Assessment of health-promoting lifestyle behaviors of adults living in the semi-rural area

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ABSTRACT

OBJECTIVE: The aim of the present study was to determine the level of healthy lifestyle behaviors and related factors in the individuals who applied to the primary health-care center.

METHODS: The study is a cross-sectional study of adults aged 18 years and over who applied to the primary health-care center. The sample size of the study was calculated as 992 people and 995 participants were accessible. The health-promoting behaviors of the individuals were assessed by the Health-Promoting Lifestyle Profile II (HPLP-II). In the analysis of the data, Mann–Whitney U-test, Kruskal–Wallis tests, and multiple linear regression analysis were used to determine effective variables on scale score.

RESULTS: The mean age of the participants was 43.8±17.1. Of the total participants, 45.7% (n=455) of them were female. The median score obtained from the HPLP-II was 132. Health responsibility, nutrition, and interpersonal relations subscale scores of male were lower than female patients, while physical activity subscale scores were higher in male patients. In participants under the age of 48 years in the study, health responsibility, nutrition, interpersonal relations, and stress management subscale scores were higher. The scores of the married participants were higher than the areas out of the stress management subdimension. Stress management subscale scores were higher in individuals with primary and lower education levels in terms of health care, nutrition, and interpersonal relations. Those who had good family income status and health perception scores also received higher scores in terms of all subscale scores.

CONCLUSION: Gender, age group, marital status, education level, income level, physician-diagnosed chronic disease history, and perceived health status were found to be related to health-promoting behaviors. Educational programs should be prepared in these issues by determining the issues that individuals are lacking in protecting and developing their health and social needs should be taken into consideration when these programs are being prepared.

Keywords: Adult; health-promoting lifestyle; semi-rural area.

Non-communicable diseases have gained importance with the reduction of infectious diseases which were the main cause of death in the past [1]. Today, non-communicable diseases, which are responsible for 80% of the deaths in the world, usually occur as a result of lifestyle-related behavioral risk factors such as smoking, physical inactivity, alcohol abuse, and unhealthy diet [2]. Behavioral risk factors related to lifestyle are the main determinants of health such as physical environment and socioeconomic factors [3]. Studies have shown that lifestyle and health status are related to utilization of health-care services and health expenses [4].

A healthy lifestyle is defined as the ability to control all behaviors that may affect the health of the individual and to choose behaviors that are appropriate to their health status in organizing their daily activities [5]. The individual who performs these behaviors continuously in

his life can maintain his/her health status in a better level as well as being healthy by being protected him/herself from diseases [6]. It has been reported that diseases and deaths decrease and quality of life increases in individuals with healthy lifestyle [7-9]. In a study conducted in Germany, having four or more healthy lifestyle behaviors were associated with a 66% reduction in mortality risk. [10] The World Health Organization also emphasized the importance of a healthy lifestyle for the 2000s with the slogan "Health for All" [11].

Healthy lifestyle behaviors are important indicators of public health and the main determinants of future health trends and health-care costs [12]. In contrast, it is very difficult to measure healthy lifestyle behaviors and to include them among the health indicators in countries.

One of the most important studies on this issue is the Health-Promoting Lifestyle Profile-II (HPLP-II) scale that was developed by Walker et al. [13] developed in 1987 and again revised in 1996. The scale suggests that healthy lifestyle behaviors consist of a combination of health responsibility, spiritual growth, stress management, interpersonal relations, nutrition, and physical activity behaviors. Healthy lifestyle behaviors have been reported to be at different levels in studies conducted in various countries [10, 14]. In studies conducted in our country, it has been reported that healthy lifestyle behaviors have been applied at a moderate level. The implementation of the scale in various groups of society will contribute to the epidemiology of healthy lifestyle behaviors. In this context, the study was planned to determine the factors affecting the healthy lifestyle behaviors and the healthy lifestyle factors among ≥18-year-old people who applied to primary health-care facilities in the semi-rural region of the province of Eskişehir.

MATERIALS AND METHODS

The study was a cross-sectional study conducted with ≥18-year-old adults who applied to the primary health-care facilities of three Public Health Centres in Eskişehir Osmangazi University Education and Research Area. Administrative and ethical permits were obtained for the study. The sample size of the study was estimated to be a population of at least 992 people based on the incidence of having a healthy lifestyle in at least 50% of the participants with a margin of the error of 3% and within 95% confidence interval.

