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FACTORS AND DETERMINANTS OF HIGH BLOOD PRESSURE AMONG AGE GROUPS IN MOSUL

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Abstract

General Background: Hypertension is a major global health problem characterized by increased arterial pressure resulting from multiple behavioral, physiological, and pathological factors. Specific Background: In Mosul, limited recent epidemiological data exist, particularly among younger populations under 50 years of age diagnosed with hypertension. Knowledge Gap: There is insufficient localized evidence regarding dominant determinants and patient behavior related to hypertension management in this age group. Aims: This study aimed to estimate the prevalence of hypertension among individuals under 50 in Mosul and to identify its main causes and management approaches. Results: Among 250 patients, hypertension was most prevalent in the 30–40 age group (49%). The leading determinants were psychological stress and difficult economic conditions, followed by kidney disease, obesity, smoking, and family history. Lifestyle modifications primarily included dietary changes (40%) and physical activity (30%), while treatment adherence varied, with only 52% taking medication regularly. Novelty: This study highlights the dominant role of socioeconomic hardship and psychological stress as primary contributors to hypertension in a younger population. Implications: These findings emphasize the need for targeted public health strategies addressing social conditions, stress management, and improved treatment adherence to control hypertension in similar populations.

Highlights:

- Psychological burden and financial constraints emerge as dominant determinants
- Highest proportion observed in individuals aged 30–40 years
- Medication adherence remains inconsistent among diagnosed patients

Keywords: Hypertension; Psychological Stress; Socioeconomic Status; Young Adults; Lifestyle Modification

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Introduction

Blood pressure is the force with which the heart pumps blood through the arteries. Elevated blood pressure (above 120/80 mmHg) is a common and serious health problem. Population-based surveillance (such as biomarker surveys) is essential to understand its true prevalence, identify risk factors like obesity and smoking, assess awareness and treatment within the community, detect undiagnosed cases (such as "masked hypertension), and guide public health efforts for prevention and control.

For your information, a population survey was conducted for the first time in 1979, and the prevalence at that time was estimated at 12% [1]. It is estimated that hypertension causes 7.5 million deaths, representing 12.8% of all deaths worldwide. A population survey is a tool for collecting data on population health, including blood pressure measurements in representative samples of the population, not just in clinics. It reveals the prevalence of hypertension, its distribution by age, sex, geographic region, and ethnic group, and identifies undiagnosed cases and those with "masked" hypertension (normal blood pressure in the clinic but elevated outside of it). Creating data on all cases helps health surveys understand the burden of disease, identify high-risk groups, evaluate the effectiveness of public health programs, and direct resources to improve healthcare, as has been done in studies that identified lead levels as a risk factor.

Globally, the prevalence of hypertension among adults aged 25 and older was approximately 40% in 2008 [2]. The prevalence of hypertension among young people represents a growing health problem, driven primarily by lifestyle factors such as obesity [3], lack of physical activity, poor diet (especially processed foods and salt), and stress. It leads to premature cardiovascular risks and organ damage. Therefore, awareness of the importance of regular checkups, lifestyle changes, and early diagnosis are vital to curbing this alarming phenomenon, which may initially remain hidden and can lead to long-term illness and death. Hypertension It rarely causes any obvious symptoms and is therefore considered a silent killer, and for this reason, early detection along with increased public awareness are important [4].

Recent studies have revealed an increase in high blood pressure rates among young adults aged 24 to 32, compared to previous studies. These studies found that kidney-related factors are among the most common causes of high blood pressure in young men and women. The studies also found that adults aged 40 to 59 have a higher level of awareness than younger adults. fewer are making lifestyle or dietary changes that could significantly reduce their blood pressure to normal levels.

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Furthermore, declining physical activity levels and rising rates of obesity and diabetes, particularly among adolescents, create conditions conducive to developing hypertension at a young age By the end of their twenties, the condition may progress to the point where medical treatment is needed. This study aims to estimate the prevalence of hypertension among young people in Mosul, as well as to explore the causes of hypertension and strategies for managing it, such as lifestyle changes and adherence to treatment [5] .

