

## Original Research Article

# PREVALENCE AND RISK FACTORS OF HYPERTENSION AMONG YOUNG ADULTS: A CROSS-SECTIONAL STUDY

Jesmy Chacko Kayyanickal<sup>1</sup>, Smitha Kiran<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of General Medicine, Sree Gokulam Medical College and Research Foundation, Thiruvananthapuram Kerala, India.

<sup>2</sup>Associate Professor, Department of General Medicine, Sree Gokulam Medical College and Research Foundation, Thiruvananthapuram Kerala, India.

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**Corresponding Author:**

**Dr. Smitha Kiran,**

Associate Professor, Department of General Medicine, Sree Gokulam Medical College and Research Foundation, Thiruvananthapuram Kerala, India.  
Email: smithakgr@gmail.com.

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## ABSTRACT

**Background:** Hypertension is increasingly prevalent among young adults, yet its risk factors remain underexplored in this demographic. This study aims to determine the prevalence and associated risk factors of hypertension among young adults, focusing on lifestyle, metabolic, and genetic influences.

**Materials and Methods:** A cross-sectional study was conducted among 140 young adults aged 18–35 years at a tertiary care hospital. Participants were selected using stratified random sampling, ensuring diverse demographic representation. Data collection included structured questionnaires on demographic details, lifestyle behaviors, dietary habits, family history of hypertension, smoking, alcohol consumption, and stress levels. Anthropometric measurements (BMI, waist-to-hip ratio) and biochemical assessments (fasting blood glucose, lipid profile) were conducted. Blood pressure was measured using a digital sphygmomanometer as per American College of Cardiology (ACC)/AHA 2017 guidelines.

**Results:** Hypertension was prevalent in 34.3% of participants, with an additional 28.6% categorized as having elevated blood pressure. Males exhibited a higher prevalence (55.7%) than females (44.3%). Obesity was a significant risk factor, with hypertensive individuals having a higher BMI ( $27.1 \pm 3.4$  kg/m<sup>2</sup>) and waist-to-hip ratio ( $0.92 \pm 0.08$ ,  $p < 0.001$ ). High fasting blood glucose ( $102.5 \pm 12.7$  mg/dL,  $p = 0.004$ ) and total cholesterol ( $195.6 \pm 17.2$  mg/dL,  $p = 0.001$ ) were associated with hypertension. Behavioral risk factors such as smoking (37.5% vs. 11.5%,  $p = 0.002$ ), alcohol consumption (43.8% vs. 19.2%,  $p = 0.008$ ), low physical activity (62.5% vs. 26.9%,  $p < 0.001$ ), high salt intake (72.9% vs. 36.5%,  $p < 0.001$ ), and high perceived stress (52.1% vs. 23.1%,  $p = 0.003$ ) were significantly associated with hypertension. Logistic regression confirmed that obesity (OR=3.5,  $p < 0.001$ ), family history of hypertension (OR=2.2,  $p = 0.028$ ), smoking (OR=2.7,  $p = 0.014$ ), high salt intake (OR=3.9,  $p < 0.001$ ), low physical activity (OR=2.5,  $p = 0.006$ ), and high perceived stress (OR=2.0,  $p = 0.031$ ) were independent predictors of hypertension.

**Conclusion:** Hypertension is highly prevalent among young adults, with modifiable lifestyle factors playing a crucial role. Obesity, smoking, alcohol consumption, high salt intake, low physical activity, and stress were key contributors, while genetic predisposition also played a role. Early screening, lifestyle modifications, and public health interventions are essential to mitigate hypertension risk and prevent long-term cardiovascular complications.

