OPEN ACCESS

Prevalence And Risk Factors Of Hypertension Among Adults Attending Family Medicine Clinics

Atef Eid Madkour Elsayed[1], Abdullah Abdulrahman Saleh Almehemed[2], Mohammed Naji Ali Bosrour[3], Mona Abdulqader Alnuzaili[4], Abdullah Ali Abdullah Alhawag[5], Latifa Adel Mohammed Alamer[6], Abdullah Ayyadah Alruwaili[7], Moudi Saleh Al-Furaidi[8], Wafaa Abdulaziz Al-Hadithi[9], Qusai Gazzaz[10], Hassan Hani Hassan Zainuddin[11], Rana Abdulrahman Mohammed Al Nahdi[12], Ahmad Hijji Ali ALSultan[13], Mohammed Dayan Alghalibi[14]

[1]Consultant cardiology King abdelaziz hospital sakaka Saudi arabia
[2]Pediatric Surgery Maternity and Children Hospital – Makkah
[3]Family Medicine PHC
[4]OB/GYN
[5]GP PHC
[6]General Practitioner PHC
[7]Medical Intern
[8]Family Medicine
[9]Family Medicine
[10]King Abdulaziz University Hospital
[11]Family Medicine
[12]Family medicine
[13]Dental Assistant Dental Center – Al Ahsa
[14]Epidemiology

Abstract

Background: Hypertension is a prevalent chronic condition with significant public health implications, particularly in primary care settings where early detection and management are critical. Family medicine clinics serve as key access points for diverse adult populations, yet the burden and determinants of hypertension in these settings require further characterization to inform targeted interventions.

Methods: A cross-sectional study was conducted among 420 adults attending family medicine clinics. Data were collected using a structured questionnaire, and blood pressure was measured using a calibrated sphygmomanometer. Sociodemographic, lifestyle, and clinical characteristics were assessed. Descriptive statistics, chi-square tests, and multivariable logistic regression were used to analyze the prevalence of hypertension and its associated risk factors.

Results: The overall prevalence of hypertension was 43.8%. Hypertension was significantly higher in older age groups, with the highest prevalence (69.0%) observed among those aged ≥60 years. Key risk factors included obesity (adjusted odds ratio [AOR] = 2.76), high dietary salt intake (AOR = 2.14), physical inactivity (AOR = 1.98), and a family history of hypertension (AOR = 1.87). Smoking and overweight were also significantly associated with hypertension in bivariate analyses.

Conclusion: Hypertension is highly prevalent among adults attending family medicine clinics, with modifiable lifestyle factors and genetic predisposition playing important roles. These findings underscore the need for integrated primary care strategies that emphasize lifestyle modification, regular screening, and sustained patient follow-up to reduce the burden of hypertension and its complications.

Introduction

Background

Hypertension is one of the most common chronic non-communicable diseases worldwide and represents a major public health challenge due to its high prevalence and serious complications. It is often referred to as a "silent disease" because many individuals remain asymptomatic for years, allowing vascular and organ damage to progress unnoticed. As populations grow and age, the burden of hypertension continues to rise, placing increasing strain on health care systems and societies (Bin Dahman et al., 2024).

Elevated blood pressure is a leading modifiable risk factor for cardiovascular diseases, including coronary artery disease, heart failure, stroke, and peripheral vascular disease. It also contributes significantly to chronic kidney disease, visual impairment, and cognitive decline. The strong association between hypertension and these adverse outcomes highlights the importance of early detection, effective management, and prevention strategies at the primary care level (Noah et al., 2020).

Family medicine clinics play a crucial role in the identification and long-term management of hypertension. These clinics often serve as the first point of contact between individuals and the health care system, providing comprehensive and continuous care. Adults attending family medicine clinics represent a diverse population with varying socioeconomic, behavioral, and clinical characteristics, making them an ideal group for studying the prevalence and determinants of hypertension (Belay et al., 2022).

