

An examination of the relationship between hypertension and healthy lifestyle behaviors in adults

Ebru Can Arıcı¹, Güleendam Karadağ²

¹Kahramanmaraş Sütçü İmam University Health Research and Practice Hospital, Kahramanmaraş/Turkey; ²Associate Professor Department of Public Health Nursing, Faculty Nursing, Dokuz Eylül University, İzmir, Turkey - Email: gkaradag71@gmail.com

Summary. *Objectives:* The modern lifestyle has led to an increase in the risk of hypertension and cardiovascular diseases. *Design:* This analytical cross-sectional study aimed to examine the relationship between hypertension and healthy lifestyle behaviors in adults. *Participants:* The research was carried out universe consisted of individuals aged 30+ years who applied to the family health center and the study sample included 400 individuals. *Measurements:* The participants' weights, heights and blood pressures were measured, the data of the study were collected by using "Questionnaire Form" and "Healthy Lifestyle Behaviors Scale". *Results:* 32.4% of the women and 31.0% of the men had blood pressures of 140/90 mmHg and above. Average BMI of the participants was 26.69±4.39. The total point average of Healthy Lifestyle Behaviors Scale obtained by the of the participants was 121.86±24.35. The participants on the subscales of self-realization, nutrition and interpersonal support were high, while the lowest score was obtained on the subscale of exercising. Further, those with lower blood pressure measurements were determined to have higher levels of self-realization, exercise, interpersonal support, stress management and healthy lifestyle behaviors compared to the levels of those with high blood pressure ($p<0.05$). *Conclusion:* It has been determined that the male, who ate meals more frequently, with higher levels of physical activity, without chronic diseases, and the participants with normal blood pressure values had higher healthy lifestyle behaviors.

Key words: adult, hypertension, lifestyle, nurses

Introduction

Globally, cardiovascular disease (CVD) is responsible for 17 million annual deaths, which translates to nearly one-third of total deaths across the world (1-3). Hypertension (HT) accounts for at least 45% of deaths from cardiovascular diseases (1). HT is a major risk factor for the development of CVD and as a worldwide public health concern, it requires intensive prevention and treatment management programs to address it, on account of its prevalence, costs, and health effects (3,4).

The modern lifestyle has led to an increase in the risk of HT and CVD (5). The principal modifiable behavioral risk factors for CVD include unhealthy diets,

physical inactivity, alcohol abuse, and smoking. Long-term exposure to these factors has also been linked to obesity, hypertension, diabetes mellitus, and dyslipidemia. Lifestyle modifications have proved to be essential and effective in the prevention and treatment of HT (6).

The prevalence of hypertension among in the 35-64 age group is about 30% in the US population and about 44% in European countries (7). The estimated HT prevalence for the population aged 20+ years was 26.4% globally in 2000 (26.6% for men and 26.1% for women), and it is projected that HT prevalence will increase to 29.2% for both men and women by 2025 (1). Studies investigating HT frequency in Turkey have been carried out since the 1960s, both

locally and on larger scales. The first comprehensive study to determine the prevalence of HT in Turkey was the Heart Diseases and Risk Factors in Turkish Adults (HDRFTA) study. The results from this study showed that the mean prevalence of HT in Turkey was 33.7%, increasing with age (8). Another study, whose focus was on HT in Turkey (PatentT), was conducted between 2002 and 2003 to particularly determine the frequency, distribution, awareness, treatment and control rates of HT in Turkey. The prevalence of HT in this study was determined as 31.8% (9). In the PatentT2 study conducted in Turkey in 2012, 30.3% of the participants were found to be hypertensive (32.3% in women, 28.4% in men) (10).

Recent socioeconomic and technological developments have led to significant changes in the way people live their lives; for example, people now tend to lead more sedentary lives, with unhealthy lifestyle habits. Therefore, the incidence of chronic diseases has increased across the world. However, it is known that positive lifestyle changes, such as regular physical activity, restriction of alcohol and cigarette use, and regular and balanced nutrition, serves to decrease CVD, HT and chronic diseases (8,10). A healthy lifestyle involves all the approaches used by an individual to take control of their own behavior and to improve the health levels of their daily activities (11,12). Walker et al. (1987) addressed healthy lifestyle behaviors under the headings of adequate and balanced nutrition, stress management, self-realization, regular exercise, interpersonal relationships, and sense of responsibility for protecting and improving individual health. It is necessary to apply health-promoting behaviors continuously to ensure life-long health. Therefore, for the development of community health, it is important that society as a whole adopt healthy lifestyle behaviors (13).

