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Pattern of Healthcare Utilization Related to Hypertension and Associated Factors: A Survey Study in the Capital of Iran

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Abstract

Background: Updating hypertension-related healthcare services requires understanding of the utilization status and its associated factors. This study aimed to assess patterns of healthcare utilization related to hypertension and its associated factors in Tehran.

Methods: This population-based cross-sectional study was conducted on adult residents over 30 years of age using a multistage stratified random sampling from December 2024 to May 2025. The data were collected using telephone interviews via a researcher-made questionnaire that included demographic information and information on the utilization patterns of health services related to hypertension. Multiple logistic regression was used to evaluate factors associated with health service utilization at the 95% confidence level using STATA-Command Survey software version 18.

Results: Among the 4,500 participants, 14.6% (95% CI= 13.4–15.8) reported the utilization of healthcare services in healthcare facilities in Tehran during the past two years, with 22.3% (95% CI= 19.5–25.3) utilization observed among individuals with hypertension. In total, the largest proportion of reasons for receiving related health services were related to having worrying about symptoms (75.5%), good response and behavior from service providers (61.3%), and a high level of centers—doctors/healthcare providers (42.4%). Among the 3843 people who did not receive health services, the greatest proportion were related to financial problems and a lack of favorable insurance status (81.2%) and inadequate health service to meet needs (63.2%). Utilization was significantly related to increasing age (OR =3.94, 95% CI= 2.01--5.09), higher education level (OR =3.74, 95% CI= 1.85--5.02), better socioeconomic status (OR =3.21, 95% CI= 1.61--4.96), having armed forces health insurance good (OR =4.03, 95% CI= 1.27--6.98), and supplementary insurance good (OR =6.13, 95% CI= 2.41--8.14).

Conclusion: Utilization of hypertension-related services in Tehran is suboptimal and is not only due to individual inattention but also the result of the interaction of various individual, economic, and social factors, which must be viewed as a package of intervenable issues to improve it.

Keywords: Utilization, Hypertension, Health care, Health services

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Introduction

Hypertension, as one of the most important risk factors associated with noncommunicable diseases (NCDs) in Iran and worldwide, kills millions of people every year. Approximately 1.4 billion adults aged 30 to79 years worldwide will have hypertension by 2024; this number is equivalent to 33% of the population in this age group (1).

Approximately 600 million adults with hypertension (44%) are unaware that they have this disease. Approximately 320 million adults with hypertension (23%) have this disease under control (2). Currently, hypertension is one of the leading causes of premature death worldwide (2). One of the global targets for NCD is to reduce the

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↑What is "already known" in this topic:
Previous studies on a smaller scale have addressed some factors related to the utilization of some health services and have not determined the factors related to the utilization in Tehran under the current socioeconomic conditions and the development of urbanization.

→What this article adds:
This study, for the first time, examined patterns and the reasons for utilization by sampling all 22 districts of Tehran through a telephone survey from different perspectives and highlighted the role of various social, economic, and cultural factors affecting utilization.

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prevalence of uncontrolled hypertension by 25% between 2010 and 2025 (3).

In Iran, hypertension is also one of the most important health challenges. According to a national survey conducted in Iran, the incidence of hypertension increased from 26% in 2016 in the general population to 32% in 2021. However, treatment coverage for hypertension has increased from 40% to 52% (4). Two systematic reviews in the Iranian population reported that the prevalence of hypertension in adults aged 30–55 years and older than 55 years was 23% and 50%, respectively (5, 6). The increasing prevalence of this disorder for various reasons, including the aging of the population, related health risk factors, and environmental factors associated with hypertension, has led to a significant increase in disability resulting from hypertension-related complications, treatment and care costs, and ultimately numerous social and health problems (7, 8).

One of the strategies that different countries choose to address the consequences of hypertension is the expansion of related healthcare services that seek early diagnosis, proper treatment, and the reduction of complications of this disorder at different levels (9). In Iran, after the political revolution, a health network was launched in all cities and villages with the aim of accessing healthcare services. With the increase in the prevalence of noncommunicable diseases due to the epidemiological transition in Iran, healthcare programs related to these diseases have expanded (10). Therefore, care packages related to noncommunicable diseases, including prevention and care of hypertension, expanded in the Family Medicine Program, Health Transformation Plan, and recent national health programs in Iran (11).

Despite the expansion of hypertension-related care packages in the Iranian health system, the COVID-19 epidemic has disrupted the ability to provide services related to hypertension and other factors related to cardiovascular diseases (12). On the other hand, the expansion of urbanization and the movement of the population from small towns and villages to live in metropolises, including the capital of Iran, has exposed different population groups to pollutants, environmental stressors, and modern urban lifestyles, which ultimately has provided the necessary basis for the spread of noncommunicable diseases, including hypertension (13).

Updating hypertension-related healthcare services requires an understanding of the utilization status and its associated factors to adopt necessary interventions to improve access, improve utilization, and ultimately promote public health (14). According to surveys conducted among adult residents of Tehran, only approximately 56% of the people are aware of hypertension, and the percentage of effective treatment coverage is approximately 45%(15). However, the pattern of healthcare utilization related to this disease is unknown, and as the health system decides to reform care packages and referral systems in metropolitan areas, it faces the challenge of not knowing the status of the pattern of health service utilization related to noncommunicable diseases, including hypertension, from the perspective of the public. This assessment cannot be performed with official data from the healthcare system in the Tehran metropolitan area. As a result, conducting a large study with a large sample size, considering the population ratio of all 22 districts of Tehran in the final sample, is highly important for the health system, which has not been done thus far. Therefore, the purpose of this study was to assess patterns of healthcare utilization related to hypertension and its associated factors in Tehran.

Methods

Study population and sampling

This study was a population-based cross-sectional study conducted on 4,500 adult Tehran residents over 30 years of age who had lived in one of the 22 districts of the city; multistage stratified random sampling was used from December 2024 toMay 2025. In the first stage, each of the 22 urban districts of Tehran was considered a stratum, and the sample size of each district was determined on the basis of the proportion of the population over 30 years of age living in Tehran. In the second stage, eligible individuals were selected from each stratum on the basis of the allocated sample size via a random sampling method. With the use of the standard formula for sample size calculation in survey studies (16), considering that healthcare utilization related to hypertension accounts for 30% of cases in Tehran (17), an estimation error of 2%, with an α error of 5%, and a design effect of 2 for this study (18), the minimum sample size was calculated as 4034 people. With the possibility of an anticipated nonresponse of 10% during sampling, the minimum sample size was considered to be 4437 people.

Data collection

The interviewers, consisting of 3 individuals with desirable social skills for conversation and interviewing, received standard training before the study began, including how to present questions in a neutral and noninductive manner, accurately record responses, and maintain the confidentiality of information. To ensure data quality, continuous monitoring and random controls were performed, the questionnaire was piloted in 20 telephone calls, and necessary modifications were made before final implementation.