Despite the availability of effective antihypertensive therapies, blood pressure control remains suboptimal in many populations. Poor awareness of hypertension status, inadequate adherence to treatment, and limited access to regular follow-up contribute to uncontrolled blood pressure. Understanding the magnitude of hypertension among adults attending family medicine clinics can help identify gaps in screening, diagnosis, and management (Ondimu et al., 2019).

The prevalence of hypertension varies widely across different regions and populations, influenced by demographic and lifestyle factors. Age is one of the strongest predictors, with blood pressure tending to increase as individuals grow older. Gender differences have also been observed, with variations in prevalence and risk profiles across different stages of life. These variations underscore the need for population-specific data to inform targeted interventions (Shah et al., 2025).

Lifestyle-related factors play a significant role in the development of hypertension. Unhealthy dietary habits, including high salt intake and low consumption of fruits and vegetables, contribute to elevated blood pressure. Physical inactivity, obesity, tobacco use, and excessive alcohol consumption further increase the risk. These modifiable risk factors are particularly relevant in primary care settings, where preventive counseling can be effectively implemented (Al-Ahmari, 2022).

Socioeconomic and psychosocial factors are increasingly recognized as important determinants of hypertension. Lower educational levels, unemployment, and financial stress have been associated with higher blood pressure levels. Chronic stress, poor sleep quality, and mental health conditions may also contribute to the development and persistence of hypertension, especially among adults facing daily life pressures (Zheng et al., 2024).

Comorbid conditions such as diabetes mellitus, dyslipidemia, and chronic kidney disease frequently coexist with hypertension. The presence of these conditions not only increases the likelihood of developing hypertension but also amplifies the risk of cardiovascular complications. In family medicine clinics, patients often present with multiple comorbidities, highlighting the need for an integrated approach to chronic disease management (Tilea et al., 2018).

Urbanization and changes in lifestyle patterns have led to an increased prevalence of hypertension in many communities. Sedentary behavior, reliance on processed foods, and reduced physical activity are common features of modern life. Adults attending family medicine clinics may reflect these broader societal changes, making them an important population for studying current trends in hypertension (Alshuhri et al., 2024).

Assessing the prevalence and risk factors of hypertension among adults attending family medicine clinics is essential for guiding public health planning and clinical practice. Identifying high-risk groups allows for the development of targeted prevention and early intervention strategies. Such research can support family physicians in optimizing screening programs, improving patient education, and ultimately reducing the burden of hypertension and its complications (Belayachi et al., 2024).

Methodology
Study Design

This study was conducted using a cross-sectional analytical design to assess the prevalence of hypertension and to identify its associated risk factors among adults attending family medicine clinics. The design was chosen to allow simultaneous measurement of blood pressure status and potential risk factors within the study population at a single point in time.

Study Setting

The study was carried out in family medicine clinics providing primary health care services to adult patients. These clinics offered general medical consultations, preventive care, and chronic disease management. The setting ensured access to a broad adult population with varying demographic and clinical characteristics, representative of individuals seeking routine primary care.

Study Population

The study population consisted of adult patients who attended family medicine clinics during the study period. Participants included both males and females aged 18 years and older. Individuals were approached during their clinic visits and assessed for eligibility before enrollment in the study.

Inclusion and Exclusion Criteria

Adults aged 18 years and above who attended family medicine clinics and consented to participate were included in the study. Patients who were critically ill, pregnant, or unable to undergo blood pressure measurement were excluded. Individuals with incomplete data or those who declined participation were also excluded from the final analysis.

Sample Size and Sampling Technique

The sample size was calculated based on an assumed prevalence of hypertension among adults, a confidence level of 95%, and an acceptable margin of error. To compensate for potential non-response, the calculated sample size was increased accordingly. A systematic sampling technique was used to recruit participants from clinic attendees during the data collection period.

Data Collection Tools and Procedures

Data were collected using a structured interviewer-administered questionnaire. The questionnaire included sections on sociodemographic characteristics, lifestyle behaviors, medical history, and family history of hypertension. Trained data collectors conducted face-to-face interviews to ensure clarity and completeness of the collected information.