Material and Methods

Study Design

This analytical cross-sectional study was conducted at a family health center between September 01, 2013 and February 01, 2014 to examine the relation between HT and healthy lifestyle behaviors in adults.

Setting and sample

The study universe consisted of individuals aged 30+ years who applied to the family health center during the research period; and the study sample included 400 individuals who had agreed to voluntarily participate in the study. The data were gathered using a questionnaire form, prepared by the researchers, and the Healthy Life Style Behaviors Scale, both of which were administered through face-to-face interviews. Also, blood pressure, Body Mass Indexes were taken.

Measurements/Instruments

Questionnaire form: This form prepared by the researchers on the basis of a literature (8,9,11,14,15) and consists of 43 questions to evaluate the patients' socio-demographic characteristics (8 questions) hypertension features (35 questions).

Blood pressure measurement: A cuffed sphygmomanometer and a stethoscope were used to measure patients' blood pressure. The patients were seated and in a rested state while the survey form was being filled out. Their blood pressure were measured twice in a 5-minute interval from the right arms while they were in a sitting position. All measurements were conducted according to the relevant principles and guidelines.

Calculation of body mass indexes

For assessment of the body-mass index of the participants (BMI, kg/m²), the limit values of <18.5 kg/m² for underweight, 18.5- 24.9 kg/m² for normal, 25.0-29.9 kg/m² for slightly overweight, 30.0- 39.9 kg/m² for overweight and >40.0 kg/m² for obese were adopted. To perform the body weight measurements, the participants, in light clothes with their shoes off, were placed on a scale sensitive to 0.5 kg; and to perform height measurements, a tape measurer was used to measure the participants as they stood against the wall, with their shoeless feet side by side.

Healthy Lifestyle Behavior Scale (HLSB)

The HLSB was developed by Walker, Sechrist and Pender (1987) (12). The validity and reliability of the scale made by Esin (1997) in Turkey, Cronbach's alpha value was found to be 0.91 (16). Questions on the scale are used to measure an individual's health-

promoting behaviors in relation to his/her lifestyle. Consisting of 48 items, the scale includes 6 subscales (self-realization: 13 items, health responsibility: 10 items, exercise: 5 items, nutrition: 6 items, interpersonal support: 7 items and stress management: 7 item), each of which may be used on its own independently. The total score on the scale is the sum of all points from the subscales constituting the HLSB. All items of the HLSB are positive. Responses to the items are made on a 4-point Likert scale (1=never, 2=sometimes, 3=frequently, 4=regularly). The lowest score possible for the whole scale is 48, while the highest possible score is 192. Higher scores obtained on the scale indicate that the individual applies stated health behaviors at a high level (12,16). In the present study, the Cronbach's alpha value was determined to be 0.95, which indicates high scale reliability. The reliability levels of the internal consistency coefficients of the subscales were 0.87 for self-actualization, 0.86 for health responsibility, 0.79 for stress management, 0.79 for interpersonal support, 0.76 for exercise, and 0.62 for nutrition.

Ethical Consideration

Before starting the study, written approval (dated 17.09.2013 and numbered 321) was obtained from the Scientific Ethics Committee. Written permission was also obtained from the Public Health Directorate for the questionnaire application. Participants were visited at home and informed about the study purpose by the researchers. The questionnaire and HLSB were applied to those who agreed to participate in the study, and their height, weight and blood pressure were measured and recorded.

Data Analysis

The SPSS 23.0 program was used for conducting analyses. A reliability analysis of the scale was performed to confirm its reliability. The arithmetic average, frequency, and percentages of the gathered data were calculated, and analysis of the data was carried out with Kruskal-Wallis H test, Mann-Whitney U test and correlation analysis. p values lower than 0.05 were considered significant.

