

Al-Zahrawi university college
Department of pharmacy



Republic of Iraq
Ministry of higher education
and scientific research

Prevalence of Hypertension Among Young Adults in Iraq Populations

A research study

**submitted to the Council of Al-Zahrawi university College, Department of
Pharmacy, to complete the requirements for obtaining a bachelor's degree in
pharmacy**

by

Hussein Ali Ismail

Mariam Mohammed Jassim

Hussein Adnan Znad

Zahraa Majed Jiyad

Sabreen Majed Jabar

Supervised by

Dr. Mohammed shaheed

Abstract

because blood pressure is one of the main risk factors for heart disease, its prevalence among young adults has gained great attention from public health. The aim of this research was to assess the prevalence of hypertension among young adults in Iraq and to show its associated risk factors. This research is a cross-sectional study conducted in Iraq involving 250 randomly selected participants aged 18-35 years from urban and rural areas.

Blood pressure was measured using a mercury sphygmomanometer according to the American Heart Association (AHA) guidelines. To confirm hypertension a home reading was taken for participants who had a high first reading. The data was analyzed using SPSS software.

The first section of the study focused on Socio-demographic and some related characteristics of participants, the second part assessed the association of gender, BMI, marital status, age, residence with hypertension, and the third part explored the association of Family history of HTN, physical activity, diet, difficulty in falling asleep, hours of sleep, mobile use in hours with HTN.

The study found that (28%) of participant have undiagnosed hypertension, with greater prevalence among urban areas compared to rural areas.

The main contributing factors were obesity, dietary habits and lifestyles. In conclusion, this research highlights the importance of early screening, awareness programs and lifestyle modification to control high blood pressure among young adults in Iraq.

1. Introduction

Hypertension is one of the major public health problems all over the world and it plays a significant role in increasing different diseases. Hypertension can lead to chronic health problems and it is one of the principal factors to increase the risk of stroke, cardiovascular diseases, and subsequent deaths.(1).

According to the World Health Organization (WHO), an estimated 1.28 billion adults aged 30–79 years worldwide have hypertension, most (two-thirds) living in low- and middle-income countries, and an estimated 46% of adults with hypertension are unaware that they

have the condition(2,3). Although hypertension has traditionally been thought of as a problem that mostly affects older persons, new research shows that it is becoming more common in young adults, in part because of changes in lifestyle and higher stress levels (4). This change in prevalence emphasizes the necessity of raising awareness and implementing preventative strategies for younger populations, who would not otherwise receive a diagnosis until the late stages of the disease (5).

Despite evidence indicating early-onset hypertension considerably increases the risk of long-term health consequences, such as coronary artery disease, stroke, and kidney failure, young individuals (ages 18 to 35) are frequently disregarded in hypertension screening programs.(6,7). Studies conducted in Western countries have demonstrated a strong correlation between high blood pressure in young adults and lifestyle factors such as drug abuse, physical inactivity, and dietary habits (8,9). Nevertheless, there is limited data on how these factors manifest in Middle Eastern countries, particularly in Iraq, where socioeconomic and cultural influences may lead to unique health patterns.

Iraq, a country known for its unique demographic and health challenges, lacks reliable data on hypertension prevalence among young adults. The sociopolitical instability of recent decades has contributed to significant adjustments in the Iraqi population's lifestyle, leading to potentially greater rates of hypertension-related risk factors, such as stress, dietary changes, and reduced physical activity(10). According to one regional study, changes in lifestyle in Iraq are associated with an increase in non-communicable diseases, with hypertension being identified as the main issue. However, there is a dearth of data explicitly aimed at young adults, which hinders the ability of public health officials to develop age-appropriate prevention strategies(11,12). Furthermore, previous studies in Iraq mainly focused on the general population rather than age-specific trends in hypertension. When they did, the sample size for young adults (18–35 years old) was small, which limited accurate estimates of trends in this age group(13,14).

This study aims to address this gap by examining the prevalence of hypertension among young adults in Iraq and identifying associated demographic and lifestyle risk factors. Understanding the extent and distribution of hypertension in this age group can inform targeted

interventions to reduce the future burden of cardiovascular diseases (CVDs) and improve health outcomes in Iraq. Additionally, this research seeks to compare the findings with global trends to identify any unique factors influencing hypertension in the Iraqi context, such as cultural norms, diet, and health service accessibility.

2. Methods

2.1 Study design

Cross-sectional observational study was designed to assess the prevalence of hypertension among young adults in Iraq population carried out between September 2024 and March 2025. The Scientific and Ethical Committee of Al-Zahrawi College approved the study's protocol, and each participant signed a consent form after being informed of the nature and purpose of the study.

2.2 Study Population

A total of 250 young adult participants, both male and female, ranging in age from 18 to 35 (15). Participants residing in both urban and rural areas of Iraq, and recruited from universities, clinics and workplace.

