ANKARA MEDICAL JOURNAL

Research Article

Ankara Med J, 2024;(4):417-429 // 10.5505/amj.2024.00946

HYPERTENSION INCIDENCE, AWARENESS, TREATMENT AND CONTROL STATUS IN ADULT PATIENTS

Büşra Göktepe[1], Cüneyt Ardıç[2]

[1]Department of Family Medicine, Gorele Op. Dr. Ergun Ozdemir State Hospital, Giresun, Türkiye
[2]Department of Family Medicine, Recep Tayyip Erdogan University Faculty of Medicine, Rize, Türkiye

Correspondence:
Büşra Göktepe (e-mail: busramolla61@gmail.com)

Submitted: 08.08.2024 // Accepted: 22.11.2024

Ankara Yıldırım Beyazıt University Faculty of Medicine
Department of Family Medicine

ANKARA MEDICAL JOURNAL

Abstract

Objectives: The aim of this study was to examine the relationship between the incidence, awareness, treatment, and control of hypertension and the factors affecting them.

Materials and Methods: The Recep Tayyip Erdogan University Rize Training and Research Hospital Family Medicine outpatient clinic conducted this descriptive study with 339 participants aged 30 years and older. Blood pressure was measured and other anthropometric measurements were recorded during the outpatient clinic visit and a questionnaire prepared by the researcher was applied.

Results: In the study, the incidence of hypertension was 41%, awareness status was 88.5% and control status was 79.7% in individuals aged 30 years and older who applied to our Family Medicine clinic. It was found that the rate of hypertension in the parents of individuals with a diagnosis of hypertension was statistically significantly higher than in individuals without hypertension (p=0.011).). The study inquired about the status of blood pressure measurement during prior visits to any healthcare facility among normotensive individuals, revealing that 16.5% of participants had not undergone blood pressure measurement during such visits.

Conclusion: Family medicine specialists, who deal with their patients with a community-oriented, holistic, and comprehensive approach, are the most prominent people who can ensure optimal blood pressure management within the scope of primary and secondary prevention by recognizing, treating, and controlling hypertension both before it occurs at elevated BP levels and in the early stages, and by providing continuous counseling.

Keywords: Hypertension, blood pressure monitoring, family practice.

Introduction

Hypertension, a systemic disease characterized by persistently elevated blood pressure (BP), is an important health problem because it causes serious complications and is widely prevalent in the population.[1] It is associated with many events, including hemorrhagic and thrombotic stroke, heart attack, sudden death, heart failure, peripheral arterial disease, aortic dissection, and renal failure. It is quantitatively the most important modifiable risk factor for early cardiovascular disease.[2] The best evidence for a causal role of increased blood pressure in cardiovascular complications is the reduction of blood pressure with antihypertensive treatment and improvement in outcome.[3] According to analyses, it has been reported that by 2030, 23 million cardiovascular deaths worldwide will be associated with hypertension (HT) and 85% of these deaths will occur in low- and middle-income countries.[4] The Turkish Hypertension Prevalence Study 2 or PatenT 2 (Prevalence, awareness, and treatment of hypertension in Turkey 2) study was conducted in 2012 to access the most up-to-date and comprehensive information on the prevalence, distribution, awareness, treatment, and control rates of hypertension in Turkey. The PatenT 2 study revealed a prevalence of hypertension in Turkey of 30.3% in 2012.[5] The TEKHARF study, which employed the real sample method, reported a 33.7% prevalence of hypertension in Turkey in 2017.[6] Due to the absence of a hypertension prevalence study conducted in Turkey following these studies, we aimed to address the data gap on this subject. If the prevalence of hypertension in Turkey remains constant until 2030, it is estimated that 17.4 million people will have hypertension, taking into account population growth.[7] The prevalence of hypertension increases with age, and in every age group from 40 to 80, women have a higher age-specific hypertension rate than men.[5]

This study aimed to evaluate the relationship between the awareness, prevalence, treatment, and control of hypertension and the factors affecting these factors in individuals aged 30 years and older who applied to the Family Medicine clinic of Recep Tayyip Erdogan University Training and Research Hospital and to present data that have not been investigated for hypertension in Turkey for a long time.