Results

Among the participants, 56.5% were female, 86.5% were married, 37.7% had an undergraduate or graduate degree, 28.7% were housewives and 52.8% had a balanced income. According to their BMIs, 50.0% were overweight, 59.3% ate three square meals a day, 41.0% consumed red meat frequently, 65.8% used olive oil in meals, 75.2% were not smokers, and 88.0% never used alcohol. In addition, 57.2% engaged in normal physical activity, and 68.3% had no chronic disease. To continue, 78.7% had not gone to the doctor due to HT in the last one year, 89.7% had a BP measurement at least once a year, and 22.7% used anti-hypertensive drugs. According to the BP measurements, 32.4% of the female participants and 31.0% of the male participants had a BP level of above $\geq 140 / 90$ mmHg (Table 1).

Table 1. Baseline Characteristics of Study Participants (n=400)

Sociodemographic features	n (%)
Gender	
Female	226 (56.5)
Male	174 (43.5)
Marital status	
Married	346 (86.5)
Single	54 (13.5)
Education Status	
Illiterate	42 (10.5)
Primary	82 (20.5)
Secondary school	58 (14.5)
High school	67 (16.8)
University and above	151 (37.7)
Occupation status	
Housewife	115 (28.7)
Officer	137 (34.3)
Worker	54 (13.5)
Retired	41 (10.3)
Other	53 (13.2)
Monthly income	
Low	115 (28.7)
Medium	74 (18.5)
High	211 (52.8)
BKI	
<18.5 kg/m ²	4 (1.0)
18.5-24.9 kg/m ²	124 (31.0)
25-29.9 kg/m ²	200 (50.0)
30-39.9 kg/m ²	66 (16.5)
>40 kg/m ²	6 (1.5)

Continued ...

Sociodemographic features	n (%)
Going to doctor in the last year due to hypertension	
Yes	85 (21.3)
No	315 (78.7)
Measuring blood pressure until now	
Yes	359 (89.7)
No	41 (10.3)
High Blood pressure	
Female	153 (32.4)
Male	142 (31.0)
Daily eating frequency	
One meal	12 (3.0)
Two meal	114 (28.5)
Three meal	237 (59.3)
More often	37 (9.2)
Most consumed foods	
Red meat	164 (41.0)
Legumes	111 (27.8)
Fish and chicken	102 (25.5)
Cereal	102 (25.5)
Vegetable and fruit	53 (13.3)
Physical activity status	
Little	126 (31.5)
Normal	229 (57.2)
Enough	45 (11.3)
Presence of chronic illness	
Yes	127 (31.7)
No	273 (68.3)
Using antihypertensive drug	
Yes	91 (22.7)
No	309 (77.3)

Table 2: Means of Height, Weight, BKI, Blood Pressure and Age of Participants (n=400)

	Min.	Maks.	M±SD
Height	145.00	190.00	169.44±9.58
Weight	45.00	122.00	76.50±12.64
BMI	16.00	46.00	26.69±4.39
Age	27.00	85.00	43.92±12.04

The mean age of the participants was 43.92 ± 12.04 years, and their mean BMI was 26.69 ± 4.39 (Table 2).

The mean HLSB score of the participants was found 121.86 ± 24.35 , and high mean scores on the subscales of self-actualization (34.76 ± 7.14), nutri-

Table 3: Score Averages of Healthy Lifestyle Behavior Scale and Sub-Dimensions (n=400)

	Min.	Max.	M±SD
Exercise	5	20	10.78±3.58
Nutrition	7	24	16.38±3.34
Health responsibility	11	40	23.68±6.42
Interpersonal support	10	28	19.08±4.09
Self-realization	17	52	34.76±7.14
Stress management	7	28	17.20±4.18
Total	63	189	121.86± 24.35

tion (16.38 ± 3.34) and interpersonal support (19.08 ± 4.09), while the lowest mean score was obtained on the subscale of exercise (10.78 ± 3.58) (Table 3).

The mean scores obtained by the male participants on the HLSB scale as a whole, as well as on the subscales of self-actualization, exercise, and stress management, were found statistically significantly higher than the female participants ($p < 0.05$).

Comparing the participants according to their eating habits, the participants who ate meals more frequently had statistically significantly higher mean scores on the HLSB scale as a whole, as well as on the subscales of self-actualization, health responsibility, exercise, nutrition, and stress management ($p < 0.05$).

Comparing the participants according to their physical activity status, the participants with a good physical activity status obtained higher mean scores on the HLSB scale as a whole and on all its subscales ($p < 0.05$).

