one country to another, as it depends on the capacity of the country to utilize the available resources for the prevention and control of the diseases" [3]. Over the last several decades, impressive gains have been made in improving hypertension detection, treatment, and control [4,5], but comparatively little work has been done in promoting primary prevention, a subject of growing interest. Encouragingly, accumulating evidence suggests that healthy lifestyle factors, such as a healthy diet and increased physical activity, contribute to lowering blood pressure [6,7], and that managing these risks can offset, at least to some extent, genetic predisposition towards hypertension and the development of subsequent cardiovascular sequelae [8]. "Further, community-based approaches can be effective in reducing blood pressure along with other cardiovascular risk factors in the population" [9,10]. The possible impact of an aging population [11], worsening levels of obesity [12], sedentary lifestyles [13], and high sodium consumption [14] on the burden of hypertension calls for a better understanding of the major risk factors associated with hypertension. It is predicted that there will be a 30% increase, with approximately 1.56 billion adults suffering from hypertension by 2025, and approximately 75% of the world's hypertensive population will reside in developing countries [15]. "Globally, complications of hypertension account for 9.4 million deaths every year out of 17 million deaths due to cardiovascular problems" [16]. "Hypertension has been identified as a significant risk factor for coronary heart disease, congestive heart failure, ischemic and hemorrhagic stroke, renal failure, and peripheral arterial diseases" [17,18]. The objective of this study was to assess the risk factors of hypertension among cardiac patients in Bangladesh.

2. METHODOLOGY

This cross-sectional observational study was conducted at the Department of Cardiology, Mugda Medical College & Hospital, Dhaka, Bangladesh, from January 2022 to December 2022. It involved 180 cases of hypertension lasting more than one year. A purposive sampling technique was employed for sample selection and informed written consent was obtained from all participants before data collection. Inclusion criteria encompassed patients who had made at least two visits to the mentioned hospital, and possessed clear and complete medical charts containing a comprehensive disease history. Exclusion criteria included patients who had only visited the hospital once, those with unavailable or unclear and incomplete medical records, pregnant women, and individuals with mental health issues. Detailed demographic and clinical data were recorded for all participants, and data analysis and presentation were carried out using MS Office tools.

3. RESULTS

In this study comprising 180 participants, the age distribution revealed that a significant majority fell into the category of individuals over 45 years old, constituting 67% of the total cohort. The next largest group was those aged between 30 and 45 years, comprising 23% of the participants. In contrast, the youngest age group, consisting of

individuals under 30 years old, constituted 10% of the total study population. The majority of cases (59%) were male, indicating a predominance of males in the study population. We observed that nearly two-thirds of the participants (61%) were from rural areas. The findings of this study indicate that nearly half of the participants, accounting for 47% of the total, fell into the category of individuals with a BMI of 30.0 or higher, which is considered obese. The next most prevalent group had a BMI ranging from 25.0 to 29.9, representing 34% of the study subjects. The remaining 19% of participants had a BMI within the range of 18.5 to 24.9, which is considered within the normal weight range. In analyzing the socio-economic status of our participants, we observed that nearly half of the cases (48%) were from the middle class and more than one-third (34%) were from lower-class families. Approximately 27% of our participants lived with hypertension for less than 5 years. In contrast, 19% had a duration of 5 to 10 years, while 16% had dealt with hypertension for 10 to 14 years. Notably, a significant proportion, comprising 28% of the participants, had managed hypertension for over 20 years. In distributing the risk factors among our participants, we observed that, in more than one-third (34%) of cases hyperlipidemia and in about one-fourth (24%) of cases, physical inactivity was found. Besides these, in 20%, 19%, 17% and 12% of cases family history of HTN, obesity, smoking and diabetes were observed respectively.