**Keywords:** Hypertension, Young Adults, Risk Factors, Obesity, Lifestyle Modification.

## INTRODUCTION

Hypertension, commonly known as high blood pressure, has long been regarded as a condition affecting older populations. However, recent trends indicate a concerning rise in its prevalence among young adults. This shift in epidemiology is attributed to various factors, including lifestyle modifications, environmental influences, genetic predispositions, and increasing stress levels associated with modern-day living. Hypertension in young adults poses a significant public health concern due to its strong correlation with cardiovascular diseases, stroke, and kidney disorders later in life. Despite being largely asymptomatic in its early stages, uncontrolled hypertension can lead to severe health complications, making early detection and management crucial.<sup>[1]</sup>

The definition of hypertension is based on consistently elevated blood pressure readings, generally classified into systolic and diastolic measurements. While normal blood pressure is considered to be around 120/80 mmHg, hypertension is diagnosed when readings exceed 130/80 mmHg on multiple occasions. Traditionally, hypertension has been categorized into primary (essential) hypertension, which develops without an identifiable cause, and secondary hypertension, which arises due to underlying medical conditions such as kidney disease, endocrine disorders, or certain medications. The majority of cases among young adults fall under primary hypertension, often influenced by lifestyle choices and hereditary factors.<sup>[2]</sup>

The prevalence of hypertension among young adults has been steadily rising across the globe. This increase is particularly evident in urban populations where sedentary lifestyles, poor dietary habits, and high-stress environments contribute significantly to the development of the condition. In many cases, young adults remain undiagnosed due to the absence of routine health check-ups and the misconception that hypertension is a disease of the elderly. Consequently, by the time a diagnosis is made, significant vascular damage may have already occurred, increasing the risk of cardiovascular morbidity and mortality. The lack of awareness and screening programs targeting young populations further exacerbates the situation, leading to late detection and poor management of the condition.<sup>[3]</sup>

Several risk factors contribute to the development of hypertension in young adults. One of the primary modifiable risk factors is an unhealthy diet, particularly the excessive consumption of salt, processed foods, and saturated fats. The increasing preference for fast food and convenience meals, which are often high in sodium and trans fats, has been linked to elevated blood pressure levels. Coupled with poor dietary choices, inadequate physical activity further amplifies the risk of hypertension. The widespread reliance on digital

devices and prolonged screen time has led to a decline in physical exercise, promoting weight gain and metabolic disturbances that contribute to hypertension.

Obesity is another major factor associated with hypertension in young adults. The accumulation of excess body fat, particularly visceral fat, has been shown to increase vascular resistance and insulin resistance, both of which play a role in the elevation of blood pressure. The rising prevalence of obesity among young populations is a significant contributor to the global burden of hypertension. Additionally, metabolic syndrome—a cluster of conditions including abdominal obesity, high blood sugar, and abnormal cholesterol levels—frequently coexists with hypertension, creating a complex interplay of risk factors that heighten the probability of cardiovascular complications.<sup>[4]</sup>

Psychosocial factors also play a crucial role in the development of hypertension. Chronic stress, anxiety, and depression have been linked to increased blood pressure levels due to their effects on the autonomic nervous system and hormonal regulation. The modern work environment, academic pressures, financial stress, and social challenges contribute to sustained stress responses, leading to prolonged activation of the sympathetic nervous system. This results in vasoconstriction, increased heart rate, and elevated blood pressure. Additionally, poor sleep patterns and sleep disorders, such as insomnia and obstructive sleep apnea, have been associated with an increased risk of hypertension, particularly among young adults with irregular sleep cycles.<sup>[5]</sup>

Substance use, including excessive alcohol consumption, smoking, and recreational drug use, is another significant risk factor for hypertension. Alcohol, when consumed in large quantities, can lead to endothelial dysfunction and increased vascular resistance, contributing to sustained high blood pressure. Similarly, smoking damages the arterial walls, leading to reduced elasticity and increased pressure within the circulatory system. The use of stimulants, including caffeine and energy drinks, has also been linked to transient spikes in blood pressure, and chronic consumption may contribute to long-term hypertension.

