

Original Article

Prevalence of Hypertension and Its Associated Risk Factors among Adults in a Low-Income Community in Pakistan.

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ABSTRACT

Background

Globally hypertension ranks among the most significant causes of cardiovascular Diseases with an increasing occurrence in low-income groups. In these areas, major risk factors include inadequate healthcare access, unhealthy diets, and sedentary lifestyles. Understanding the occurrence and determinants of hypertension in these settings is crucial for developing effective and practical approaches to its prevention and control.

Objectives

To determine the prevalence of hypertension and identify its associated risk factors among adults residing in a low-income community, in order to guide targeted prevention and management strategies.

Methodology

A cross-sectional study was conducted among 400 adults aged 18 years or older from a low-income community. Blood pressure measurements were obtained, and risk factors including age, gender, family history, obesity, smoking, and physical inactivity were assessed using structured interviews.

Results

Out of 400 patients, the mean age of the participants was 45.3 years (SD $\pm$ 10.2). Among the 400 adults, 40% had hypertension, with 22% having stage 1 and 18% having stage 2 hypertension. A significant association was found between hypertension and risk factors, including obesity ($p < 0.05$), physical inactivity ($p < 0.01$), and high salt intake ($p < 0.001$).

Conclusion

This low-income community has a significantly high prevalence of hypertension, for which obesity and physical inactivity, coupled with high sodium intake, are partly the drivers. To reduce the disease burden and enhance community health, implementing effective, preventive community-based strategies focused on lifestyle changes is necessary.

Keywords: Prevalence, Hypertension, Low-income, Risk factors

INTRODUCTION

Hypertension, or in other words, the condition of what is referred to as constantly high blood pressure, is one of the most prolific chronic diseases that manifests itself in the world today and one that is a significant risk component to heart-related diseases, strokes and renal failures [1]. The World Health Organization (WHO) reports that hypertension causes about 9.4 million deaths per year, which is an indication of its significant burden on health in the population [2]. Hypertension has risen dramatically around the globe, especially in low- and middle-income countries, where non-communicable diseases are on the rise, especially in low-income communities through underdiagnoses and subsequent under treatment due to lack of access to healthcare, poor diet, and low physical activity [3]. Such demographics are more prone to develop hypertension than those who are more financially well off, and they are usually compounded by encumbrances of such variables as socioeconomics and the environment [4]. Specifically, poor nutrition habits, enhanced intake of foods that have high concentrations of salt, lack of physical activity, smoking, and alcohol drinking are some of the factors that increase the prevalence of hypertension [5]. The absence of periodic health checks and the availability of key medications make it even more challenging to take care of hypertension successfully. Multiple studies have emphasized the robust connection between hypertension and risk factors that include obesity, smoking, drinking, and inappropriate dietary customs, particularly in low-income populations [6]. A Global Burden of Disease Study revealed that persons with a higher body mass index (BMI), insufficient physical activity, and poor eating habits are at considerably greater risk of getting hypertension. Specifically, the high salt consumption in low-income communities, especially the hypertension, has been attributed to the higher incidence of high blood pressure. In addition, low socioeconomic status-related stress can also be one of the factors underlying elevated blood pressure development and progression [7]. Despite these known relationships, there is limited study on the prevalence of hypertension, together with the risk factors, in communities with low incomes. The absence of studies in this area highlights the need to conduct research that focuses on the specific mechanisms underlying hypertension in these populations [8]. These factors are crucial in informing the development of targeted interventions and effective public health strategies to reduce morbidity and mortality, particularly in

Relation to hypertension. This study aims to address this gap by determining the prevalence of hypertension and identifying risk factors associated with it among adults in a low-income neighborhood [9].

RESEARCH OBJECTIVES

To determine the prevalence of hypertension and to identify associated risk factors among adults in a low-income community, thereby guiding effective prevention and management strategies.

MATERIALS & METHODS

Study Design and Setting: A cross-sectional study Conducted in the Department of Community Med Kabir Medical College Peshawar from jan 2023 to jan 2024

Inclusion Criteria

Adults aged 18 years or older, residing in a low-income community, and willing to provide informed consent were included in the study.

