The Relationship Between Nutritional Knowledge and Hypertension Prevention Attitudes Among Individuals with a Family History of Hypertension

Deniz TANKUT[1], Sibel TUNÇ KARAMAN[1*], Okcan BASAT[1] **Original Article**

[1] University of Health Sciences, Gaziosmanpaşa Training and Research Hospital, Department of Family Medicine, Istanbul, Turkey

Received: Jully 22, 2025 **Accepted:** December 22, 2025 **Published:** December 31, 2025. **DOI: 10.5281/zenodo.18107134**

***Corresponding author:** University of Health Sciences, Gaziosmanpaşa Training and Research Hospital, Department of Family Medicine, Istanbul, Turkey, E-mail: :deniztankut@yahoo.com

Cite This Article as: Tankut D, Tunç Karaman S, Basat O. The Relationship Between Nutritional Knowledge and Hypertension Prevention Attitudes Among Individuals with a Family History of Hypertension. Essentials Frontline Med J. 2025:3(1); 15-24.

Externally Peer-Reviewed.

ABSTRACT

Objective: This study aimed to investigate the relationship between the nutritional knowledge levels of individuals with hypertension (HT) in their families and their attitudes towards preventing HT.

Methods: This cross-sectional study was carried out with individuals aged 18 and over who applied to the Family Medicine Outpatient Clinic of a tertiary hospital, and those who had a family member with HT and met the inclusion criteria for the study. Descriptive Information Form, Nutrition Knowledge Scale (NKS) and Attitudes Scale towards Prevention of HT (ASPH) were used to obtain the data.

Results: The mean age of 212 participants included in the study was 37.11 ± 10.45, and 66% (n=140) were women. While the average NKS total score of the participants was 90.05 ± 20.27, the average ASPH total score was 111.49 ± 16.52. 25.5% (n=54) of the participants had low, 15.6% (n=33) had moderate, 23.1% (n=49) had high, and 35.8% (n=76) had very high nutritional knowledge. A significant correlation was found between NKS and ASPH total scores ($r = 0.883$, $p = 0.001$). Significant negative correlations were observed between age and body mass index (BMI) and NKS total scores ($r = -0.232$, $p = 0.001$; $r = -0.260$, $p = 0.001$, respectively). Similarly, age and BMI were also negatively correlated with ASPH total scores ($r = -0.231$, $p = 0.001$; $r = -0.175$, $p = 0.011$, respectively).

Conclusion: Nutrition knowledge and attitudes towards HT prevention were high among individuals with a family history of HT. Increased nutrition knowledge contributed positively to the development of attitudes towards HT prevention. Both nutrition knowledge and preventive attitudes were positively associated with female gender, younger age, higher socioeconomic status, and lower BMI. These findings highlight the importance of nutrition education and targeted interventions in developing preventive strategies to reduce HT risk.

Keywords: Attitude, hypertension, knowledge, nutrition, prevention

INTRODUCTION

Hypertension (HT) is defined as the persistent elevation of systemic arterial blood pressure and constitutes a significant public health issue worldwide (1). Globally, more than 1 billion adults suffer from HT (2). In Turkey, the prevalence of diagnosed HT among individuals aged 15 years and older has been reported as 16.1% (3). HT increases mortality and morbidity and places a substantial burden on healthcare systems (4, 5). Despite these impacts, the desired success levels in the diagnosis and treatment of HT have not yet been achieved.

The development of HT involves the interplay of genetic predisposition, dietary habits, and lifestyle factors. Individuals with a family history of HT are at higher risk due to both genetic and environmental influences. Therefore, enhancing nutritional knowledge and preventive health attitudes in these individuals is critical for the prevention and management of HT (6). In this context, the shaping of lifestyle behaviors among at-risk individuals plays a key role in HT prevention. Healthy lifestyle behaviors include balanced and low-sodium nutrition, regular physical activity, avoidance of harmful habits, regular blood pressure monitoring, and adherence to periodic health check-ups. Increasing awareness of

these behaviors supports individual health consciousness and contributes to public health improvement (7, 8).

