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The Relationship Between Lifestyle, Health Promotion Lifestyle Profile II And High Blood Pressure In University Students

Gülden Aynaci*, Ozlem Akdemir

Trakya University, Edirne, Turkey

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***Correspondence:** Gülden Aynaci. Trakya University, Edirne, Turkey. E-mail: guldenaynaci@hotmail.com

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Abstract

BACKGROUND: Identifying and controlling systemic arterial blood pressure is important in young people, and it is possible to reduce the frequency of systemic arterial hypertension by improving the lifestyle.

AIM: The aim of the study is to assess the relationship between healthy lifestyle behaviors and systemic blood pressure in university students.

MATERIALS: The study sample consisted of 200 university students from a state university in Edirne. Lifestyles and habits were evaluated with Health Promotion Lifestyle Profile II. Students' blood pressure was measured from both arms twice.

RESULTS: The mean HPLP-II score of those who frequently feel good was significantly higher than those who rarely feel good. The mean score of those who frequently wake up between 06:00-09:00 in the morning was statistically significantly higher than those who wake up outside these hours. Those who perform social or artistic activities during their leisure times had a mean scale score higher than those who don't perform. Although there wasn't a statistically significant difference according to smoking status, the mean score of non-smokers was higher than smokers. The mean scale scores were higher in frequent salt users than non-frequent users; participants with low saturated fatty acid intake had higher scores than those with high intake, and rare fast food consumers had higher scores than frequent consumers. The statistically significant difference between blood pressure values of females and males was due to higher blood pressure in male students. Those working in a part-time job had higher blood pressure values than those who weren't working. Among the students whose body mass indexes could be evaluated, there were differences in blood pressure values.

CONCLUSION: It has been observed in our study that health-related responsibilities and lifestyle behaviours increase with better leisure time activities, improved eating habits and a positive outlook on life. Turning youngs' tendencies towards healthy lifestyle behaviours to habits can make them healthier, more collective and more productive regarding physical, social and psychological well-being.

Introduction

Systemic arterial hypertension is a clinical, multifactorial disease characterised by increased blood pressure. It is generally seen together with structural and functional changes in target organs (heart, brain, kidneys) and as a result risk for cardiovascular events increases [1]. High blood pressure is the biggest contributor to the disease and death burden worldwide, and 9.4 million deaths occur each year [2]. Because it is highly dependent on changeable risk factors, the frequency of deaths can be prevented by directing lifestyle to a healthy pathway [3]. Hypertension and its complications may start at young ages [4]. Identifying and controlling systemic arterial blood pressure is important in young people, and it is possible to reduce the frequency of systemic arterial hypertension by improving the lifestyle [5].

It is accepted that the healthy lifestyle behaviours are the main way particularly to prevent chronic diseases. For this reason, regulation of lifestyle is important for protecting and improving health. A healthy lifestyle is a way of life that sustains and improves one's health and well-being. Most importantly, it involves a healthy diet, physical activities, regular life, coping with stress, interpersonal communication and health responsibility [6] [7].

In young people, a high body mass index, unhealthy eating habits, family history of hypertension, and the tendency for rising blood pressure are risk factors for hypertension. Hypertension can lead to death silently over the years [8] [9] [10] [11].

To increase the level of a healthy lifestyle, it is first necessary to evaluate behaviours. Before any intervention to improve healthy behaviours, it is very important to evaluate the way of life at present. For this purpose, the Health Promoting Lifestyle Profile which has accepted efficiency and reliability may be used [12]. This scale is widely used in the world. It may be used to evaluate the health of adolescent mothers and their families [13], elderly women and their health sustainability [14], as a preliminary test of a program for the prevention of type 2 diabetes in high-risk adolescents [15], to evaluate lifestyle behaviors after a major surgery [16], in studies that evaluate patient education and lifestyle in chronic diseases [17], and to evaluate health-promoting features in young people [18].

