

PREVALENCE AND RISK FACTORS OF HYPERTENSION AMONG YOUNG ADULTS IN DISTRICT FAISALABAD

Dr. Sultan Ayaz^{*1}, Moater Batool²

^{*1}Associate Professor, Department of Eastern Medicine, Government College University, Faisalabad, Pakistan.

²Department of Public Health Government College University, Faisalabad

DOI: <https://doi.org/10.5281/zenodo.22810706>

Keywords

Hypertension, sedentary lifestyle, risk factors, young adults.

Article History

Received: 10 June 2026

Accepted: 01 September 2026

Published: 17 September 2026

Copyright @Author

Corresponding Author: *

Dr. Sultan Ayaz

Abstract

Background: Hypertension is a medical condition in which blood pressure is constantly increased. It occurs when arterioles narrow and excessive pressure is exerted against the walls of blood vessels, causing the heart to work harder to maintain blood pressure. Several factors have been recognized as major risk factors for hypertension, including socio-demographic factors such as age, gender, family history, and diabetes mellitus. Other factors, including sleep duration, body mass index (BMI), smoking, alcohol intake, physical activity, dietary habits, and stress, are important predictors of hypertension. Hypertension is becoming increasingly prevalent among young adults.

Objective: The purpose of this study was to determine the prevalence and risk factors of hypertension among young adults in District Faisalabad.

Methodology: A cross-sectional study was conducted among 250 randomly selected individuals. Formal informed consent was obtained from each participant, and ethical guidelines regarding privacy and confidentiality were followed. Data were collected through interviews using a self-structured questionnaire. The questionnaire included questions regarding demographic characteristics, lifestyle habits, behavioral factors, social activities, education, knowledge, and understanding of hypertension. The collected data were analyzed using SPSS. The Chi-square test and independent t-test were performed to determine the association between hypertension and its potential risk factors. A p-value of ≤ 0.05 was considered statistically significant.

Results: The prevalence of hypertension among the 250 participants was 19.8%. Hypertension was significantly associated with BMI, physical activity, salt intake, fast-food consumption, stress levels, sleep duration, smoking, and family history. Hypertension was observed among 33.82% of overweight participants, 28.99% of those who never exercised, and 21.43% of those who exercised once or twice a week. Similarly, 38.18% of participants who always added extra salt to their diet, 39.13% of those who consumed fast food daily, 38.14% of those who often experienced stress, 32.43% of those who slept for less than 4 hours, 38.64% of active smokers, and 37% of participants with a positive family history showed hypertension.

Conclusion: The study concluded that hypertension was prevalent among young adults in District Faisalabad and was significantly associated with several lifestyle and behavioral risk factors. Proper knowledge and understanding of blood pressure should be provided to young adults. Regular

screening and educational programs should be conducted to promote a healthy lifestyle, reduce sedentary behavior, and address other modifiable risk factors to reduce the prevalence of hypertension among young adults.

Introduction:

Hypertension is a common medical condition characterized by persistently elevated blood pressure. It occurs when excessive pressure is exerted against the walls of blood vessels, increasing the workload of the heart required to maintain blood circulation (Ondimu et al., 2019). Blood pressure is an important indicator of cardiovascular health, and sustained elevation can produce physiological and vascular changes that increase the risk of disease. Hypertension is generally classified according to systolic and diastolic blood pressure levels. In the classification reported in the literature, systolic blood pressure of 140 mmHg or higher and diastolic blood pressure of 90 mmHg or higher are considered hypertensive levels (Bisognano et al., 2011). Persistent elevation of blood pressure can contribute to vascular changes and atherosclerosis, which may be particularly important when elevated blood pressure develops at a younger age (Dai et al., 2015). Hypertension affects individuals across different social and economic groups and remains an important global health problem. It is strongly associated with cardiovascular diseases and kidney failure and is influenced by several factors, including environmental conditions, dietary habits, age, sex, family history, and nutritional status (Li et al., 2019). Persistent high blood pressure increases the risk of several serious complications, including congestive heart failure, myocardial infarction, stroke, peripheral vascular disease, and kidney failure (Iqbal et al., 2018). Because many individuals with hypertension may remain unaware of their condition, delayed diagnosis and inadequate treatment can further increase the risk of complications. Therefore, identifying hypertension at an early stage and recognizing associated risk factors are important components of disease prevention and control.