2.2.1 Inclusion Criteria

- Individuals Residents in Iraq.
- Aged 18 to 35 years(15).
- Volunteers are willing to participate and provide informed consent.

2.2.2 Exclusion Criteria

- Pregnant women (to remove confusion due to pregnancy-induced hypertension (16)).

2.3 Data Collection

2.3.1 Questionnaire

The questionnaire was designed to include demographic characteristics, anthropometric measurements (height, weight, body mass index), family history of hypertension, and life factors (physical activity, smoking, dietary habits, alcohol use, and hours of sleep)(17).

2.3.2 Measurements of Blood Pressure

A mercury sphygmomanometer was used to measure BP (for its high accuracy compared to digital devices (18)), following the American Heart Association (AHA) and the American College of Cardiology (ACC) guidelines (19) : (Taking a 5-minute of rest in the sitting posture with the shield placed on a table at heart level, one reading was taken, and for people with high reading, a home reading was taken for them to confirm). Home reading is very important for people with high initial readings to make sure that there is White-coat HTN or masked HTN, people with white-coat HTN have high readings in the doctor's office, but home reading is normal. The prevalence of this phenomenon among individuals was about 13% (20).

2.3.3 Classification of Hypertension

Participants were classified according to AHA/ACC blood pressure categories: Normal: <120/<80mmHg. Elevated: 120–129/<80mmHg. Hypertension Stage 1: 130–139/80–89 mmHg. Hypertension Stage 2: $\geq 140/\geq 90$ mmHg (19).

2.4 Statistical Analysis

The data of the present study was entered and analyzed through the Statistical Package for the Social Sciences (SPSS version 26). The data were presented as frequencies and percentages or mean and standard deviation in appropriate tables and graphs. Chi square test, T test was used where is appropriate to find out the possible association between the related variables of the current study. Statistical association was considered significant when p value equal or less than 0.05 ($P \text{ value} \leq 0.05$).

3. Results

3.1 Socio-demographic and some related characteristics of participants

Table 1 presents the sociodemographic characteristics and other relevant data for a study involving 250 participants assessing the prevalence of hypertension among young adults in Iraq. The age of the included participants (N=250) ranged from 18 to 35 years with a mean of 24.26 ± 5.064 . Less than one thirds of the participants of the study reported that have

hypertension (28%). The table provides detailed information on gender distribution, residence, smoking status, marital status, and family history of hypertension. Additionally, it includes data on body mass index (BMI), sleep patterns, and stages of hypertension.

The gender distribution shows that male to female ratio was 1.17:1. The smoking status reveals that 71.2% of participants are smokers. The table also highlights the stages of hypertension, with 34.4% categorized as normotensive, 37.6% with elevated blood pressure, and 28% at various stages of hypertension (Stage 1 and Stage 2).

Sleep patterns and family history of hypertension are also documented, providing insight into lifestyle factors that may contribute to the condition.

Table 1: Socio-demographic and some related characteristics of the included participants.

Total no. of participants	250	
variable	categories	
Gender	Male	145 (58%)
	Female	105 (42%)
Percent of hypertensive patients	Normotensive	180 (72%)
	Hypertensive	70 (28%)
Stage of hypertension	Normotensive	86 (34.4%)
	Elevated	94 (37.6%)
	Stage 1	41 (16.4%)
	Stage 2	29 (11.6%)
Residence	Urban	179 (71.6%)
	Rural	71 (28.4%)
Smoking	Yes	178 (71.2%)
	No	72 (28.8)
Age	Mean	24.26
	Std. Deviation	5.064±
BMI	Mean	24.7
	Std. Deviation	5.51±

Marital status	Single	167 (66.8%)
	Married	79 (31.6)
	Divorced	3 (1.2%)
	Widowed	1 (0.4%)
Trouble in falling asleep	Yes	120 (48%)
	No	130 (52%)
Hours of sleep	Less than 4 hours	10 (4%)
	4-6 hours	65 (26%)
	6-8 hours	119 (47.6)
	More than 8 hours	56 (22.4)
Family history of hypertension	Yes	155 (62%)
	No	95 (38%)
BMI: Body mass index, N: Numbers of the Study participant, SD: Standard deviation		