Blood Pressure Measurement

Blood pressure was measured using a calibrated and validated sphygmomanometer. Measurements were taken with the participant seated comfortably after a minimum of five minutes of rest, with the arm supported at heart level. Two readings were obtained at least five minutes apart, and the average of the readings was used for analysis. Hypertension was defined based on systolic and/or diastolic blood pressure measurements or a previous diagnosis of hypertension with current use of antihypertensive medications.

Assessment of Risk Factors

Risk factors assessed in the study included age, sex, body mass index, smoking status, physical activity level, dietary habits, and presence of comorbid conditions such as diabetes mellitus. Body mass index was calculated using measured height and weight and classified according to standard categories. Lifestyle factors were assessed based on self-reported behaviors.

Data Management and Statistical Analysis

Collected data were reviewed for completeness and consistency before entry into a statistical software package for analysis. Descriptive statistics were used to summarize participant characteristics and estimate the prevalence of hypertension. Inferential statistics were applied to examine associations between hypertension and potential risk factors. Multivariable logistic regression analysis was performed to identify independent predictors of hypertension, with results presented as odds ratios and corresponding confidence intervals.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional review authority. Written informed consent was obtained from all participants prior to data collection. Participant confidentiality and anonymity were maintained throughout the study, and data were used solely for research purposes.

Results

Overview of Study Participants

A total of 420 adults attending family medicine clinics were included in the final analysis. Participants varied in age, gender, educational level, lifestyle behaviors, and clinical characteristics. The prevalence of hypertension and its associated risk factors were assessed using descriptive and inferential statistical methods.

Table 1. Sociodemographic Characteristics of Participants (n = 420)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	18–29 years	96	22.9
	30–44 years	128	30.5
	45–59 years	112	26.7
	≥60 years	84	20.0
Gender	Male	210	50.0
	Female	210	50.0
Marital Status	Single	132	31.4
	Married	256	61.0
	Other	32	7.6
Education Level	Primary or less	96	22.9
	Secondary	164	39.0
	University or higher	160	38.1

The majority of participants were aged 30–44 years (30.5%), followed by 45–59 years (26.7%). Gender distribution was equal between males and females (50% each). Most participants were married (61.0%) and had secondary education (39.0%), indicating a predominantly middle-aged, educated adult population.

Table 2. Lifestyle Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Smoking Status	Non-smoker	276	65.7
	Current smoker	144	34.3
Physical Activity	Regular activity	158	37.6
	Irregular/None	262	62.4
Dietary Salt Intake	Low/Moderate	172	41.0
	High	248	59.0
Body Mass Index (BMI)	Normal	134	31.9
	Overweight	164	39.0
	Obese	122	29.0

More than half of participants reported high salt intake (59.0%) and physical inactivity (62.4%). Overweight and obesity were common, affecting 39.0% and 29.0% of participants respectively. Smoking prevalence was 34.3%, indicating significant exposure to modifiable hypertension risk factors.

Table 3. Clinical Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Diabetes Mellitus	Yes	96	22.9
	No	324	77.1

Family History of Hypertension	Yes	168	40.0
	No	252	60.0
Previous Hypertension Diagnosis	Yes	132	31.4
	No	288	68.6

Approximately 22.9% of participants had diabetes mellitus, while 40.0% reported a family history of hypertension. Nearly one-third (31.4%) had a previous diagnosis of hypertension, highlighting a considerable burden of chronic disease among clinic attendees.

Table 4. Prevalence of Hypertension Among Participants

Blood Pressure Status	Frequency (n)	Percentage (%)
Normotensive	236	56.2
Hypertensive	184	43.8

The overall prevalence of hypertension was 43.8% (n = 184), while 56.2% (n = 236) of participants had normal blood pressure readings. This indicates that nearly two out of five adults attending family medicine clinics were hypertensive.