For data collection, a telephone interview process was conducted on the basis of the telephone numbers of the homes in each urban district. To reduce the possibility of information bias, particularly recall bias, after starting the phone conversation, the interviewer introduced herself, explained the purpose of the study, the meaning of utilization, and the health services in question, and mentioned that the questions were related to the last health services received regarding hypertension during the past two years. To manage possible selection bias, the interview process was conducted during both morning and evening hours. If the respondent did not meet the criteria for participation in the study, they were asked to talk to a person over 30 years of age living in the home. Otherwise, they call the next contact number. If the individual was unwilling to participate, the next phone number was selected from the list of contact numbers, and the questioning process continued until the next person answered. If the person did not answer the call, the next time would call him. If there was still no answer, the call was repeated two days later. Finally, if there was

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still no answer, another phone number was selected from the list for questioning.

Study questionnaire

The questionnaire used in this study consisted of a standard researcher-developed questionnaire with two parts (Appendix 1). The first part included demographic characteristics, including age, sex, marital status, health education status, insurance status, self-reported health and socioeconomic status, household size, job status, source of information related to hypertension, self-reported hypertension status, concern about the consequences of the disease and nonadherence to follow-up care. To measure socioeconomic status, the standard question "What would your situation be if we divided socioeconomic status into five categories in your place of residence?" The following response options were used: low, low to moderate, moderate, moderate to high, and high (19). Self-rated health was also measured via the standard question (20), “In general, how would you rate your health today?” Responses ranged on a 5-point Likert scale from “very bad” to “very good.” The second part of the questionnaire included the measurement of utilization status, time and place of receiving services, circumstances of service utilization, providing health education, perceived impact on health, reasons for utilizing or not utilizing, and waiting time to receive care services related to hypertension. First, individuals were asked “Have they received health services related to hypertension from one of the medical and health centers in Tehran during the past two years?”. If individuals answered yes, questions related to utilization were asked about the last service received. Individuals who did not receive services during this time period were only asked about their reasons for not receiving healthcare services, which was a multiple-choice question.

The validity and reliability assessment was conducted via two qualitative and quantitative methods. First, while related evidence was reviewed, initial questions were designed; then, by conducting a focus group discussion among providers of hypertension-related care services (healthcare providers and physicians), the questions were revised, and the validity and reliability assessment process was carried out. The CVR and CVI indices, as well as Cronbach's alpha for all items of this questionnaire, were greater than 0.8 0.8.

After the instrument was standardized, the questioning process began. After the conversation and while the researcher introduced himself, the interviewer explained the purpose of the study. The individual was then assured that none of this information would be made available to anyone and that the data would be used in general in a research study. At the beginning of the questioning, verbal consent was obtained. After the participants were asked about their demographic information and hypertension status, they were asked if they had received hypertension-related services from a related medical or health center, at least once in the past two years. Otherwise, the questioning process ended with a question about the reasons for not receiving services.

In multiple-choice questions, items were stated by the interviewer and selected by the participant. Any item that the individual needed to explain was explained by the interviewer, and the individual was asked if there was anything other than the items stated.

Analysis

Data analysis was performed using Stata software and the survey-weighted (svy) commands. To generalize the results to the adult population (≥30 years) of Tehran, a sampling weight was calculated for each individual. This weight was determined on the basis of the ratio of the population of people over 30 years of age in each region to the number of samples allocated to that district so that each individual represented a certain number of the actual population of his or her district.

Applying these weights in all analyses resulted in estimates of proportions and indices related to health service utilization being more accurate representatives of the target population. In this study, missing data were identified and investigated before analysis. The percentage of missing data was calculated for each variable, and the pattern of missing data (random or nonrandom) was assessed. To manage missing data, if the percentage was low (<5%), incomplete records were excluded from the analysis. In cases where missing data were significant, multiple imputation was used to minimize the possible effect of incomplete data on the results of the analyses.

In the description section, the number and percentage were used by sex, place of service receipt, and hypertension status. To facilitate the application of the results, utilization status, last place of service, and last time of service were analyzed and reported by hypertension status. Additionally, to compare the utilization patterns across health service delivery systems, the results were analyzed by the place where the patients received the last health service. In the analytic section concerning health service utilization, the analysis was performed via multiple logistic regression. First, each variable that was measured in both groups, utilized and not utilized, was analyzed via univariable analysis. Variables that had a p value less than 0.2 were entered into the multiple logistic regression analysis, and their relationship with utilization status was measured. The analysis was performed at 95% confidence intervals using STATA software version 18.

Results

Demographic characteristics:

According to Table 1, out of a total of 6489 contacted households, 4500 people were willing to participate (overall response rate = 69.3%). In total, 2083 females (46.3%) and 2417 males (53.7%) participated in the study, with the largest proportion in the 30-40 years (32.7%) and 40–50 years (24.7%) age groups. In terms of education level, most had an associate or bachelor's degree (57.8%).

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Table 1. Demographic characteristics of the participants (N=4500)

Variable	Level	Males (2083 people - 46.3%)		Females (2417 people - 53.7%)		Total (4500 people)		*P* value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Age group	30-40	717	34.4	892	36.9	1610	32.7	0.116
	40-50	527	25.3	583	24.1	1110	24.7	
	50-60	414	21.3	524	21.7	967	21.5	
	Over 60	395	19	418	17.3	813	21.1	
Education level	Less than diploma	180	8.6	209	8.6	389	8.6	0.529
	Diploma	295	14.2	304	12.6	599	13.3	
	Associate	518	24.9	634	26.2	1152	25.6	
	Bachelor	663	31.8	785	32.5	1448	32.2	
	Master and above	427	20.5	485	20.1	912	20.3	
Marital status	Single	868	41.7	1042	43.1	1910	42.4	0.209
	Married	1050	50.4	1160	48	2210	49.1	
	Separated/Spousal Deceased	165	7.9	215	8.9	380	8.5	
Job status*	Freelance	562	27	78	3.2	640	14.2	0.001
	Retired	95	4.6	122	5	217	4.8	
	Unemployed	472	22.7	343	14.2	815	18.1	
	Housewife	-	-	1731	71.6	1731	38.5	
	Student	470	22.6	412	17	882	19.6	
	Worker	373	17.9	96	4	469	10.4	
	Nonmanagerial employee	216	8.9	860	41.3	1076	23.9	
	Managerial employee	325	15.6	206	8.5	531	11.8	
	University professor	12	0.6	25	1	37	0.8	
Self-rated health status	Very bad	145	7	176	7.3	321	7.1	0.898
	Bad	277	13.3	328	13.6	605	13.4	
	middle	826	39.7	943	39	1769	39.3	
	Good	678	32.5	772	31.9	1450	32.3	
	Very good	157	7.5	198	8.2	355	7.9	
Self-reported socioeconomic status	low	325	15.6	401	16.6	726	16.1	0.478
	low to moderate	422	20.3	468	19.4	890	19.8	
	moderate	836	40.1	990	41	1826	40.6	
	moderate to high	335	16.1	352	14.6	687	15.3	
	high	165	7.9	206	8.5	371	8.2	
Type of Insurance	Social Security (Self-employed)	163	7.8	215	8.9	378	8.4	0.697
	Iran Health	572	27.5	665	27.5	1237	27.5	
	Social Security (formal employees)	942	45.2	1086	44.9	2028	45.1	
	Armed Forces Medical Services	267	12.8	304	12.6	571	12.7	
	Uninsured	139	6.7	147	6.1	286	6.3	