The study group consisted of a total of 995 people aged ≥18 years who consecutively applied to the primary health-care facilities in the district centers for any reason

and agreed to participate in the study. Individuals who agreed to participate in the study were interviewed in the waiting room of the Family Health Center polyclinic. Oral informed consent was obtained from the individuals who were informed about the subject and purpose of the study. Previously prepared questionnaire forms were filled in by face-to-face interview method. This process took approximately 20–25 min. For this study, a questionnaire was prepared based on literature data [5, 6]. The questionnaire consisted of two parts. In addition to sociodemographic characteristics (gender, age, marital status, level of education, and income level), in the first part, the patients were questioned about a physician-diagnosed chronic illness and their perceived health status at the time of questioning.

The second part consisted of the HPLP-II scale which assessed health-promoting behaviors related to healthy lifestyle. The Turkish validity and reliability study of the scale was performed in 2008 by Bahar et al.

This 4-point Likert-type scale (never=1 and regularly=4) consisted of 52 questions included in six subdimensions such as health responsibility (3, 9, 15, 21, 27, 33, 39, 45, and 51), physical activity (4, 10, 16, 22, 28, 34, 40, and 46), nutrition (2, 8, 14, 20, 26, 32, 38, 44, and 50), spiritual growth (6, 12, 18, 24, 30, 36, 42, 48, and 52), interpersonal relations (1, 7, 13, 19, 25, 31, 37, 43, and 49), and stress management (5, 11, 17, 23, 29, 35, 41, and 47). The scores that can be obtained from the scale vary between 52 and 208 points, and it is accepted that the level of healthy lifestyle behavior increases as the score increases [17]. The income levels of the individuals were evaluated as good, middle, and poor according to their perceptions. General health perception was evaluated based on how people defined their own health status (good, moderate, and poor). In our study, those who were previously diagnosed with chronic disease by a physician were considered to have physician-diagnosed chronic disease. Those who smoked at least one cigarette a day were defined as smoker. Obtained data were evaluated in IBM SPSS (version 15.0) statistical package program loaded in a computer.

Descriptive statistics, Mann–Whitney U-test, and Kruskal–Wallis tests were used to analyze the data. Multiple linear regression analysis was also performed to determine the factors affecting the scale and subscale scores. The logarithm of the dependent variable HPLP-II and subscale scores were taken into consideration and adapted to normal distribution. Multiple linear regression model was applied and the model was created with statistically significant values. The level of statistical significance was accepted as $p \leq 0.05$.

TABLE 1. Distribution of the participants of the study group according to their sociodemographic characteristics

Sociodemographic characteristics	n (%)
Gender	
Female	455 (45.7)
Male	540 (54.3)
Age groups (years)	
18–39	464 (46.6)
40–64	389 (39.1)
≥65	142 (14.3)
Marital status	
Married	725 (72.9)
Single	194 (19.5)
Divorced/deceased spouse	76 (7.6)
Levels of education	
Primary school	414 (41.6)
Secondary school	117 (11.8)
Lyceé and above	464 (46.6)
Income level	
Good	259 (26.0)
Middle	612 (61.5)
Poor	124 (12.5)
History of physician-diagnosed chronic disease	
Yes	421 (42.3)
No	574 (57.7)
Perceived health state	
Good	553 (55.6)
Moderate	347 (34.9)
Poor	95 (9.5)

RESULTS

The mean age of the participants in the study group was 43.8±17.1 years (minimum 18 and maximum 93) and 54.3% (540) of the participants were male. While 41.6% (n=414) of the participants had primary and lower education levels, 72.9% (n=725) of them were married. 42.3% (n=421) of the study group had physician-diagnosed chronic disease. Furthermore, 55.6% of the participants (n=553) reported that they perceived their health as good and 9.5% (n=95) of them as poor.

The distribution of the participants of the study group according to their sociodemographic characteristics is given in Table 1.

The internal validity coefficients of the scale and its subdimensions of the study group according to gender and age groups are given in Table 2.

The internal validity coefficients of HPLP-II and its subdimensions were found to be acceptable in terms of gender and age groups.

The HPLP-II scores of the participants of the study group ranged between 82.0 and 208.0 and the median value (1st and 3rd quartiles) was 132.0 (118.0–149.0). Table 3 shows the distribution of the participant's scores they obtained from the subdimensions of HPLP-II and their subscale domains according to their sociodemographic characteristics.