The aim of our study is to assess healthy lifestyle behaviors in university students and their relation to systemic blood pressure. Sociodemographic characteristics, habits, sleep quality, nutritional characteristics, healthy lifestyle behaviors and blood pressure levels were evaluated.

Materials

The study universe consisted of university students in Edirne, and the study sample consisted of 201 university students from a state university in Edirne. To evaluate the demographic information and lifestyles of the patients "Personal Information Form" was used. In the personal information form in addition to demographic features questions were asked about sleep hours, cigarette and alcohol use, eating habits, physical activities, social media use, and presence of hypertension in the family.

Lifestyles and habits were evaluated with Health Promotion Lifestyle Profile II. This scale is the revised form of Health Promotion Lifestyle Profile which was developed by Walker et al., [12]. It evaluates health-promoting behaviours related to a healthy lifestyle. It has 52 items. In the assessment of this scale, the lowest possible score is 52, and the highest possible score is 208.

Several studies conducted in various countries and with various study groups have compared this scale with various scales that assess the lifestyles of individuals. It is considered to be effective and reliable to assess healthy lifestyle behaviours [19] [20] [21].

In our study, voluntary students rested for 10 minutes before blood pressure measurement. Using a standard mercury sphygmomanometer covering two-thirds of the upper arm and having an appropriate cuff size, blood pressure was measured at sitting position from both arms twice with a 10-minute interval, and care was exercised to ensure that no cigarettes or caffeinated food were received within 30 minutes before the measurement. The higher of the two measurements was recorded.

Table 1: Definition and classification of systemic blood pressure levels*

CLASSIFICATION	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Stage 1 hypertension	140-159	and/or	90-99
Stage 2 hypertension	160-179	and/or	100-109
Stage 3 hypertension	≥180	and	≥110

*2016 European Guidelines on cardiovascular disease prevention in clinical practice. European Heart Journal.

Approval was obtained from the Clinical Trials Ethics Committee of the University and informed consents were obtained from all participants.

All statistical analyses were performed with SPSS 20.0 Package Program. Normal distribution of the data was controlled with Shapiro-Wilk test. Two group comparisons were performed with the Student t-test. Multiple comparisons after one-way analysis of variance were evaluated with the Bonferroni test. Chi-square test was used for the relations between categorical variables. Descriptive statistics for numerical variables were given as mean and standard deviation. Descriptive statistics for categorical variables were given as percentage and frequency. The statistical significance level for all statistical analyses was defined as 5%.

Results

Table 2 shows the demographic features of the participants. This study involved university students between 18-24 years of age. The mean age of female students was 20.5 ± 1.73, and male students were 20.9 ± 1.77. Eighty per cent of the study sample was females. Some students from Health Vocational High School and Applied Sciences High School were equal. According to the place of residence during education 172 (86%) were staying at the dormitory and 26 (14%) were staying at home. 176 (88%) participants found their income level adequate, and 24 (12%) said it was low.

The mean score obtained by the students of Health Vocational High School from Health Promotion Lifestyle Profile II (HPLP II) (132.05 ± 1.70) was statistically significantly higher than the mean score obtained by the students from Applied Sciences Vocational High School (126.14 ± 1.91). No difference could be found according to income level and place of residence during school; the score of those who didn't work in additional jobs during school was found to be statistically significantly higher than those who work.

Table 2: Demographic features and the mean HPLP-II scores of the participants in this study

	N	%	Mean Score from the Scale	Standard Deviation	P
Gender					
Male	40	20.0	126.80	2.846	0.370
Female	160	80.0	129.69	1.443	
School					
Health Vocational High School	100	50.0	132.05	1.703	0.022*
Applied Sciences High School	100	50.0	126.14	1.911	
Place of Residence					
House	26	14.0	125.6	3.004	0.312
Dormitory	172	86.0	129.5	1.424	
Family income status					
Low	24	12.0	123.8	3.718	0.151
Good	176	88.0	129.6	1.367	
Working in a part-time job					
Yes	16	9.0	116.9	4.638	0.06*
No	182	91.0	129.97	1.318	