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Table 1. Demographic characteristics of the participants (N=4500)

Variable	Level	Males (2083 people - 46.3%)		Females (2417 people - 53.7%)		Total (4500 people)		*P* value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Supplementary insurance status	No	1789	85.9	1904	85.4	3693	82.1	0.690
	Yes	294	14.1	353	14.6	807	17.9	
Household	Single-person household	264	12.7	279	11.5	543	12.1	0.452
	2 people	1347	64.7	1542	63.8	2889	64.2	
	3 people	223	10.7	274	11.3	497	11	
	4 people	126	6	163	6.7	289	6.4	
	5 people	36	1.7	57	2.4	93	2.1	
	More than 6 people	87	4.2	102	4.2	189	4.2	
hypertension status	No	1276	61.3	1484	61.4	2760	61.3	0.146
	Yes	325	15.6	322	13.3	647	14.4	
	unknown	482	23.1	611	25.3	1093	24.3	
Concerns about adverse health outcomes due to hypertension	Not at all	220	10.6	421	17.4	641	14.2	0.001
	Slightly	210	10.1	312	21.9	522	11.6	
	Moderately	520	25	792	32.8	1312	29.2	
	Very much	1133	54.4	892	36.9	2025	45	
Source of information for education about hypertension*	Physician or other healthcare professionals	756	36.3	1184	49	1940	43.1	0.001
	Television or radio	400	19.2	636	26.3	1036	23	
	Family or friends	661	31.7	967	40	1628	36.2	
	Books, magazines, or brochures	189	9.1	226	9.4	415	9.2	
	Social media such as Telegram, Instagram, etc.	1310	62.9	1723	71.3	3033	67.4	

*Participants could choose multiple options.

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A total of 93.7% of the participants reported having basic health insurance, 17.9% of whom had supplementary insurance. In total, 14.4% of the participants self-reported having hypertension, with 15.6% being females and 13.3% being males. Only 74.2% of the participants expressed high or moderate concerns about delayed treatment and the occurrence of adverse health outcomes due to hypertension, and in terms of information sources, most people reported social media (67.4%) and physicians or other healthcare professionals (43.1%). A statistically significant difference was observed between male and female participants in terms of job status, concern status, and source of information (P<0.05).

Healthcare utilization, time and place of last services by disease status

As Table 2 shows, a total of 14.6% (95% CI= 13.4–15.8) of the participants received health services in one of the healthcare facilities in Tehran during the past two years, with a utilization proportion of 22.3% (95% CI= 19.5–25.3) in those with hypertension and 11.9% (95% CI= 10.5–13.3) in those without hypertension.

Among those who received healthcare services, the largest proportion reported receiving their last service more than a year ago (55.1%), whereas among those with hypertension, 37.5% (95% CI= 28.6–46.4) received the service more than a year ago. In terms of the place where the last service was received, the largest proportion was private specialist physicians (33.9%) and private-sector general practitioners (28.1%).

Patterns of healthcare utilization related to hypertension by type of facility, circumstances, waiting times, and service outcomes

According to Table 3, in terms of circumstances of service utilization, the highest proportion was related to medical advice, referrals, or recommendations from a physician or healthcare provider (66.2%). The main reasons for receiving the last service for most people were having worrying symptoms (75.5%), good response and behavior from service providers (61.3%), and high scientific and skill levels among centers and providers (42.4%).

While the wait time before receiving service was more than 30 minutes for most people (63.3%), the wait time while receiving service was less than 15 minutes for most people (74.1%). Additionally, 71.2% of people stated that health education was not provided, and only 46.6% believed that these services had a perceived impact on their health.

Reasons for not receiving healthcare services

As Table 4 shows, among those who did not receive health services, most participants reported financial difficulties and a lack of appropriate insurance status (81.2%) and insufficient services to meet needs (63.2%) as reasons for their non-utilization, and the least frequent reasons were self-medication with conventional or traditional remedies (14.2%) and fear of receiving health services (22.9%).

Association between healthcare utilization for hypertension and associated factors via multiple logistic regression

Table 5 shows the associations between health service utilization for hypertension and associated factors according to multiple logistic regression. The odds of healthcare utilization were approximately 2.81 (95% CI=1.06--3.68) and 3.94 (95% CI=2.01--5.09) times greater for people aged 50 to60 years and over 60 years, respectively, than for those aged under 40 years. Males had significantly lower utilization of services than females did (OR=0.82, 95% CI=0.47--0.92). Among the nonmedical factors, having a master's degree or higher (OR=3.74, 95% CI=1.85--5.02), having armed force insurance (OR=4.03, 95% CI=1.27--6.98) and supplementary insurance (OR=6.13, 95% CI=4.22--8.14) were significantly associated with health service utilization.

The participants who received information from health workers or social networks had 3.43 (95% CI=1.98--4.94) and 3.16 (95% CI=2.14--5.96) times greater odds of healthcare utilization, respectively. There was also a significant positive relationship between hypertension and utilization (OR=3.56, 95% CI=1.96--5.61).

Discussion

The purpose of this study was to identify patterns and factors associated with healthcare utilization related to hypertension in Tehran. One of the key findings of this study was the low utilization of hypertension-related services among diagnosed patients. This study revealed that 14.6% of all participants and 22.3% of individuals with hypertension had received hypertension-related services at least once in the past two years. Previous studies have reported different levels of utilization depending on the group under investigation. The Oraii study revealed that 53% of individuals with hypertension received health services in Tehran (21).

Ebrahimi noted that only 30% of people with hypertension in Tehran receive the necessary medical and healthcare services (22). A machine learning-based study in Tehran revealed that the utilization of health services is 49% in hypertensive patients and 7% in asymptomatic people (23). Another study reported that the percentage of people with hypertension who utilized health services was only 10% (24).

The wide range of estimates across studies may be due to differences in the definition of utilization, the time period considered, the type of health service, and the method of data collection. Unlike studies that assess health service utilization on the basis of only the registration of visits or the receipt of services in formal systems, this study's approach was based on individuals' perceptions and reports of receiving hypertension-related services. This methodological distinction may explain why the reported utilization rate in this study was lower than that reported in some previous studies.