While the subscale scores of the males concerning the subdimensions of health responsibility, nutrition and interpersonal relations are lower than those of the females, subscale scores of males concerning the phys-

TABLE 2. Internal validity coefficients of the scale and its subdimensions according to gender and age groups

	Health responsibility	Nutrition	Physical activity	Interpersonal relations	Spiritual growth	Stress management	HPLP-II
Gender							
Female	0.754	0.646	0.849	0.808	0.790	0.713	0.845
Male	0.750	0.668	0.850	0.809	0.776	0.690	0.852
Age group							
18–39 years	0.751	0.655	0.865	0.794	0.782	0.691	0.849
40–64 years	0.749	0.655	0.832	0.820	0.778	0.699	0.852
≥65 years	0.752	0.660	0.850	0.798	0.783	0.604	0.823
Total	0.756	0.655	0.851	0.811	0.781	0.690	0.849

HPLP-II: Health-Promoting Lifestyle Profile II.

TABLE 3. Sociodemographic characteristics of the participants according to median scores they obtained from HPLP-II scale and its subdimensions

Sociodemographic characteristics	Health responsibilit median (minimum-maximum)	Nutrition median (minimum-maximum)	Physical activity median (minimum-maximum)	Interpersonal relations median (minimum-maximum)	Spiritual growth median (minimum-maximum)	Stress management median (minimum-maximum)	HPLP-II Median (minimum-maximum)
Scores of the study group	22 (9–36)	23 (10–36)	14 (8–32)	27 (12–36)	27 (11–36)	20 (8–32)	132 (82–208)
Gender							
Female	23 (11–36)	24 (11–35)	13 (8–32)	27 (16–36)	27 (13–36)	20 (9–32)	133 (86–208)
Male	21 (9–35)	22 (11–35)	14 (8–32)	26 (16–36)	27 (11–36)	20 (8–32)	130.5 (82–202)
P	<0.001	<0.001	<0.001	<0.001	0.206	0.769	0.009
Age group (years)							
<40	21 (9–35)	22 (10–34)	14 (8–32)	26 (12–36)	26.5 (11–36)	19 (8–32)	129 (82–188)
40–64	23 (11–36)	25 (12–36)	14 (8–32)	27 (14–36)	28 (16–36)	21 (10–32)	136 (85–208)
≥65	23 (11–33)	24 (12–33)	12 (8–30)	27 (16–36)	26 (17–36)	21 (10–32)	131 (88–189)
P	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Marital scores							
Married	22 (10–36)	24 (10–36)	13 (8–32)	27 (13–36)	27 (13–36)	20 (8–32)	133 (85–208)
Single	21 (9–34)	21 (12–33)	16 (8–31)	26 (12–36)	27 (11–36)	20 (8–32)	130.5 (82–183)
Divorced/deceased spouse	22 (13–35)	23.5 (12–33)	11.5 (8–29)	26 (16–36)	25 (17–36)	20 (11–32)	127.5 (88–189)
P	≤0.001	<0.001	<0.001	0.007	0.024	0.878	0.090
Level of education							
Primary school and lower	23 (11–35)	25 (10–35)	11 (8–32)	27 (14–36)	27 (13–36)	21 (9–32)	134 (85–196)
Secondary school	21 (9–35)	23 (15–34)	14 (8–32)	25 (13–36)	27 (17–36)	19 (8–32)	127 (87–202)
Lyceé and above	22 (10–36)	22 (11–36)	16 (8–32)	26 (12–36)	27 (11–36)	20 (8–32)	132 (82–208)
P	<0.001	<0.001	<0.001	<0.001	0.505	0.01	0.017
Income level							
Good	23 (9–35)	24 (13–34)	15 (8–32)	28 (14–36)	29 (14–36)	21 (11–32)	141 (85–202)
Middle	22 (10–36)	23 (10–36)	14 (8–32)	26 (15–36)	27 (16–36)	20 (8–32)	130 (85–208)
Poor	21 (11–32)	22 (11–35)	12 (8–27)	25 (12–36)	24.5 (11–36)	18 (8–29)	123 (82–181)
P	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
History of physical diagnosed chronic disease							
Yes	23 (11–35)	24 (10–35)	13 (8–30)	27 (12–36)	27 (16–36)	20 (10–32)	133 (85–189)
No	22 (9–36)	23 (11–36)	14 (8–32)	26 (13–36)	27 (11–36)	20 (8–32)	131.5 (82–208)
P	≤0.001	0.026	<0.001	0.048	0.202	0.101	0.341
Perceived health state							
Good	23 (10–35)	24 (10–35)	14 (8–32)	27 (12–36)	28 (14–36)	21 (11–32)	136 (85–202)
Moderate	22 (9–36)	23 (12–36)	13 (8–32)	26 (13–36)	26 (11–36)	19 (10–32)	127 (82–208)
Poor	21 (12–35)	23 (11–34)	11 (8–29)	25 (15–36)	24 (13–36)	18 (8–27)	125 (88–185)
P	0.006	0.043	<0.001	<0.001	<0.001	<0.001	<0.001