Table 5. Distribution of Hypertension by Age Group

Age Group	Hypertensive n (%)	Normotensive n (%)	Total
18–29 years	18 (18.8)	78 (81.2)	96
30–44 years	42 (32.8)	86 (67.2)	128
45–59 years	66 (58.9)	46 (41.1)	112
≥60 years	58 (69.0)	26 (31.0)	84

Hypertension prevalence increased progressively with age, from 18.8% among individuals aged 18–29 years to 69.0% among those aged 60 years or older. The highest burden was observed in the elderly population, demonstrating a strong age-related trend.

Table 6. Association Between Hypertension and Lifestyle Risk Factors

Risk Factor	Hypertensive n (%)	Normotensive n (%)
Smoking	84 (58.3)	60 (41.7)
Non-smoking	100 (36.2)	176 (63.8)
Physical inactivity	136 (51.9)	126 (48.1)
Regular activity	48 (30.4)	110 (69.6)
High salt intake	132 (53.2)	116 (46.8)
Low/Moderate salt	52 (30.2)	120 (69.8)

Hypertension was more common among smokers (58.3%) compared with non-smokers (36.2%). Participants with physical inactivity showed a higher prevalence (51.9%) than those physically active (30.4%). High salt consumption was strongly associated with hypertension (53.2%) compared with low/moderate intake (30.2%), highlighting lifestyle factors as major contributors.

Table 7. Association Between Hypertension and BMI

BMI Category	Hypertensive n (%)	Normotensive n (%)
Normal	34 (25.4)	100 (74.6)
Overweight	74 (45.1)	90 (54.9)
Obese	76 (62.3)	46 (37.7)

Hypertension prevalence increased with BMI, affecting 25.4% of individuals with normal weight, 45.1% of overweight participants, and 62.3% of obese participants. Obesity demonstrated the strongest association with hypertension among anthropometric factors.

Table 8. Multivariable Predictors of Hypertension

Risk Factor	Adjusted Odds Ratio (AOR)	95% Confidence Interval
Age ≥45 years	3.12	2.01–4.84
Obesity	2.76	1.74–4.38
Physical inactivity	1.98	1.28–3.07
High salt intake	2.14	1.39–3.30
Family history of hypertension	1.87	1.22–2.87

Older age (≥45 years) was the strongest predictor of hypertension (AOR = 3.12), followed by obesity (AOR = 2.76) and high salt intake (AOR = 2.14). Physical inactivity and family history also significantly increased hypertension risk, confirming both genetic and lifestyle contributions.

Discussion

The present study assessed the prevalence of hypertension and its associated risk factors among adults attending family medicine clinics. The findings demonstrated a high burden of hypertension, affecting 43.8% of the study population. This prevalence highlights hypertension as a major public health concern in primary care settings and emphasizes the importance of routine screening and early intervention within family medicine services.

The observed prevalence of hypertension in this study is comparable to findings reported in similar outpatient and primary care settings. Bin Dahman et al. reported a hypertension prevalence of 45.3% among adults attending medical outpatient clinics in Yemen, which closely aligns with the current findings (Bin Dahman et al., 2024). Likewise, studies conducted in Ethiopia and Kenya documented prevalence rates ranging from moderate to high, reinforcing the global consistency of hypertension burden among adults seeking healthcare services (Belay et al., 2022; Shah et al., 2025).

Age was identified as a strong determinant of hypertension, with prevalence increasing progressively across older age groups. Participants aged 60 years and above demonstrated the highest prevalence (69.0%), confirming the well-established relationship between aging and elevated blood pressure. Similar age-related trends were reported in studies from Nigeria and Ethiopia, where hypertension prevalence increased significantly with advancing age due to vascular stiffness and cumulative exposure to risk factors (Noah et al., 2020; Belay et al., 2022).

The equal gender distribution in the study population allowed for balanced assessment; however, hypertension prevalence was influenced more by age and lifestyle factors than by sex. Comparable observations were noted in Kenyan and Yemeni studies, where gender differences were less pronounced after adjusting for behavioral and metabolic factors (Bin Dahman et al., 2024; Shah et al., 2025). This finding suggests that prevention strategies should focus more on modifiable risks rather than demographic characteristics alone.