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Table 2. Healthcare utilization, time and place of last services by disease status

Variable	Levels	hypertension status						Total		*P*
		Yes		No		Unknown		(N=4500)		
		N=647 (14.4%)		N=2760 (61.3%)		N=1093 (24.3%)				
		N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	
Utilization status	No	503	77.7 (74.7 – 80.5)	2432	88.1 (86.7 – 89.5)	906	82.9 (80.5 – 85.3)	3843	85.4 (84.2 – 86.6)	0.001
	Yes	144	22.3 (19.5 – 25.3)	328	11.9 (10.5 – 13.3)	187	17.1 (14.7 – 19.5)	657	14.6 (13.4 – 15.8)	
		N=144 (21.9%)		N=328(49.7%)		N=187(28.4%)		(N=657)		
Time of last use of healthcare services (month)	< 3	17	11.8 (6.9 – 16.7)	47	14.3 (10.5 – 18.1)	25	13.4 (8.8 – 18.0)	89	13.5 (10.8 – 16.2)	0.001
	3-6	34	23.6 (16.2 – 31.0)	39	11.9 (8.5 – 15.3)	12	6.4 (3.0 – 9.8)	85	12.9 (10.3 – 15.5)	
	6-12	39	27.1 (19.3 – 34.9)	61	18.6 (14.3 – 23.0)	22	11.8 (7.3 – 16.3)	122	18.6 (15.5 – 21.7)	
	>12	54	37.5 (28.6 – 46.4)	171	52.1 (46.1 – 58.1)	128	68.4 (61.5 – 75.3)	362	55.1 (51.2 – 59.0)	
Place of Last use of healthcare services	Primary healthcare center	27	19.0 (12.0 – 26.0)	52	15.9 (11.8 – 20.0)	31	16.6 (11.3 – 21.9)	110	16.7 (13.7 – 19.7)	0.001
	Private specialist physician	53	36.6 (27.5 – 45.7)	110	33.5 (28.2 – 38.8)	61	32.6 (25.7 – 39.5)	223	33.9 (30.2 – 37.6)	
	Private-sector general practitioner	37	25.7 (18.0 – 33.4)	94	28.7 (23.2 – 34.2)	55	29.4 (22.5 – 36.3)	185	28.1 (24.1 – 32.1)	
	Government clinic or hospital	13	8.8 (3.9 – 13.7)	30	9.1 (5.9 – 12.3)	11	5.9 (2.4 – 9.4)	54	8.2 (6.0 – 10.4)	
	Social Security clinic or hospital	10	7.1 (2.3 – 11.9)	21	6.4 (3.8 – 9.0)	16	8.6 (4.4 – 12.8)	46	7.0 (4.9 – 9.1)	
	Traditional medicine	4	2.8 (0.1 – 5.5)	22	6.7 (3.9 – 9.5)	14	7.5 (3.5 – 11.5)	39	5.9 (3.9 – 7.9)	

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Table 3. Patterns of healthcare utilization related to hypertension by type of facility, circumstances, waiting times, and service outcomes (n=657)

Variable	Levels	Primary healthcare center (n=110)	Private specialist physician (n=296)	General-private doctor (n=117)	Government clinic or hospital (n=34)	Social Security clinic or hospital (n=41)	Traditional medicine (n=59)	Total (n=657)	*P*.value
circumstances of service utilization*	Voluntarily and with the individual's knowledge	96 (87.3)	103 (34.7)	64 (54.7)	5 (14.7)	18 (43.9)	46 (78.3)	332 (50.5)	0.001
	medical advice, referral, or recommendation from a physician or health care provider	71 (64.5)	224 (75.8)	72 (61.5)	22 (64.7)	25 (61)	21 (35)	435 (66.2)	
	Recommendations from family, friends and neighbors	11 (10)	81 (27.3)	18 (15.4)	23 (65.9)	27 (65.9)	43 (73.3)	203 (27.9)	
	Other reasons	11 (10)	7 (2.4)	3 (2.6)	1 (2.9)	2 (2.9)	8 (13.3)	32 (4.6)	
Reason for the last receive healthcare services*	Close distance and easy access to the service center	62 (56.3)	74 (24.9)	47 (39.6)	10 (28.4)	5 (11.9)	16 (26.8)	214 (32.5)	0.001
	Low cost or no financial issues to get the service	84 (76.4)	47 (15.8)	41 (34.9)	24 (69.4)	31 (74.9)	46 (78.4)	273 (41.5)	
	Good response and behavior of service providers	38 (34.7)	227 (76.4)	66 (56.2)	17 (50.2)	16 (39.8)	39 (66.9)	403 (61.3)	
	Convenient working hours for visiting centers	79 (71.5)	31 (10.5)	17 (13.9)	21 (60.3)	33 (81.7)	38 (65.9)	219 (33.3)	
	High level of centers - doctors/healthcare providers in terms of science, literacy, training methods, and medical advice	28 (25.6)	146 (49.2)	45 (38.5)	9 (26.8)	7 (16.8)	44 (74.9)	279 (42.4)	
	Having worrying symptoms	58 (52.3)	265 (89.4)	83 (71.2)	23 (66.3)	29 (70.4)	38 (64.9)	496 (75.5)	
	Other reasons	11 (9.4)	19 (6.2)	7 (5.9)	2 (3.3)	2 (5.4)	10 (16.9)	51 (7.7)	
Waiting time before receive healthcare services	less than 15 minutes	60 (54.5)	43 (14.9)	19 (16.3)	5 (13.6)	7 (15.8)	36 (61.6)	111 (16.9)	0.001
	15-30 minutes	30 (27.6)	54 (17.9)	25 (20.6)	7 (20.2)	6 (13.8)	18 (30.1)	130 (19.8)	
	>30	20 (17.9)	199(67.2)	73 (61.8)	22 (66.2)	28 (70.4)	5 (8.3)	416 (63.3)	

*Participants could choose multiple options

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Table 3. Cont

Variable	Levels	Primary healthcare center (n=110)	Private specialist physician (n=296)	General-private doctor (n=117)	Government clinic or hospital (n=34)	Social Security clinic or hospital (n=41)	Traditional medicine (n=59)	Total (n=657)	*P*.value
Waiting time during receive healthcare services	less than 15 minutes	67 (61.2)	235 (79.5)	85 (72.9)	29 (85.3)	30 (73.2)	41 (69.6)	487 (74.1)	0.001
	15-30 minutes	20 (18.3)	44 (14.8)	19 (16.2)	3 (9.8)	9 (22.2)	16 (27.2)	111 (16.9)	
	>30	33 (20.5)	17 (5.7)	13 (10.9)	2 (4.9)	2 (4.6)	2 (3.2)	69 (9)	
Providing educational intervention during healthcare services	No	80 (72.7)	228 (77.1)	93 (79.4)	22 (64.1)	37 (90.2)	8 (13.3)	468 (71.2)	0.001
	Yes	30 (27.3)	68 (22.9)	24 (20.6)	12 (35.9)	4 (9.8)	51 (86.7)	189 (28.8)	
perceived impact on their health	No	69 (62.3)	118 (39.8)	55 (46.9)	14 (40.9)	18 (43.6)	18 (29.7)	292 (44.4)	0.001
	Yes	29 (26.6)	152 (51.3)	52 (44.2)	18 (53.9)	17 (41.4)	38 (68.4)	306 (46.6)	
	I do not know	12 (11.1)	26 (8.9)	10 (8.9)	2(5.2)	6 (15.3)	2(1.9)	59 (8.9)	