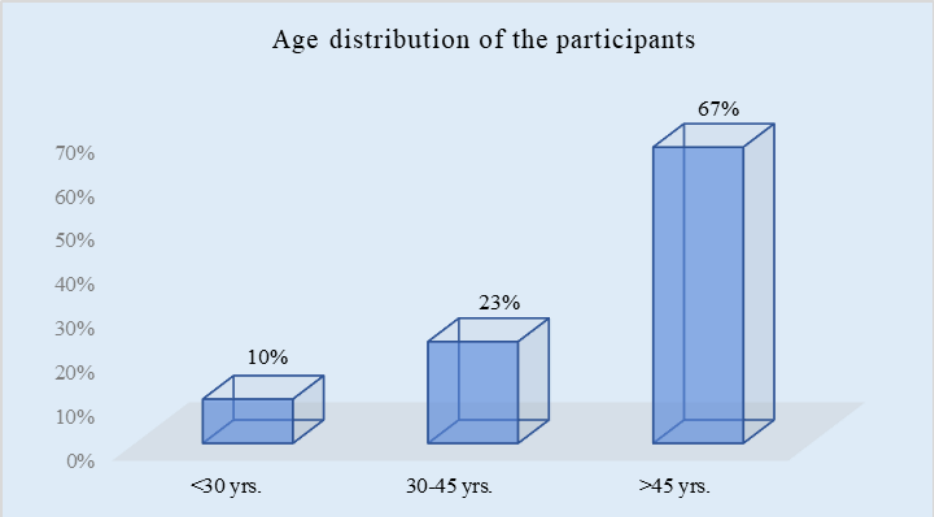

Fig. 1. Column chart showed age wise participants (N=180)

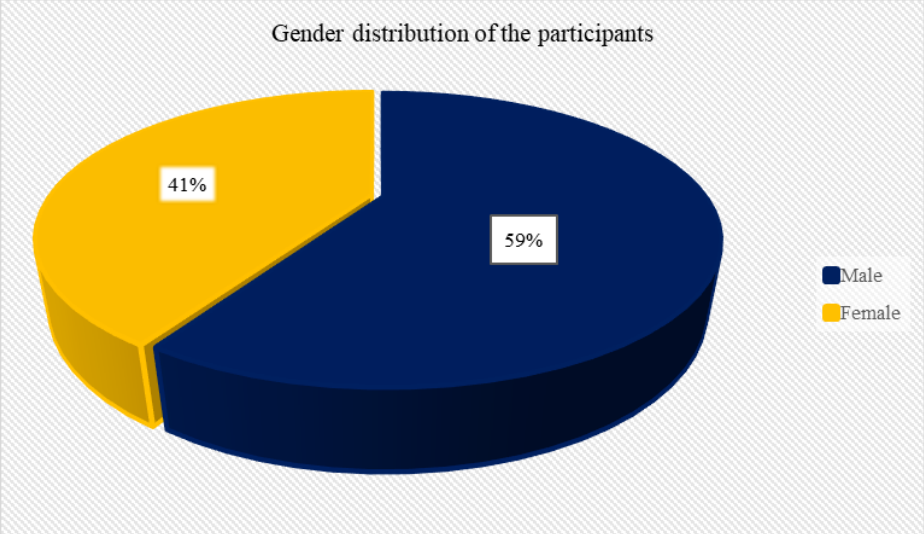

Fig. 2. Pie chart showed gender wise participants distribution (N=180)