Hypertension may be classified into primary and secondary hypertension. Primary hypertension is

generally not associated with one identifiable underlying cause and is commonly observed among adolescents and young adults. Familial history has been identified as an important factor associated with primary hypertension in younger populations (Goldstein et al., 2008). Secondary hypertension occurs when an underlying disease or condition contributes to elevated blood pressure. Renal, endocrine, cardiovascular, and neurological disorders may contribute to secondary hypertension, particularly among younger individuals (Anyaeogu & Dharnidharka, 2013). The development and maintenance of hypertension involve several physiological mechanisms, including the autonomic nervous system, vascular resistance, renal function, and the renin-angiotensin-aldosterone system. Increased sympathetic activity can contribute to increased cardiac output, vascular resistance, and sodium and water retention, ultimately contributing to elevated blood pressure (Delacroix et al., 2014). The increasing occurrence of hypertension among young adults is an important public health concern. Although hypertension is commonly associated with older age, elevated blood pressure can develop during young adulthood and may have consequences later in life. Early exposure to high blood pressure can produce changes in the vasculature and myocardium and has been associated with an increased risk of cardiovascular disease and mortality. Increasing overweight and obesity among younger populations have also been identified as important contributors to the development of hypertension. Young adulthood is therefore considered an important period for prevention and early management because appropriate interventions during this stage may reduce the risk of cardiovascular disease in later life (Zhang et al., 2017).

Several modifiable and non-modifiable factors contribute to the development of hypertension.

Non-modifiable factors include age, gender, and family history, while modifiable factors include obesity, dietary habits, alcohol consumption, tobacco use, and physical inactivity. Sleep duration, body mass index (BMI), smoking, and alcohol intake have also been identified as important predictors of hypertension (Zahid et al., 2024). Tobacco consumption is an established cardiovascular risk factor, and the risk of hypertension may increase with greater cigarette consumption. Alcohol consumption may also influence blood pressure through effects on the sympathetic nervous system, vascular function, and electrolyte balance (Zahid et al., 2024). In addition, sedentary behavior has become increasingly common and has been identified as an important factor associated with hypertension among young adults (Park et al., 2020).

Body mass index is another important factor associated with hypertension. BMI is commonly used as an indicator of overweight and obesity and represents the relationship between a person's body weight and height. Increased BMI and obesity are associated with metabolic changes, including insulin resistance and alterations in triglyceride and cholesterol levels, which may adversely affect blood pressure and cardiovascular health. Previous research has reported a strong relationship between increased BMI and hypertension among young adults. Childhood and adolescent obesity may also contribute to the development of hypertension at a younger age (Manzoor et al., 2019).

Dietary practices are also relevant to blood pressure control. High salt intake, unhealthy dietary patterns, inadequate consumption of fruits and vegetables, and frequent consumption of unhealthy foods have been associated with increased cardiovascular risk. Changes in food consumption patterns and nutrition have contributed to increasing rates of hypertension and related diseases in developing countries (Safdar et al., 2015). Physical inactivity, smoking, obesity, stress, and excessive use of technology may further contribute to unhealthy lifestyles among younger populations. The increasing

availability of fast food and urbanization may promote sedentary behavior and unhealthy dietary practices, potentially increasing the risk of obesity and hypertension among young people (Shah et al., 2018). Family history is another important risk factor for hypertension. Individuals with a positive family history may have a greater likelihood of developing elevated blood pressure. In addition to genetic influences, family dietary habits and lifestyle patterns may also contribute to this risk. The combination of hereditary susceptibility and modifiable behavioral factors makes early identification and lifestyle modification particularly important among young adults. Physical inactivity, tobacco consumption, unhealthy dietary practices, and increased body fat have been identified as factors associated with cardiovascular conditions and hypertension (Waseem et al., 2021).

In Pakistan, hypertension represents an important cardiovascular health concern. Approximately one-third of adults in Pakistan have been reported to suffer from hypertension, making it a major contributor to cardiovascular and renal complications. Dietary changes and changing patterns of food consumption have been identified as important factors associated with the increasing burden of hypertension in developing countries (Safdar et al., 2015). Despite the health consequences associated with hypertension, awareness and screening remain important challenges. Young adults may remain undiagnosed because they may not undergo routine blood pressure screening, while the absence of obvious symptoms can delay recognition of the condition. Hypertension is therefore often described as a "silent" condition because individuals may have elevated blood pressure without being aware of it.