Materials and Methods

Participants and sampling

The Recep Tayyip Erdogan University Training and Research Hospital, Department of Family Medicine, conducted a descriptive study between 01.11.2022 and 31.01.2023. The Recep Tayyip Erdogan University Medical Faculty Non-Interventional Clinical Research Ethics Committee reviewed the study following the committee's directive during the meeting and determined it to be scientifically and ethically appropriate, issuing decision number 2023/18. The study included male and female patients over 30 years of age who applied to the Recep Tayyip Erdogan University Training and Research Hospital Family Medicine Outpatient

Clinic. The study excluded pregnant women, individuals who were bed or wheelchair-bound and could not be measured standing up, individuals with cognitive dysfunction who were unable to answer the questionnaire questions, and individuals who refused to participate in the study when informed before the survey. The G power analysis, which determined the sample size, estimated the population of Rize in 2022 to be 347,582 people. The Patent 2 study reports a prevalence of hypertension in our country at 30.3%.

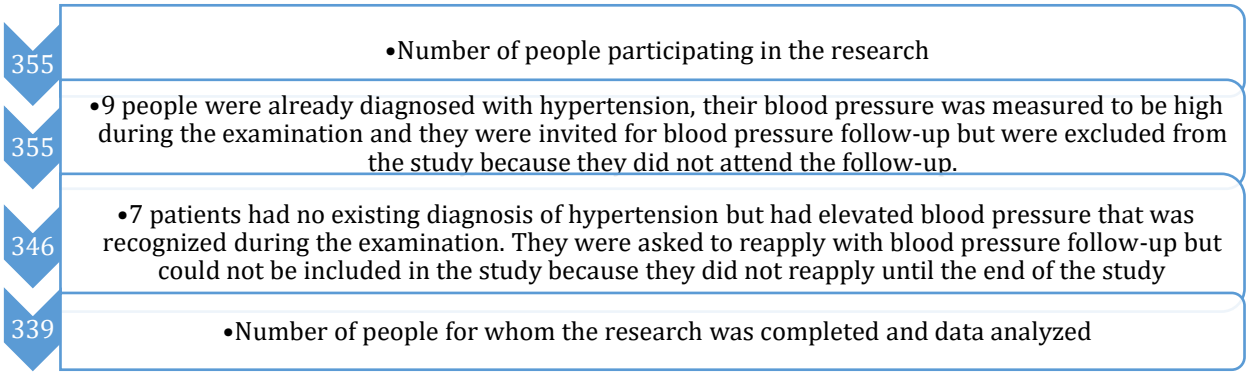

Figure 1. Flow Diagram

Tools

The researchers, after reviewing the literature, prepared a questionnaire form to gather sociodemographic and medical history data from the patients. The questionnaire asked about the participant's age, gender, place of residence, education level, regular physical activity, salt-restricted diet, presence of stress, diagnosis of hypertension, chronic diseases, alcohol use, smoking, number of packs/years of smoking, and parental history of hypertension, among other details. The study also collected data on anthropometric measurements, blood pressure measurements taken during the outpatient clinic visit, and LDL cholesterol levels analyzed within the last 6 months. For people who have been diagnosed with high blood pressure, the questionnaire asked about their use of antihypertensive drugs, the types of drugs they took (angiotensin-converting enzyme inhibitor (ACE-I), angiotensin receptor blockers (ARB), calcium channel blockers (CCB), beta-blockers, diuretics), their blood pressure at target, what they did to get their blood pressure there, how they got treatment for their newfound hypertension, what antihypertensive drug groups they started on, and how well they were doing with their treatment. The researcher administered the questionnaire face-to-face during the participant's outpatient clinic visit. The researcher used an automatic (digital display) sphygmomanometer (OMRON M2 Basic HEM-7121 J-E Intellisense, Tokyo, Japan) with a suitable cuff on both arms to measure and record blood pressure. Blood pressure was measured when the patient was not talking, leaning back, sitting on a chair with feet on the floor, with the arm supported at the level of the heart, and resting for at least five minutes. The

researcher ensured that the patient had not consumed tea, coffee, or smoked within the last 30 minutes. The researcher also measured the patient's height, weight, body mass index (BMI), and waist circumference. The researcher obtained information on the antihypertensive medication or medications used by the patients from the MEDULLA pharmacy system and/or e-NABIZ system.