*****indicates those with a statistically significant difference.

Table 3 evaluates lifestyle features of study participants. The mean HPLP-II score of those who frequently feel good (131.61 ± 1.47) was significantly higher than those who rarely feel good (123.36 ± 2.44). The mean score of those who frequently wake up between 06:00-09:00 in the morning (131.06 ± 1.46) was statistically significantly higher than those who wake up outside these hours. Although there wasn't a difference in sleep duration, the mean score of those that sleep 6-8 hours a day was higher than those who sleep less or more.

Table 3: Lifestyle features and the mean HPLP-II scores of the study participants

	N	%	The mean scale score	Standard deviation	P
Satisfaction with health					
Absent	6	3.0	119.67	4.410	0.187
Moderate	104	52.0	127.83	1.769	
Good	90	45.0	131.23	1.957	
How does he/she frequently feel					
Good-very good	140	70.0	131.61	1.479	0.003*
Moderate	59	29.5	123.36	2.443	
Sleep duration / in 24 hours					
< 5 hours	22	11.0	127.27	4.805	0.652
6-8 hours	160	80.0	129.70	1.394	
> 8 hours	18	9.0	126.17	4.243	
Sleeping time					
Before 12:00 pm	57	28.5	132.47	2.176	0.099
After 12:00 pm	143	71.5	127.78	1.567	
Morning waking time					
Before 06:00 o'clock	8	4.0	113.38	6.918	0.010*
Between 06:00-09:00	144	72.0	131.06	1.469	
After 09:00 o'clock	48	24.0	125.90	2.641	
Regular sports/ exercise					
Never	140	70.0	125.21	1.475	<0.001*
< 2 hours /week	10	5.0	133.70	4.412	
> 2 hours /week	50	25.0	139.14	2.426	
Breakfast					
0-3 days/ week	39	19.5	126.28	2.760	0.280
4-7 days/ week	161	80.5	129.80	1.451	
Leisure activities (hobbies, social and artistic activities)					
Absent	18	9.0	116.94	4.828	<0.001*
Moderate	140	70.0	127.79	1.384	
Frequent	42	21.0	138.74	2.920	
Quality of Life					
Bad	8	4.0	111.75	7.991	0.005*
Moderate	146	73.0	128.55	1.426	
Good	46	23.0	133.91	2.757	
Watching TV/ week					
0-1 hour	114	57.0	128.03	1.865	0.586
2-4 hours	56	28.0	131.07	2.197	
5 hours or more	30	15.0	129.60	2.597	
PC, tablet pc, laptop etc.					
0-1 hour /day	31	15.5	126.74	3.555	0.634
2-3 hours /day	74	37.5	128.69	1.830	
4 hours or more /day	95	47.5	130.22	2.000	
The frequency of social media use					
0-1 hour/day	22	11.0	130.27	4.167	0.673
2-3 hours/day	70	35.0	127.56	2.041	
>4 hours/day	108	54.0	129.89	1.801	

*****Indicates statistically significant difference.

Those who perform social or artistic activities during their leisure times had a mean scale score (138.74 ± 2.92) higher than those who don't perform such activities (127.7 ± 1.38). There wasn't any difference according to social media use and use of electronic devices such as a computer or tablet PC.

There wasn't a statistically significant difference between those who regularly exercise or perform sports activities and who don't and who have breakfast 4 times or more or less than 4 times a week but those who perform regular exercises or who have breakfast more than 4 times a week had higher scale scores than others.

Table 4 shows the mean HPLP-II scores of the participants according to risk factors. The mean score of those who use alcohol (131.04 ± 1.37) was higher than those who don't use alcohol (121.25 ± 3.31). Although there wasn't a statistically significant difference according to smoking status, the mean score of non-smokers was higher than smokers.