Early detection of elevated blood pressure is important because lifestyle modifications can help address several modifiable risk factors. Public education, regular screening, promotion of physical activity, healthier dietary practices, adequate sleep, smoking prevention, and appropriate weight management may contribute

to reducing the risk of hypertension. Although research has been conducted on hypertension in different populations, gaps remain regarding awareness, prevalence, and associated lifestyle factors among young adults, particularly in low- and middle-income settings.

Therefore, assessment of hypertension among young adults is important for identifying the magnitude of the problem and understanding the factors associated with its occurrence. Local evidence can assist in developing appropriate awareness, screening, and prevention strategies. The present study was therefore conducted to determine the prevalence of hypertension and identify its associated socio-demographic, behavioral, and lifestyle risk factors among young adults in District Faisalabad.

Methodology:

Study Design and Setting

A cross-sectional study was conducted at Aziz Fatima Hospital, Allied Hospital, and other social circles in District Faisalabad.

Study Duration

The study was conducted over a period of 6 months.

Target Population

The target population comprised young adults aged 18–39 years residing in District Faisalabad.

Sampling Technique

Participants were selected using a random sampling method from Aziz Fatima Hospital, Allied Hospital, and other social circles. These sites were selected based on accessibility and patient flow, and eligible individuals were invited to participate.

Sample Size

A sample size of 250 participants was determined using a 95% confidence level and a 5% margin of error.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Individuals aged 18–39 years.
- Diagnosed individuals with hypertension (systolic BP ≥ 130 mmHg or diastolic BP ≥ 80 mmHg).
- Individuals who provided informed consent.
- Individuals without other comorbidities.

Exclusion Criteria

- Individuals younger than 18 or older than 39 years.
- Individuals with hypertension secondary to renal or endocrine disorders.
- Pregnant or breastfeeding individuals.
- Individuals with acute illness or infection at the time of the study.
- Individuals taking medications that could affect blood pressure.

Ethical Considerations

Ethical approval was obtained before data collection. All participants were informed about the study purpose, their voluntary participation, and their rights. Written informed consent was obtained, and participants' information was kept confidential and used only for research purposes.

Data Collection Procedure

After obtaining official and ethical approval, data were collected from 250 participants using a self-structured questionnaire through a survey-based interview. The questionnaire assessed demographic characteristics, lifestyle and behavioral factors, social activities, education and understanding, and medical and family history. Participants also provided their blood pressure values to assess hypertension status. Each questionnaire required approximately 10–15 minutes to complete. Collected information was recorded and reviewed for accuracy and completeness.

Statistical Analysis

Data were entered, coded, and analyzed using SPSS (Statistical Package for the Social Sciences).

Descriptive statistics were used to summarize the data. Continuous variables were presented as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages. The Chi-square test and independent-samples t-test were used to assess associations between hypertension and demographic, lifestyle, behavioral, family-history, psychological, and educational factors. A p-value

<0.05 was considered statistically significant.

Result:

4.1. Demographic information of participants

The first part of the results highlighted the demographic information of participants, in which age groups and BMI come first, which are most important for considering the general profile of the population.