Statistical Analysis

We performed statistical analyses using SPSS 22.0 for Windows. We presented descriptive measures as mean, standard deviation, and percentage distribution. The Kolmogorov-Smirnov test checked the data's conformity to the normal distribution. We used a chi-square test (Fisher's exact test when necessary) to compare the distributions of categorical variables and a student t-test to compare the averages between two groups that met parametric conditions. The statistical significance level was taken as $p<0.05$.

Results

A total of 339 individuals participated in the study; 58.9% were normotensive, 36.3% were hypertensive, and 4.8% were first diagnosed with hypertension. In the study, 44.6% of participants diagnosed with hypertension were male, whereas 40% of participants without such a diagnosis were male. 23.7% of individuals diagnosed with hypertension resided in rural areas, whereas 15.5% of participants without such a diagnosis lived in rural regions.

The analysis of hypertension prevalence across age groups indicated that men exhibited a higher likelihood of having hypertension than women in the 30-39 and 50-59 age brackets, whereas women demonstrated a greater likelihood than men in the remaining age groups (Figure 2).

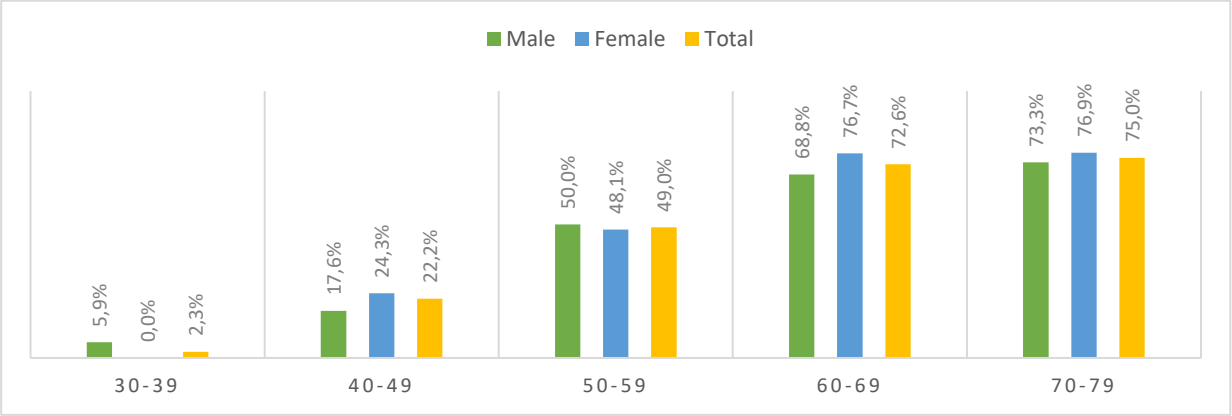

Figure 2. Distribution of the prevalence of hypertension according the gender in age groups

The prevalence of hypertension in male participants was 43.7%, while the prevalence of hypertension in female participants was 39.1% (Table 1). There was no statistically significant relationship between male and female gender in the distribution of the prevalence of hypertension (p:0.398).

While 83.9% of the male participants were aware of hypertension, this rate was 92.2% among the female participants. The overall awareness rate for hypertension was 88.5% (p:0.126) (Table 1). In the study, hypertension under control was defined as systolic blood pressure (SBP) <130 mmHg and diastolic blood pressure (DBP) <80 mmHg.[1] We evaluated managed hypertension with office blood pressure measures after patient self-reporting. Table 1 illustrates the control status of hypertension in patients having an active diagnosis of the condition. Hypertension was managed in 72.5% of males and 85.9% of women (p = 0.067) (Table 1).