*Participants could choose multiple options

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Table 4. Reasons for not seeking or receiving healthcare services by hypertension status*

Levels	Hypertension status				*P*.value
	Yes N=505 (15.1%)	No N=2432 (61.3%)	Unknown N=906 (23.6%)	Total (n=3843)	
Long distance from the service center	99 (19.6)	720 (29.6)	204 (22.6)	1023(26.6)	0.001
no symptoms or problems.	138 (27.4)	1550 (63.7)	560 (61.8)	2248(58.5)	
Financial problems and lack of favorable insurance status	421 (83.4)	1926 (79.2)	766 (84.6)	3113(81.2)	
Working hours coincide with the center's activities.	136 (26.9)	562 (23.1)	220 (24.3)	918(23.9)	
self-medication with conventional or traditional remedies	59 (11.7)	355 (14.6)	125 (13.8)	539(14.2)	
Incorrect behavior or low level of literacy and knowledge of the service provider	325 (64.3)	1437 (59.1)	546 (60.3)	2308(60.1)	
Inadequate service to meet needs	349 (69.2)	1499 (61.6)	581 (64.1)	2429(63.2)	
Distrust in health services	186 (36.8)	712 (29.3)	278 (30.7)	1176(30.6)	
Fear of health services	132 (26.2)	479 (19.7)	269 (29.7)	880(22.9)	
Other reasons	25 (4.9)	148 (6.1)	50 (5.5)	223(5.8)	

*Participants could choose multiple options.

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Table 5. Association between healthcare utilization for hypertension and associated factors using multiple logistic regression

Variable	Level	OR Crude	95% CI OR		P value	OR adjusted	95% CI OR		*P* value
			Lower	Upper			Lower	Upper	
Age group	Under 40	Ref	-	-	-	Ref	-	-	-
	40-50	2.36	1.03	3.98	0.007	1.23	0.93	1.74	0.126
	50-60	3.91	1.13	5.17	0.003	2.81	1.06	3.68	0.041
	Over 60	4.83	2.06	6.89	0.001	3.94	2.01	5.09	0.002
Gender	Female	Ref	-	-	-	Ref	-	-	-
	Male	0.71	0.34	0.97	0.007	0.82	0.47	0.92	0.017
Education	Undergraduate	Ref	-	-	-	Ref	-	-	-
	Diploma	1.24	0.94	2.03	0.472	-	-	-	-
	Associate	1.48	0.84	2.31	0.361	-	-	-	-
	Bachelor	1.27	0.79	2.48	0.420	-	-	-	-
	Master and above	4.81	1.73	6.37	0.001	3.74	1.85	5.02	0.001
Self-reported socioeconomic status	Very bad	1.89	0.89	3.04	0.162	1.03	0.89	2.08	0.079
	Bad	Ref	-	-	-	Ref	-	-	-
	Middle	1.98	0.96	2.13	0.410	-	-	-	-
	Good	3.97	1.16	5.15	0.007	3.21	1.61	4.96	0.026
	Very good	3.84	1.23	4.97	0.003	3.09	1.48	4.86	0.012
Marital status	Single	Ref	-	-	-	Ref	-	-	-
	Married	4.17	1.82	6.84	0.001	3.88	1.97	6.03	0.001
	Separated/Spousal Deceased	2.12	1.06	3.91	0.031	1.74	0.94	3.10	0.174
Job	Freelance	1.34	0.95	2.69	0.490	-	-	-	-
	Retired	4.69	1.84	6.32	0.001	3.09	1.49	5.56	0.001
	Unemployed	Ref	-	-	-	Ref	-	-	-
	Housewife	4.12	1.69	6.03	0.004	3.29	2.03	5.69	0.006
	Student	1.85	0.89	2.36	0.326	-	-	-	-
	Worker	3.98	1.06	5.21	0.001	3.16	1.89	4.95	0.001
	Nonmanagerial employee	3.12	1.89	5.61	0.004	2.64	1.13	3.87	0.019
	Managerial employee	4.12	2.04	5.87	0.001	3.29	2.64	6.38	0.001
	Academic	3.41	1.47	5.97	0.003	2.19	1.06	3.65	0.023
Household	single-person household	Ref	-	-	-	Ref	-	-	-
	2 people	2.03	0.86	3.61	0.202	1.69	0.98	2.41	0.161
	3 people	2.98	1.06	4.03	0.013	2.03	0.96	3.58	0.087
	4 people	3.16	1.39	5.68	0.035	2.98	1.13	4.85	0.005
	5 people	4.32	1.49	6.37	0.001	3.94	2.06	5.97	0.001
	6 people and above	4.38	2.79	6.98	0.001	3.29	1.84	5.37	0.007

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Table 5. Cont

Variable	Level	OR Crude	95% CI OR		P value	OR adjusted	95% CI OR		*P* value
			Lower	Upper			Lower	Upper	
Type of Insurance	Social Security (formal employees)	2.89	1.95	5.94	0.003	1.67	0.94	2.24	0.071
	Social Security (Self-employed)	2.16	1.82	4.39	0.29	-	-	-	-
	Iran Health	1.94	0.85	3.92	0.061	1.29	0.76	2.43	0.132
	Armed Forces Medical Services	4.89	1.72	6.93	0.001	4.03	1.27	6.98	0.001
	Uninsured	Ref	1	1	-	Ref	-	-	-
Supplementary insurance status	No	Ref	1	1	-	Ref	1	1	-
	Yes	6.98	3.69	8.67	<0.001	6.13	4.22	8.14	<0.001
Source of access to information	Doctors or other healthcare professionals	4.28	2.65	6.12	<0.001	3.43	1.98	4.96	<0.001
	Television or radio	Ref	1	1	-	Ref	1	1	-
	Family or friends	2.98	1.45	4.27	0.013	1.74	0.89	2.46	0.078
	Books, magazines, or brochures	1.24	0.83	2.03	0.510	-	-	-	-
	Social media such as Telegram, Instagram, etc.	4.37	2.39	6.98	0.001	3.16	2.14	5.96	0.004
Self-rated health status	Very bad	1.06	0.53	1.27	0.37	-	-	-	-
	Bad	Ref	1	1	-	Ref	1	1	-
	Middle	3.69	1.29	5.37	0.001	2.84	1.96	3.85	0.037
	Good	4.07	2.09	6.34	0.001	3.41	2.29	5.84	0.001
hypertension status	No	Ref	-	-	-	Ref	-	-	-
	Yes	4.67	2.07	6.49	0.001	3.56	1.96	5.61	0.001

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The low utilization of hypertension-related health services in this study cannot be attributed simply to “lack of awareness” or “individual neglect” but rather to a significant disconnect between the formal health service delivery system and individuals’ lived experience of receiving care (25). In other words, what is defined, recorded, and reported as “service delivery” in the health system structure does not necessarily overlap with what individuals perceive as effective, meaningful, and relevant care. In such circumstances, contact with the health system does not necessarily translate into an experience of effective care from the individual’s perspective, and this discrepancy can affect how services are reported and even continued use.