Literature Review

One of the most significant causes of cardiovascular disease is hypertension. Recently, hypertension has contributed to the death of one in seven people with hypertension, and the costs of treating it in developed countries are very high. In the United States, for example, the cost reached $56 billion in 2015. Hypertension rates are calculated according to age, sex, and race. Everyday environmental factors and social conditions, such as social deprivation, living conditions, low socioeconomic status, and unequal access to medical care, are associated with increased hypertension and the burden of cardiovascular disease. These factors are considered the social determinants of physical health, which the World Health Organization defines as "the conditions in which people are born, work, live, grow up, and age, and the health systems available for managing disease." The five main determinants include: social and community context, economic stability, education, health and healthcare, built environment, and neighborhood environment. However, understanding the impact of these social determinants on hypertension outcomes in adults in the United States remains insufficient [6].

In two large-scale studies conducted in the United States, the Coronary Artery Disease Risk Evolution in Young Adults (CARDIA) study and the Jackson Heart Study (JHS), a subset of participants did not experience an increase in blood pressure. However, in the latter CARDIA study, the oldest participant was 60 years old, while the follow-up period in the JHS study was approximately eight years to assess changes in blood pressure. Some recent studies have shown that blood pressure can be lowered through various lifestyle factors, such as abstaining from alcohol, maintaining a normal body mass index, increasing physical activity, and following a heart-healthy diet, including taking potassium supplements, which help maintain normal blood pressure, and reducing sodium intake [7].

Material And Methods

The study included 250 individuals under the age of 50 who had previously been diagnosed with hypertension at Ibn Sina Hospital. A detailed medical history and a comprehensive body system review were conducted. The responses were received, but the sources were unknown. The participants received the questionnaire only once. This study focused on five main axes: age, gender, causes of high blood pressure, proposed lifestyle modifications, and adherence to prescribed medications for each patient.

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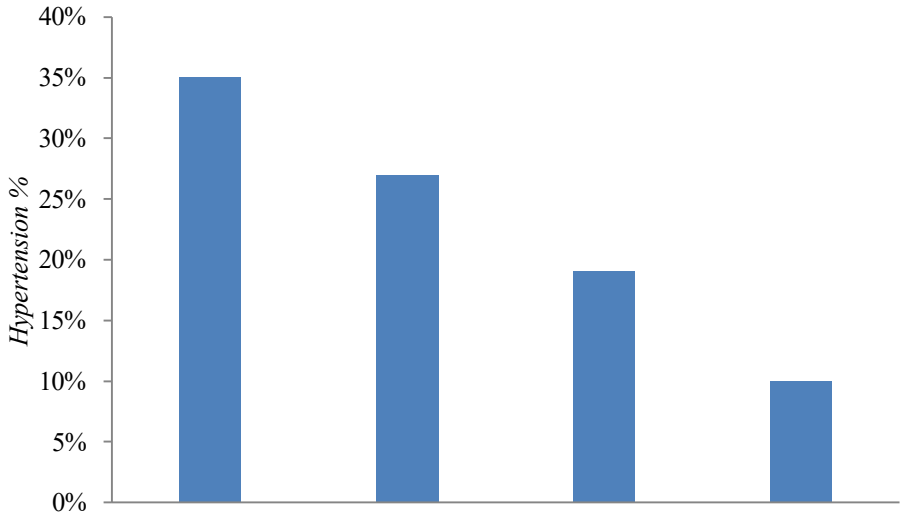
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Result And Discussion

Age and Hypertension: All participants in this study were under 50 years of age. Hypertension was observed to be 49% prevalent in the 30-40 age group, 20% in the 30-35 age group, 16% in the 25-29 age group, and 5% in the 20-24 age group, as shown in Figure 1.

Causes of Hypertension: There are several causes of hypertension, but chronic stress is one of the most common, especially among immigrants. Hypertension was also observed in 35% of individuals with low socioeconomic status, 27% in those with kidney disease, 19% in obese individuals, 10% in smokers, 5% in individuals with a family history of hypertension, and 4% in individuals with heart disease, as shown in Figure 1.