Table 1. Distribution of the prevalence, awareness, and under-control status of hypertension in the participants

	Male (n:142)		Female (n:197)		Total (n:339)		
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI	*p*
Prevalence (n:339)	62(43.7)	35.7-51.9	77(39.1)	32.5-46.0	139(41.0)	35.9-46.3	0.398
Awareness (n:139)	52(83.9)	73.3-91.4	71(92.2)	84.4-96.7	123(88.5)	82.4-93.0	0.126
Under Control Status (n:123)	37(72.5)	58.5-82.9	61(85.9)	76.4-92.5	98(79.7)	72.6-86.6	0.067

Analysis of the relationship between study participants' hypertension and parental hypertension revealed that 75.5% of individuals with hypertension had a parental diagnosis of hypertension, compared to 62.5% of those without hypertension (p = 0.011) (Table 2)

Table 2. Examination of the relationship between the presence of hypertension in individuals and parental diagnosis of hypertension

		Hypertension				
		No		Yes		
		n	Percent (%)	n	Percent (%)	*p*
Do the parents have a diagnosis of hypertension?	**No**	75	37,5	34	24,5	
	Yes	125	62,5	105	75,5	0,011

*Chi-square test

The study compared the average body mass index and waist circumference between groups with and without blood pressure at the target value, focusing on individuals with hypertension across both genders. No statistically significant difference was observed between the groups (Table 3).

Table 3. Comparison of body mass index and waist circumference averages between those with and without blood pressure at target value in individuals with hypertension

	Is blood pressure at target value in individuals with hypertension?									
	Male					Female				
	Yes		No			Yes		No		
	Average	SD	Average	SD	*p*	Average	SD	Average	SD	*p*
BMI (kg/m^2)	31.1	8.9	31.6	5.8	0.861	33.6	6.0	36.7	4.7	0.119
Waist circumference (cm)	105.5	9.6	107.9	14.9	0.484	105.1	16.3	108.5	11.0	0.531

*Student t test

The normotensive participants in the study were queried regarding prior blood pressure measurements taken during visits to health institutions. Results indicated that 16.3% of men and 16.7% of women reported having never received such measurements (Figure 3).

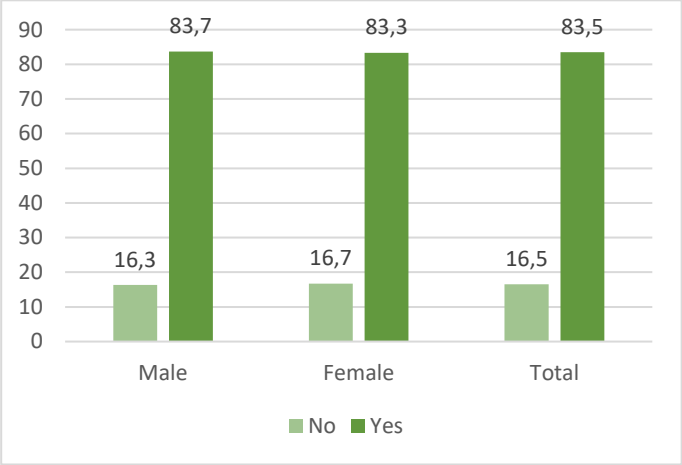

Figure 3. Status of blood pressure measurement in previous visits to any health institution in normotensive individuals

Figure 4 illustrates the distribution of treatment status and characteristics among hypertensive participants in the study. Among those receiving antihypertensive treatment, 4.1% were on monotherapy, with 43.7% of these individuals employing calcium channel blockers (CCB). Among the patients getting treatment, 26.2% were prescribed a triple combination therapy, with 29.7% giving the ACE-I-CCB-Diuretic combination and 29.6% receiving the ARB-CCB-Diuretic combination. It was noted that 22.2% of patients undergoing antihypertensive treatment were administered quadruple combination therapy, with 40% receiving ARB-CCB-Beta blocker-diuretic and 40% receiving ACE-I-CCB-Beta blocker-diuretic.