The literature includes various studies examining the nutritional knowledge and preventive attitudes of individuals diagnosed with HT (9-12). However, limited research has focused on individuals without HT diagnosis. Especially, there is a paucity of studies concentrating on those with a family history of HT, indicating the need for more detailed investigation of this population (13, 14).

This study aims to evaluate the nutritional knowledge levels and preventive attitudes toward HT among individuals with a family history of HT, as well as to examine the relationship between these two variables. These findings may guide healthcare professionals in planning preventive services for individuals with a family history of HT.

METHODS

Study Design

This cross-sectional study was conducted between April 16 and June 16, 2023, among individuals who presented to the Family Medicine Outpatient Clinic of a tertiary care hospital and met the inclusion criteria.

Sample Size Determination

Determining the minimum sample size for studies using newly developed scales can be challenging due to limited preliminary data for formal power analysis. Therefore, recommendations based on the number of items in the scale were considered. Gorsuch (1983) and Kline (1994) recommend a minimum of 100 participants; Cattell (1978) suggests 3 to 6 times the number of items, and Hair et al. (2010) advocate at least 5 times the number of items (15-18).

Sample size was calculated using the Nutrition Knowledge Scale (31 items), which had more items than the ASPH (26 items). The recommended minimum sample size ranged from 100 to 192 participants. Accordingly, the study aimed to recruit 200 participants, and a total of 212 participants were enrolled.

Study Population

Participants were eligible for the study if they were aged 18 years or older; had a close relative—defined in this study as a parent, child, spouse, or grandparent—diagnosed with and treated for HT; did not have a personal diagnosis of HT; had no known active or severe psychiatric illness; had sufficient cognitive ability, which was determined by the researchers through observation during face-to-face interviews, based on participants' ability to comprehend study information and respond appropriately to the questionnaire items; and agreed to participate.

Individuals were excluded if they were under 18 years of age; had no family history of HT among the specified relatives; had a personal diagnosis of HT; had conditions preventing effective communication (e.g., significant hearing or speech impairment, cognitive dysfunction, or inability to cooperate); were pregnant or breastfeeding; or were unable to read and write.

Data Collection

A Descriptive Information Form, Nutrition Knowledge Scale (NKS) and Attitudes Scale towards Prevention of HT (ASPH) were used to obtain the data.

Using a researcher-designed form, participants' sociodemographic characteristics—including age, gender, education level, marital status, employment status, income level, and Body Mass Index (BMI) (kg/m^2) were recorded. The form also assessed the presence of chronic diseases, medication use, identification of family members with HT, duration of the HT, presence of HT-related complications, and knowledge about HT. Additionally, participants were asked about the presence of a blood pressure monitor at home, the location and frequency of blood pressure measurements, and symptoms observed in family members with HT.

Attitudes Scale towards Prevention of HT developed by Albayrak and Şengezer in 2022, was designed to assess the preventive attitudes of individuals with a family history of HT. The scale consists of 26 items, among which items 15 and 20 are negatively worded and are scored in reverse.

The scale includes five factors: Prevention and control (items 1, 4, 7, 10, 13, 18, 22, and 25); Habits and lifestyle (items 6, 12, 17, 21, 24, and 26); Nutritional attitude (items 5, 11, 16, and 20); Mental state and physical activity (items 3, 9, and 15); and Knowledge of disease and risk (items 2, 8, 14, 19, and 23). The overall reliability coefficient (Cronbach's alpha) of the scale is 0.910, while the subscale coefficients range between 0.601 and 0.813 (19).

The Nutrition Knowledge Scale, developed by Öngün Yılmaz et al. in 2021, was designed to assess adults' level of knowledge regarding nutrition, and its validity and reliability have been established in Turkish. The scale is a 31-item, five-point Likert-type instrument, with responses ranging from "Strongly agree" to "Strongly disagree," scored from 4 to 0, respectively. The total score ranges

from 0 to 126, with higher scores indicating a higher level of nutrition knowledge.