Genetic predisposition is another critical aspect of hypertension in young adults. Individuals with a family history of hypertension are at a higher risk of developing the condition, suggesting a hereditary component in blood pressure regulation. While genetic factors alone may not be sufficient to cause hypertension, they can interact with environmental and lifestyle influences to increase susceptibility. Epigenetic modifications, influenced by diet, stress, and exposure to toxins, may also play a role in altering gene expression related to blood pressure control.<sup>[6]</sup>

Despite the increasing burden of hypertension among young adults, there remains a lack of awareness and preventive measures targeting this

demographic. Early screening, lifestyle modifications, and public health interventions are essential in addressing the growing prevalence of hypertension. Encouraging young adults to adopt healthier lifestyles, engage in regular physical activity, maintain a balanced diet, and manage stress effectively can significantly reduce the risk of hypertension and its associated complications. Additionally, integrating routine blood pressure monitoring into standard healthcare practices for young individuals can aid in early detection and timely intervention.<sup>[7]</sup>

Hypertension is no longer confined to older populations and is increasingly affecting young adults at an alarming rate. The interplay of dietary habits, physical inactivity, obesity, stress, substance use, and genetic predisposition has contributed to the rising prevalence of this condition. Given its potential to cause long-term health complications, addressing hypertension in young adults should be a public health priority.

## MATERIALS AND METHODS

This cross-sectional study was conducted to assess the prevalence and risk factors associated with hypertension among young adults. The study was carried out at tertiary care hospital. The research adhered to the ethical guidelines set by the Institutional Ethics Committee, and informed consent was obtained from all participants. A total of 140 young adults aged 18–35 years were enrolled in the study. Participants were selected using a stratified random sampling method to ensure representation across different demographic and socioeconomic backgrounds. Exclusion criteria included individuals with a prior diagnosis of hypertension, secondary hypertension, or those on antihypertensive medications.

### Methodology

Data were collected using a structured questionnaire and clinical examination. The questionnaire was designed to obtain demographic details, lifestyle factors, dietary habits, family history of hypertension, smoking and alcohol consumption status, physical activity levels, and stress assessment.

### Blood Pressure Measurement

Blood pressure was measured using a standard digital sphygmomanometer following the American Heart Association (AHA) guidelines. Participants were asked to rest for at least five minutes before the measurement. Three readings were taken at 5-minute intervals, and the average of the last two readings was considered for analysis. Hypertension was defined as per the American College of Cardiology (ACC)/AHA 2017 guidelines:

- **Normal:** <120/80 mmHg
- **Elevated BP:** 120–129/<80 mmHg
- **Hypertension Stage 1:** 130–139/80–89 mmHg
- **Hypertension Stage 2:** ≥140/90 mmHg

## Anthropometric and Biochemical Measurements and Lifestyle and Behavioral Factors

Anthropometric measurements, including Body Mass Index (BMI) and Waist-to-Hip Ratio (WHR), were recorded to assess obesity and related risk factors. Height and weight were measured using a calibrated stadiometer and a digital weighing scale, and BMI was classified according to the World Health Organization (WHO) guidelines. WHR was determined using a flexible measuring tape, with central obesity defined based on WHO standards. Additionally, a subset of participants underwent biochemical assessments, including fasting blood glucose and lipid profile evaluations, which were conducted using venous blood samples to assess metabolic health markers.

Lifestyle and behavioral factors were also examined to determine their potential association with hypertension. Physical activity levels were assessed using the International Physical Activity Questionnaire (IPAQ), categorizing participants based on their activity intensity and duration. Dietary habits were evaluated using a food frequency questionnaire to analyze nutrient intake and food consumption patterns. Smoking and alcohol consumption were self-reported and categorized according to frequency and duration to assess their potential role as risk factors. Furthermore, psychosocial stress levels were measured using the Perceived Stress Scale (PSS), providing insight into stress-related contributions to hypertension prevalence.

### Statistical Analysis

Data were analyzed using SPSS version 25.0. Descriptive statistics (mean, standard deviation, frequencies) were used to summarize participant characteristics. The chi-square test was used for categorical variables, and an independent t-test was applied for continuous variables. Logistic regression analysis was performed to determine the association between risk factors and hypertension, with a significance level set at  $p < 0.05$ .