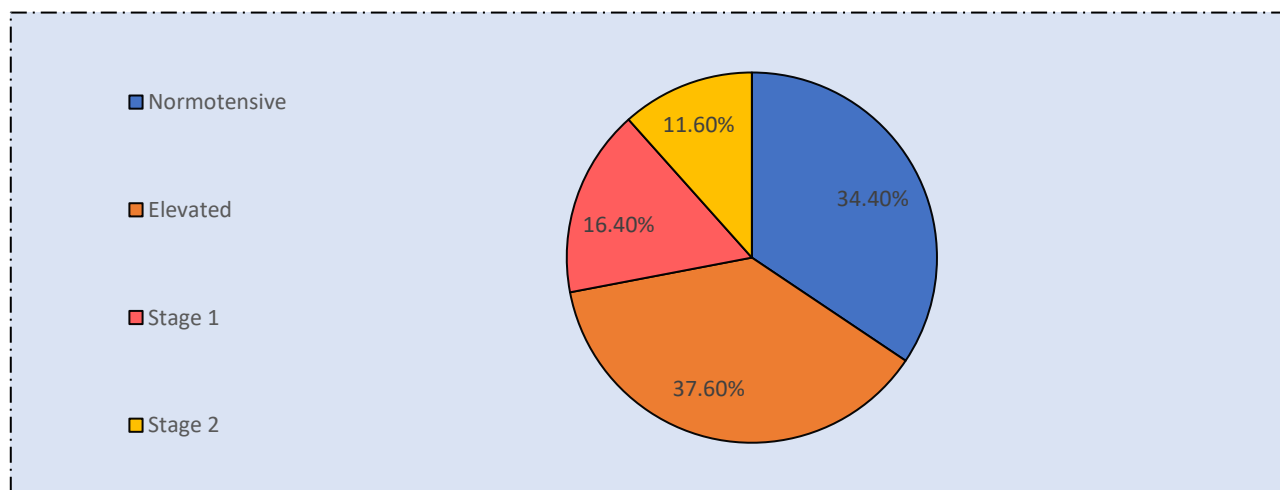


Figure 1: Distribution of study sample according to classification of blood pressure

3.2 The association of gender, BMI, marital status, age, residence with hypertension

Table 2 demonstrates the association between sociodemographic factors and hypertension among the 250 participants, showing variables with statistically significant relationships ($p \leq 0.05$). The table provides detailed data on gender, marital status, age, BMI and residence.

Gender shows a significant association with hypertension ($p = 0.001$), where 35% of males and 17% of females are hypertensive. Residence is another significant factor ($p = 0.042$), indicating that urban residents have a higher prevalence of hypertension (32%) than rural residents.

BMI is especially significant ($p = 0.002$), with hypertensive participants having a higher mean BMI (26.73, SD = 6.39) compared to normotensive individuals (24.02, SD= 4.95).

Marital status doesn't show a statistically significant association with hypertension at the level of $p \leq 0.05$.

Table 2 demonstrate the association of gender, BMI, marital status, age, residence with hypertension

		Hypertension No. (%)		
variables	Categories	Normotensive No. (%)	Hypertensive No. (%)	P value
Gender	Male	93 (64%)	52 (35%)	0.001
	Female	87 (83%)	18 (17%)	
Marital status	Single	124 (74%)	43 (26%)	0.314
	Married	54 (68%)	25 (32%)	
	Divorced	2 (66%)	1 (34%)	
	Widowed	0 (0.0%)	1 (100%)	
	Std. deviation	4.25	4.303	
Age	Mean	24.025	25.26	0.053
	Std. deviation	4.95	5.72	
BMI	Mean	24.02	26.73	0.002
	Std. deviation	4.95	6.39	
Residence	Urban	122 (68%)	57 (32%)	0.042
	Rural	58 (82%)	13 (18%)	
BMI: Body mass index, No: Numbers of the Study participant, SD: Standard deviation				