Nutrition knowledge levels were classified based on total scores as low (≤79), moderate (80–90), high (91–100), and very high (≥101). The Cronbach's alpha coefficient of the scale was reported as 0.851, indicating high internal consistency (20).

Ethical considerations

The study was conducted with the approval of the Local Ethics Committee (Date: 01.03.2023, Approval Number: 27). All procedures were carried out in accordance with the Declaration of Helsinki. Verbal and written informed consent were obtained from all participants.

Statistical analyses

Analyses were performed using IBM SPSS Statistics 22. Categorical variables were presented as frequencies and percentages; continuous variables as means and standard deviations. Normality was tested using the Kolmogorov-Smirnov test. Non-normally distributed variables were analyzed using Mann-Whitney U and Kruskal-Wallis tests; Pearson correlation was applied for normally distributed variables, and Spearman correlation for non-normally distributed variables. Chi-square tests were used for categorical data comparisons. Statistical significance was set at $p < 0.05$.

RESULTS

This study included 212 aged 18–64 years (mean age 37.11 ± 10.45; mean BMI 25.80 ± 4.33 kg/m²). Participants' sociodemographic and medical characteristics were described in Table 1.

Table-1. Distribution of Participants' Sociodemographic and Medical Characteristics

		n	%
Gender	Female	140	66
	Male	72	34
Education level	Literate only	8	3.8
	Primary school	35	16.5
	Middle school	5	2.4
	High school	73	34.4
	University	91	42.9
Marital status	Married	134	63.2
	Single	78	36.8
Income level	Low income	87	41
	Moderate income	76	35.8
	High income	49	23.1
Presence of chronic disease	No	192	90.6
	Yes	20	9.4
Regular medication use	No	149	70.3
	Yes	63	29.7
	Min-Max	**Mean±SD**	
Age	18 - 64	37.11 ± 10.45	
Body mass index	17.3 - 35.5	25.80 ± 4.33	

Participants' knowledge and practices related to HT were detailed in Table 2. Among them, 64.6% had hypertensive parents, 10.4% spouses or children, and 32.5% grandparents. 30.2% reported complications (e.g., retinopathy, nephropathy) in their hypertensive relatives. Notably, 38.2% were unaware of the HT diagnostic blood pressure threshold, while 56.1% knew that treatment is typically lifelong or exceeds 10 years. Although 78.8% owned a blood pressure monitor, only 13.6% measured their blood pressure frequently. Most measurements were done at home (82.1%).

Table-2. Distribution of Participants' Family History, Knowledge, and Behavioral Characteristics Regarding Hypertension

		n	%
A. Family History and Health Status			
Family members with HT*	Parents	137	64.6
	Spouse-children	22	10.4
	Grandparents	69	32.5
Presence of complications in hypertensive family members	Yes	64	30.2
	No	148	69.8
Symptoms observed in hypertensive family members*	Headache	162	76.4
	Dizziness	107	50.5
	Palpitation	81	38.2
	Chest pain	37	17.5
	Visual disturbance	20	9.4
	Nosebleed	64	30.2
B. Knowledge and Behavioral Characteristics Regarding Hypertension			
Known blood pressure thresholds for HT diagnosis (mmHg)	130/80	2	0.9
	140/90	68	32.1
	150/90	32	15.1
	160/100	29	13.7
	Don't know	81	38.2
Knowledge of treatment duration for HT	Less than 1 year	8	3.8
	1-5 years	11	5.2
	5-10 years	7	3.3
	More than 10 years/ lifelong	119	56.1
	Don't know	67	31.6
Knowledge of doctor visits frequency for hypertensive patients	Monthly	37	17.5
	Every 3 months	46	21.7
	1-2 times a year	93	43.9
	When blood pressure rises	36	17
Availability of blood pressure monitor at home	Yes	167	78.8
	No	45	21.2
Frequency of self-measuring blood pressure	Never	48	22.6
	Rarely	135	63.7
	Often	20	9.4
	Always	9	4.2
Places where blood pressure is measured*	Home	174	82.1
	Pharmacy	18	8.5
	Family health center	27	12.7
	Hospital	26	12.3

Descriptive statistics for the scale scores were presented in Table 3. ASPH scores ranged 73–130 (mean 111.49 ± 16.52, α=0.928) and NKS scores 12–124 (mean 90.05 ± 20.27, α=0.936). Based on NKS, 25.5% had low, 15.6% moderate, 23.1% high, and 35.8% very high nutrition knowledge.