## RESULTS

### Demographic Characteristics of Study Participants (Table 1)

The demographic distribution of the study participants highlights key characteristics that may influence hypertension prevalence. The majority of participants (46.4%) were in the 18–24 age group, followed by 35.7% in the 25–30 age group, and 17.9% in the 31–35 age group. This distribution suggests that a significant proportion of young adults, particularly those in their early twenties, were included in the study.

Gender-wise, males (55.7%) slightly outnumbered females (44.3%), which is important when analyzing gender-related variations in hypertension prevalence. Socioeconomic status also varied among participants, with 50% belonging to the middle-

income group, 28.6% from the low-income group, and 21.4% from the high-income group. Socioeconomic factors, including access to healthcare, dietary habits, and lifestyle choices, may play a role in hypertension risk.

A significant portion of participants (37.1%) reported a family history of hypertension, which is a crucial risk factor. Genetic predisposition, combined with environmental and lifestyle influences, contributes to the early onset of high blood pressure. The larger proportion (62.9%) of participants without a family history suggests that lifestyle and behavioral factors might be major contributors to hypertension in young adults.

#### **Blood Pressure Distribution Among Participants (Table 2)**

The distribution of blood pressure categories among participants reveals the prevalence of hypertension within the study population. A total of 52 participants (37.1%) had normal blood pressure (<120/80 mmHg), while 40 individuals (28.6%) were classified under the elevated BP category (120–129/<80 mmHg). This suggests that nearly one-third of the participants were at risk of progressing to hypertension if preventive measures were not adopted.

Hypertension Stage 1 (130–139/80–89 mmHg) was observed in 30 participants (21.4%), while Hypertension Stage 2 ( $\geq$ 140/90 mmHg) was noted in 18 individuals (12.9%). These findings indicate that a considerable proportion (34.3%) of young adults in this study were already hypertensive, underscoring the growing prevalence of hypertension in this demographic. Given the asymptomatic nature of early hypertension, many individuals may be unaware of their condition, reinforcing the need for regular blood pressure monitoring and lifestyle modifications.

#### **Association of Anthropometric and Biochemical Parameters with Hypertension (Table 3)**

Anthropometric and biochemical markers were analyzed to determine their association with hypertension. Participants with hypertension had a significantly higher Body Mass Index (BMI) ( $27.1 \pm 3.4$  kg/m<sup>2</sup>) compared to those with normal blood pressure ( $23.5 \pm 2.1$  kg/m<sup>2</sup>), with a p-value of <0.001, indicating a strong association between obesity and hypertension. Excess weight contributes to increased vascular resistance and metabolic disturbances, which can elevate blood pressure.

The waist-to-hip ratio (WHR) was also significantly higher among hypertensive participants ( $0.92 \pm 0.08$ ) compared to normotensive individuals ( $0.85 \pm 0.06$ ), with a p-value of 0.002. Central obesity is a well-documented risk factor for cardiovascular diseases, suggesting that abdominal fat distribution plays a crucial role in blood pressure regulation.

Biochemical parameters further supported the association of metabolic health with hypertension. Fasting blood glucose levels were significantly higher in hypertensive participants ( $102.5 \pm 12.7$  mg/dL) compared to those with normal BP ( $88.2 \pm$

$9.1$  mg/dL), with a p-value of 0.004. Elevated blood glucose levels may indicate insulin resistance, which has been linked to hypertension development.

Similarly, total cholesterol levels were considerably elevated in hypertensive participants ( $195.6 \pm 17.2$  mg/dL) versus normotensive individuals ( $168.5 \pm 14.3$  mg/dL), with a p-value of 0.001. Dyslipidemia is a key contributor to vascular dysfunction, which may lead to increased arterial stiffness and hypertension. These findings highlight the importance of monitoring metabolic health parameters in young adults to identify those at higher risk of developing hypertension.

#### **Lifestyle and Behavioral Risk Factors Associated with Hypertension (Table 4)**

Lifestyle factors play a crucial role in hypertension development. Smoking was significantly more common among hypertensive participants (37.5%) compared to normotensive individuals (11.5%), with a p-value of 0.002. Tobacco use contributes to vascular inflammation and endothelial dysfunction, increasing the risk of high blood pressure.