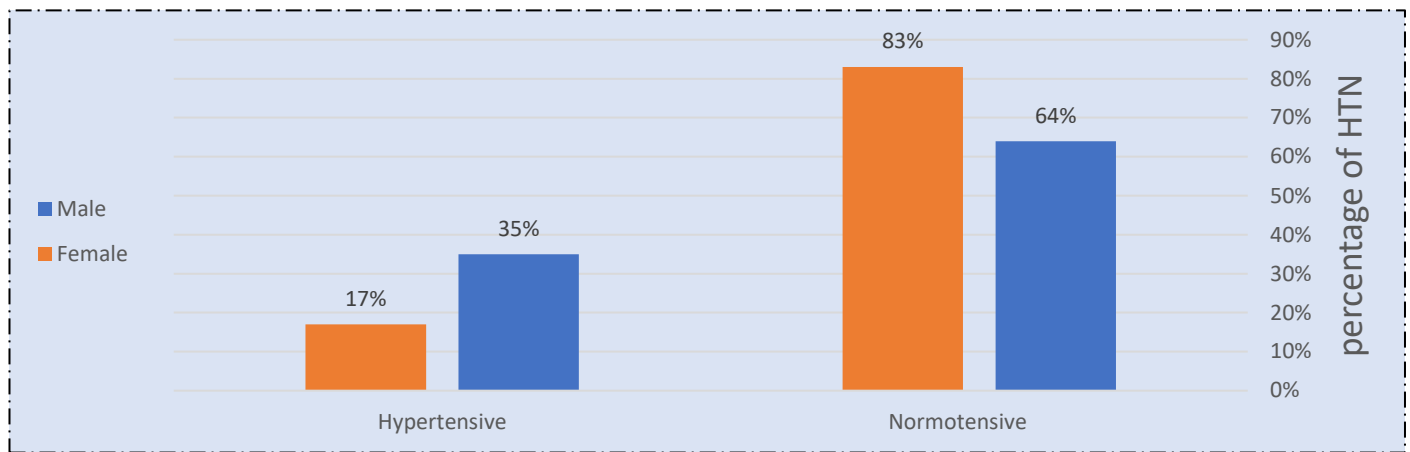


Figure 2: association between gender and HTN

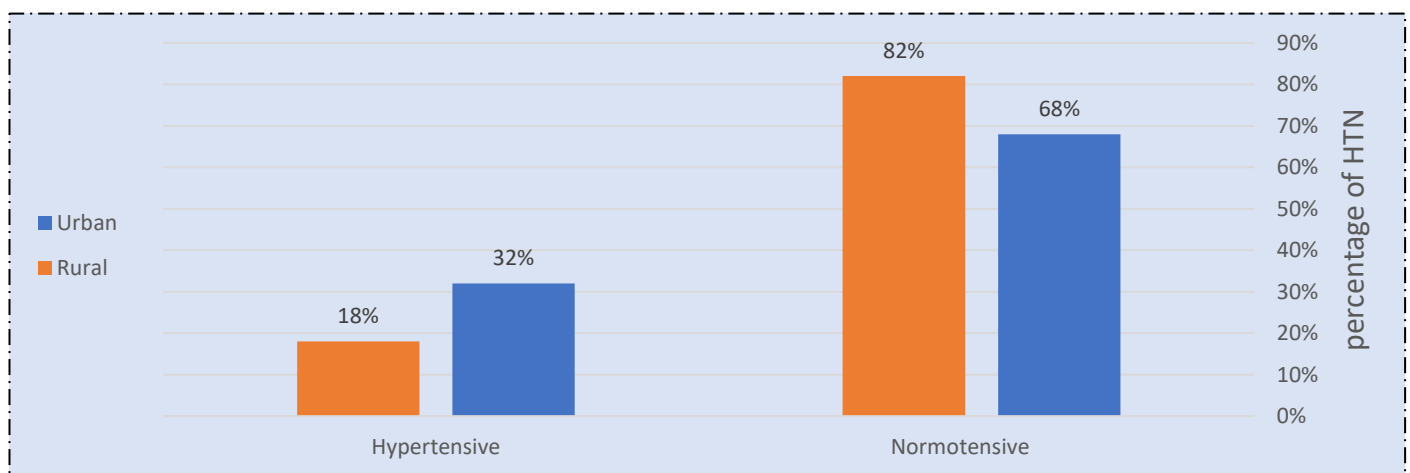


Figure 3: association between residence and HTN

3.3 The association of Family history of HTN, physical activity, diet, difficulty in falling asleep, hours of sleep, mobile use in hours with HTN

Table 3 demonstrates the association between sociodemographic factors and hypertension among the 250 participants, highlighting variables with statistically significant relationships ($p \leq 0.05$). The table provides detailed data on family history of hypertension, physical activity, diet, sleep patterns and mobile usage.

Family history of hypertension shows significant ($p = 0.027$), with 33% of participants who have a family history of hypertension being hypertensive, compared to 20% without such a history.

Other variables, such as physical activity, hours of sleep, and mobile use, doesn't show a statistically associated association with hypertension at $p \leq 0.05$ level.

Table 3 demonstrate the association of Family history of hypertension, physical activity, diet, difficulty in falling asleep, hours of sleep, mobile use in hours with HTN

		Hypertension No. (%)		
Variables	Categories	Normotensive No. (%)	Hypertensive No. (%)	P value
Family history of hypertension	Yes	104 (67%)	51 (33%)	0.027
	No	76 (80%)	19 (20%)	
Physical activity	Every day	101(69%)	46 (31%)	0.053
	3-5 times/week	3 (100%)	0 (0.0%)	
	2-5 times/week	1 (50%)	1 (50%)	
	Rarely	2 (33%)	4 (67%)	
	Never	73 (79%)	19 (21%)	
Diet	Healthy	29 (78%)	8 (22%)	0.442
	Average with a mix of healthy and unhealthy food	125 (72%)	48 (28%)	
	Unhealthy	26 (65%)	14 (35%)	
Difficulty in falling asleep	Yes	91(76%)	29 (24%)	0.195
	No	89 (68%)	41 (32%)	
Hours of sleep	Less than 4 hours	7 (70%)	3 30%)	0.126
	4-6 hours	40 (61%)	25 (39%)	
	6-8 hours	88 (74%)	31(26%)	
	More than 8 hours	45 (80%)	11 (20%)	
No: Numbers of the Study participant, SD: Standard deviation				