The mean scale scores were higher in frequent salt users than non-frequent users (133.23 ± 1.68 vs 123.98 ±1.86); participants with low saturated fatty acid intake had higher scores (132.06 ± 1.99) than those with high intake (126.89 ± 1.65), and rare fast food consumers had higher scores (130.18 ± 3.18) than frequent consumers (120.59 ± 3.29). Body mass index was evaluated in 155 students, and no significant difference could be detected. No significant difference was found in the scale score according to the stress level.

Table 4: Distribution of the participants according to risk factors and the mean HPLP-II score

	N	%	The mean scale score	Standard deviation	P
Smoking					
Yes	156	78.0	130.02	1.413	0.186
No	44	22.0	125.91	2.999	
Alcohol consumption					
No	161	80.5	131.04	1.377	0.003*
Yes	36	18.0	121.25	3.316	
Hypertension in a 1st-degree relative					
Yes	51	25.5	129.29	2.692	0.935
No	149	74.5	129.05	1.466	
Consumption of processed food					
0-1 meal/ week	84	42.0	129.36	1.964	0.922
2-3 meals/ week	86	43.0	128.57	2.116	
4 or more meals / week	30	15.0	130.00	2.671	
Salt use					
Normal	111	55.5	133.23	1.683	<0.001*
Frequent- every time	89	44.5	123.98	1.860	
Use of saturated fat- frying oil					
0-1 meal/week	86	43.0	132.06	1.999	0.047*
2 or more meals /week	114	57.0	126.89	1.657	
Fast food consumption					
Never	22	11.0	130.18	3.812	0.023*
1-3 meals/ week	149	74.5	130.62	1.473	
>3 meals/ week	29	14.5	120.59	3.299	
BMI					
Underweight	23	11.5	128.39	3.630	0.440
Normal	114	57	131.71	1.612	
Overweight	18	9.0	126.94	4.119	
Stress level					
Low	24	12.0	126.08	3.780	0.393
Moderate	106	53.0	130.71	1.774	
High	70	35.0	127.74	2.151	

*****indicates the statistically significant difference.

In Table 5 there was a significant difference between systemic arterial blood pressure and the mean scale score. The difference was mainly due to the difference between those with stage 1 hypertension and others. No case with stage 2 or 3 hypertension was detected.

Table 5: Systemic blood pressure values and the mean scale scores of the participants

Blood Pressure Values	N	The mean scale score	Standard deviation	P
Optimal	61	128.30	2.143	
Normal	107	132.44	1.658	<0.001*
High Normal	20	126.25	3.864	
Stage 1 Hypertension	12	108.42	6.612	

***Indicates statistically significant difference.**

Table 6 demonstrates the association between systemic blood pressure values and sociodemographic features. The statistically significant difference between blood pressure values of female and male students was due to higher blood pressure in male students. No significant difference in blood pressure values could be found according to the school they were attending, the place of residence, and their income status. Those working in a part-time job had higher blood pressure values than those who weren't working.

Table 6: Change in systemic blood pressure values according to sociodemographic features

	Optimal	Normal	High Normal	Stage 1	P
Gender					
Female	57 (35.6%)	84 (52.5%)	12 (7.5%)	7 (4.4%)	0.001*
Male	4 (10.0%)	23 (57.5%)	8 (20%)	5 (12.5%)	
School					
Health Vocational High School	29 (29.0%)	57 (57.0%)	11 (11.0%)	3 (3.0%)	0.293
Applied Sciences High School	31 (31.3%)	50 (50.5%)	9 (9.1%)	9 (9.1%)	
Place of residence					
Dormitory	55 (%32.0)	91 (%52.9)	16 (%9.3)	10 (%5.8)	0.653
House	6 (%21.4)	16 (%57.1)	4 (%14.3)	2 (%7.1)	
Family income status					
Low	4 (%17.4)	13 (%56.5)	3 (%13.0)	3 (%13.0)	0.273
Good	57 (%32.2)	94 (%53.1)	17 (%9.6)	9 (%5.1)	
Work in a part-time job					
Yes	3 (18.8%)	8 (50.0%)	1 (6.5%)	4 (25.0%)	0.010*
No	58 (31.9%)	97 (53.3%)	19 (10.4%)	8 (4.4%)	

***Indicates statistically significant difference.**

Table 7 demonstrates the association between lifestyle features and systemic blood pressure of the participants in this study. No difference could be detected in how they frequently feel, daily sleep duration, morning waking time, weekly breakfast frequency, and use of social media and electronic devices such as a computer, tablet pc etc.