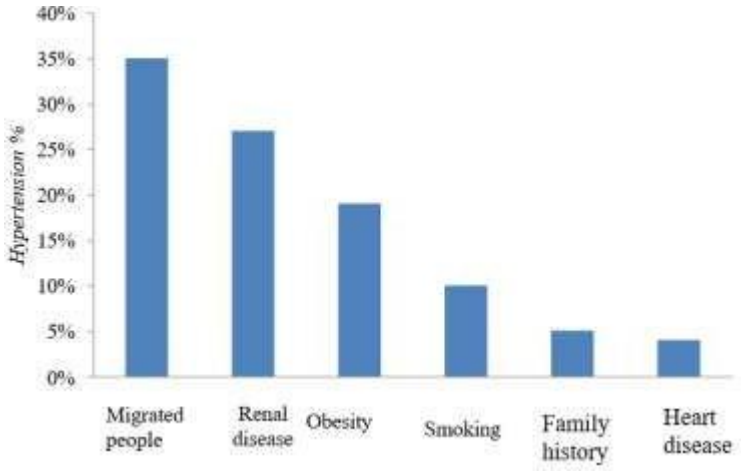
Figure 1. *Age and hypertension of participants*



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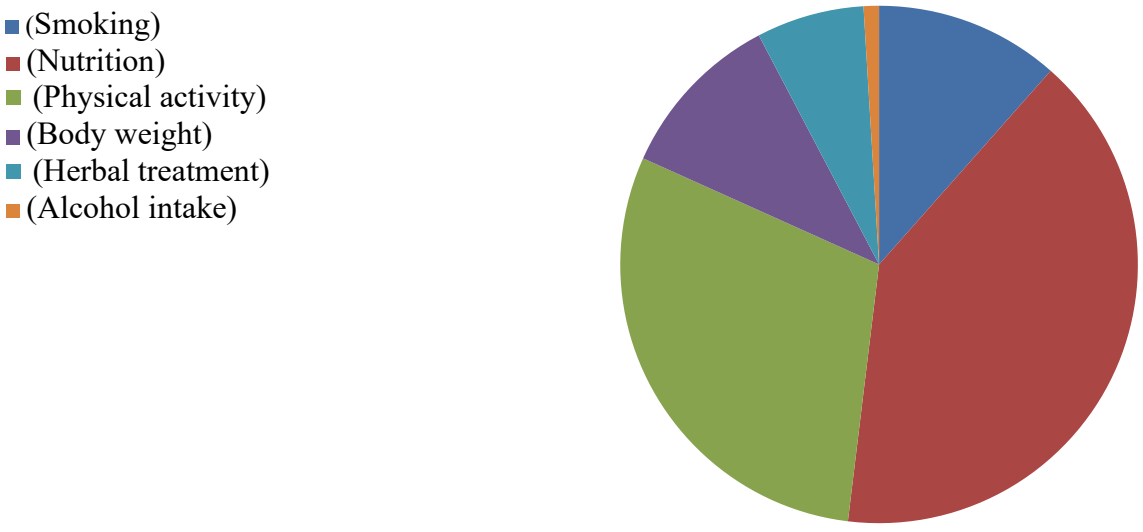
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Figure 2. *Causes of hypertension in participants*



Following the recommendations, the majority of participants (40%) indicated a change in their dietary habits, with 30% focusing on exercise and burning calories. Eleven percent quit smoking, 10% opted for a healthier diet, avoiding sugars and fats, 7% lowered their blood pressure using herbs, and 1% decided to abstain from alcohol, as illustrated in Figure 3.