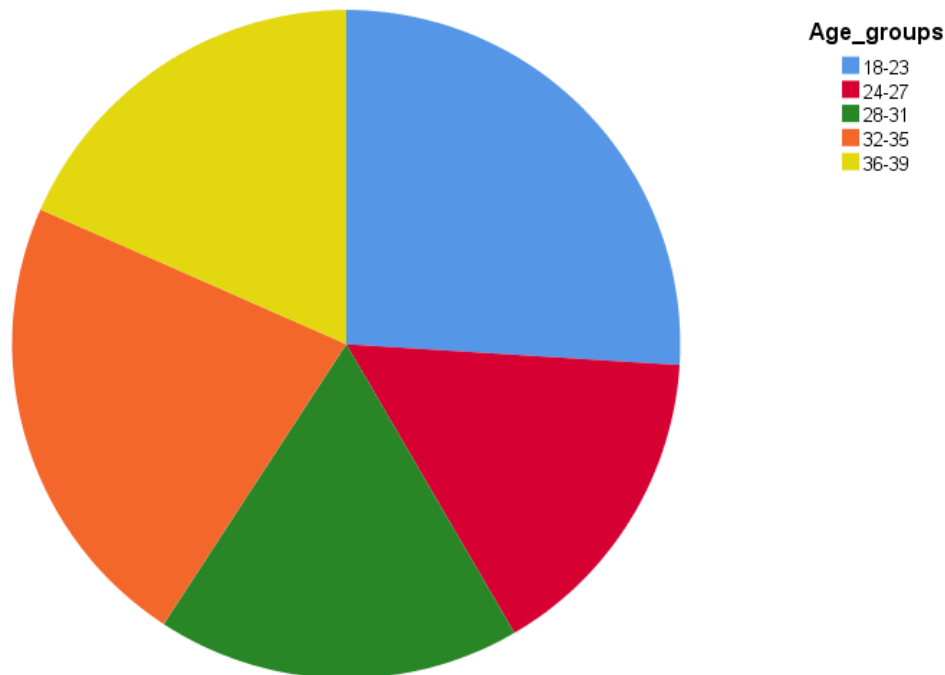


Fig 4.1.1: Age groups of participants

All the participants were divided into five groups: 18-23, 24-27, 28-31, 32-35, and 36-39. The pie chart shows the distribution among all the groups. It indicates that individuals in the 18-23

age group were 65 (25.8%) that were higher, followed by 32-35 (22.2%), 36-39 (18.4%), 28-31 (17.5%), and 24-27 (15.5%).

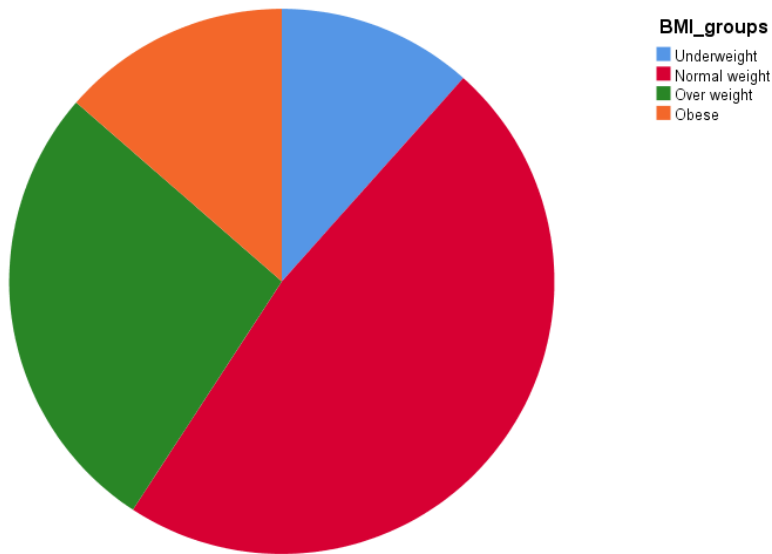


Fig 4.1.2: BMI of participants

Participants were split into four groups based on their BMI: underweight, normal weight, overweight, and obese. The pie chart above shows the distribution among all four groups. It indicates that normal weight showed the largest portion (47.2%), followed by those with

overweight (27.0%). Obese and underweight showed (13.5%) and (11.5%), respectively.

The following table summarizes the other Participants' personal details, such as gender, marital status, occupation, education, and area of residence. The study involved 250 individuals in total, of whom

Prevalence of Hypertension status and its association with demographic factors

Table 4.2: Hypertension status prevalence

HTN status	N	%
0 (Non-hypertensive)	202	80.2
1 (Hypertensive)	48	19.8

Chi-squares of Demographic factors

Table 4.2.2: Chi-Square Test for Association between Age Groups and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	15.947	4	0.003

Likelihood Ratio	20.170	4	0.000
Liner-by-Linear Association	12.262	1	0.000
N of Valid cases	250		

The chi-squared test was used on the demographic factor of age group, with a significant value of 0.05, which shows 0.003 of statistics indicating that the relationship between age and the presence of hypertension is

statistically significant. According to this, the incidence of hypertension in the 18–39 age range rises noticeably with age, with the highest rates seen in those between the ages of 36 and 39.