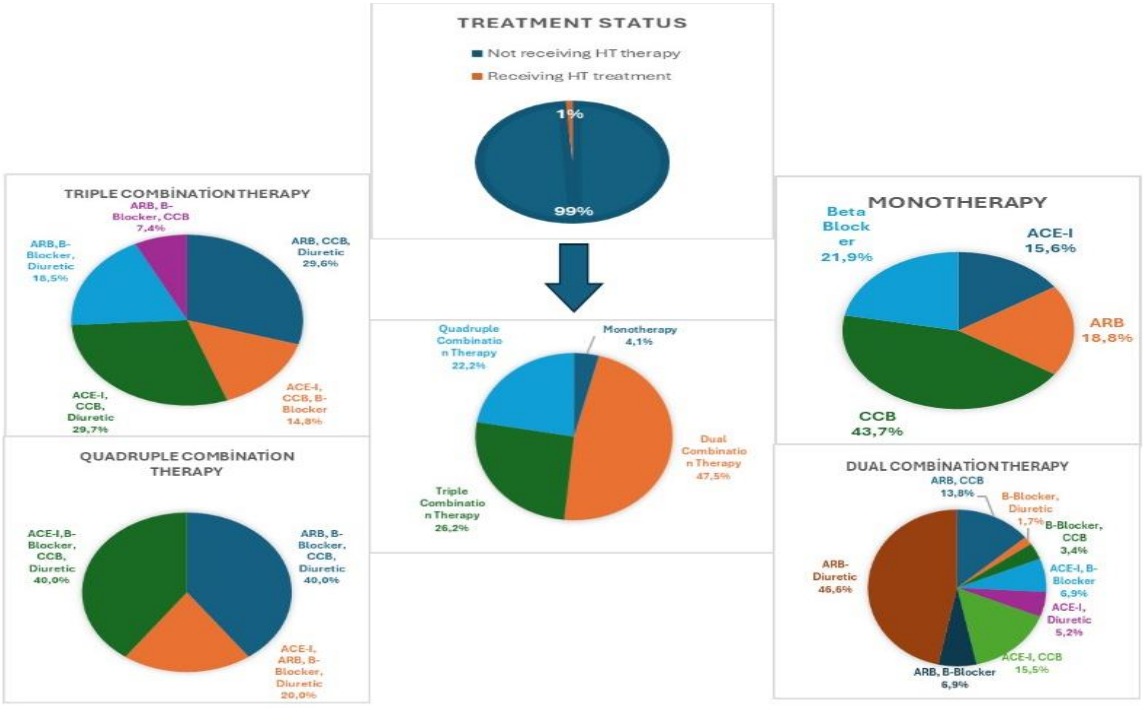

Figure 4. Distribution of treatment status of hypertensive individuals and characteristics of treatment received by individuals receiving treatment

(ACE-I: Angiotensin-converting enzyme inhibitor, ARB: Angiotensin receptor blockers, CCB: Calcium channel blocker HT: Hypertension)

Discussion

The study found that the prevalence of hypertension among participants was 41%. In 2012, the PatenT 2 study, encompassing a representative adult population in Turkey, indicated a hypertension prevalence of 30.3%.[5] The TEKHARF study, published in 2017, indicated a prevalence of 33.7% in Turkey and 36.5% in TEMD data.[1,6] Our research and the existing literature indicate a recent rise in the prevalence of hypertension. The aging population, urbanization, alterations in food habits, and heightened social stress may contribute to this trend.

The awareness level among participants with hypertension was 88.5%, whereas the control group had a level of 79.7%. The PatenT 2 study indicated that 40.7% of hypertension patients were cognizant of their diagnosis in 2003, increasing to 54.7% in 2012, while control rates escalated from 8.1% in 2003 to 28.7% in 2012.[5] According to WHO data, only 14% of the estimated 1.4 billion people with hypertension worldwide have their blood pressure under control.[8] Recent enhancements in Turkey's healthcare system, including improved access

to medical facilities, easier availability of medications, heightened expertise among physicians and healthcare personnel, and implemented educational initiatives, may have contributed to increased awareness and management of hypertension.[9]

The study involved participants aged 30 years and older who visited our family medicine clinic, revealing that 47.5% of individuals with hypertension belonged to the 60-79 age group. A study conducted in Germany indicated that 71% of individuals aged 65 to 79 were diagnosed with hypertension.[10] The PatenT 2 study, consistent with global data, indicated that the prevalence of hypertension rises with age, reaching 60–70% after the age of 60.[5] In light of these results, it can be considered that the prevalence of hypertension may increase in the coming years with the aging of the population in our country.