Table-3. Descriptive Characteristics Related to Scale Scores

	Min-Max	Mean±SD	Median	Cronbach's alpha
ASPH total score	73 - 130	111.49 ± 16.52	115	0.928
Prevention and control	24 - 40	34.71 ± 4.71	36	0.820
Habits and lifestyle	16 - 30	24.97 ± 4.34	26	0.810
Nutritional attitude	11 - 20	17.01 ± 2.85	18	0.837
Mental state and physical activity	8 - 15	13.48 ± 2.24	15	0.848
Knowledge of disease and risk	13 - 25	21.32 ± 3.51	21	0.877
NKS total score	12 - 124	90.05 ± 20.27	97	0.936
			n	**%**
Nutrition knowledge levels according to NKS	Low		54	25.5
	Moderate		33	15.6
	High		49	23.1
	Very high		76	35.8

Table 4 revealed a strong positive correlation between NKS and ASPH scores (r=0.883, p=0.001) and a weak negative correlation between relatives' HT duration and NKS scores (r=−0.191, p=0.005). No significant correlation was found between HT duration and ASPH scores.

Table-4. Correlations Between Scale Total Scores and Demographic/Clinical Variables

Variable	Correlation with NKS total score		Correlation with ASPH total score	
	r	**p**	**r**	**p**
NKS total score	—	—	0.883	**0.001**[a]
ASPH total score	0.883	**0.001**[a]	—	—
Age	-0.232	**0.001**[b]	-0.231	**0.001**[b]
Body mass index	-0.260	**0.001**[b]	-0.175	**0.011**[b]
HT duration	-0.191	0.005[a]	-0.102	0.138[a]

[a]*Spearman's rho correlation test* [b]*Pearson correlation analysis *p<0,05*

ASPH: Attitudes Toward Hypertension Prevention Scale; NKS: Nutrition Knowledge Scale

ASPH and NKS scores by sociodemographic characteristics were summarized in Table 5. Females scored higher than males (p=0.001); scores increased with education and income (p=0.001). Married participants had higher ASPH scores (p=0.001); NKS scores did not differ by marital status. Chronic disease presence had no significant effect.

Table-5. Distribution of ASPH and NKS Scores by Sociodemographic Characteristics

		ASPH total score	NKS total score
		Mean ± SD	**Mean ± SD**
Gender	Female	115.87 ± 12.57	94.64 ± 18.22
	Male	102.97 ± 19.76	81.11 ± 21.18
	[1]p	**0.001***	**0.001***
Education level	Literate only	91.25 ± 19.93	66.75 ± 21.86
	Primary school	99.34 ±19.32	74.49 ± 15.53
	Middle school	108.4 ± 23.29	85.2 ± 17.82
	High school	111.34 ±16.87	89.36 ± 21.46
	University	118.23 ± 8.71	98.9 ± 15.13
	[2]p	**0.001***	**0.001***
Marrital status	Married	114.07 ± 16.32	92.11 ± 19.56
	Single	107.06 ± 16.01	86.5 ± 21.09
	[1]p	**0.001***	0.233
Income level	Low	100.32 ± 18.18	77.34 ± 19.01
	Moderate	115.97 ± 9.33	95.82 ± 13.29
	High	124.37 ± 6.65	103.65 ± 18.68
	[2]p	**0.001***	**0.001***
Presence of chronic disease	No	110.91 ± 17.11	89.26 ± 21
	Yes	117.1 ± 7.14	97.6 ± 7.83
	[1]p	0.508	0.498