HPLP-II: Health-Promoting Lifestyle Profile II.

ical activity were relatively higher. Interpersonal relations and stress management scores were not different between both genders. In the study, participants under 40 years of age obtained higher scores when compared with the other age groups in terms of health responsibility, nutrition, interpersonal relations, and stress management.

The married participants had gotten higher scores in all subdomains excepting the stress management subdomain. Participants with primary or lower educational levels obtained higher scores concerning subdimensions of health responsibility, nutrition, interpersonal relations, and stress management but relatively lower scores in the physical activity subdimension. The scores obtained from all subdomains of the scale were higher in those with higher income levels. The scores received by individuals related to the spiritual growth subdomain do not change with the educational levels of the individuals.

Those with physician-diagnosed chronic disease had a higher score in subdimensions of health responsibil-ity, nutrition, and interpersonal relations but lower in the physical activity subdimension. People who had a good perception concerning their health status had also received higher scale and subscale scores. Table 4 displays the results of multiple linear regression analysis showing the factors related to the HPLP-II scale and its subscale scores obtained by the study participants.

DISCUSSION

In this study, which was conducted to evaluate the healthy lifestyles of individuals living in semi-rural areas, the median score obtained from the Healthy Lifestyle Behavior Scale-II (HLPL-II) was 132.0 (118.0–149.0) points and the mean score was 135.8 points. In the various studies conducted in our country, the HLPL-II scale scores obtained by the study participants ranged from 120.8 to 136.1 [18-22]. Considering that 208 points were the highest score that can be obtained from HLPL-II scale, the average score obtained in the study was at a middle level, and the scores of other studies reported in

TABLE 4. The results of multiple linear regression analysis showing the factors related to the HPLP-II scale and its subscale scores obtained by the study participants

Sociodemographic characteristics	Health responsibility β (95% CI)	Nutrition β (95% CI)	Physical activity β (95% CI)	Interpersonal relations β (95% CI)	Spiritual growth β (95% CI)	Stress management β (95% CI)	HPLP-II β (95% CI)
Gender	0.031*** (0.018–0.043)	0.024*** (0.012–0.035)	−0.024* (−0.044−−0.005)	0.026*** (0.016–0.036)			0.013** (0.004–0.022)
Age group	1.358*** (0.008–0.029)	0.013** (0.003–0.023)	0.007 (−0.010–0.023)	0.015*** (0.007–0.024)	0.008* (0.001–0.014)	0.024*** (0.015–0.034)	0.013*** (0.006–0.020)
Marital status	−0.012** (−0.022−−0.002)	−0.014** (−0.023−−0.005)	0.013 (−0.003−−0.028)	−0.010** (−0.018−−0.003)	−0.008 (−0.015–0.000)		
Level of education	−0.006 (−0.014–0.001)	−0.022** (−0.029−−0.015)	0.044*** (0.032–0.057)	−0.007* (−0.013−−0.001)		−0.004 (−0.012–0.003)	−0.003 (−0.009–0.002)
Income level	−0.021*** (−0.031−−0.010)	−0.015** (−0.025−−0.005)	−0.022* (−0.038−−0.005)	−0.015*** (−0.024−−0.007)	−0.018*** (−0.026–0.010)	−0.022*** (−0.032−−0.012)	−0.018*** (−0.025−−0.011)
History of physician-diagnosed disease	−0.007 (−0.021–0.008)	0.010 (−0.003–0.024)	0.005 (−0.017–0.028)	0.000 (−0.011–0.012)			
Perceived health state	0.012** (−0.022−−0.003)	0.013** (−0.022−−0.004)	0.017* (−0.033–0.002)	0.022*** (−0.030−−0.015)	0.031*** (−0.039−−0.024)	0.032*** (−0.041−−0.022)	0.022*** (−0.029−−0.015)
R2	0.084	0.109	0.114	0.110	0.112	0.104	0.105
F	12.968***	17.327***	18.221***	17.499***	31.326***	28.657***	23.314***

*≤0.05; **≤0.01; ***≤0.001; CI: Confidence interval; HPLP-II: Health-Promoting Lifestyle Profile II; CI: Confidence interval.