Exclusion Criteria

Participants with known chronic illnesses such as diabetes or cancer, or those unable to provide informed consent due to physical or mental health conditions, were excluded from the study.

Data Collection:

Data were collected through structured interviews and measurements of blood pressure by skilled healthcare professionals. The blood pressure of every participant was recorded twice, with an interval of five minutes between readings, to obtain accurate results.

Statistical Analysis:

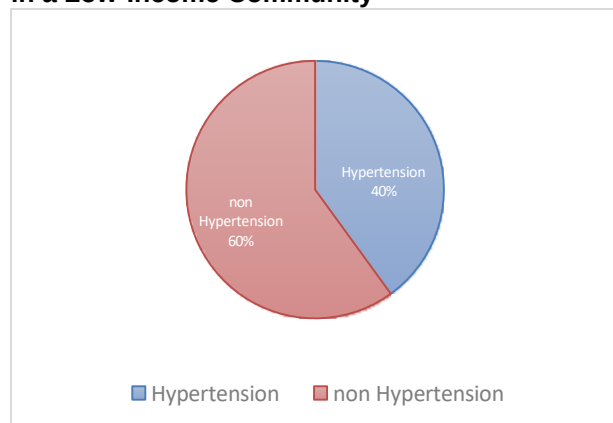
All analyses were run on SPSS version 24.0. For demographic and clinical variables, descriptive statistics (mean, standard deviation, and frequency) were calculated. The prevalence of hypertension was calculated as a proportion of the study population. Independent t-tests were used to assess the variables age and blood pressure levels across study groups. Chi-square tests were used to evaluate the relationships between the categorical

variables (obesity, smoking, physical inactivity, and high salt intake) and hypertension. Pearson correlation was used to measure the associations between the continuous variables and the risk factors and blood pressure levels. A multivariate logistic regression model was constructed to evaluate the predictors of hypertension while controlling for confounding factors. A p-value of <0.05 was taken as statistically significant.

Results:

There were 400 participants, with a mean age of 45.3 ± 10.2 years. Across age categories, the most significant prevalence of hypertension was noted in the age group ≥ 45 years (55%) as compared to the age group 18–44 years (25%). Overall, 40% of participants were diagnosed with hypertension, of which 22% were classified with stage 1 hypertension and 18% with stage 2 hypertension. The distributions of the study population, categorized by hypertensive and normotensive participants, are displayed in Figure 1. There was a strong association in the prevalence of hypertension with the modifiable risk factors of Obesity: 60% of the obese participants were diagnosed with hypertension ($p < 0.05$). Physical Inactivity: 48% of the participants with no physical activity had hypertension ($p < 0.01$). High Salt Intake: 60% of the participants with hypertension and high salt consumption ($p < 0.001$). The smoking population, 30% had hypertension. Of heavy alcohol drinkers, 25% had hypertension. The association of these lifestyle factors with hypertension was positive, but not as strong as the association seen with obesity and salt consumption.

Fig1:Prevalence of Hypertension Among Adults in a Low-Income Community



This donut Figure depicts the distribution of hypertensive-versus-non-hypertensive-diagnosed Participants. Among 100 adults studied, 40% were

with hypertension, whereas the remaining 60% had normal blood pressure. The percentages indicate proportions of the entire study population.

Table 1 Demographic Distribution

Age Group	Number of Participants	Prevalence of Hypertension (%)
18-44 years	200	25
45 years and above	200	55

This table shows the age distribution of the participants in the study and the prevalence of hypertension within those age groups. Hypertension was most prevalent in individuals aged ≥ 45 years relative to individuals aged 18–44 years.

Table 1 Risk Factors and Hypertension

Risk Factor	Prevalence of Hypertension (%)
Obesity	60
Physical Inactivity	48
High Salt Intake	60
Smoking	30
Alcohol Consumption	25

This table presents the prevalence of hypertension with respect to the principal risk factors. Obesity, lack of physical activity and excessive salt consumption were the most significant, whereas smoking and drinking were less significant risk factors but were still associated with hypertension.