A cohort research tracking individuals over 54 years revealed a significant independent correlation between parental hypertension diagnosis and elevated blood pressure levels, as well as the onset of hypertension in adulthood.[11] A separate study indicated that a familial history of hypertension in both mothers and fathers increased the probability of hypertension in both genders.[12] The study revealed that the prevalence of hypertension among the parents of individuals diagnosed with hypertension was statistically substantially greater than that of individuals without hypertension (p=0.011). The findings of our investigation align with the existing literature. The concordance of blood pressure within families may be ascribed to both common environmental factors and genetic predisposition. Shared genetic susceptibility is probably due to the cumulative effect of multiple genetic variations that elevate blood pressure.[11]

In the study, researchers inquired about the blood pressure measurement history of normotensive individuals during prior visits to healthcare facilities, and unexpectedly, discovered that 16.5% of the participants had never undergone a blood pressure measurement. The PatenT study revealed that 32.2% of participants had never undergone blood pressure measurement, while the PatenT 2 study indicated that 15.5% of individuals in Turkey had not had their blood pressure measured despite searching for care at a health institution for various reasons.[5,13] In our country, it may be important to increase blood pressure measurement to increase awareness of hypertension, to recognize and intervene in hypertension at an early stage, to identify patients in the stage of increased BP before hypertension occurs to provide primary prevention, and to address pharmacological and non-pharmacological treatments within the scope of guidelines. The higher the BMI, the higher the risk of morbidity and mortality.[13] In the PatenT study, it was found that body mass index was high in hypertensives and there was a linear relationship between hypertension and body mass index.[14] In the Balcova Heart Project, it was reported that 61.1% of individuals with high waist circumference were hypertensive.[15] Another study showed that both overweight and obesity were highly associated with hypertension risk in men and women.[16] In our study, the average BMI and waist circumference of hypertensive adults, both with and without blood pressure at the target value, were compared across genders, revealing no

statistically significant differences between the groups. However, it is significant that the average BMI and waist circumference were markedly elevated in both men and women, irrespective of whether blood pressure met the target range Interventions to reduce adiposity and avoid overweight can have major impacts on risk factors and the development of cardiovascular diseases at the individual and community level. The main approach in the treatment of metabolic diseases such as HT and obesity; providing weight control, increasing physical activity, and abandoning a sedentary lifestyle.[17] For this reason, it is known that family physicians in primary care have a major role in the prevention of obesity and then in the recognition and treatment of obesity.

Our study investigated hypertension as well as chronic renal disease, diabetes mellitus, coronary artery disease, and hyperlipidemia. Our study did not identify a significant association between hypertension and the chronic diseases examined.

The WHO published guidelines on the pharmacological treatment of hypertension in 2021; recommends the initiation of pharmacological antihypertensive treatment in individuals with a confirmed diagnosis of hypertension and systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg, single-pill combination therapy as initial treatment, and the selection of antihypertensive drugs to be used in combination from three drug classes including diuretics (thiazide or thiazide-like), ACE-I/ARBs and dihydropyridine group CCBs.[8] We evaluated the treatment status of the hypertensive individuals who participated in our study and the distribution of the characteristics of the treatment received by the individuals who received treatment. The results of the study showed that the antihypertensive treatments initiated in hypertensive individuals in recent years were largely following the WHO recommendations. The accessibility of online environments for both physicians and patients, enhanced communication among healthcare providers, the presence of updated guidelines in conjunction with ongoing technological advancements, and the global accumulation of knowledge regarding hypertension may have impacted these findings.

When the studies in the literature were examined, it was observed that Patent 2 and TEKHARF studies were conducted in 2012 and 2017, respectively, to assess the prevalence of hypertension in Turkey, but studies on this subject in recent years have been quite limited. To fill this gap in the literature, the incidence, awareness, treatment, and control status of hypertension, risk groups were determined and the effectiveness of family physicians working in primary care in the diagnosis, treatment, and follow-up of hypertension was demonstrated in this study.

Limitations and Alternatives

The study's strength is its application of suitable interventions for participants, grounded in established guidelines for hypertension and associated risk factors. The study's execution at a single center represents a

limitation. The results obtained do not reflect the entire population. Multicenter studies are essential for this purpose.

Conclusion

In the study, we found that the prevalence of hypertension in individuals aged 30 years and older who applied to our family medicine clinic was higher than the current data in Turkey, hypertension awareness was at the level of developed countries, and the status of hypertension under control was well above the data in Turkey. The treatment approach for hypertensive individuals with uncontrolled blood pressure was reorganized, lifestyle change recommendations were reiterated, new hypertension was diagnosed in several patients, and pharmacological treatment was initiated alongside lifestyle change recommendations. In line with these results, family medicine specialists, who address their patients with a community-oriented, holistic, and comprehensive approach, are the most prominent people who can ensure optimal blood pressure management within the scope of primary and secondary prevention by recognizing, treating and controlling hypertension both before it occurs at elevated BP levels and in the early stages, and by providing continuous counseling. Therefore, family physicians should carefully consider the management of blood pressure at each stage and explain this to patients, promoting health and well-being at every stage and involving them in managing their health.