*[1]Mann Whitney U Test, [2]Kruskal Wallis Test *p<0.05 (statistically significant)*

ASPH and NKS scores by family history and HT knowledge were illustrated in Table 6. Scores did not differ by hypertensive parents but were lower in participants with hypertensive spouses or children (p=0.001). Those with hypertensive grandparents had higher NKS scores (p=0.001). Correct knowledge of the 140/90 mmHg threshold, lifelong treatment duration, regular doctor visits, home BP monitor possession, and frequent BP self-measurement were all associated with higher scores (p=0.001).

Table 6. Distribution of ASPH and NKS Scores by Family History and Hypertension-Related Knowledge

		ASPH total score	NKS total score
		Mean ± SD	**Mean ± SD**
HT in parents	Yes	113.6 ± 14.01	90.24 ± 19.14
	No	107.64 ± 19.85	89.69 ± 22.31
	[1]p	0.168	0.364
HT in spouse/children	Yes	90.68 ± 20.32	66.41 ± 17.29
	No	113.9 ± 14.23	92.78 ± 18.79
	[1]p	**0.001***	**0.001***
HT in grandparents	Yes	111.7 ± 17.39	94.87 ± 20.41
	No	111.39 ± 16.15	87.72 ± 19.86
	[1]p	0.525	**0.001***
Known blood pressure thresholds for HT diagnosis (mmHg)	130/80	105 ± 1.41	75.5 ± 16.26
	140/90	124 ± 7.89	105.09 ± 16.03
	150/90	100.16 ± 14.52	79.41 ± 20.06
	160/100	104.21 ± 22	81.55 ± 20.82
	Don't know	108.23 ± 14.18	85.02 ± 16.22
	[2]p	**0.001***	**0.001***
Knowledge of treatment duration for HT	Less than 1 year	116 ± 5.66	104.13 ± 3.18
	1-5 years	81.73± 9.73	56.55 ± 2.94
	5-10 years	78.86 ± 11.7	60.86 ± 11.11
	More than 10 years/ lifelong	119.15 ± 11.24	98.45 ± 17.41
	Don't know	105.64 ± 14.58	81.99±16.22
	[2]p	**0.001***	**0.001***
Knowledge of doctor visits frequency for hypertensive patients	Monthly	107.46 ± 14.07	85.86 ± 17.03
	Every 3 months	113.11 ± 16.41	93.85 ± 22.4
	1-2 times a year	116.43 ± 16.18	96.3 ± 18.95
	When blood pressure rises	100.81 ± 14.28	73.33 ± 12.66
	[2]p	**0.001***	**0.001***
Availability of blood pressure monitor at home	Yes	113.87 ± 15.61	93.3 ± 19.05
	No	102.67 ± 16.97	77.98 ± 20.31
	[1]p	**0.001***	**0.001***
Frequency of self-measuring blood pressure	Never	90.48 ± 15.39	66.88 ± 15.55
	Rarely	117.42 ± 11.3	96.56 ± 17.42
	Often	116.25 ± 9.04	98.1 ± 8.27
	Always	124 ± 0	98 ± 0
	[2]p	**0.001***	**0.001***

DISCUSSION

This study examined the relationship between nutritional knowledge and attitudes toward HT prevention among individuals with a family history of HT. The results revealed that participants had high levels of both knowledge and attitudes. Higher nutritional knowledge was associated with more positive prevention attitudes.

Both outcomes were positively associated with female gender, younger age, higher socioeconomic status, and normal BMI. Additionally, participants who measured their blood pressure more frequently and those who correctly identified diagnostic thresholds for HT demonstrated significantly better knowledge and attitudes. These findings suggest that improving nutritional literacy—especially in at-risk groups—can foster healthier perspectives and potentially more effective preventive behaviors.