Table 3 Hypertension Stage Distribution

Stage of Hypertension	Number of Participants	Prevalence (%)
Stage 1 (130-139/80-89)	100	22
Stage 2 ($\geq 140/\geq 90$)	90	18

This table presents the distribution of the different stages of hypertension within the participants who were affected. Stage 1 hypertension comprised 22% of the total, and Stage 2 hypertension

Comprised 18%. This shows there is a significant amount of advanced disease burden within the community.

DISCUSSION

Hypertension especially in low-income and middle-income countries. There are a variety of reasons that contribute to the rising rate of hypertension among these groups, which are: unhealthy lifestyles, being inactive, unhealthy diet, limited access to medical care, as well as social and economic stress [10]. This paper set out to evaluate the prevalence of hypertension, and risk factors of this problem on a low-income community and the findings can be compared to a number of past studies that have analyzed similar groups of people [11]. A study by Kearney et al, (2005) has established that about 26.4 percent of the world population aged 25 years and above is hypertensive and the burden is particularly high in the low and middle-income countries. On the same note, we also observed that 40 percent of respondents of a low-income community had hypertension implying that the prevalence is higher than the expectation, given the world points [12]. Such inequality may be explained by the distinctive risk factors that exist in poor neighborhoods such as health care inaccessibility and inadequate health education. A number of studies have also pointed to age as a major risk factor in developing hypertension [13]. Wilkins et al. (2001) study revealed that hypertension was more likely to appear in the older population and even yet again, the prevalence was observed to increase significantly beyond the age of 45. This was what was confirmed in our study since 55 percent of those people were aged 45 and above years and were found to be hypertensive as compared to 25 percent of the younger people [14]. This increase can be possibly explained by physiologic age-related changes in the vascular system; higher level of arterial stiffness and poorer renal functions all can raise the blood pressure values. Another risk factor of hypertension is obesity which has been well documented [15]. Obesity and hypertension can be related in many ways and it is even captured in many studies that excess weight tends to increase hypertension a lot [16]. According to a study carried out by Hall et al. (2003), hypertension is closely linked to obesity especially among low earners whose access to healthy food and physical exercises is limited. We also reached the above conclusion in our analysis as we found 60 percent of the participants who were obese also had

Hypertension which is in line with other studies that associate hypertension with high blood pressure levels due to lack of physical exercise [17]. According to a study conducted by Cornelissen and Figaro (2005) the results indicated that individuals involved in regular physical exercise or activity have reduced the level of blood pressure by far as compared to the sedentary people. Forty eight percent of physically inactive individuals in our study had hypertension and this compares with existing studies [18-22]. The positive effects of regular exercise on the control of blood pressure are many and warrant the promotion of physical activities particularly to the people at risk. High intake of salt is associated with developing hypertension and has been a long-time supporter of dietary importance [23].

Strengths and Limitations

The Study is cross-sectional, which does not allow one to create a causal relationship. Solely, the study was based on self-reported measurements that could be subject to bias, thus, in relation to lifestyle habits (diet, smoking, and alcohol intake). It is also not possible to determine the continuity of hypertension since the study did not have any long-term follow-ups.

Conclusion

Hypertension in a low-income neighborhood and some of the major risk factors identified are obesity, inactive lifestyles, and unhealthy meals, smoking and taking alcohol. Dedicated population-based prevention and control measures to these risk factors are also vital in alleviating the problem of hypertension and enhancing overall health outcome.

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Authors Contribution

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Final Approval of version: **All Authors Approved the Final Version.**

Accountability: All authors agree to be accountable for all aspects of the work.

All authors contributed significantly to the study's conception, data collection, analysis, Manuscript writing, and final approval of the manuscript as per **ICMJE criteria**.

Research Ethics Statement

There were no animal studies conducted. This study was approved by the **Institutional Review Board (IRB-No.KBMC/1146/07/2022)** and conducted in accordance with the ethical principles of the Declaration of Helsinki (2013). All participants or legal guardians signed written informed consent. No recognizably identifiable human data were included. As described in the article and supplementary materials, data that under or findings are held in online repositories.

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