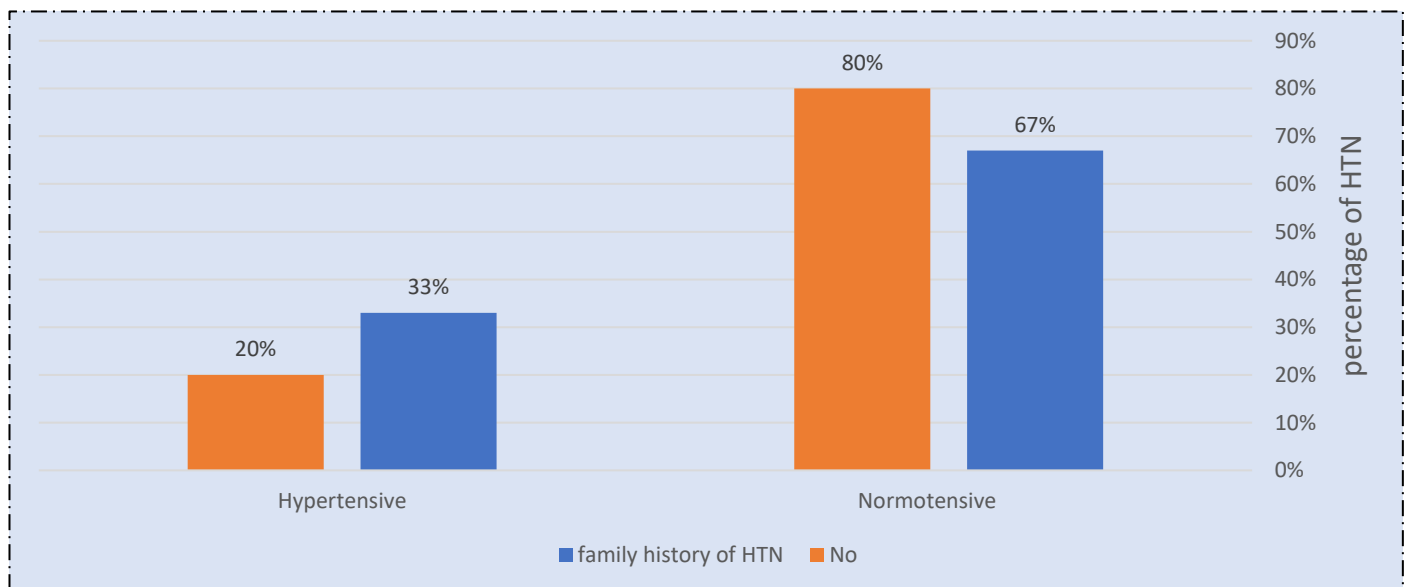


Figure 4: association of family history with HTN

4. Discussion

Hypertension is one of the risk factors in cardiovascular disease, and it significantly affects young people globally(21) . This study focused on the prevalence of hypertension among young people in Iraq, and analyzed the social, demographic and lifestyle choices that contribute to the occurrence of the disease. The results indicate that 28% of the participants had high blood pressure, and significant associations were also observed between high blood pressure and factors such as gender, family history, body mass index (BMI) and Residence

4.1 Prevalence and Socio-demographic Associations

The study showed that hypertension is more prevalent among males (35%) compared to females (17%), with gender showing a statistically significant association ($p = 0.001$). These results were similar to those of other studies (22).

Family history of hypertension was also considered an important indicator ($p = 0.027$). Young people with a family history had a 33% prevalence of hypertension, while those without a family history had a lower prevalence (20%). This is similar to studies that suggest that the genetic factor has a strong effect on high blood pressure (23)(24) .

Considering genetic and family overlap (consanguineous marriage) in Iraq, these results confirm the great importance of early screening of young people with genetic predisposition.

BMI showed a significant association with high blood pressure ($p = 0.002$), with individuals with hypertension showing a higher average BMI (26.73 ± 6.39) compared to normotensive participants (24.02 ± 4.95). This finding is consistent with studies linking obesity to increased blood pressure (25)(26).

Excess weight causes insulin resistance, endothelial dysfunction, and increased activity of the sympathetic nervous system, all play a role in hypertension pathogenesis (27).

4.2 Lifestyle Factors and Hypertension

The study also identified residency as a contributing factor, with urban residents having a significantly higher prevalence of hypertension (32%) compared to participants in rural areas (18%) ($p = 0.042$). Urbanization is often associated with lifestyle changes, including high stress levels, increased consumption of canned and processed prepared foods, and decreased physical activity. All are risk factors for hypertension (28)(29).