Our findings are consistent with a limited number of previous studies exploring how family history affects HT-related behaviors. For example, Asante et al. reported that regular blood pressure monitoring correlated with knowledge levels, with attitude emerging as the strongest predictor (21). Similarly, Çetinkaya Özdemir et al. found that individuals with a family history of HT were more likely to adopt positive prevention behaviors (22). The ASPH scores in our study support these earlier findings.

In contrast, several studies—such as those by Tokem et al., Yavuz et al., and Rahman et al.—have highlighted inadequate knowledge and prevention attitudes among hypertensive patients, often accompanied by poor adherence to preventive practices (23-25). The relatively high scores in our sample may reflect the facilitating role of intra-family information sharing in the presence of chronic illness.

To our knowledge, research specifically targeting nutritional knowledge among individuals with a family history of HT is scarce. Most prior studies involving broader patient populations report moderate to low knowledge levels (26-28). In contrast, 23.1% and 35.8% of our participants exhibited high and very high nutritional knowledge, respectively. This may reflect heightened sensitivity to dietary issues within families impacted by chronic disease.

Multiple studies have shown that women tend to have greater nutritional knowledge and more favorable health attitudes than men (27, 29, 30). Our findings support this pattern and may relate to cultural roles, health expectations, or greater health information exposure among women.

Regarding age, findings in the literature are inconsistent. Some studies report that nutrition knowledge increases with age, possibly due to lifelong exposure to dietary habits and health-related experiences. Others, however, indicate no clear association or even a decline among older adults (31-33). In our study, a negative correlation was observed between age and both nutrition knowledge and health-promoting attitudes. This may be due to lower education, reduced access to health information, or limited digital literacy in older participants.

Educational attainment was positively associated with both outcomes, a relationship commonly reported in prior research (27, 34, 35). Our results affirm the critical role of health education in fostering knowledge and motivation for HT prevention.

Finally, studies frequently report an inverse association between BMI and nutritional knowledge (27, 28, 36). Similarly, our data showed that individuals with lower knowledge levels had higher BMI, emphasizing the need for targeted interventions.

Limitations of the Study

This study has several limitations that should be acknowledged. The cross-sectional design restricts the ability to infer causal relationships between nutritional knowledge and preventive attitudes. The single-center setting may limit the generalizability of the findings. In addition, reliance on self-reported questionnaires introduces potential recall and social desirability biases.

Despite these limitations, the study provides valuable insights into nutrition knowledge and preventive attitudes among individuals with a family history of HT. These findings may guide preventive efforts for hypertension.

Future research should employ longitudinal designs to clarify causal links. Including more diverse populations could enhance external validity. Broadening the scope to assess nutrition knowledge and preventive behaviors across multiple family members could provide deeper insights. Moreover, qualitative studies are warranted to explore barriers and facilitators influencing individuals with a family history of HT.

CONCLUSION

This study revealed that individuals with a family history of hypertension possess good nutrition knowledge and favorable attitudes toward hypertension prevention. Nutrition knowledge was positively associated with preventive behaviors. Female gender, younger age, higher socioeconomic status, and lower BMI were

linked to better knowledge and attitudes. In addition, regular blood pressure monitoring and accurate understanding of hypertension were associated with more proactive preventive behaviors. These findings highlight the importance of identifying individuals with hypertensive relatives and encouraging lifestyle modifications. Promoting nutrition education and fostering positive attitudes toward hypertension prevention may contribute to improved long-term cardiovascular outcomes, particularly in at-risk populations.

DECLARATIONS

Ethical approval: The study was conducted with the approval of the Clinical Research Ethics Committee of Gaziosmanpaşa Training and Research Hospital (Date: 01.03.2023, Approval Number: 27).

Conflict of interest statement: On behalf of all authors, the corresponding author states that there is no conflict of interest.

Financial support: No financial support was provided for the study.

Data availability statement: The data used and analyzed during the study could be available from the corresponding author upon reasonable request.

Authors' contributions

Concept/Design: DT, STK, OB.