The participants without a chronic disease obtained statistically significantly higher mean scores on the HLSB scale as a whole and on all its subscales than those of the participants with a chronic disease ($p < 0.05$).

Comparing the participants according to their BP measurements, the participants with low BP measurements had higher mean scores on the HLSB scale as a whole and on the subscales of exercise, interpersonal support, and stress management ($p < 0.05$).

The mean scores of the underweight and normal weight participants on the subscales of exercise and stress management were higher than those obtained by the overweight and obese participants ($p < 0.05$).

Table 4: Comparison of Participants some Features and Healthy Lifestyle Behavior Scale and Sub-Dimensions Scores (n=400)

Features	n	Self-realization	Health responsibility	Exercise	Nutrition	Interpersonal support	Stress management	Total
Gender								
Female	174	181.15	199.96	170.95	196.54	192.65	186.04	185.21
Male	226	215.40	200.92	223.25	203.55	206.55	211.63	212.27
U		16295.000	19567.500	14519.500	18973.000	18295.500	17145.500	17002.000
p		.003	.934	.000	.546		.028	.020
Presence hypertension in family								
Yes	175	177.70	189.95	175.74	186.23	180.30	174.25	177.04
No	225	218.23	208.70	219.76	211.60	216.21	220.92	218.74
U		15698.00	17841.500	15354.000	17190.000	16152.500	15094.000	15582.500
p		.000	0.107	.000	.029	.002	.000	.000
Daily eating frequency								
One meal	12	173.08	180.67	157.00	149.96	186.63	151.63	158.63
Two meal	114	186.04	176.34	187.27	157.89	195.66	178.94	177.06
Three meal	237	200.01	204.13	200.43	216.48	195.99	207.01	205.03
More often	37	257.05	258.09	255.81	245.85	248.81	241.04	257.31
KWH		11.337	14.785	11.736	28.245	7.237	11.474	15.563
p		.010	.002	.008	.000	0.065	.009	.001
Physical activity status								
Little	126	140.96	141.11	111.11	151.30	144.16	141.58	128.31
Normal	229	223.28	222.97	234.76	215.93	223.19	224.42	228.29
Often	45	251.26	252.43	276.47	259.71	242.78	243.73	261.22
KWH		51.078	51.117	115.608	39.039	45.030	49.099	74.795
p		.000	.000	.000	.000	.000	.000	.000
Presence of chronic illness								
Yes	127	165.33	181.95	165.81	172.81	169.80	160.68	164.30
No	273	216.86	209.13	216.64	213.38	214.78	219.02	217.34
U		12868.500	14980.000	12930.500	13819.500	13437.00	12278.500	12738.000
p		.000	.028	.000	.001	.000	.000	.000
Using antihypertensive drug								
Yes	91	151.54	178.12	156.60	160.86	159.23	150.50	152.99
No	309	214.92	207.09	213.43	212.17	212.65	215.22	214.49
U		9604.500	12022.500	10065.000	10452.000	10304.000	9509.500	9736.500
p		.000	.035	.000	.000	.000	.000	.000
High Blood pressure								
Yes	126	182.29	191.75	183.61	184.35	176.03	183.73	181.29
No	274	208.88	204.52	208.27	207.93	211.75	208.21	209.34
U		14967.000	16160.000	15133.500	15227.500	14179.000	15149.00	14841.000
p		.032	.304	.047	.057	.004	.049	.024
BMI								
Underweight	4	195.63	240.25	279.38	164.75	215.88	208.88	213.38
Normal	124	199.52	202.74	194.60	198.15	200.77	206.06	199.19
Overweight	200	206.96	200.64	208.45	202.05	205.02	203.51	205.95
Obese	66	193.80	205.27	196.52	209.94	196.49	192.11	197.89
Morbid obese	6	82.25	70.75	48.58	117.67	78.25	72.00	66.25
KWH		7.153	8.210	13.656	4.024	7.207	8.249	8.635
p		.128	.084	.008	.403	.125	.008	.071

