

Prevalence and relationship of hypertension among adult patients visiting primary health care centers in Baghdad, Iran: Cross-sectional study

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ABSTRACT

Hypertension causes cardiovascular morbidity and mortality worldwide. The study was a cross-sectional one that sought to find out the hypertension prevalence and other related factors in adults who visit primary healthcare centers (PHCs) in Baghdad. Systematic random sampling will be used to recruit a total of 520 adults [?]18 years old enrolled in six PHCs in Baghdad in the period of April-October 2024. A single visit measurement of blood pressure was done in accordance with standardized WHO STEPS protocols. Hypertension was considered as systolic BP [?]140 mmHg and/or diastolic BP [?]90 mmHg, or the present consumption of antihypertensive drugs. Structured questions were used to gather data on demographics, lifestyle and medical history. Findings revealed prevalence of hypertension of 34.6 (n=180) among PHC attendees with 48.3% having never been diagnosed. Other factors of importance were; age [?]50 years (aOR=3.24, p<0.001), obesity (aOR=2.68, p<0.001), diabetes mellitus (aOR=2.42, p=0.001), family history (aOR=2.18, p=0.002), physical inactivity (aOR=1.86, p=0.008) and high salt intake (aOR=1.72, p=0.008). These results show high prevalence of hypertension among PHC attendants and the prevalence of unrecognized cases, which indicate the necessity of the systematic opportunistic screening and lifestyle change program in the primary care environment.

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1. INTRODUCTION

Hypertension is one of the most serious international issues of health, as it influences the lives of about 1.28 billion adults in the world. It is the major risk factor that is modifiable and causes cardiovascular disease, stroke, chronic kidney disease and early death. According to the World Health Organization (WHO), hypertension is the cause of death to some 10.4 million people every year (1). Even with the existence of effective interventions, hypertension is still not appropriately managed in most of the populations especially in the low- and middle-income countries (2).

The Middle East has been facing urbanization, shift of diet to high sodium processed foods and more sedentary lifestyles, which have led to increasing prevalence of hypertension over the past decades. Epidemiological research conducted

on Iraq is giving a rate of 25-40% prevalence among adults but current data in primary healthcare centres in Baghdad is scarce. Other regional findings have indicated the same trend including those of Iran and Saudi Arabia where PHC-based surveys found prevalence rates of 30-38% (3).

There are several risk factors that develop into hypertension and these include non-modifiable risk factors like age, sex and family history and the modifiable risk factors such as obesity, physical inactivity, unhealthy diet (especially high salt content) as well as high alcohol intake and smoking. It is critical to identify the local distribution of risk factors to be able to develop specific prevention measures (4).

In Iraq, primary healthcare centers (PHCs) are the initial point of contact of the majority of patients and are quite important in terms of

screening, diagnosing, and treating hypertension. These settings are the best to detect undiagnosed hypertension because the Iraqi PHC system has been increasing its participation in the management of chronic diseases. The aim of this study was to find out the rates of hypertension prevalence and the related factors in adults visiting PHCs in Baghdad to present the information that could inform primary care-related prevention and control programs (5).

2-MATERIALS AND METHODS

Study Design and Setting

The study was a cross-sectional study, which was carried out at six primary healthcare centers in Baghdad (three in Al-Karkh and three in Al-Rusafa health directorates) between April and October 2024. The PHCs chosen represent various urban and semi-urban localities and offer holistic services of primary care such as chronic disease management.

Sample Size Calculation

Sample size was estimated by using a single proportion estimation formula by presuming that the prevalence of hypertension in the region was 30 percent (estimated by earlier studies in the region) and that the 95 percent level of confidence ($Z_{\alpha}=1.96$) and 5 percent margin of error. This gave a minimum sample of 323 participants. The enrolment was 520 participants (about 87 per PHC) to ensure coverage of the possible incomplete data and to be able to conduct subgroups analyses.

Sampling Technique and Population of the Study.

A systematic random sampling method was used in which all the third adults who were eligible to attend and participated in the PHC in the study period were contacted to participate. Everyone appeared in just one instance. Five hundred and twenty adults were enrolled with the age [?]18 years. One of the exclusion criteria was pregnancy, acute disease during the visit, and inability to make an informed consent.

Table 1: The instruments in this study.