Data Collection and/or Processing: DT STK

Data analysis and interpretation: DT, STK

Literature Search: DT, STK

Drafting manuscript: STK

Critical revision of manuscript: DT, STK, OB.

Acknowledgments: None

REFERENCES

1. McEvoy JW, McCarthy CP, Bruno RM, Brouwers S, Canavan MD, Ceconi C, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension [published correction appears in Eur Heart J. 2025 Apr 7;46(14):1300.
2. World Health Organization. Health topics/Hypertension. Available at: https://www.who.int/health-topics/hypertension#tab=tab_1 Access date: 27.06.2025
3. Türkiye Sağlık Araştırması 2022. Available at: https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Health-Survey-2022-49747 Access date: 01.04.2025
4. Brouwers S, Sudano I, Kokubo Y, Sulaica EM. Arterial hypertension. Lancet. 2021;398(10296):249-261.
5. Ohya Y, Kario K, Itoh H, Nishiyama A, Ishimitsu T, Ichihara A, et al. Statement of the Asian Hypertension Society Network: the Okinawa Declaration on the unity of hypertension societies in Asian countries and regions to overcome hypertension and hypertension-related diseases. Hypertens Res. 2022;45(1):1-2.
6. Shim JS, Heo JE, Kim HC. Factors associated with dietary adherence to the guidelines for prevention and treatment of hypertension among Korean adults with and without hypertension. Clin Hypertens. 2020;26:5.
7. Shamsi SA, Salehzadeh M, Ghavami H, Asl RG, Vatani KK. Impact of lifestyle interventions on reducing dietary sodium intake and blood pressure in patients with hypertension: A randomized controlled trial. Turk Kardiyol Dern Ars. 2021;49(2):143-150.
8. di Cagno A, Fiorilli G, Buonsenso A, Di Martino G, Centorbi M, Angiolillo A, et al. Long-term physical activity effectively reduces the consumption of antihypertensive drugs: a randomized controlled trial. J Cardiovasc Dev Dis. 2023;10(7):285.
9. Ruan Y, Huang Y, Zhang Q, Qin S, Du X, Sun Y. Association between dietary patterns and hypertension among Han and multi-ethnic population in southwest China. BMC Public Health. 2018;18(1):1106.
10. Maharjan N, Maharjan N, Li R. Knowledge on diet among the hypertensive patients in a tertiary care center Nepal: a descriptive cross-sectional study. JNMA J Nepal Med Assoc. 2020;58(222):98-101.
11. Mu T, Xu R, Zhu Q, Chen, L, Dong D, Xu J, et al. Diet-related knowledge, attitudes, and behaviors among young and middle-aged individuals with high-normal blood pressure: A cross-sectional study in China. Front Public Health. 2022;10:898457.
12. Zhang Z, Xuan Z, Fu Y, Zhao H, Zhan P, Yang C, & et al. Knowledge, attitudes, and practices regarding hypertension diet among patients with hypertension. Scientific reports. 2025;15(1):11915.
13. Asiri AA, Asiri S, Asiri H. Knowledge related to hypertension risk factors, diet, and lifestyle modification: a comparative study between hypertensive and non-hypertensive individuals. Cureus. 2020;12(8):e9890.
14. Gong D, Yuan H, Zhang Y, Li H, Zhang D, Liu X, et al. Hypertension-related knowledge, attitudes, and behaviors among community-dwellers at risk for high blood pressure in Shanghai, China. Int J Environ Res Public Health. 2020;17(10):3683.
15. Gorsuch RL. Factor analysis. 2nd ed. Lawrence Erlbaum Associates; 1983.
16. Kline P. An easy guide to factor analysis. Routledge; 1994.
17. Cattell RB. The scientific use of factor analysis in behavioral and life sciences. Plenum Press; 1978.
18. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis. 7th ed. Pearson; 2010.
19. Albayrak Z, Şengezer T. Attitudes towards the prevention of hypertension development in ındividuals who have a family member with hypertension: A scale development study. Turk J Fam Pract. 2022;26(2):53-65
20. Öngün Yılmaz H, Aydin Haklı D, Toğuç H, Çobanoğlu Z, Önel Sayar C, Erkul C, et al. Nutrition Knowledge Scale (NKS): Development, factor structure, and validation for healthy adults. Progress in Nutrition. 2021;23(3):e2021104.
21. Asante DO, Dai A, Walker AN, et al. Assessing hypertension and diabetes knowledge, attitudes and practices among residents in Akatsi South District, Ghana using the KAP questionnaire. Front

Public Health. 2023;11:1056999. doi:10.3389/fpubh.2023.1056999.