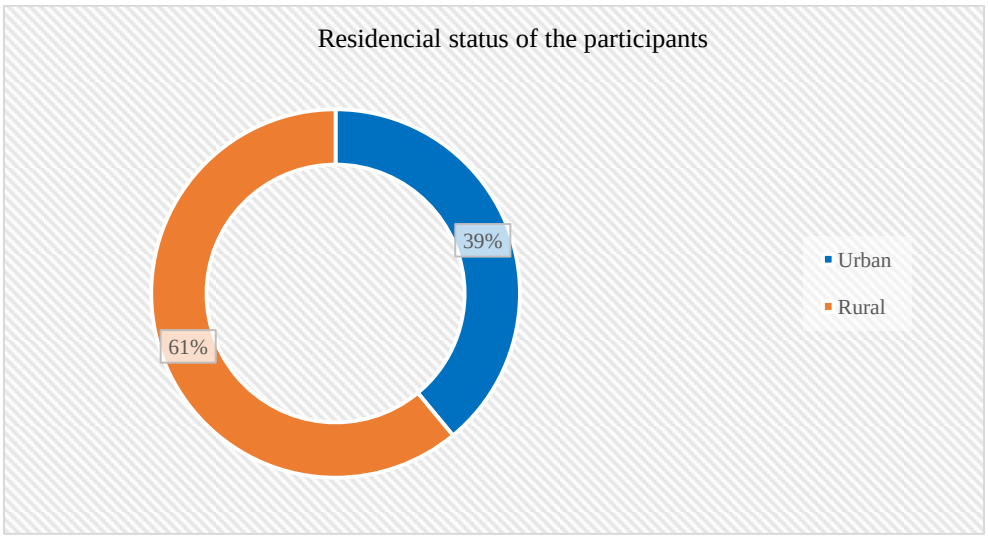

Fig. 3. Ring chart showed residencial status wise participants (N=180)

Table 1. Age distribution of Participants (N=180)

Age (Year)	n	%
<30 yrs.	18	10%
30-45 yrs.	41	23%
>45 yrs.	121	67%

Table 2. BMI status of study subjects (N=180)

BMI (Kg/m^2)	n	%
18.5–24.9	35	19%
25.0–29.9	61	34%
≥30.0	84	47%

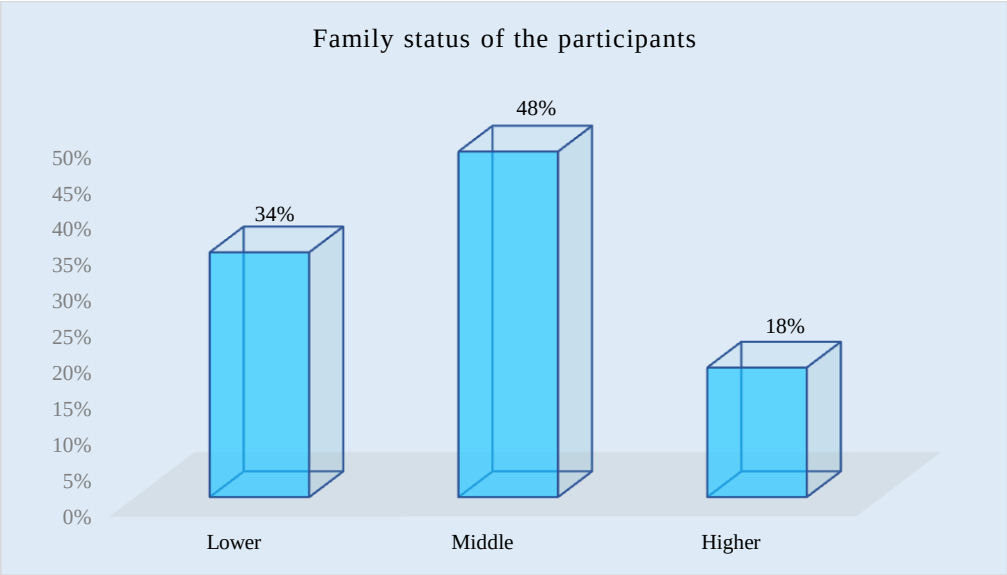

Fig. 4. Column chart showed family status wise participants (N=180)

Table 3. Duration of hypertension (N=180)

Duration (Year)	n	%
<5 Yrs.	48	27%
5-10 Yrs.	34	19%
10-14 Yrs.	29	16%
15-20 Yrs.	18	10%
>20 Yrs.	51	28%