Although the percentage of participants who smoked was 71.2%, the study did not establish a statistically significant association between smoking and hypertension. However, studies show that smoking contributes to endothelial damage and causes atherosclerosis, two are precursors to hypertension(30)(31).The lack of significance in this study may be attributed to sample size limitations or differences in the duration and frequency of smoking among participants.

Physical activity did not show a statistically significant relationship with hypertension ($p = 0.053$). This can be attributed to self-reported bias or the intensity and duration of physical activity among participants. However, the importance of regular exercise in regulating blood pressure is well documented in cardiovascular research (32).

4.3 Sleep Patterns and Hypertension

Participants who had difficulty in falling asleep were (48%), as well as those who slept less than four hours a day (4%) both had hypertension (24%) to (30%) respectively. Although the association was not statistically significant, current research suggests that lack of sleep leads to increased sympathetic nervous activity, promoting high blood pressure(33)(34). These

results show the need for the intervention of the Iraqi Ministry of Health to educate young people about the importance of sleep.

4.4 Public Health Implications

The results of this study underscore the urgent need for intervention to reduce the prevalence of hypertension among Iraqi youth. Due to strong associations with BMI, gender, and family history, early screening programs in schools and universities can be helpful. Public health campaigns should focus on healthy eating habits, weight management, and regular physical activity.

Furthermore, the high prevalence of hypertension in urban areas underscores the need for an urban planning policy that encourages a healthy lifestyle, including expanding green spaces for physical activity and improving access to healthy and fresh foods.

4.5 Conclusion

This study contributes to a growing body of studies on hypertension in young people, especially in the Middle Eastern population. The high prevalence of hypertension (28%) in this study demonstrates the importance of addressing modifiable risk factors such as obesity, diet, and urban lifestyle choices. Future research should focus on longitudinal studies to assess causation and explore potential interventions tailored to the Iraqi context.

5. References

1. Zhou B, Perel P, Mensah GA, Ezzati M. Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. *Nat Rev Cardiol.* 2021;18(11):785–802.
2. Balouchi A, Rafsanjani MHAP, Al-Mutawaa K, Naderifar M, Rafiemanesh H, Ebadi A, et al. Hypertension and Pre-Hypertension in Middle East and North Africa (MENA): A meta-analysis of prevalence, awareness, treatment, and control. *Curr Probl Cardiol.* 2022;47(7):101069.
3. World Health Organization. 2023 [cited 2025 Jan 13]. Hypertension. Available from: <https://www.who.int/news-room/fact-sheets/detail/hypertension>

4. Zhang Y, Moran AE. Trends in the prevalence, awareness, treatment, and control of hypertension among young adults in the United States, 1999 to 2014. *Hypertension*. 2017;70(4):736–42.
5. Chobanian A V, Bakris GL, Black HR, Cushman WC, Green LA, Izzo Jr JL, et al. Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. *hypertension*. 2003;42(6):1206–52.
6. Yano Y, Reis JP, Colangelo LA, Shimbo D, Viera AJ, Allen NB, et al. Association of blood pressure classification in young adults using the 2017 American College of Cardiology/American Heart Association blood pressure guideline with cardiovascular events later in life. *JAMA*. 2018;320(17):1774–82.
7. Meher M, Pradhan S, Pradhan SR. Risk factors associated with hypertension in young adults: a systematic review. *Cureus*. 2023;15(4).
8. Ostchega Y, Fryar CD, Nwankwo T, Nguyen DT. Hypertension prevalence among adults aged 18 and over: United States, 2017–2018. 2020;
9. Wang W, Zhou H, Qi S, Yang H, Hong X. The association between physical activities combined with dietary habits and cardiovascular risk factors. *Heliyon*. 2024;10(7).
10. Al-Isawi Z, Kadhim S, Yahya Y, Hadi NR. Stress as a possible cause of a high incidence of hypertension and diabetes and a low incidence of asthma in the Iraqi population. *J Med Life*. 2023;16(3):434.
11. Organization WH. Noncommunicable diseases country profiles 2018. 2018;
12. Sulaiman HA, Andsoy II. Health behaviors, knowledge, and attitudes toward cardiovascular disease risk factors in young Iraqi adults: a sample from Erbil, Iraq. *Cardiovascular Prevention and Pharmacotherapy*. 2024;6(3):92–101.
13. Guo F, He D, Zhang W, Walton RG. Trends in prevalence, awareness, management, and control of hypertension among United States adults, 1999 to 2010. *J Am Coll Cardiol*. 2012;60(7):599–606.