Lifestyle-related factors played a central role in the development of hypertension in this study. High dietary salt intake was significantly associated with elevated blood pressure, with more than half of participants consuming excessive salt demonstrating hypertension. This association has been consistently documented across multiple studies, including those conducted in Kenya and Saudi Arabia, emphasizing salt reduction as a key preventive strategy (Ondimu et al., 2019; Alshuhri et al., 2024).

Physical inactivity was another significant risk factor identified in this research. Participants with low or no physical activity showed markedly higher hypertension prevalence compared to those engaging in regular exercise. This finding aligns with evidence from African and Middle Eastern studies, where sedentary behavior was strongly linked to poor blood pressure control (Noah et al., 2020; Al-Ahmari, 2022).

Smoking was also associated with a higher prevalence of hypertension among participants. Smokers exhibited a substantially greater proportion of hypertension compared to non-smokers, supporting previous findings that nicotine-induced vasoconstriction and endothelial dysfunction contribute to elevated blood pressure (Ondimu et al., 2019). Similar associations have been reported among outpatient populations in Kenya and Nigeria (Noah et al., 2020; Shah et al., 2025).

Body mass index showed a strong positive relationship with hypertension, with obese participants exhibiting the highest prevalence (62.3%). This dose–response relationship between BMI and hypertension has been widely reported in the literature. Studies from Ethiopia and Saudi Arabia

similarly identified obesity as one of the strongest predictors of hypertension, likely mediated through insulin resistance, inflammation, and sympathetic nervous system activation (Belay et al., 2022; Al-Ahmari, 2022).

The presence of diabetes mellitus was common among hypertensive participants, reflecting the clustering of cardiometabolic risk factors. This coexistence has been observed in primary care populations in Romania and Morocco, where metabolic disorders were found to exacerbate blood pressure elevation and complicate disease management (Tilea et al., 2018; Belayachi et al., 2024).

Family history of hypertension emerged as a significant independent predictor, highlighting the contribution of genetic predisposition. Participants with a positive family history had higher odds of hypertension, consistent with findings reported in Nigerian and Yemeni outpatient studies (Noah et al., 2020; Bin Dahman et al., 2024). This underscores the importance of targeted screening among individuals with hereditary risk.

Multivariable logistic regression analysis confirmed that age ≥45 years, obesity, high salt intake, physical inactivity, and family history were independent predictors of hypertension. These results mirror findings from Kenya and Ethiopia, where similar risk profiles were identified after controlling for confounders (Belay et al., 2022; Shah et al., 2025).

The high proportion of participants with a previous diagnosis of hypertension indicates improved detection but also suggests potential challenges in long-term control. Studies from Saudi Arabia and Morocco have demonstrated that uncontrolled hypertension remains prevalent despite diagnosis, often due to poor adherence and lifestyle factors (Alshuhri et al., 2024; Belayachi et al., 2024).

Family medicine clinics are strategically positioned to address these challenges through continuous care, lifestyle counseling, and follow-up. Evidence from China and Romania highlights that structured primary care interventions and physician–patient continuity significantly improve blood pressure control and adherence to treatment (Zheng et al., 2024; Tilea et al., 2018).

The findings of this study emphasize the multifactorial nature of hypertension, where behavioral, metabolic, and genetic factors interact. Addressing a single risk factor in isolation is unlikely to yield optimal outcomes, reinforcing the need for comprehensive, patient-centered management strategies within primary care settings (Al-Ahmari, 2022; Shah et al., 2025).

Overall, the high prevalence of hypertension and the strong association with modifiable risk factors underscore the urgent need for preventive strategies focusing on lifestyle modification, early screening, and sustained follow-up in family medicine clinics. Integrating these approaches can substantially reduce the burden of hypertension-related complications at both individual and population levels (Bin Dahman et al., 2024; Belay et al., 2022).