22. Çetinkaya Özdemir S, Semerci V, Metin T. Effect of alexithymia severity on attitudes toward hypertension prevention in adults: a cross-sectional study. MAS Journal of Applied Sciences. 2023;8(3):511-519.
23. Tokem Y, Taşçı E, Yılmaz M. Investigation of disease management of individuals with hypertension at home. Turk J Card Nur. 2013;4(5):30-40.
24. Aygün O, Yavuz S, Aygün K, Yıldırım E. The relevance between knowing the salt ingredient of nutrients and consuming them: is it better with hypertensive patients?. Turk J Fam Pract. 2015;19(4): 170-178.
25. Rahman M, Alam SS, Mia M, Haque M, Islam K. Knowledge, attitude and practice about hypertension among adult people of selected areas of Bangladesh. MOJ Public Health. 2018;7(4):211-214.
26. Yahia N, Wang D, Rapley M, Dey R. Assessment of weight status, dietary habits and beliefs, physical activity, and nutritional knowledge among university students. Perspect Public Health. 2016;136(4):231-244.
27. Valmórbida JL, Goulart MR, Busnello FM, Pellanda LC. Nutritional knowledge and body mass index: a cross-sectional study. Rev Assoc Med Bras (1992). 2017;63(9):736-740.
28. Özkarabulut AH, Rashidi M, Yıldırım G. Measuring Nutritional Knowledge Levels of Diabetes Patients Type 2. IGUSABDER. 2021;(14):241-257.
29. Mohammed AH, Hassan BAR, Suhaimi AM. Hypertension knowledge, awareness, and attitude among the hypertensive population in Kuala Lumpur and rural areas in Selangor, Malaysia. J Public Health (Berl.). 2021;29:443-450.
30. Almomani MH, Rababa M, Alzoubi F, Alnuaimi K, Alnatour A, Ali RA. Effects of a health education intervention on knowledge and attitudes towards chronic non-communicable diseases among undergraduate students in Jordan. Nurs Open. 2020;8(1):333-342.
31. Ong RHS, Chow WL, Cheong M, Lim GH, Xie W, Baggs G, et al. Associations between socio-demographics, nutrition knowledge, nutrition competencies and attitudes in community-dwelling healthy older adults in Singapore: findings from the SHIELD study. J Health Popul Nutr. 2021;40(1):52.
32. Koch F, Hoffmann I, Claupein E. Types of nutrition knowledge, their socio-demographic determinants and their association with food consumption: results of the NEMONIT Study. Front Nutr. 2021;8:630014.
33. Aihemaitijiang S, Ye C, Halimulati M, Huang X, Wang R, Zhang Z. Development and validation of Nutrition Literacy Questionnaire for the Chinese elderly. Nutrients. 2022;14(5):1005.
34. Arslan H, Yücel İ. Examination of nutritional knowledge levels of elite swimmers. Journal of Sports and Performance Researches. 2023;14(2):165-176.
35. Mengi Çelik Ö, Duran S. Evaluation of the relationshıp between social media addiction and nutrition knowledge and some variables in nurse candidates. Karya J Health Sci. 2022;3(3):302-306.
36. Ul Haq I, Mariyam Z, Li M, Huang X, Jiang P, Zeb F, et al. A comparative study of nutritional status, knowledge attitude and practices (KAP) and dietary ıntake between international and Chinese students in Nanjing, China. Int J Environ Res Public Health. 2018;15(9):1910.