Table 4.2.3: Chi-Square Test for Association between Gender and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	0.370	1	0.543
Likelihood Ratio	.372	1	0.542
Liner-by-Linear Association	0.369	1	0.544
N of Valid cases	250		

The demographic variable of sexual orientation was subjected to a chi-square test; the results showed a statistical significance of 0.05, or 0.543. There is no significant correlation between sex and blood pressure, as indicated by the p-value

exceeding the statistical threshold level of 0.05. This demonstrated that both male and female individuals had a comparable frequency of hypertension.

Table 4.2.4: Chi-Square Test for Association between BMI groups and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	14.218	3	0.003

Likelihood Ratio	13.513	3	0.004
Liner-by-Linear Association	6.210	1	0.013
N of Valid cases	250		

The chi-squared test was used on the demographic factor of BMI groups, with a significant value of 0.05, which shows 0.003 of statistics indicating that the relationship between BMI and the presence of hypertension is

statistically significant. According to this, obese and overweight participants had higher rates of hypertension as compared to underweight and normal weight participants.

Table 4.2.5: Chi-Square Test for Association between Marital Status and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	0.81	1	0.776
Likelihood Ratio	0.81	1	0.776
Liner-by-Linear Association	0.81	1	0.776
N of Valid cases	250		

A chi-squared test was used on the demographic factor gender, with a significance level of 0.05, which shows 0.776 of the statistics. There is no statistically significant association between marriage status and high blood pressure, as

indicated by the p-value exceeding the threshold of significance level of 0.05. This shows that marital status did not significantly influence the prevalence rates.

Table 4.2.6: Chi-Square Test for Association between Occupation and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	5.283	3	0.152
Likelihood Ratio	5.128	3	0.163
Liner-by-Linear Association	4.889	1	0.27
N of Valid cases	250		

A Chi-squared test was used on the demographic factor occupation with a significance level of 0.05, showing that there was no significant connection between employment and hypertension. Although unemployed participants had higher observed rates, the difference was not statistically meaningful.

Table 4.2.7: Chi-Square Test for Association between Area of Residence and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	1.801	1	0.180
Likelihood Ratio	1.852	1	0.240
Liner-by-Linear Association	1.794	1	0.174
N of Valid cases	250		

A Chi-squared test was used on the demographic factor area of residence, with a p-value of 0.05, showing that the correlation between area of residence and hypertension was not statistically significant. Although urban residents had higher

observed rates, there was no statistically significant difference.

Table 4.2.8: Chi-Square Test for Association between Education Level and Hypertension Status

Test statistics	Value	Df	p- value
Pearson's Chi-square	1.458	4	0.834
Likelihood Ratio	2.394	4	0.664
Liner-by-Linear Association	0.000	1	0.986
N of Valid cases	250		

Lifestyle, Behavioral factors, and Family history of participants

Variables	Categories	N	%
Exercise per week	Never	69	27.4
	1-2 times per week	98	38.9
	3-5 times per week	53	21.0
	Daily	30	11.9
Smoking	Yes	44	17.5
	No	206	81.7
Alcohol	Yes	0	0
	No	250	100
	1-2 times per week	114	45.2

Fast Food per week	3-5 times per week	74	29.4
	Never	39	15.5
	Daily	23	9.1
Extra salt	Never	51	20.2
	Sometimes	144	57.1
	Always	55	121.8
Coffee more than twice per day	Yes	204	81.0
	No	46	18.3
Sleep hours	Less than 4 hours	37	14.7
	4-6 hours	117	46.4
	7-8 hours	80	31.7
	More than 8 hours	16	6.3
Fruit and veg serving per day	0-1	123	48.8
	2-3	84	33.3
	4-5	36	14.3

	6+	7	2.8
Stress levels	Yes, often	97	38.5
	Sometimes	104	41.3
	Rarely	36	14.3
	Never	13	5.2
Family History	Yes	130	51.6
	No	93	36.9
	Not sure	27	10.7

Association of hypertension with lifestyle, behavioral factors, and family history of participants

Variables	Categories	Normotensive n (%)	Hypertensive n (%)
Exercise per week	Never	49 (71.01)	20 (28.99)
	1-2 times per week	77 (78.57)	21 (21.43)
	3-5 times per week	48 (90.57)	5 (9.43)
	Daily	28 (93.33)	2 (6.67)
Smoking	Yes	27 (61.36)	17 (38.64)
	No	175 (84.95)	31 (15.05)