Table 7: The association between lifestyle features of the participants and systemic blood pressure values

	Optimal	Normal	High Normal	Stage 1	P
How does he/she frequently feel					
Good- very good	44 (31.4%)	77 (55.0%)	13 (9.3%)	6 (4.3%)	0.385
Moderate	16 (27.1%)	30 (50.8%)	7 (11.9%)	6 (10.2%)	
Sleep duration/in 24 hours					
<5 hours	5 (22.7%)	13 (59.1%)	1 (4.5%)	3 (13.6%)	0.205
6-8 hours	51 (31.9%)	87 (54.4%)	15 (9.4%)	7 (4.4%)	
> 8 hours	5 (27. 8%)	7 (38.9%)	4 (22.2%)	2 (11.1%)	
Sleep time					
Before 24:00 at night	12 (21.1%)	34 (59. 6%)	9 (15.8%)	2 (3.5%)	0.094
After 24:00	49 (34.3%)	73 (51.0%)	11 (7.7%)	10 (7.0%)	
Breakfast					
0-3 days/ week	11 (28.2%)	21 (53.8%)	5 (12.8%)	2 (5.1%)	0.912
4-7 days/ week	50 (31.1%)	86 (53.4%)	15 (9.3%)	10 (6.2%)	
Computer, tablet pc, laptop etc.					
0-1 hour/day	9 (29.0%)	19 (61.3%)	3 (9.7%)	0 (0%)	0.227
2-3 hours /day	23 (31.1%)	42 (56.8%)	3 (4.1%)	6 (8.1%)	
4 hours or more /day	29 (30.5%)	46 (48.4%)	14 (14.7%)	6 (6.3%)	
The frequency of social media use					
0-1 hour/day	5 (22.7%)	13 (59.1%)	2 (9.1%)	2 (9.1%)	0.458
2-3 hours/day	25 (35.7%)	38 (54.3%)	3 (4.3%)	4 (5.7%)	
>4 hours/day	31 (28.7%)	56 (51.9%)	15 (13.9%)	6 (5.6%)	

***Indicates statistically significant difference.**

No statistically significant difference could be found according to whether or not they perform social and artistic activities in their leisure times and whether or not they regularly exercise.

The associations between the risk factors of the study participants and systemic blood pressure values are demonstrated in Table 8. There was a significant difference in systemic blood pressure values between those who use alcohol or not; no difference could be detected according to smoking status, the frequency of salt use, the frequency of consumption of foods including fatty acids, processed food and fast food. Among the students whose body mass indexes could be evaluated, there were differences in blood pressure values. No significant difference could be found according to the stress level.

Table 8: The association between risk factors of the participants and systemic blood pressure values