No.	Instrument	Company	Origin
1	Digital Sphygmomanometer (HEM-7120)	Omron	Japan
2	Digital Weight Scale	Seca	Germany
3	Stadiometer	Seca	Germany
4	Waist Circumference Measuring Tape	Seca	Germany
5	Glucometer (Accu-Chek Active)	Roche	Germany

Data Collection and Measurements

The data on the demographics, medical history, family history of hypertension, and lifestyle factors was collected with the help of a structured questionnaire based on the WHO STEPS instrument. Measurement of blood pressure was done on one visit using a standardized WHO STEPS protocol: patients were allowed a rest of 5 minutes in the seated position with their back leaner, feet flat on the floor and arm leaner at the heart position. Calibrated Omron digital sphygmomanometers fitted with cuffs of the right size were used to take 3 consecutive readings at 1-minute intervals and the average of the two last readings was taken.

Definitions of Variables

Hypertension was considered to be systolic BP [?]140 mmHg and/or diastolic BP [?]90 mmHg or the antihypertensive drug use (JNC 7 criteria). Obesity was considered to be BMI [?]30 kg/m². Diabetes was determined as a history of physician diagnosis or fasting capillary glucose [?]126mg/dl using calibrated point-of-care glucometer; those that screened positive were referred to formal laboratory confirmation. The

physical activity level was measured through a structured questionnaire that was based on the WHO STEPS tool; physical inactivity was categorized as <150 minutes/week of moderate intensity aerobic exercise or <75 minutes/week of exercise of vigorous intensity. Excess salt was conceptualized as self-reported norm of adding additional amount of table salt to meals often or always and /or of having salty processed foods (pickles, processed meats, chips) at least three times per week.

Statistical Analysis

The SPSS version 26 was used to analyze the data. Continuous variables were recorded in terms of mean +- SD, categorical variables in terms of frequencies and percentages. Bivariate analysis was done with Chi-square test and independent t-test. Univariate analysis variables having p below 0.1 were included in multivariate logistic regression to determine independent variables that would have been associated with hypertension. Hosmer-Lemeshow test was used to test model fit. Significant p-value was taken to be less than 0.05.

Ethical Considerations

The protocol of the study was assessed and accepted by the Institutional Review Board of Al-Karkh Health Directorate, Baghdad (Approval No.: KHD-2024-HTN-015). All the participants were informed and given written permission before being enrolled. Those subjects who were identified as having raised blood pressure were sent to the confirmation department to be handled. Every procedure was performed in the frames of the ethical principles of the Declaration of Helsinki and data confidentiality was ensured in the process.

3-RESULTS

Five hundred and twenty participants were recruited and the average age of the sample was

46.8±15.2 years. The sample size was 304 females (58.5%). Hypertension was found to be prevalent at PHC (34.6% n=180). It is important to note that 48.3 percent of hypertensive participants (n=87) were previously unrecognized during the study, which implies that the role of previously undetected hypertension among the population seeking primary care is high among adults. Hypertensive subjects were also much older and larger in terms of BMI, systolic and diastolic blood pressure, and more likely to have diabetes than non-hypertensives (all p<0.001). The demographic and clinical characteristics are given in Table 2.

Table 2: demographic and Biochemical Characteristics.

Variable	HTN (n=180)	No HTN (n=340)	P-value
Age (years)	54.6 ± 12.8	42.6 ± 14.2	<0.001
Female n (%)	98 (54.4)	206 (60.6)	0.168
BMI (kg/m ²)	31.4 ± 5.6	27.2 ± 4.8	<0.001
Systolic BP (mmHg)	148.6 ± 18.4	118.4 ± 10.6	<0.001
Diastolic BP (mmHg)	94.2 ± 12.6	76.8 ± 8.4	<0.001
Diabetes n (%)	68 (37.8)	52 (15.3)	<0.001
Age (years)	54.6 ± 12.8	42.6 ± 14.2	<0.001

*Deficient: 25(OH)D <20 ng/mL; **Non-Deficient: 25(OH)D ≥20 ng/mL (insufficient + sufficient)

The multivariate logistic regression analysis is in table 3. Once the possibilities of confounding variables were considered, age 50 years, obesity, diabetes, family history, physical inactivity, and

excessive intake of salt were found to be independently related with hypertension. The Hosmer-Lemeshow test revealed that there was a sufficient fit of the model (kh²=8.42, p=0.394).

Table 3: Multivariate Logistic Regression Analysis of the risk factors.