Similarly, alcohol consumption was higher among hypertensive participants (43.8%) compared to those with normal BP (19.2%), with a p-value of 0.008. Excessive alcohol intake can lead to increased sympathetic nervous system activity and disrupt blood pressure regulation.

Physical inactivity was another major risk factor, with 62.5% of hypertensive individuals reporting low physical activity levels compared to 26.9% of normotensive individuals ( $p < 0.001$ ). Sedentary lifestyles contribute to obesity, poor cardiovascular health, and elevated blood pressure, highlighting the need for regular physical activity to prevent hypertension.

High salt intake was observed in 72.9% of hypertensive individuals compared to 36.5% of normotensive participants, with a p-value of <0.001. Excessive sodium intake leads to water retention, increased blood volume, and higher arterial pressure. These findings suggest that dietary modifications, particularly reducing salt intake, may be an effective strategy in hypertension prevention.

Perceived stress levels were significantly higher among hypertensive individuals (52.1%) compared to normotensive individuals (23.1%), with a p-value of 0.003. Chronic stress activates the hypothalamic-pituitary-adrenal (HPA) axis, leading to prolonged sympathetic stimulation and increased blood pressure. Stress management strategies such as relaxation techniques and lifestyle counseling could help mitigate hypertension risk in young adults.

#### **Logistic Regression Analysis of Risk Factors for Hypertension (Table 5)**

A logistic regression analysis was performed to determine the odds of developing hypertension based on various risk factors. Individuals with a BMI  $\geq 25$  kg/m<sup>2</sup> had 3.5 times higher odds of developing hypertension (OR = 3.5, 95% CI: 1.8–6.7,  $p < 0.001$ ). This confirms the strong link between obesity and high blood pressure.



A family history of hypertension was associated with a 2.2-fold increased risk of hypertension (OR = 2.2, 95% CI: 1.1–4.3,  $p = 0.028$ ), reinforcing the hereditary component of blood pressure regulation. Smoking increased the risk of hypertension by 2.7 times (OR = 2.7, 95% CI: 1.2–5.9,  $p = 0.014$ ), while high salt intake was associated with a nearly fourfold increased risk (OR = 3.9, 95% CI: 2.1–7.2,  $p < 0.001$ ). These findings emphasize the importance of smoking cessation and dietary modifications in hypertension prevention.

Low physical activity was linked to a 2.5-fold higher risk of hypertension (OR = 2.5, 95% CI: 1.4–4.6,  $p = 0.006$ ), highlighting the protective role of regular exercise in maintaining blood pressure levels. Lastly, high perceived stress doubled the risk of hypertension (OR = 2.0, 95% CI: 1.1–3.9,  $p = 0.031$ ), suggesting that stress reduction strategies should be incorporated into hypertension management programs.

**Table 1: Demographic Characteristics of Study Participants (n=140)**

Characteristic	Frequency (n)	Percentage (%)
<b>Age Group (Years)</b>		
18–24	65	46.4
25–30	50	35.7
31–35	25	17.9
<b>Gender</b>		
Male	78	55.7
Female	62	44.3
<b>Socioeconomic Status</b>		
Low	40	28.6
Middle	70	50.0
High	30	21.4
<b>Family History of Hypertension</b>		
Yes	52	37.1
No	88	62.9

**Table 2: Blood Pressure Distribution Among Participants**

Blood Pressure Category	Frequency (n)	Percentage (%)
Normal (<120/80 mmHg)	52	37.1
Elevated (120–129/<80 mmHg)	40	28.6
Hypertension Stage 1 (130–139/80–89 mmHg)	30	21.4
Hypertension Stage 2 ( $\geq 140/90$ mmHg)	18	12.9