This perception gap is particularly important for diseases such as hypertension, which are often asymptomatic. In the absence of obvious and immediate symptoms (26), patients' perceptions of the need for regular follow-up depend largely on the quality of the interaction with service providers, the amount of explanation and health education received, and the perceived effectiveness of the health service. If an individual feels that their visit does not lead to a tangible change in health status, a better understanding of the disease, or effective control, they are less likely to view the visit as a “receipt of hypertension-related services” or to have any motivation to continue following up (27).

Additionally, a low amount of service utilization should be seen as a reflection of structural and communication challenges in the healthcare delivery system rather than simply the result of a lack of knowledge or inappropriate individual behaviors (28). This finding suggests that enhancing the use of hypertension-related services requires a rethinking of how services are defined, delivered, and communicated to patients so that the care provided is also experienced as effective, relevant, and valuable from the recipient's perspective. Otherwise, even with physical access to services, people's active and continuous participation in the care process will be challenged.

The study revealed that only a quarter of the participants had received their most recent service within the past six months. However, one-third of those who reported having hypertension had not received any service for more than a year. Although the guidelines for risk assessment and health care related to hypertension recommend follow-up care at intervals of 3 to 6 months (11), this study revealed that a high percentage of people do not adhere to this recommendation. A study conducted by Hedavand et al. revealed that only 20% of the Tehran population had timely visits to one of the health centers for cardiovascular-related care (29). Another study noted that only 40% of people with risk factors for hypertension had timely visits to a health center in the past year (30). The delay in receiving services related to hypertension can be attributed in part to the often-asymptomatic nature of hypertension; in the absence of immediate clinical symptoms, many individuals do not feel the need to seek regular care. In such circumstances, an individual's decision to seek treatment is less based on clinical advice and more influenced by previous experiences with the health system, the level of perception of the effectiveness of services, and the perceived value of previous visits (25).

Therefore, low follow-up rates do not necessarily mean individual neglect but may be the result of a lack of tangible incentives to continue care. On the other hand, the quality of interaction between service providers and patients plays a decisive role in the continuation of service use. When visits to health centers are accompanied by inadequate communication, limited explanation of the disease and treatment, or lack of responsiveness to patient concerns, the individual's motivation for regular follow-up decreases, even if the individual is theoretically aware of the chronicity of the disease (31).

The significant relationship between socioeconomic status and utilization indicates the prominent role of some social inequalities in access to and utilization of the health system (32). A study consistent with the findings of this study showed that individuals with higher socioeconomic status are more likely to receive continuous and effective care services because of greater financial capacity, job stability, higher awareness, and the ability to choose higher-quality centers (33), whereas as shown in the Chaturvedi study, individuals with lower economic status, despite greater need, face more serious financial and structural barriers (32). The significant relationship between having armed health insurance and supplementary medical insurance with better utilization in the present study also emphasizes the importance of social and economic factors affecting utilization. Socioeconomic problems not only seem to be a primary facilitator or deterrent in seeking health services but also play a decisive role in the continuity, type, and quality of services received. Individuals with higher economic status are not only able to afford the direct and indirect costs of care but also have job flexibility, greater awareness, and the ability to choose higher-quality centers and providers (34). This pattern suggests that inequality in the use of hypertension-related services is not simply a reflection of differences in individual needs or preferences but rather a result of the unequal distribution of resources and opportunities in the health system (32). The significant role of supplementary insurance in the use of services also highlights this structural inequality. Although basic insurance provides basic coverage for health services, the findings of this study suggest that this coverage is not sufficient to ensure effective and sustainable access to specialist services and regular follow-up of hypertension patients.

Another finding of this study was that higher educational and job status had a significant relationship with health service utilization. The findings of a multinational study in 76 countries around the world also revealed a direct relationship between better control and care and better employment and education conditions (35). Consistent with the results of the present study, another study emphasized that improving care, strengthening self-care, and other service-seeking behaviors related to hypertension depend on factors such as working conditions and education, which have a mediating role in the implementation of interventions (36). It appears that higher education is usually associated with greater health literacy, a better understanding of the importance of prevention and healthcare, and a greater ability to follow treatment recommendations (37). On the other hand, a study conducted by Yarifard et al. revealed

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that job type can affect health service utilization in terms of both income level and leisure time and the possibility of regular visits to health centers. Unstable jobs or jobs with long working hours practically limit the opportunity to use services regularly, even if the individual wishes to do so (38).

This study also has several limitations. The data collection process was conducted through telephone questioning, and all the data in this study were based on self-reports from participants, which could lead to some information bias. Usually, people who have more favorable communication conditions are willing to participate in the study, which could affect the selection of study participants. Despite the limitations of telephone surveys and the generalizability of the findings, this study examined healthcare utilization patterns from the perspective of service recipients in a large sample size, and there were samples from different areas of the Tehran metropolis in the study.

Conclusion

This study indicates that the utilization of hypertension-related services in the Tehran metropolis is suboptimal, and this is not only a reflection of individual inattention or lack of awareness but also of structural and communication gaps in the health system. Patients' experience with the effectiveness of care, the quality of interaction with providers, and the perception of the value of services play decisive roles in the continuation of follow-up, especially in often asymptomatic diseases such as hypertension. Socioeconomic factors, including financial status; type of insurance, education, and employment conditions; access, quality, and continuity of care; and inequality in these dimensions, make effective care more accessible to affluent groups. Therefore, improving the utilization of services requires a multidimensional approach that simultaneously strengthens physical access, the quality of communication, patient education, adequate insurance coverage, and the effectiveness of services; otherwise, increasing the number of centers or clinical recommendations alone cannot ensure active and continuous patient participation.

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Conflict of Interests

The authors declare that they have no competing interests.

Authors' Contributions

Conceptualization: Seyed Saeed Hashemi Nazari, Koorosh Etemad; Formal analysis: Ahmad Mehri; Methodology: Koorosh Etemad, Ahmad Mehri; Project administration: Ahmad Mehri; Supervision: Seyed Saeed Hashemi Nazari, Koorosh Etemad; Validation: Maryam Farhadpour Writing-original draft: Ahmad Mehri; and Investigation: Manoochehr Karami, Mohsen Barooni.