14. Muna A, Al-Badri HJ, Mousa NA. Hypertension control among adult Iraqis. *J Fac Med Baghdad*. 2022;64(3):145–52.
15. Ondimu DO, Kikuvu GM, Otieno WN. Risk factors for hypertension among young adults (18-35) years attending in Tenwek Mission Hospital, Bomet County, Kenya in 2018. *Pan African Medical Journal*. 2019;33(1).
16. Bosu WK, Reilly ST, Aheto JMK, Zucchelli E. Hypertension in older adults in Africa: a systematic review and meta-analysis. *PLoS One*. 2019;14(4):e0214934.
17. Chuka A, Gutema BT, Ayele G, Megersa ND, Melketsedik ZA, Zewdie TH. Prevalence of hypertension and associated factors among adult residents in Arba Minch Health and Demographic Surveillance Site, Southern Ethiopia. *PLoS One*. 2020;15(8):e0237333.
18. Khosravi A, Behjati M, Mansouri A, Jozan M, Mohammadifard N, Taheri M, et al. Evaluation of correlation between digital vs. mercury sphygmomanometer in a middle-income country: The role of socio-economic situation. *Clin Exp Hypertens*. 2022;44(2):113–8.
19. Flack JM, Adekola B. Blood pressure and the new ACC/AHA hypertension guidelines. *Trends Cardiovasc Med*. 2020;30(3):160–4.
20. Fagard RH, Cornelissen VA. Incidence of cardiovascular events in white-coat, masked and sustained hypertension versus true normotension: a meta-analysis. Vol. 25, *Journal of hypertension*. LWW; 2007. p. 2193–8.
21. Liu J, Bu X, Wei L, Wang X, Lai L, Dong C, et al. Global burden of cardiovascular diseases attributable to hypertension in young adults from 1990 to 2019. *J Hypertens*. 2021;39(12):2488–96.
22. Muna A, Al-Badri HJ, Mousa NA. Hypertension control among adult Iraqis. *J Fac Med Baghdad*. 2022;64(3):145–52.

23. Lamelas P, Diaz R, Orlandini A, Avezum A, Oliveira G, Mattos A, et al. Prevalence, awareness, treatment and control of hypertension in rural and urban communities in Latin American countries. *J Hypertens*. 2019;37(9):1813–21.
24. Debora C, Tolimba C, Palunggi S, Siregar D, Harefa L. Risk Factors for Hypertension Among Adults Living in A Rural Area, Minahasa. *Jurnal Keperawatan Indonesia*. 2023;26(1):36–45.
25. Landi F, Calvani R, Picca A, Tosato M, Martone AM, Ortolani E, et al. Body mass index is strongly associated with hypertension: Results from the longevity check-up 7+ study. *Nutrients*. 2018;10(12):1976.
26. Shariq OA, McKenzie TJ. Obesity-related hypertension: a review of pathophysiology, management, and the role of metabolic surgery. *Gland Surg*. 2020;9(1):80.
27. Hall JE, do Carmo JM, da Silva AA, Wang Z, Hall ME. Obesity-induced hypertension: interaction of neurohumoral and renal mechanisms. *Circ Res*. 2015;116(6):991–1006.
28. Popkin BM. Relationship between shifts in food system dynamics and acceleration of the global nutrition transition. *Nutr Rev*. 2017;75(2):73–82.
29. Bruno CM, Amaradio MD, Pricoco G, Marino E, Bruno F. Lifestyle and hypertension: An evidence-based review. *J Hypertens Manag*. 2018;4(1):1–10.
30. Benowitz NL, Burbank AD. Cardiovascular toxicity of nicotine: implications for electronic cigarette use. *Trends Cardiovasc Med*. 2016;26(6):515–23.
31. Dikalov S, Itani H, Richmond B, Arslanbaeva L, Vergeade A, Rahman SMJ, et al. Tobacco smoking induces cardiovascular mitochondrial oxidative stress, promotes endothelial dysfunction, and enhances hypertension. *American Journal of Physiology-Heart and Circulatory Physiology*. 2019;316(3):H639–46.
32. Pescatello LS, Buchner DM, Jakicic JM, Powell KE, Kraus WE, Bloodgood B, et al. Physical activity to prevent and treat hypertension: a systematic review. *Med Sci Sports Exerc*. 2019;51(6):1314–23.

33. Mirjat AA, Mirjat AA, Naveed M, Majeed F, Chong S. Factors influencing sleep quality and effects of sleep on hypertension. *Sleep Vigil*. 2020;4(2):125–36.
34. Li C, Shang S. Relationship between Sleep and Hypertension: Findings from the NHANES (2007–2014). *Int J Environ Res Public Health*. 2021;18(15):7867.