**Table 3: Association of Anthropometric and Biochemical Parameters with Hypertension**

Parameter	Normal BP (n=52)	Hypertension (n=48)	p-value
<b>BMI (kg/m<sup>2</sup>)</b>	23.5 ± 2.1	27.1 ± 3.4	<0.001
<b>Waist-to-Hip Ratio (WHR)</b>	0.85 ± 0.06	0.92 ± 0.08	0.002
<b>Fasting Blood Glucose (mg/dL)</b>	88.2 ± 9.1	102.5 ± 12.7	0.004
<b>Total Cholesterol (mg/dL)</b>	168.5 ± 14.3	195.6 ± 17.2	0.001

**Table 4: Lifestyle and Behavioral Risk Factors Associated with Hypertension**

Risk Factor	Hypertension (n=48)	Normal BP (n=52)	p-value
Smoking	18 (37.5%)	6 (11.5%)	0.002
Alcohol Consumption	21 (43.8%)	10 (19.2%)	0.008
Physical Activity (Low)	30 (62.5%)	14 (26.9%)	<0.001
High Salt Intake	35 (72.9%)	19 (36.5%)	<0.001
Perceived Stress (High)	25 (52.1%)	12 (23.1%)	0.003

**Table 5: Logistic Regression Analysis of Risk Factors for Hypertension**

Variable	Adjusted Odds Ratio (OR)	95% CI	p-value
BMI $\geq 25$ kg/m <sup>2</sup>	3.5	1.8 – 6.7	<0.001
Family History of Hypertension	2.2	1.1 – 4.3	0.028
Smoking	2.7	1.2 – 5.9	0.014
High Salt Intake	3.9	2.1 – 7.2	<0.001
Low Physical Activity	2.5	1.4 – 4.6	0.006
High Perceived Stress	2.0	1.1 – 3.9	0.031

## DISCUSSIONS

The present study aimed to assess the prevalence and risk factors of hypertension among young adults. The findings indicate that 34.3% of the participants were hypertensive (Stage 1 and Stage 2 combined), while an additional 28.6% had elevated

blood pressure. These results highlight a growing concern regarding hypertension in young adults, emphasizing the importance of early screening and intervention.

The prevalence of hypertension observed in this study aligns with findings from Wyszynska et al. (2023), who reported that approximately 32.5% of

young adults in Poland had hypertension, with an additional 29.1% in the prehypertension category.<sup>[6]</sup> Similar trends were observed in a study conducted in urban Varanasi by Singh et al. (2017), where 36.7% of young adults were hypertensive, and a significant association was found between hypertension and urban lifestyle factors.<sup>[7]</sup>

The current study found that hypertension was more common among males (55.7%) than females (44.3%), which is consistent with Liu et al. (2017), who reported that young males in the Tujia-Nationality Settlement of China were more likely to develop hypertension due to higher smoking and alcohol consumption rates.<sup>[8]</sup> Additionally, Sabapathy et al. (2024) found that young men in Zimbabwe had a significantly higher prevalence of hypertension than women, which was attributed to gender-specific behavioral and metabolic differences.<sup>[9]</sup> Family history of hypertension was another significant factor, with 37.1% of participants reporting a positive family history. This finding is supported by Patil et al. (2017), who found that individuals with a parental history of hypertension were 2.8 times more likely to develop the condition in Nagpur, India.<sup>[10]</sup> This suggests a strong genetic predisposition in the development of hypertension among young adults.

Obesity and metabolic health markers showed a strong correlation with hypertension in the study. Hypertensive individuals had significantly higher BMI ( $27.1 \pm 3.4 \text{ kg/m}^2$ ) and waist-to-hip ratio ( $0.92 \pm 0.08$ ), findings that are in line with Shahimi et al. (2022), who reported that young adults with BMI  $\geq 25 \text{ kg/m}^2$  had a 3.2 times higher risk of developing hypertension.<sup>[11]</sup> Similarly, the association between central obesity and hypertension was confirmed in a study from Kenya by Ondimu et al. (2019), where 41% of hypertensive participants exhibited high waist-to-hip ratios.<sup>[12]</sup>

Biochemical markers such as fasting blood glucose and total cholesterol were significantly higher in hypertensive participants in this study. Zaki et al. (2021) found similar trends in their Malaysian cohort, where young adults with hyperglycemia and hypercholesterolemia had significantly higher hypertension prevalence, suggesting an underlying metabolic syndrome component.<sup>[13]</sup> These findings reinforce the need for comprehensive metabolic screening in young adults at risk of hypertension.