Alcohol	Yes	0	0
	No	202 (80.79)	48 (19.21)
Fast Food per week	1-2 times per week	101 (88.60)	13 (11.40)
	3-5 times per week	50 (67.57)	24 (32.43)
	Never	37 (94.87)	2 (5.13)
	Daily	14 (60.87)	9 (39.13)
Extra salt	Never	45 (88.24)	6 (11.76)
	Sometimes	123 (85.43)	21 (14.57)
	Always	34 (61.82)	21 (38.18)
Coffee more than twice per day	Yes	163 (79.91)	41 (20.09)
	No	19 (73.08)	7 (26.92)
Sleep hours	Less than 4 hours	25 (67.57)	12 (32.43)
	4-6 hours	87 (74.36)	30 (25.64)
	7-8 hours	75 (93.75)	5 (6.25)
	More than 8 hours	15 (93.75)	1 (6.25)

Fruit and veg serving per day	0-1	87 (70.73)	36 (29.27)
	2-3	75 (89.29)	9 (10.71)
	4-5	33 (91.67)	3 (8.33)
	6+	7 (100)	0
Stress levels	Yes, often	60 (61.68)	37 (38.14)
	Sometimes	93 (89.42)	11 (10.58)
	Rarely	36 (100)	0
	Never	13 (100)	0
Family History	Yes	94 (72.31)	36 (27.69)
	No	85 (91.40)	8 (8.60)
	Not sure	23 (85.19)	4 (14.81)

Education and understanding of participants

Frequency distribution of Education and understanding of participants (N =250)

Variables	Categories	N	%
Know normal BP	Yes	189	75
	No	61	24.4
	Yes	115	45.6

Check BP regularly			
	No	91	36.1
	Occasionally	44	17.5
Lifestyle impact on BP	Yes, significantly	85	33.7
	Yes, somewhat	94	37.3
	No	46	18.3
	Unsure	25	9.9
Key health factor	Diet	81	32.1
	Physical activity	58	23.0
	Stress	79	31.3
	Sleep	32	12.7
Willing to participate in screening	Yes	218	86.5
	No	32	12.7
Want advice on BP	Yes	175	69.4
	No	42	17.1
	Maybe	32	12.7

Group statistics in all continuous variables of participants

Variables	HTN Status	N	Mean	Std Deviation	Std Error Mean
Add Extra Salt	No	202	1.95	0.625	0.044
	Yes	48	2.31	0.689	0.099
Family history	No	202	1.65	0.677	0.048
	Yes	48	1.33	0.63	0.091
Exercise per week	No	202	2.27	0.982	0.069
	Yes	48	1.77	0.805	0.116
Do you smoke	No	202	1.87	0.341	0.024
	Yes	48	1.65	0.483	0.07
Fast Food per week	No	202	1.82	0.966	0.068
	Yes	48	2.15	1.031	0.149
Sleep hours	No	202	2.4	0.799	0.056
	Yes	48	1.9	0.66	0.095
Tea and Coffee more than twice per day	No	202	1.19	0.396	0.028
	Yes	48	1.15	0.357	0.051
Fruit Veg Servings Per Day	No	202	1.8	0.835	0.059
	Yes	48	1.31	0.589	0.085
Stress Levels	No	202	2.01	0.858	0.06
	Yes	48	1.23	0.425	0.061

Participants with and without hypertension are shown the descriptive statistics (means and standard deviations) in the Table. Those with hypertension were often older, slightly heavier, ate more fast food and salt, were less active, slept for shorter periods, ate fewer portions of fruit

and vegetable intake, and had greater levels of stress than people without hypertension. Participants with hypertension also smoked more frequently. There was no discernible difference between the two groups in their consumption of tea or coffee.

Independent sample t-test of all continuous variables of participants.