	Optimal	Normal	High Normal	Stage 1	P
Smoking					
No	49 (31.4%)	87 (55.8%)	11 (7.1%)	9 (5.8%)	0.069
Yes	12 (27.3%)	20 (45.5%)	9 (20.5%)	3 (6.8%)	
Alcohol use					
No	53 (32.9%)	88 (54.7%)	14 (8.7%)	6 (3.7%)	0.016*
Yes	8 (22.2%)	17 (47.2%)	5 (13.9%)	6 (16.7%)	
Salt consumption					
Normal	30 (27.0%)	63 (56.8%)	13 (11.7%)	5 (4.5%)	0.370
Frequent- Every time	31 (34.8%)	44 (49.4%)	7 (7.9%)	7 (7.9%)	
Consumption of saturated fat- frying oil					
0-1 meal/week	23 (26.7%)	52 (60.5%)	9 (10.5%)	2 (2.3%)	0.139
2 or more meals /week	38 (33.3%)	55 (48.2%)	11 (9.6%)	10 (8.8%)	
Fast food consumption					
Never	7 (31.8%)	10 (45.5%)	4 (18. 2%)	1 (4.5%)	0.445
1-3 meals/ week	45 (30.2%)	83 (55.7%)	14 (9.4%)	7 (4.7%)	
>3 meals/ week	9 (31.0%)	14 (48.3%)	2 (6.9%)	4 (13.8%)	
BMI					
Underweight	12 (%52.2)	10 (%43.5)	0 (%.0)	1 (%4.3)	<0.001*
Normal	31 (%27.2)	69 (%8.8)	10 (%8.8)	4 (%3.5)	
Overweight	4 (%22.2)	5 (%27.8)	6 (%33.3)	3 (%16.7)	
Stress level					
Low	9 (%37.5)	9 (%37.5)	2 (%8.3)	4 (%16.7)	0.242
Moderate	33 (%31.1)	56 (%52.8)	12 (%11.3)	5 (%4.7)	
High	19 (%27.1)	42 (%60.0)	6 (%8.6)	3 (%4.3)	

***Indicates statistically significant difference.**

Discussion

Prevalence of hypertension is increasing worldwide, and research has shown that young age group is affected increasingly more especially in the last 20 years. Hypertension increases morbidity and mortality. Prevalence of hypertension in the young age group is important because of the serious consequences of hypertension and the probability of secondary hypertension in this age group. Hypertension is an important preventable risk factor for cardiovascular diseases [22] [23].

Due to changing conditions in every aspect of life in our age, a more passive lifestyle which is not compatible with people's natural structure has become widespread. In every day, school or business life, stressful and unfavourable conditions can trigger unexpected physical problems as well as some psycho-social disadvantages. Improving physical activity, supporting healthy eating habits, and improving the ability to cope with stress play an important role in maintaining both physical and psychosocial well-being.

In our study, the rate of high-normal systemic arterial pressure in university students was 8.1%, and the rate of hypertension was 5.6%. Results of our study are consistent with studies that found 7.4% hypertension in Ethiopia and 7% hypertension in Kuwait [24]. In Saudi Arabia, 7.5% of the students were hypertensive [25]. These results are consistent with the study that reported 9.3% hypertension prevalence in medical students in Jeddah [26]. In a study conducted at King Fahd University in Dammam, blood pressure was reported to be 13.8% among male students [27]. But this finding is low compared with reported hypertension rates in Nigeria (19.3%), Tunisia (35.1%), and Gambia (38%) [28]. The differences may be due to data collection methods, the socioeconomic status of the evaluated population, and differences in healthy lifestyle behaviours.

As the number of positive health behaviours increases, the score of Health Promotion Lifestyle Profile II also increases [12]. The mean scale score in our study was detected to be 129.69 ± 1.44 in females and 126.80 ± 2.84 in males.

A study published by the American Pediatric Academy reported that young people are more likely to reduce their intake of food than to increase physical activity in healthy lifestyle behaviours to maintain their physical appearance [29]. It has been observed in our study that health-related responsibilities and lifestyle behaviours increase with better leisure time activities, improved eating habits and a positive outlook on life. As the ability of individuals to feel healthy grows, the healthy lifestyle they have acquired will become a habit.

Turning young people's tendencies towards healthy lifestyle behaviours to habits can make them healthier, more collective and more productive regarding physical, social and psychological well-being. Supporting healthy lifestyle behaviours in educational institutions will help to protect youth from chronic diseases such as hypertension as well as contribute to the social development of young people. Thus, healthy and dynamic young people, who are exemplified in the society, will lead the way of making healthy lifestyles attitudes in the whole society.

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