Risk Factor	aOR	95% CI	P-value
Age ≥50 years	3.24	2.12 - 4.96	<0.001
Obesity (BMI ≥30)	2.68	1.76 - 4.08	<0.001
Diabetes mellitus	2.42	1.52 - 3.86	<0.001
Family history of HTN	2.18	1.42 - 3.34	0.002
Physical inactivity (<150 min/wk)	1.86	1.18 - 2.94	0.008
High salt intake	1.72	1.10 - 2.68	0.018

aOR = adjusted Odds Ratio; Model adjusted for age and education level

4-DISCUSSION

This research indicates a great proportion of adult hypertension (34.6%) in PHCs in Baghdad. It should be mentioned that this is prevalence among PHC attendees as opposed to a community based estimate of the general population. However, the result is congruent with the estimates in the region and indicates the high burden of cardiovascular risk factors amongst the primary care seeking adults in Iraq. It is important to note

that the fact that nearly half of hypertensive cases (48.3) were not previously diagnosed points to the critical gaps in their detection and the fact that PHCs can become the area where opportunistic hypertension screening can take place (6).

The close relationship that exists between obesity and hypertension (aOR=2.68) in our study is in accordance with the world literature and the caliber of adiposity in regulating blood pressure in a variety of different ways, such as sodium

retention, activation of sympathetic nervous system and dysfunction of the vascular system. This association promises to keep up with the increase of the prevalence of hypertension with the increasing levels of obesity in Iraq as a result of urbanization and change of diets (7).

The association of hypertension and diabetes (aOR=2.42) is an indicator of the overlapping pathophysiology and risk factors of the two conditions, which frequently occur with each other as part of the metabolic syndrome. Such a comorbidity pattern signals a high cardiovascular risk and requires combined strategies of screening and management. When either of the conditions is detected, these primary care providers ought to screen consistently when screening them (8).

Associations with lifestyle aspects that can be changed such as physical inactivity (aOR=1.86) and high salt consumption (aOR=1.72) have significant prevention opportunities. The ultimate measure of salt intake, 24 hrs urinary sodium is not practical in large scale in normal PHC survey in Iraq; however, self-reported dieting habits offer actionable data in counseling. Interventions at the population level that would affect these factors and individual counseling in the primary care environment may go a long way in reducing the burden of hypertension (9).

The present system of PHC in Iraq has been increasing its role in chronic diseases management. We conclude that the opportunistic approach that may be effective to implement in order to screen all the adult attendees is the integration of the routine blood pressure measurements. In addition, the mentioned observation of clustering hypertension with obesity and diabetes facilitates the formulation of combined NCD-management guidelines in PHCs, which might enhance the performance and patient outcomes.

Study Limitations

Some limitations can be made on this study. To begin with, it is cross-sectional in nature, meaning that it cannot establish causal relationships between risk factors and hypertension, it is possible to state that the established associations are not causal but correlational. Second, only one visit was used to measure blood pressure and this could be overstating the prevalence of hypertension because of the white-coat effect; clinical diagnosis usually needs to be ascertained on different occasions. Third, self-reported lifestyle factors (physical activity and salt) were not validated by validated measures (IPAQ to measure physical activity, and 24-hour urinary sodium to measure salt intake), and

were subjected to recall or social desirability bias. Fourth, the screening of diabetes by using point-of-care glucometers is accurate but less than formal laboratory testing and is applicable in PHC settings. Fifth, the sample consisted of adults visiting PHCs and is not representative of the adult population in Baghdad; the non-visitors to healthcare facilities might have a different prevalence of hypertension. Lastly, confounding by the unmeasured factors like alcohol usage and chronic stress, etc. cannot be ruled out.

CONCLUSION

This research paper illustrates a high rate of hypertension in adults who visit PHCs in Baghdad with a significant percentage of the patients having previously not been diagnosed. Severe relationship was found between obesity, diabetes, family history, physical inactivity, and high salt consumption. These results can be used to support: (1) the systematic opportunistic screening of hypertension in all attendees to PHCs; (2) integrated management of diabetes and hypertension in PHCs; (3) lifestyle modifications that can reduce weight loss, physical activities and salt content in the diet; (4) community-driven campaigns on hypertension risk factors and the need to monitor blood pressure; (5) training PHC personnel on cardiovascular risks assessment with the help of tools like WHO CVD risk charts. It is necessary to enhance the primary healthcare capacity to identify and treat hypertension in order to decrease the burden of cardiovascular disease in Iraq.

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