Variables	t(df)	P value	Mean Difference	Significant
Add Extra Salt	-3.59 (248)	< .001	-0.367	Yes
Family History	2.94 (248)	.004	0.315	Yes
Exercise per Week	3.28 (248)	.001	0.501	Yes
Smoking	3.69 (248)	< .001	0.221	Yes
Fast Food per Week	-2.06 (248)	.040	-0.324	Yes
Sleep Hours	4.02 (248)	< .001	0.5	Yes
Tea/Coffee >2/day	0.76 (248)	.450	0.047	No
Fruits & Vegetables	3.84 (248)	< .001	0.489	Yes
Stress Levels	6.12 (248)	< .001	0.781	Yes

Discussion:

This study assessed the prevalence and risk factors of hypertension among young adults aged 18–39 years in District Faisalabad, Pakistan. The findings indicate that hypertension is an important health concern even among younger adults. Its prevalence increased with age and was highest among participants aged 36–39 years, supporting evidence that blood pressure increases with age due to vascular changes and arterial stiffness. Hypertension was more common among males than females. Previous research in Pakistan has also identified demographic, lifestyle, medical, and psychological factors associated with hypertension, including tobacco use, family history, obesity, diabetes, stress, anxiety, and anger-related problems (Riaz et al., 2021).

Age and BMI were significantly associated with hypertension in a study by Manzoor and Zaib (2019), which is consistent with the present findings. Hypertension was more frequent among overweight and obese participants, indicating obesity as an important modifiable risk factor.

Urban residents also showed a higher prevalence, which may be related to sedentary lifestyles, dietary habits, and stress. Physical inactivity, smoking, frequent fast-food consumption, and high salt intake were associated with higher hypertension prevalence. Participants who exercised regularly and those who slept 7–8 hours had lower prevalence, while regular stress was associated with higher hypertension. However, caffeine consumption was not significantly associated with hypertension in this study.

A positive family history of hypertension was significantly associated with the condition, suggesting the combined influence of genetic susceptibility and shared lifestyle factors. These findings are generally consistent with research from Pakistan and other low- and middle-income countries linking obesity, poor diet, urbanization, physical inactivity, and stress with hypertension. Afzal and Ahmad (2012) also reported significant associations between psychosocial and family-related factors, low family cohesion, and lack of exercise with hypertension among Pakistani adults. Furthermore, a meta-analysis of 18

population-based studies involving 42,600 participants reported an overall pooled hypertension prevalence of 26.3% among Pakistani adults (Rafique et al., 2018). The higher prevalence in that study may be explained by the inclusion of middle-aged and older adults, whereas the present study focused specifically on young adults.

The cross-sectional design of this study prevents the establishment of causal relationships. Lifestyle information, including diet, exercise, and stress, was self-reported and may therefore be affected by recall bias. In addition, the study was limited to District Faisalabad, which may restrict the generalizability of the findings to the wider Pakistani population.

Overall, this study demonstrates a considerable burden of hypertension among young adults in Faisalabad. Older age, obesity, physical inactivity, smoking, frequent fast-food consumption, high salt intake, inadequate sleep, stress, and family history were important associated factors. Early screening, health education, regular physical activity, healthy dietary practices, weight management, adequate sleep, stress control, and reduced salt and tobacco use may help prevent hypertension and reduce its long-term cardiovascular consequences among young adults.

Conclusion:

This study concludes that hypertension is a significant health concern among young adults aged 18–39 years in District Faisalabad, with an overall prevalence of 19.8%. The findings indicate that hypertension is associated with several demographic, lifestyle, and behavioral factors, particularly increased age, higher BMI, tobacco use, physical inactivity, sedentary lifestyle, high salt intake, frequent fast-food consumption, stress, inadequate sleep, and a positive family history. These findings highlight the importance of early detection and prevention of hypertension among young adults. Regular blood pressure screening, health awareness, physical activity, healthy dietary practices, reduced salt and fast-food intake, adequate sleep,

stress management, and tobacco cessation should be encouraged to reduce the risk of hypertension and its future cardiovascular and renal complications.

REFERENCES

- Anyaegebu, E. I., & Dharnidharka, V. R. (2014). Hypertension in the teenager. *Pediatric Clinics of North America*, 61(1), 131–151. <https://doi.org/10.1016/j.pcl.2013.09.011>
- Afzal, S., & Ahmad, M. (2012). Psychosocial risk factors associated with hypertension in females of 18–49 years in a community of Faisalabad. *Annals of King Edward Medical University*, 18(1), 12–17.
- Goldstein, I. B., Shapiro, D., & Weiss, R. E. (2008). How family history and risk factors for hypertension relate to ambulatory blood pressure in healthy adults. *Journal of Hypertension*, 26(2), 276–283. <https://doi.org/10.1097/HJH.0b013e3282f15c27>
- Lu, Y., Lu, M., Dai, H., Yang, P., Smith-Gagen, J., Miao, R., Zhong, H., Chen, R., Liu, X., Huang, Z., & Yuan, H. (2015). Lifestyle and risk of hypertension: Follow-up of a young pre-hypertensive cohort. *International Journal of Medical Sciences*, 12(7), 605–612. <https://doi.org/10.7150/ijms.12446>
- Manzoor, F., & Zaib, F. (2019). Hypertension: Association between hypertension and BMI in Faisalabad district. *The Professional Medical Journal*, 26(2), 330–333. <https://doi.org/10.29309/TPMJ/2019.26.02.3117>
- Park, J. H., Moon, J. H., Kim, H. J., Kong, M. H., & Oh, Y. H. (2020). Sedentary lifestyle: Overview of updated evidence of potential health risks. *Korean Journal of Family Medicine*, 41(6), 365–373. <https://doi.org/10.4082/kjfm.20.0165>