Conclusion

This study demonstrated a high prevalence of hypertension among adults attending family medicine clinics, with age, obesity, physical inactivity, high salt intake, and family history identified as significant risk factors. The findings highlight the critical role of primary care in early detection, prevention, and management of hypertension. Implementing comprehensive lifestyle interventions, strengthening patient education, and enhancing long-term follow-up within family medicine services are essential to reducing the burden of hypertension and improving cardiovascular health outcomes.

References

1. Bin Dahman, L., Al-Awbathani, A. M., Bawazir, A. A., Al-Awbathani, A. S., Alhabshey, H. A., Saad, H. O., & Ahmed, N. A. (2024). Prevalence of Hypertension and Its Associated Risk Factors Among Adults Attending Medical Outpatient Clinics at Ibn Sina General Hospital Authority in Mukalla City, Yemen. Cureus, 16(5), e60540. https://doi.org/10.7759/cureus.60540
2. Noah, S. P., Etukumana, E. A., Udonwa, N., & Morgan, U. M. (2020). Risk Factors for Hypertension among Adult Patients Attending the General Outpatient Clinics of a Tertiary Hospital in Uyo, South-South Nigeria. West African journal of medicine, 37(5), 490–498.
3. Belay, D. G., Fekadu Wolde, H., Molla, M. D., Aragie, H., Adugna, D. G., Melese, E. B., Tarekegn, G. E., Gezahegn, E., & Kibret, A. A. (2022). Prevalence and associated factors of hypertension among adult patients attending the outpatient department at the primary hospitals of Wolkait tegedie zone, Northwest Ethiopia. Frontiers in neurology, 13, 943595. https://doi.org/10.3389/fneur.2022.943595

4. Ondimu, D. O., Kikuvi, G. M., & Otieno, W. N. (2019). Risk factors for hypertension among young adults (18-35) years attending in Tenwek Mission Hospital, Bomet County, Kenya in 2018. The Pan African medical journal, 33, 210. https://doi.org/10.11604/pamj.2019.33.210.18407

5. Shah, J., Manji, S., Smith, C., Nambafu, J., Ochola, A., Barasa, L., Amir, F., Abdalla, H., Jowi, S., Mithi, C., Patel, R., & Ali, S. K. (2025). Prevalence and risk factors of hypertension among clients seeking care at Selected Healthcare Facilities in Kenya. PloS one, 20(10), e0334255. https://doi.org/10.1371/journal.pone.0334255

6. Al-Ahmari A. K. (2022). Prevalence of Hypertension and Its Associated Risk Factors Among Patients with Rheumatoid Arthritis in the Kingdom of Saudi Arabia. International journal of general medicine, 15, 6507–6517. https://doi.org/10.2147/IJGM.S370956

7. Zheng, Y., Liu, Y., Xue, D., Shang, Z., Zhang, B., & Dai, Y. (2024). Research on the control rate of hypertension under family physician-contracted service. BMC primary care, 25(1), 47. https://doi.org/10.1186/s12875-024-02280-0

8. Tilea, I., Petra, D., Voidazan, S., Ardeleanu, E., & Varga, A. (2018). Treatment adherence among adult hypertensive patients: a cross-sectional retrospective study in primary care in Romania. Patient preference and adherence, 12, 625–635. https://doi.org/10.2147/PPA.S162965

9. Alshuhri, M., Alshehry, B., Alotaibi, T., & Alhalal, D. (2024). Prevalence and Associated Factors of Uncontrolled Hypertension Among Patients Attending Primary Healthcare Centers in Riyadh, Saudi Arabia. Cureus, 16(7), e64783. https://doi.org/10.7759/cureus.64783

10. Belayachi, S., Boukhari, F. Z., Essayagh, F., Terkiba, O., Marc, I., Lambaki, A., Zohoun, A., Essayagh, M., Essayagh, T., & Essayagh, S. (2024). Uncontrolled blood pressure and its risk factors among hypertensive patients, Marrakech, Morocco. Scientific Reports, 14(1), 2953. https://doi.org/10.1038/s41598-024-53115-y