Discussion

As a health problem, HT is responsible for the most deaths worldwide (15). In the present study, 32.4% of the female participants and 31.0% of the male participants were determined to have a BP level of above $\geq 140 / 90$ mmHg. In the HDRFTA study, the prevalence of hypertension was reported to be 33.7% in 1990, whereas this rate increased to 36.3% in adult males and 49.1% in adult females in the period from 2001 to 2002 (8). The prevalence of hypertension throughout all of Turkey was determined to be 31.8% in the Turkish Hypertension Prevalence Study conducted by the Turkish Society of Hypertension and Renal Diseases in rural and urban areas in 26 provinces of Turkey in 2003 (14). Öztürk et al. (2011) reported the prevalence of HT as 31.7% (32.4% for females, 31.0% for males) in Kahramanmaraş, Turkey, and as 34.6% (42.9% for females, 24.4% for males) in Kayseri, Turkey (15). Wang et al. in their research, determined the prevalence of hypertension as 29.6% in total, with the prevalence being higher in men than in women (17). In a study conducted in Nepal, the overall age and sex-adjusted prevalence of hypertension was 28% (23% for females, 38% for males) (18).

Overweight and obesity, which are increasing globally, are known to pose risks for diseases such as CVD, type 2 diabetes, HT, dyslipidemia, and metabolic syndrome (19). In the present study, 50% of the participants were determined to be overweight and 16.5% to be obese. Çayır et al. found in their study of patients who visited a nutrition and dietetics outpatient clinic that 35.1% of women and 16.4% of men were obese (19). Kapelios et al. found in their study of lifestyle, diet and cardiovascular morbidity in rural areas that 29.6% of men and 37.8% of women were obese (BMI ≥ 30 kg/m²) (20). In a study by Mehmood et al. on medical students, 15.8% of the women and 15.3% of the men were reported to have a BMI of between 25-45 kg/m² (4). A study with university students conducted by Tayem et al. found that 25% of the participants were overweight (31.1% males, 15.6% females) and 7.2% were obese. (21). The present study results indicated that HT is related to age, gender and BMI. In results from other studies, Tayem et al. found that BP was related to smoking and BMI, Peng et al. deter-

mined that BMI was associated with physical activity inadequacy and ischemic heart disease, and Ilow et al. reported that BMI, smoking and inadequate physical activity were associated with CVD. (21-23).

In the present study, the mean scores obtained by the male participants on the HLSB scale as a whole and on the subscales of self-actualization, exercise, and stress management were found to be higher than those of the female participants. However, Sivrikaya et al. determined no significant relationship between gender and HLSB (24). Yalçınkaya et al. found in their study of health workers that males had statistically significantly higher mean scores on the subscales of health responsibility and nutrition than those of females (25). Tambağ conducted a study with university nursing students and found that female students had higher mean scores on the subscales of health responsibility and nutrition than those of the male students, while male students obtained a higher mean score on the subscale of exercise than that of the female students (11). As can be seen from the above cited research, results related to the gender variable differ across studies.

It is largely people's own responsibility to be healthy and to maintain a healthy lifestyle, and this responsibility has an important role in preventing chronic diseases (13). The adoption of a healthy lifestyle, the reduction of unhealthy behaviors and habits to a minimum level, and the responsibility taken by individuals for their own health are necessary to lower the risk and to prevent chronic diseases. In the present study, underweight people had higher mean scores on the subscales of exercise and stress management than those in other weight groups. In addition, the participants who ate meals more frequently obtained higher mean scores on the HLSB scale as a whole and on the subscales of self-actualization, health responsibility, exercise, nutrition, and stress management. Yalçınkaya et al. found in their study of health workers that participants with a balanced diet obtained higher HLSB scores than those of other participant groups (25).

It is known that genetic structure and familial predisposition are effective in the formation of HT and other chronic diseases (2). In the present study, the participants with a history of HT in their family had statistically significantly higher mean scores on the HLSB scale as a whole and on all its subscales than

those of the participants without a history of HT in their family. In addition, the participants with low BP levels obtained higher mean scores on the HLSB scale as a whole and on the subscales of self-actualization, exercise, interpersonal support, and stress management than those in other groups. Further, the participants who were using anti-hypertensive drugs had statistically significantly higher mean scores on the HLSB scale as a whole and on all its subscales than those of the participants not using antihypertensive drugs. Şahin and Biçer determined in their study on hypertensive patients that participants had low HLSB scores (26). Level of physical activity and active lifestyle play an important role in preventing chronic diseases, especially hypertension. However, changes in the modern lifestyle and social structure have resulted in people leading more sedentary lifestyles. In the present study, the participants who were involved in more physical activity had higher mean scores on the HLSB scale as a whole and all its subscales than those in other groups. on the subscale of healthy lifestyle behaviors. Mete et al. found in their study of university students that students who regularly played sports had high scores on the HLSB scale (27).