- Riaz, M., Shah, G., Asif, M., Shah, A., Adhikari, K., & Abu-Shaheen, A. (2021). Factors associated with hypertension in Pakistan: A systematic review and meta-analysis. *PLOS ONE*, 16(1), e0246085. <https://doi.org/10.1371/journal.pone.0246085>
- Safdar, N. F., Bertone-Johnson, E. R., Cordeiro, L., Jafar, T. H., & Cohen, N. L. (2015). Dietary patterns and their association with hypertension among Pakistani urban adults. *Asia Pacific Journal of Clinical Nutrition*, 24(4), 710-719. <https://doi.org/10.6133/apjcn.2015.24.4.27>
- Shah, N., Shah, Q., & Shah, A. J. (2018). The burden and high prevalence of hypertension in Pakistani adolescents: A meta-analysis of the published studies. *Archives of Public Health*, 76, 20. <https://doi.org/10.1186/s13690-018-0265-5>
- Zahid, Z., Shah, M. A., Tanvir, H., Amjad, A., Butt, N. S., & Asim, F. (2024). Prevalence and associated factors of hypertension in young adults: A cross-sectional study. *The Professional Medical Journal*, 31(1). <https://doi.org/10.29309/TPMJ/2024.31.01.7839>
- Zhang, Y., & Moran, A. E. (2017). Trends in the prevalence, awareness, treatment, and control of hypertension among young adults in the United States, 1999 to 2014. *Hypertension*, 70(4), 736-742. <https://doi.org/10.1161/HYPERTENSIONAHA.117.09801>
- Rafique, I., Saqib, M. A. N., Munir, M. A., Qureshi, H., Rizwanullah, Khan, S. A., & Fouad, H. (2018). Prevalence of risk factors for noncommunicable diseases in adults: Key findings from the Pakistan STEPS survey. *Eastern Mediterranean Health Journal*, 24(1), 33-41. <https://doi.org/10.26719/2018.24.1.33>
- Waseem, M., Siddiqui, H., Fazal, M., Laiq, I., & Tariq, I. (2021). Frequency of hypertension risk factors and level of knowledge among university students of twin cities in Pakistan. *Foundation University Journal of Rehabilitation Sciences*, 1(2). <https://doi.org/10.33897/fujrs.v1i2.242>
- Delacroix, S., Chokka, R. C., & Worthley, S. G. (2014). Hypertension: Pathophysiology and treatment. *Journal of Neurology & Neurophysiology*, 5(6), 250.
- Li, A. L., Peng, Q., Shao, Y. Q., Fang, X., et al. (2019). The effect of body mass index and its interaction with family history on hypertension: A case-control study. *Clinical Hypertension*, 25, 6. <https://doi.org/10.1186/s40885-019-0111-2>
- Woelf, K. J., & Bisognano, J. D. (2011). Nondrug interventions for treatment of hypertension. *Journal of Clinical Hypertension*, 13(11), 829-835. <https://doi.org/10.1111/j.1751-7176.2011.00524.x>
- Bisognano, J. D., Bakris, G., Nadim, M., Sanchez, L., Kroon, A. A., Schafer, J., de Leeuw, P. W., & Sica, D. A. (2011). Baroreflex activation therapy lowers blood pressure in patients with resistant hypertension: Results from the double-blind, randomized, placebo-controlled Rheos pivotal trial. *Journal of the American College of Cardiology*, 58(7), 765-773. <https://doi.org/10.1016/j.jacc.2011.06.008>