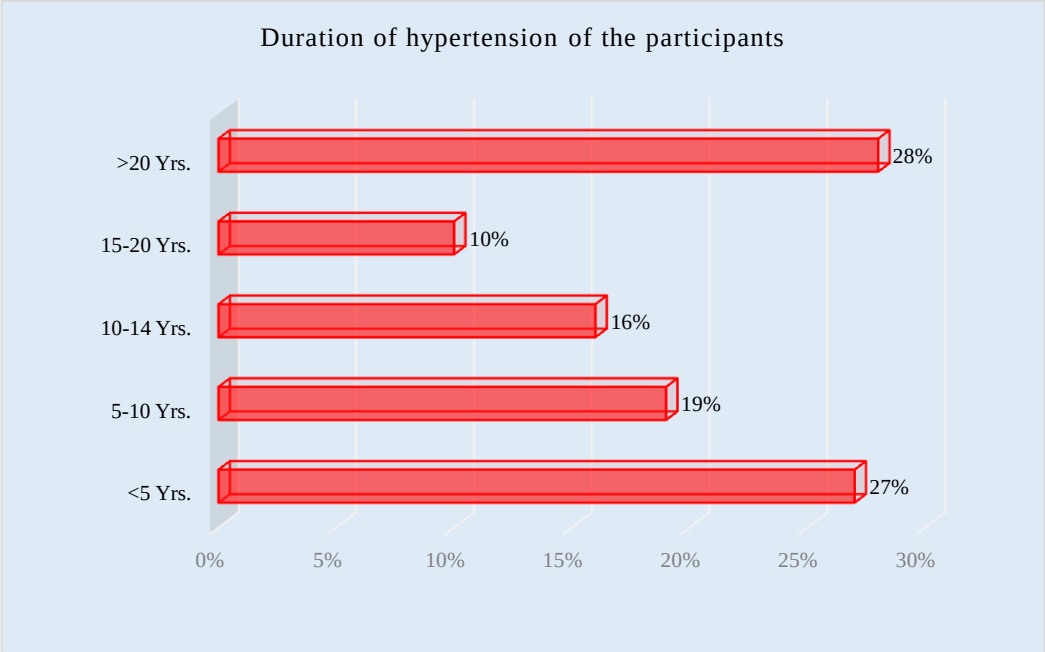

Fig. 5. Bar chart showed duration of hypertension among participants (N=180)

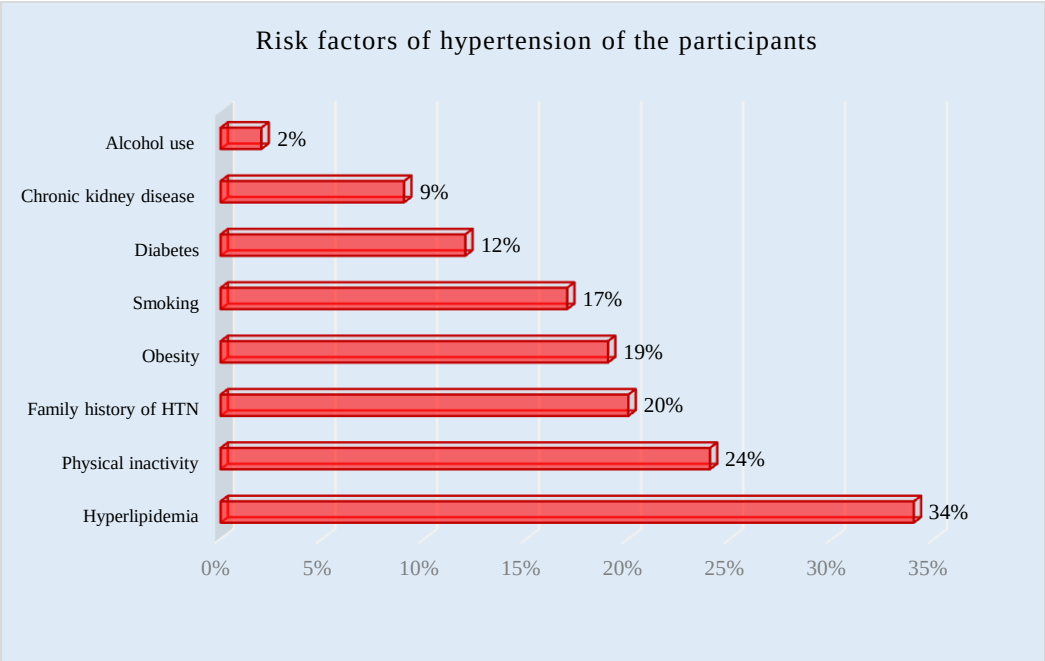

Fig. 6. Bar chart showed risk factors of hypertension among participants (N=180)