Conclusion

It has been determined that the male participants, the participants who ate meals more frequently, with higher levels of physical activity, without chronic diseases, not using antihypertensive drugs, the thin and normal weight, and the participants with normal blood pressure values had higher healthy lifestyle behaviors.

It is recommended that regular training on the prevention of chronic diseases be provided to communities, and that counseling services be integrated with primary care services, in order to increase awareness of hypertension. It is also recommended that supportive planning and programs on the prevention of hypertension and other chronic diseases be increased to promote the adoption of healthy lifestyle behaviors across society.

Acknowledgments

The authors would like to thank all the study participants for their participation.

References

1. Mendis S, Puska P, Norrving B, eds. Global atlas on cardiovascular disease prevention and control. Geneva: World Health Organization. 2011 (Available at http://whqlibdoc.who.int/publications/2011/9789241564373_eng.pdf) (Accessed on 15/03/2016)
2. Valerio L, Peters RJ, Zwinderman AH, Pinto-Sietsma SJ. Association of family history with cardiovascular disease in hypertensive individuals in a multiethnic population. *J Am Heart Assoc*, 2016, 5(12) pii: e004260. doi: 10.1161/JAHA.116.004260
3. Daştan İ, Erem A, Çetinkaya V. Urban and rural differences in hypertension risk factors in Turkey. *Anatol J Cardiol*, 2017, 17: 000-000 DOI:10.14744/AnatolJCardiol.2017.74
4. Mehmood Y, Al-Swailmi FK, Al-Enazi SA. Frequency of obesity and comorbidities in medical students. *Pak J Med Sci*, 2016, 32(6): 1528-1532. doi: 10.12669/pjms.326.10492.
5. Kumar P, Kumar D, Ranjan A, Singh CM, Pande, S, Agarwal N. Prevalence of hypertension and its risk factors among school going adolescents of Patna, India. *J Clin Diagn Res*, 2017, 11(1): SC01-SC04. doi: 10.7860/JCDR/2017/23886.9196.
6. González-Chica DA, Dal Grande E, Bowden J, Musker M, Hay P, Stocks N. Are we reducing the risk of cardiovascular disease and improving the quality of life through preventive health care? Results of a population-based study in South Australia. *Prev Med*, 2017, 99: 164-170. doi: 10.1016/j.ypmed.2017.02.007.
7. Zhang X, Zhang H, Ma Y, Che W, Hamblin MR. Management of hypertension using Olmesartan alone or in combination. *Cardiol Therapeutics*, 2017, 6(1): 13-32. doi: 10.1007/s40119-017-0087-5.
8. Onat A, Türkmen S, Karabulut A, Yazıcı M, Can G, Sansoy V. Combined hypercholesterolemia and hypertension among turkish adults: prevalence and prediction of cardiovascular disease risk. *Turk Cardiology Sci Arch*, 2004, 32(8): 533-541
9. Abacı A. The current status of cardiovascular risk factors in Turkey. *Arch Turk Soc Cardiol*, 2011, 39(Suppl 4): 1-5 doi: 10.5543/tkda.2011.abaci
10. Sengul S, Akpolat T, Erdem Y, Dericı U, Arıcı M, Sindel S, et al. Turkish society of hypertension and renal diseases. Changes in hypertension prevalence, awareness, treatment, and control rates in Turkey from 2003 to 2012. *J Hypertens*, 2016, 34(6): 1208-17. doi: 10.1097/HJH.0000000000000901
11. Tambağ H. Hatay health school students' healthy lifestyle behaviors and influencing factors. *Journal of Hacettepe University Faculty of Nursing*, 2011, 18(2): 47-58. (in Turkish)
12. Walker SN, Sechrist KR, Pender NJ. The Health-Promoting Lifestyle Profile: development and psychometric characteristics. *Nurs Res*, 1987, 36(2): 76-81.
13. Hekim M. The importance of physical activity in the prevention of type II Diabetes, hypertension and obesity. *J Int Soc Res*, 2015, 8(38): 1081-1086. Doi Number: <http://dx.doi.org/10.17719/jisr.20153813713>