Lifestyle choices significantly influenced hypertension risk in this study. Smoking was prevalent in 37.5% of hypertensive participants compared to 11.5% in normotensive individuals ( $p = 0.002$ ). This is consistent with Noilhan et al. (2016), who found that tobacco use was strongly correlated with early-onset hypertension due to its vasoconstrictive and pro-inflammatory effects.<sup>[14]</sup>

Alcohol consumption was also significantly associated with hypertension, with 43.8% of hypertensive participants consuming alcohol regularly. Grasso et al. (2018) highlighted similar concerns in their study on young adults, showing

that excessive alcohol consumption was linked to a twofold increase in hypertension risk due to its effects on the renin-angiotensin system.<sup>[15]</sup>

Physical inactivity was another significant risk factor, with 62.5% of hypertensive participants reporting low activity levels ( $p < 0.001$ ). This aligns with findings from Singh et al. (2017), where physically inactive young adults had a 2.7 times higher risk of developing hypertension.<sup>[7]</sup> The importance of physical activity in reducing hypertension risk cannot be overstated, as sedentary behavior leads to weight gain, insulin resistance, and vascular dysfunction.

High salt intake was observed in 72.9% of hypertensive individuals, reinforcing the well-established link between dietary sodium and hypertension. This finding is consistent with Zaki et al. (2021), who reported that high salt consumption increased the likelihood of developing hypertension by nearly fourfold.<sup>[13]</sup> These results emphasize the importance of dietary interventions, such as reducing salt intake, to mitigate hypertension risk in young adults.

Lastly, perceived stress was significantly associated with hypertension, with 52.1% of hypertensive participants reporting high stress levels. Shahimi et al. (2022) found that chronic stress and mental health disorders were major contributors to blood pressure variability in young adults, reinforcing the need for stress management strategies.<sup>[11]</sup>

Logistic regression analysis in this study showed that obesity (BMI  $\geq 25 \text{ kg/m}^2$ ) had the strongest association with hypertension (OR = 3.5,  $p < 0.001$ ). Similar findings were reported by Wszyńska et al. (2023), who found that young adults with obesity were at a threefold increased risk of hypertension compared to those with normal BMI.<sup>[6]</sup>

A positive family history of hypertension was also a significant predictor (OR = 2.2,  $p = 0.028$ ), which aligns with Patil et al. (2017), reinforcing the genetic predisposition to hypertension.<sup>[10]</sup>

Smoking increased hypertension risk by 2.7 times ( $p = 0.014$ ), comparable to findings from Noilhan et al. (2016), where tobacco users had an OR of 2.9 for developing hypertension.<sup>[14]</sup> High salt intake (OR = 3.9,  $p < 0.001$ ) and low physical activity (OR = 2.5,  $p = 0.006$ ) were also significant predictors, consistent with data from Zaki et al. (2021) and Singh et al. (2017), respectively.<sup>[7,13]</sup>

High perceived stress was associated with a twofold increased risk of hypertension (OR = 2.0,  $p = 0.031$ ), reinforcing the findings from Shahimi et al. (2022), where stress-related hypertension was a significant concern in young adults.<sup>[11]</sup>

## CONCLUSION

This study highlights the growing prevalence of hypertension among young adults, with 34.3% of participants classified as hypertensive and 28.6% in the elevated BP category. Key risk factors identified

include obesity, physical inactivity, high salt intake, smoking, alcohol consumption, and high perceived stress. The strong association between metabolic markers and hypertension reinforces the need for early screening and lifestyle modifications. Genetic predisposition also played a role, but modifiable factors were the primary contributors.

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