Figure 3. *changing life style to reduce hypertension in participants*

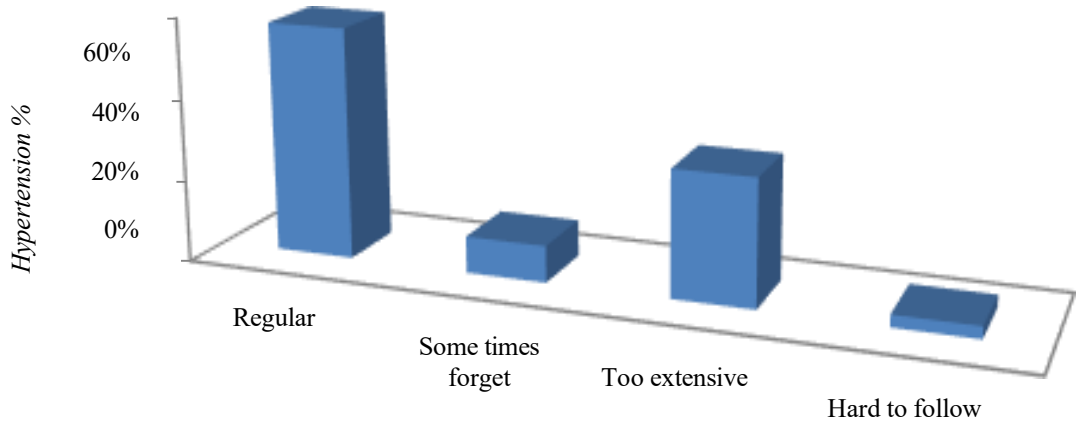


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The disciplined adherence to blood pressure treatment is the key to successfully managing this global disease. The results indicated that 52% of patients took their medications regularly, 10% took their medications with moderate regularity, 30% of patients did not adhere to doctors' recommendations to take their medications due to the difficulty of the treatment plan, and 8% did not take their medications due to the high cost of treatment (Figure 4).

Figure 4.*Hypertension therapies*



Stress affects blood pressure by stimulating the sympathetic nervous system's catecholamines, which in turn increase heart rate and cardiac output, thus raising blood pressure. Repeated activation of the sympathetic nervous system may prevent it from returning to its normal (resting) state, thus contributing to high blood pressure [8].

Narrowing of the arteries that carry blood to the kidneys (renal stenosis) is a common cause of high blood pressure. When the kidneys receive a low blood volume, they react as if the body were anemic, releasing hormones that stimulate the body to retain water and sodium, leading to elevated blood pressure. A well-established link between high blood pressure and obesity is also recognized across all age groups, as it is believed that the sympathetic nervous system is in a state of near-constant activation associated with obesity [9].

Many studies have indicated that smoking is common among alcoholics, leading to high blood pressure and an enlarged heart.[11] Recent Australian guidelines recommend that smoking, diet, alcohol consumption, exercise, body weight, lifestyle (including nutritional, health, and psychological factors), and even work-related stress are among the most important determinants of hypertension and should not be ignored.[10, 12]

It has been found that high sodium intake in young adults promotes higher blood pressure than in obese young adults.[13] Several recent studies have concluded that physical activity is the optimal solution for controlling hypertension.[14, 15]

Therefore, both the European Society of Hypertension and the American College of Sports Medicine recommend exercise as part of lifestyle modifications for the prevention and treatment of hypertension.[16, 17]

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Conclusion

One billion people worldwide currently suffer from high blood pressure, most of whom have it without any apparent cardiovascular disease.

Maintaining normal blood pressure requires a healthy lifestyle. This includes limiting salt (sodium) intake to less than 2,300 mg per day, engaging in 30 minutes of moderate-intensity exercise (such as brisk walking) daily, maintaining a healthy weight, quitting smoking, and managing stress.

1. Eating a healthy diet: Focus on fruits, vegetables, whole grains, and lean proteins.
2. Reducing sodium (salt) intake: Limit processed and canned foods, and avoid adding salt to your food.
3. Regular physical activity: Regular aerobic (cardio) exercise can help lower blood pressure by 5–8 mmHg.
4. Maintaining a healthy weight: Even losing a small amount of weight (4.5 kg) can help lower blood pressure.
5. Quit smoking: Smoking damages blood vessels and directly raises blood pressure.
6. Manage stress: Techniques such as deep breathing, meditation, and relaxation can help stabilize blood pressure.
7. Monitor your blood pressure: Regularly measure your blood pressure at home to track any changes. Get enough sleep: Getting 7-9 hours of restful sleep each night is essential for heart health.
8. Avoid certain medications: Be wary of cold medicines and decongestants that can raise blood pressure.
9. Drink water: Stay hydrated.
10. Eat potassium-rich foods: Such as bananas and avocados, which help reduce the effects of sodium.

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