14. Altun B, Arıcı M, Nergizolgu G, Derici U, Karatan O, Turgan C. Prevalence, awareness, and control of hypertension in Turkey (the Paten T study) in 2003. *J Hypertens*, 2005, 23: 17-23.
15. Öztürk A, Aykut M, Günay O, Gün İ, Özdemir M, Çıtıl R, Öztürk Y. Prevalence and factors affecting of hypertension in adults aged 30 years and over in Kayseri province *Erciyes Tıp Derg*, 2011, 33(3): 219-228. (in Turkish)
16. Esin N. The Turkish version of the Health-Promoting Lifestyle Profile instrument. *Hemşirelik Bülteni*, 1999, 12: 87-95. (in Turkish)
17. Wang J, Zhang L, Wang F, Liu L, Wang H, The China National Survey of Chronic Kidney Disease Working Group. Prevalence, awareness, treatment, and control of hypertension in China: Results from a national survey. *Am J Hypertens*, 2014, 27(11): 1355-61. doi: 10.1093/ajh/hpu053.
18. Neupane D, Shrestha A, Mishra SR, Bloch J, Christensen B, McLachlan CS, Karki A, Kallestrup P. Awareness, prevalence, treatment, and control of hypertension in western Nepal. *Am J Hypertens*, 2017, 30(9): 907-913. doi: 10.1093/ajh/hpx074
19. Çayır A, Atak A, Köse SK. Assessment of obesity frequency and related factors on individuals attending to the department of nutrition and dietetics Ankara Üniversitesi Tıp Fakültesi Mecmuası, 2011, 64(1): 13-19. DOI: 10.1501/Tipfak_0000000779
20. Kapelios CJ, Kyriazis I, Ioannidis I, Dimosthenopoulos C, Hatzigelaki E, Liatis S, The PERSEAS Study Group. Diet, life-style and cardiovascular morbidity in the rural, free living population of Elafonisos island. *BMC Public Health*, 2017, 17: 147. doi: 10.1186/s12889-017-4053-x.
21. Tayem YI, Yaseen NA, Khader WT, Abu Rajab LO, Ramahi AB, Saleh MH. Prevalence and risk factors of obesity and hypertension among students at a central university in the West Bank. *Libyan J Med*, 2012, 7: 10.3402/ljm.v7i0.19222.
22. Peng Y, Wang Z, Dong B, Cao S, Hu J, Adegbija O. Life's simple 7 and ischemic heart disease in the general Australian population. *PLoS One*, 2017, 12(10): e0187020. doi: 10.1371/journal.pone.0187020.
23. Iłow R, Róžańska D, Regulska-Iłow B. Prevalence of cardiovascular disease risk factors among pharmacy students from Wrocław Medical University (Poland). *Adv Clin Exp Med*, 2017, 26(5): 843-850.
24. Sivrikaya AH, Sivrikaya SK, Altun ÖŞ. Examination of healthy lifestyle attitudes of physical education and sports teaching department students. *Balıkesir Health Sci. Journal*, 2013, 2(3): 133-138. doi: 10.5505/bsbd.2013.32032
25. Yalçınkaya M, Özer FG, Karamanoğlu AY. Evaluation of healthy lifestyle behaviors in health care workers. *TAF Prev Med Bull*, 2007, 6(6): 409-420.
26. Akgün Şahin Z, Biçer N. Healthy lifestyle behaviors of hypertension patients. *MN Kardiyoloji*, 2015, 22(4): 180-185 (in Turkish)
27. Mete B, Nacar E, Tekin Ç, Pehlivan E. Feeding and healthy life behaviors in medicine faculty students. *International Peer-Reviewed Journal of Nutrition Research*, 2017, 9: 16-30. Doi: 10.17362/DBHAD.2017.1.0005

Correspondence:

Gülendam Karadağ, PhD

Department of Public Health Nursing, Faculty Nursing,
Dokuz Eylül University, İzmir, Turkey.

Tel. +90 232 4126964

Fax + 90 232 4124755

E-mail: gkaradag71@gmail.com