Ethical Considerations

No personally identifiable information was obtained from the participants. This study was also approved by the Research Ethics Committee of Shahid Beheshti University of Medical Sciences (number 65365).

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Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, following the completion of required legal procedures.

AI Use Statement

AI tools were used solely for idea generation and structural guidance during manuscript preparation. No AI-generated text was used into the manuscript.

References

1. Li F, Li J, Tan S, Zeng G, Zhu J, Zhou J, et al. Cardiovascular Disease Attributable to High Systolic Blood Pressure in Younger Adults Requires Greater Attention: Insights from the Global Burden of Disease Study 2021. J Am Heart Assoc. 2025:e041964.
2. Organization WH. Global report on hypertension: the race against a silent killer: World Health Organization; 2023.
3. Salinas A, Kones R. Barriers to global action plan for the prevention and control of noncommunicable diseases: proposal modifications to the voluntary targets. J Prev Med. 2018;3(1):1–5.
4. Heidari-Foroozan M, Rezaei N, Malekpour M-R, Behnoush AH, Ahmadi N, Abbasi-Kangevari M, et al. Hypertension prevalence and cascade of care in Iran: Updates from the STEPs 2021 national and subnational survey. 2024.
5. Mirzaei M, Moayedallaie S, Jabbari L, Mohammadi M. Prevalence of hypertension in Iran 1980–2012: a systematic review. J Tehran Univ Heart Cent. 2016;11(4):159.
6. Haghdoust A, Sadeghirad B, Rezazadeh KM. Epidemiology and heterogeneity of hypertension in Iran: a systematic review. Arch Iran Med. 2008 Jul;11(4):444-52.
7. Gheorghe A, Griffiths U, Murphy A, Legido-Quigley H, Lamptey P, Perel P. The economic burden of cardiovascular disease and hypertension in low-and middle-income countries: a systematic review. BMC Public Health. 2018;18(1):975.
8. Qian J, Chen Y, Lu D, Ma J, Liu K. The prevalence, disability-adjusted life years, and mortality of hypertensive heart disease and its attributable risk factors: results from the global burden disease study 2019. Arch Med Sci. 2023;19(5):1186.
9. Saleem SM, Bhattacharya S, Deshpande N. Noncommunicable diseases, type 2 diabetes, and influence of front of package nutrition labels on consumer's behavior: Reformulations and future scope. Diabetes Metab Syndr Clin Res Rev. 2022;16(2):102422.
10. Yousefi M, Dastan I, Alinezhad F, Ranjbar M, Hamelmann C, Ostovar A, et al. Prevention and control of noncommunicable diseases in iran: the case for Investment. BMC public health. 2022;22(1):1248.
11. Derakhshan S, Khalili D, Mahdavi A, Hashemi-Nazari SS, Kavousi A, Hadavandsiri F, et al. Evaluation of the effectiveness of the Iran-package of essential noncommunicable disease (IraPEN) program in reducing cardiovascular disease risk in pilot areas. BMC Public Health. 2025;25(1):429.
12. Kluge HHP, Wickramasinghe K, Rippin HL, Mendes R, Peters DH, Kontsevaya A, et al. Prevention and control of noncommunicable diseases in the COVID-19 response. Lancet. 2020;395(10238):1678–80.
13. Khorrami Z, Etemad K, Yarahmadi S, Khodakarim S, Kameli M, Hezaveh AM, et al. Urbanization and noncommunicable disease (NCD) risk factors: WHO STEPwise Iranian NCD risk factors surveillance in 2011. East Mediterr Health J. 2017;23(7):469–79.
14. Bakhtiari A, Takian A, Majdzadeh R, Haghdoost AA. Assessment and prioritization of the WHO "best buys" and other recommended interventions for the prevention and control of noncommunicable

[DOI: 10.47176/mjiri.40.44]

diseases in Iran. BMC Public Health. 2020;20(1):333.
15. Poorhoseini HR, Shafiee A. A general Report of the National Plan for High Blood Pressure Control at Tehran Heart Center in 2019. J Community Health. 2020;7(3):340–4.
16. Rahman MM. Sample size determination for survey research and nonprobability sampling techniques: A review and set of recommendations. J Entrep. 2023;11(1):42–62.
17. Ebrahimi M, Mansournia MA, Haghdoost AA, Abazari A, Alaeddini F, Mirzazadeh A, et al. Social disparities in prevalence, treatment and control of hypertension in Iran: second National Surveillance of Risk Factors of Noncommunicable Diseases, 2006. J Hypertens. 2020;28(8):1620–9.
18. Gianini RJ, Caneto NF, Junqueira NM, Rodrigues LG, Parri BZ, Rodrigues CIS. Precision assessment of a hypertension prevalence survey. BMC Public Health. 2024;24(1):2188.
19. Baigi V, Nedjat S, Fotouhi A, Janani L, Mohammad K. Subjective social status in association with various health and socioeconomic indicators in Tehran. J Public Health. 2016;24(6):497–503.
20. Nedjat S. Is Self-Rated Health a Good Indicator for Assessment of Population Health? A Review Article. Iran J Epidemiol. 2015;10(4):89–96.
21. Oraii A, Shafiee A, Jalali A, Alaeddini F, Saadat S, Sadeghian S, et al. Prevalence, awareness, treatment, and Control of Hypertension among adult residents of Tehran: the Tehran Cohort Study. Global Heart. 2022;17(1):31.
22. Ebrahimi M, Mansournia MA, Haghdoost AA, Abazari A, Alaeddini F, Mirzazadeh A, et al. Social disparities in prevalence, treatment and control of hypertension in Iran: second National Surveillance of Risk Factors of Noncommunicable Diseases, 2006. J Hypertens. 2010;28(8):1620–9.
23. Tavolinejad H, Roshani S, Rezaei N, Ghasemi E, Yoosefi M, Rezaei N, et al. A machine learning approach to evaluate the state of hypertension care coverage: from 2016 STEPs survey in Iran. PLoS One. 2022;17(9):e0273560.
24. Oori MJ, Mohammadi F, Norouzi-Tabrizi K, Fallahi-Khoshknab M, Ebadi A. Prevalence of medication adherence in patients with hypertension in Iran: A systematic review and meta-analysis of studies published in 2000-2018. ARYA Atheroscler. 2019;15(2):82.
25. Hamrahian SM, Maarouf OH, Fülöp T. A critical review of medication adherence in hypertension: barriers and facilitators clinicians should consider. Patient Prefer. 2022:2749–57.
26. Oraii A, Shafiee A, Jalali A, Alaeddini F, Saadat S, Sadeghian S, et al. Prevalence, Awareness, Treatment, and Control of Hypertension among Adult Residents of Tehran: The Tehran Cohort Study. Glob Heart. 2022;17(1):31.
27. Sherman MD, Hooker SA. Family medicine physicians' confidence and perceived effectiveness in delivering health behavior change interventions. Fam Pract. 2020;37(4):493–8.
28. Park S, Kim DD. Patient-provider communication and access, use, and financial burden of care. Am J Prev. 2024;67(5):740–5.
29. Hadavandsiri F, Khalili D, Mahdavi A, Afkar M, Ostovar A, Hashemi-Nazari S–S, et al. Timely referral to health centers for the prevention of cardiovascular diseases: IraPEN national program. Front Public Health. 2023;11:1098312.
30. Jahangard-Rafsanjani Z, Hakimzadeh N, Sarayani A, Najafi S, Heidari K, Javadi MR, et al. A community pharmacy-based cardiovascular risk screening service implemented in Iran. Pharm Pract. 2017;15(2).
31. Zeng J, Gao Y, Hou C, Liu T. The impact of doctor–patient communication on medication adherence and blood pressure control in patients with hypertension: a systematic review. PeerJ. 2024;12:e18527.
32. Chaturvedi A, Zhu A, Gadela NV, Prabhakaran D, Jafar TH. Social determinants of health and disparities in hypertension and cardiovascular diseases. Hypertension. 2024;81(3):387–99.
33. Edoh NL, Chigboh VM, Zouo SJC, Olamijuwon J. Improving healthcare decision-making with predictive analytics: A conceptual approach to patient risk assessment and care optimization. J Int Dent Med Res. 2024;3(2):1–10.
34. Askarzade E, Gorji HA, Arabloo J. The Role of Supplementary Insurance in Achieving Universal Health Coverage: A Comprehensive Review. Med J Islam Repub Iran. 2024;38:28.
35. Kirschbaum TK, Sudharsanan N, Manne-Goehler J, De Neve J-W, Lemp JM, Theilmann M, et al. The association of socioeconomic status with hypertension in 76 low-and middle-income countries. J Am Coll. 2022;80(8):804–17.
36. Abdalla M, Bolen SD, Brettler J, Egan BM, Ferdinand KC, Ford CD, et al. Implementation strategies to improve blood pressure control in the United States: a scientific statement from the American Heart Association and American Medical Association. Hypertension. 2023;80(10):e143–e57.
37. Lee JS, Segura Escano R, Therrien NL, Kumar A, Bhatt A, Pollack LM, et al. Antihypertensive medication adherence and medical costs, health care use, and labor productivity among people with hypertension. J Am Heart Assoc. 2024;13(21):e037357.
38. Yarifard K, Abdi Z, Jaafaripooyan E. Factors Affecting the Utilization of Preventive Health Services by Middle-Aged Population: A Scoping Review. Iran J Public Health. 2025;54(3):554.