Ethical Considerations: The study was approved by the Recep Tayyip Erdogan University Medical Faculty Non-Interventional Clinical Research Ethics Committee board (Number: E-40465587-050.01.04-589).

Conflict of Interest: The authors declare no conflict of interest.

Hypertension Incidence, Awareness, Treatment, and Control Status in Adult Patients -2023 Thesis, 13th International Congress of Family Medicine it was presented on 1-5 November 2023 and ranked 3rd in oral presentation.

References

1. Hypertension Diagnosis and Treatment Guideline: The Society of Endocrinology and Metabolism of Turkey. Identifying Risks in Hypertension. 6th ed. Baltimore: Turkish Endocrinology and Metabolism Society; 2022:11-22.
2. Collaborators GBDRF. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018;392(10159):1923-94.
3. Ninomiya T, Perkovic V, Turnbull F, et al. Blood pressure lowering and major cardiovascular events in people with and without chronic kidney disease: meta-analysis of randomised controlled trials. Bmj. 2013;347:f5680.
4. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. Plos Med. 2006;3(11):e442.
5. Sengul S, Akpolat T, Erdem Y, et al. Changes in hypertension prevalence, awareness, treatment, and control rates in Turkey from 2003 to 2012. J Hypertens. 2016;34(6):1208-17.
6. Onat A, Can G, Yuksel H, et al. TEKHARF 2017. In: Onat A, ed. Blood Pressure and Hypertension in Our Societ. 1st ed. Baltimore: Logos Publishing; 2017:104-119.
7. Yurekli AA, Bilir N, Husain MJ. Projecting burden of hypertension and its management in Turkey, 2015-2030. Plos One. 2019;14(9):e0221556.
8. WHO. Guideline for the pharmacological treatment of hypertension in adults 2021. Available from: https://iris.who.int/bitstream/handle/10665/344424/9789240033986-eng.pdf (Accessed: 09.04.2023)
9. Saglıkta-Donusum-Programı. 2007 Available from: https://www.saglik.gov.tr/TR,11415/saglikta-donusum-programi.html. (Accessed: 10.04.2023)
10. Neuhauser HK, Adler C, Rosario AS, Diederichs C, Ellert U. Hypertension prevalence, awareness, treatment and control in Germany 1998 and 2008–11. Journal of Human Hypertension. 2015;29(4):247-53.
11. Wang NY, Young JH, Meoni LA, Ford DE, Erlinger TP, Klag MJ. Blood pressure change and risk of hypertension associated with parental hypertension: the Johns Hopkins Precursors Study. Arch Intern Med. 2008;168(6):643-8.
12. Rebbeck TR, Turner ST, Sing CF. Probability of having hypertension: Effects of sex, history of hypertension in parents, and other risk factors. Journal of Clinical Epidemiology. 1996;49(7):727-34.

13. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension. 2018;71(6):e13-e115.
14. Altun B, Arici M, Nergizoglu G, et al. Prevalence, awareness, treatment and control of hypertension in Turkey (the PatenT study) in 2003. Journal of Hypertension. 2005;23:1817-23.
15. Sozmen K, Ergor G, Unal B. Factors affecting hypertension prevalence, awareness, treatment uptake and blood pressure control. Dicle Medical Journal. 2015;42(2).
16. Wilson PW, D'Agostino RB, Sullivan L, Parise H, Kannel WB. Overweight and obesity as determinants of cardiovascular risk: the Framingham experience. Arch Intern Med. 2002;162(16):1867-72.
17. Ozkan Pehlivanoglu EF, Saglan Y, Balcioglu H, Yildiz P, Bilge U, Unluoglu I. Evaluation of Mediterranean Type Nutrition Habits with Blood Pressure Regulation and Metabolic Syndrome Parameters in Patients with Hypertension. Anatol J Family Med 2019;2(3):103–7.