6. Appendices

6.1 The research ethical board of al-Zahrawi university college (REBZ) approval form.

**The Research Ethical
Board of Al-Zahrawi University College (REBZ)
Approval Form**



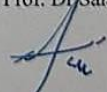
Email: salam.waheed@g.alzahu.edu.iq
Address: Karbala-Najaf highway, near pillar 1111, Iraq, Holly Karbala

Unique Approval Number: REBZ Ref No. 10/2/2025

1	Evaluation the treatment of measles patients in central and southern Iraq during outbreak	م.د. محمود جاسم جواد
2	Evaluation of the treatment of lung cancer patients in central and southern Iraqi	م.د. محمود جاسم جواد
3	Awareness and implementation of pharmacogenetic testing in Iraqi hospitals: an explorative pilot study	م.د. علي حسن زكي عجام
4	Pharmacists' attitude and role in diabetes management in Middle Euphrates area in Iraq	م.د. تحرير شلمان علوان
5	Evaluation of awareness and knowledge of hypertensive patients regarding antihypertensive drugs compliance in the middle Euphrates area	م.م. عسق صائق جعفر
6	Assessment of chronic liver disease treatment in Iraqi patients	م.م. منتظر زيارة
7	Prevalence of hypertension among young adults in Iraq population	م.م. محمد شهيد ساجت
8	Assessment of diabetic foot knowledge and awareness among a sample of Iraqi diabetic patients	م.م. سنان فرات حسين
9	Evaluation of some commercially available toothpastes in Karbala markets	م.م. احمد محمد جواد
10	Association of insulin resistance with lipid metabolism in type 2 diabetic patients in the Middle Euphrates area	م.د. فاضل عبد الامير وداعة
11	Comparative study on the efficacy of Symbicort vs Brequal in asthmatic patients	م.م. عقيل قيس عبد الجليل
12	Comparative analysis of endocrine function in a sample of Iraqi patients with sufficient and deficient vitamin D level	م.م. احمد صبيح محمد
13	Assessment of osteoporosis knowledge and awareness among pharmacy students in Holly Karbala	م.م. عطاء سكار داود
14	Prevalence and diagnostic markers of metabolic acidosis in chronic kidney disease: Across sectional study	م.م. احمد صبيح محمد

The REBZ has reviewed the above-titled research and approved its design and conduct.

Chairman of the Committee
Assist. Prof. Dr. Salam W. Ahjel

Signature: 

الاستاذ المساعد الدكتور
سalam وحميد عايجل



1

Figure 5: Ethical approval

6.2 Questionnaire for this study.

Prevalence of hypertension among young adults Iraqi population			
Section 1 : demographic information			Number : Name : BP : BP :
1. Age :		(18-35)	
2. Gender :	☐ male ☐ female		
3. Height :			
4. Weight :			
5. Occupation :	☐ student ☐ employed ☐ unemployed ☐ self-employed other		
6. Level of education :	☐ diploma ☐ bachelor's ☐ master's ☐ doctoral other		
7. Location :	☐ urban ☐ rural		
8. Marital status :	☐ single ☐ married ☐ divorced ☐ widowed		
Section 2: medical history and health information			
9. Have you ever been diagnosed with hypertension?	☐ Yes ☐ no		
10. If yes, at what age were you diagnosed?			
11. Do you have a family history of hypertension?	☐ Yes ☐ no		
12. Do you have any other medical conditions?	☐ Diabetes ☐ cardiovascular disease ☐ kidney disease ☐ obesity other ☐ none		
13. Are you currently taking any medication for hypertension?	☐ Yes ☐ no		
Section 3: lifestyle factors			
14. How often do you engage in physical activity (e.g., walking, running, gym workouts)?	☐ Every day ☐ 3-5 times/week ☐ 1-2 times/week ☐ rarely ☐ never		
15. How would you describe your diet?	☐ Healthy & balanced ☐ average, with a mix of healthy & unhealthy foods ☐ unhealthy		
16. Do you smoke?	☐ Yes ☐ no		
17. If yes, how many cigarettes do you smoke per day?			
18. Do you consume caffeine(e.g., coffee, tea, energy drinks)?	☐ Yes ☐ no		
19. If yes, how many cups or servings of caffeine do you consume per day?	☐ 1-2 servings ☐ 3-4 servings ☐ 5 or more servings		
Section 4: stress and sleep patterns			
20. On a scale of 1-10, how would you rate your daily stress levels?(1 = no stress,10 = very high stress)			
21. What are your main sources of stress?	☐ work ☐ school ☐ family ☐ finances ☐ relationships ☐ health ☐ other		
22. How many hours of sleep do you get on an average night?	☐ Less than 4 hr. ☐ 4-6 hr. ☐ 6-8 hr. ☐ more than 8 hr.		
23. Do you have trouble falling asleep or staying asleep?	☐ Yes ☐ no		
24. What is the average number of hours you use your mobile phone per day?			

Figure 6: Questionnaire