Table 4. The risk factors of hypertension. (N=180)

Risk factors	n	%
Hyperlipidemia	62	34%
Physical inactivity	43	24%
Family history of HTN	36	20%
Obesity	34	19%
Smoking	31	17%
Diabetes	22	12%
Chronic kidney disease	16	9%
Alcohol use	3	2%

4. DISCUSSION

This study aimed to assess the risk factors of hypertension among cardiac patients in Bangladesh. In this study of 180 participants, the majority (67%) were over 45 years old, with the next largest group (23%) aged between 30 and 45 years. However, some other studies have reported an increasing prevalence of coronary artery disease among the young population in Bangladesh and India. [18] In a study by Smith et al. [19], it was reported that the relationship between BP and the risk of CVD events is continuous, consistent, and independent of other risk factors. The pre-hypertensive group has a greater chance of progression to hypertension and other CVDs. The majority of our cases (59%) were male and similar findings were found in another recent study [20]. But in some studies [21,22] females were dominating. We found that nearly two-thirds of our participants (61%) were from rural areas. However, in many studies, the majority of the study subjects were found from urban areas. Furthermore, the World Health Federation reported that urban residents may face an increased risk of experiencing CVD due to poor quality city living standards. These standards include the limited availability of safe spaces for exercise or recreation, growing pressures from mass marketing, and the prevalence of unhealthy and affordable food options in urban areas. The study findings revealed that 47% of participants were classified as obese (BMI of 30.0 or higher), while 34% had a BMI between 25.0 and 29.9, and 19% fell within the normal weight range (BMI of 18.5 to 24.9). Another study indicated that overweight individuals faced a twofold risk of developing hypertension, while obese individuals had over a threefold risk compared to underweight individuals. Additionally, further research demonstrated that obesity, defined as a BMI greater than 25, carried a 2.62 times higher risk of developing hypertension when compared to those with a BMI below 25. [23] This suggests that obesity not only increases the risk of hypertension but can also predict uncontrolled hypertension. Other studies have supported these findings, showing that overweight and obese patients are less likely to have controlled blood pressure [24]. In analyzing the distribution of risk factors among our participants, it was noted that hyperlipidemia was present in more than one-third (34%) of cases, while physical inactivity was identified in about one-fourth (24%) of cases. Additionally, a family history of hypertension was present in 20% of cases, obesity in 19%, smoking in 17%, and diabetes in 12%. Some other studies [25,26] reported that the association of family history increases the risk of developing hypertension because it exposes the patient to high blood pressure, heart disease, and stroke, or their family had the same lifestyle habit. In some studies, [27,28], it was reported that physical activity in less than 10 minutes daily increased the risk of hypertension. This increase in risk was attributed to increased peripheral vascular resistance due to an increase in neuro-hormonal and structural responses, leading to enhanced sympathetic nerve activity and a decrease in arterial lumen diameters [29]. Similarly, a study in India showed that a lack of physical exercise was the major risk factor for the development of complications of hypertension [30]. A Canadian study showed that excess body weight and living a sedentary lifestyle predispose an individual to hypertension and its complications [31].

5. LIMITATION OF THE STUDY

This study has significant limitations. It was a single-centered study with a relatively small sample size and a short duration. Therefore, its findings may not be fully representative of the entire country's situation. Caution is necessary when applying these results to a broader national context. A larger, multi-centered study with a longer timeframe may provide a more comprehensive understanding.

6. CONCLUSION AND RECOMMENDATION

The most prevalent risk factors of hypertension among cardiac patients in Bangladesh are hyperlipidemia, physical inactivity, family history of hypertension, obesity, smoking, and diabetes. Recognizing these prevalent risk factors is crucial for developing targeted interventions and public health strategies to mitigate the burden of hypertension in this population. Addressing these factors through lifestyle modifications, improved screening, and effective management approaches is vital for improving cardiovascular health and reducing hypertension-related complications among cardiac patients in Bangladesh.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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