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Appendix 1. Questionnaire: Healthcare utilization for hypertension and its associated factors

As you may know, the healthcare system aims to provide high-quality health and medical services to individuals suffering from hypertension and hypertension. A group of researchers from Shahid Beheshti University of Medical Sciences is conducting a study to "Examine the utilization of healthcare services in the provision of care for hypertension in Tehran."

In this study, "utilization" refers to individuals' use of a wide range of healthcare and medical services related to hypertension and hypertension, which are provided to adults in the national health system to maintain and improve their health. These services include care, screening, diagnosis, and treatment related to both hypertension and hypertension, which you have received over the past three months, six months, one year, or beyond from health, medical, and outpatient centers in the city.

We kindly request you to complete this questionnaire, which will take less than 5 minutes. No personally identifiable information is included in this questionnaire, and all data from this study will be used in aggregate to support research and help improve the healthcare service delivery system in Tehran.

Demographic characteristics

Age	… year
Education	• Less than diploma • Diploma • Associate • Bachelor • Master and above
Marital status	• Single • Married • Separated/Spousal Deceased
Job status (you can select multiple options)	• Freelance • Retired • Unemployed • Housewife • Student • Worker • Nonmanagerial employee • Managerial employee • University professor
In general, how would you rate your health?	• Very bad • Bad • middle • Good • Very good
What was your position if the socioeconomic status was divided into five categories where you?'	• Very bad • Bad • middle • Good • Very good
Basic health insurance type	• Self-employed/Tamin ejtemaei • Health • Administrative/Tamin ejtemaei • Armed Forces Insurance • Uninsured
Supplementary insurance status	• No • Yes
Household	• single-person household • 2 people • 3 people • 4 people • 5 people • 6 people and above

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Cont.

Hypertension status characteristics of the study participants	
Based on your last visit or screening by a doctor or health care provider, do you have high blood pressure?	• No • Yes • I do not know
Which members of your family have hypertension? (you can select multiple options)	• Father • Mother • Sister • Brother • Wife • Child • None • I do not know
Do you have concerns that not seeking timely treatment for hypertension may lead to negative health consequences?	• Not at all • A little • Relatively • Very
From which source have you received the most information about hypertension? (you can select multiple options)	• Doctors or other healthcare professionals • Television or radio • Family or friends • Books, magazines, or brochures • Social media such as Telegram, Instagram, etc.
Questions related to utilization	
In the past two years, have you ever received hypertension-related services from one of the health service centers in Tehran?	• No • Yes
If yes, how long ago did you last receive service?	• Less than three months • 3-6 months • 6-12 months • More than 12 months
If yes, from which center was the last service received?	• primary healthcare center • Private specialist doctor's office • Private general practitioner's office • Government clinic or hospital - University of Medical Sciences • Social Security clinic or hospital • Islamic medicine practitioner, traditional medicine, Iranian medicine practitioner who was not a medical staff
If yes, under what conditions did you receive your last service? (you can select multiple options)	• Voluntarily and with the individual's knowledge • Advice, call or order from a doctor or health care provider • Concern about having symptoms • Recommendations from family, friends and neighbors • Other reasons
If yes, what do you think was the reason for receiving the last service? (you can select multiple options)	• Close distance and easy access to the service center • Low cost or no financial issues to get the service • Good response and behavior of service providers • Convenient working hours for visiting centers • High level of centers - doctors/healthcare providers in terms of science, literacy, training methods, and medical advice • Having worrying symptoms • Other reasons
If no, what do you think was the reason for not receiving the service? (You can select multiple options	• Long distance from the service center • no symptoms or problems. • Financial problems and lack of favorable insurance status • Working hours coincide with the center's activities. • Self-treatment with modern and traditional medicine drugs • Incorrect behavior or low level of literacy and knowledge of the service provider • Inadequate service to meet needs • Distrust in health services • Fear of health services • Other reasons
Waiting time before receive healthcare services from the moment you arrive at the service location to meeting the service provider	• less than 15 minutes • 15-30 minutes • >30 •
Waiting time during receive healthcare services from the moment you meet with the service provider until it is completed	• less than 15 minutes • 15-30 minutes • >30
Was necessary health education provided during the last service received?	• No • Yes
In your opinion, did the last service provided have an impact on your health?	• No • Yes • I don't know

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