Turkey were close to maximum.

Different HPLP-II scale scores obtained may be originated from the differences in the age, gender, cultural state, occupation, educational level, and economic status of the participants of the study groups.

In the study performed, the median HPLP-II scale scores were higher than those obtained by men. Similar results were reported in the study performed by Özbaşaran et al. [23] In some studies, a difference was reported between some subgroups, while any difference was not indicated between the total scale score and gender of the study participants [19, 24, 25]. In the study group, the median subscale scores for health responsibility, nutritional, and interpersonal relations were higher in female, while median physical activity score was higher in men. Although similar results have been reported in literature, some studies could not find any relationship between gender and subscale scores [19, 26-30]. In their study, Bagwell and Bush noted that women had obtained higher scores in subdimensions of health responsibility and interpersonal relations [31]. It is known that women are more concerned with their health than men [25]. Since women are responsible for taking responsibility in their home life, making decisions about food, and most of the women in the study group were housewives, it can be thought that the score obtained from the nutrition subdomain was higher in women.

The higher level of physical activity in men can be explained by the fact that men can move more freely in rural areas and that women have a more restricted life in terms of cultural reasons [32]. This may be also a feature of the region where the study was conducted.

In the study group, the median HPLP-II score was relatively higher in the 40–64 age group. In some studies, no difference was found between age groups [33, 34]. It is expected that since health problems increase in individuals as they aged, they will behave in accordance with healthy lifestyles [35].

Participants under 40 years of age had obtained higher scores relative to other age groups in terms of health responsibility, nutrition, interpersonal relations, and stress management subdomains. Pulllen et al. [36] reported that young people have higher attitudes toward displaying health-promoting behaviors. In some studies, no significant relationship was found between age and score, and subscale scores obtained [21]. In older participants, researchers reported that subscale scores were higher in terms of nutrition [37].

Some researchers have indicated that any relationship did not exist between the subscale score of nutrition and age [38]. Middle-aged group in whom chronic diseases begin to manifest may have a high degree of awareness about the subject and may be paying more attention to applying healthy lifestyle behaviors to prevent the progression of their health problems.

As the level of education increases, individuals' awareness of the health risks and the importance of preventive health services are expected to increase the likelihood of behaving in accordance with the healthy lifestyle. In the study, the mean scale score obtained from the individuals of primary and lower education level was higher relative to middle school graduates. Pasinlioğlu et al. [38] reported that there was an increase in the level of education in terms of healthy lifestyle behavior as the level of education increased.

In their study, Demir et al. [39] reported that there was no correlation between the level of education and the scale score obtained. While participants with primary and lower education levels more strictly complied with subdomains of health responsibility, nutrition, interpersonal relations, and stress management behaviors, individuals with high school or higher education level applied physical activity recommendations among health promotion behaviors. In a study by Pehlivan et al. [40] on non-working women, high school graduates reported that they were more sensitive to nutrition than primary school and university graduates. Since smaller number of secondary school graduates participated in our study, such a difference may not be revealed. Moreover, even if people have higher levels of awareness and knowledge, this may not be reflected in their behaviors.

As the family income level increased, HPLP-II scale total scores and scores obtained in spiritual growth, interpersonal relations, and stress management subdomains also increased. There are similar studies reporting that the total score of the scale increases as the income level increases [23, 25, 39]. In a study by Özcan et al., [19] it was reported that there was no relationship between the family income status and the score obtained from the scale. Those who declared good levels of income had higher sensitivity to health responsibility, physical activity, and nutrition behavior. In the study of Shaheen et al., [41] it was reported that as the income level increased, the total scale and subscale scores increased.

The higher economic status encourages the application of health-promoting behaviors [42]. As socioeco-

nomic level increases, it is expected that there will be a positive progress in behaviors toward healthy living due to the improvement of living conditions such as nutrition and access to health services [18, 43].

In the study, the scores of the participants who had physician-diagnosed chronic disease obtained in terms of health responsibility and nutrition were higher than those without physician-diagnosed chronic disease, while their subscale scores they got from the physical activity were lower and there was no difference in terms of total scale and subscale scores they obtained.

In another study, it was reported that people with physician-diagnosed diabetes had higher scores on the health responsibility subdomain, while there was no difference found between the participants with and without diabetes in terms of the total scale and subscale scores [44]. In a study by Prinçi et al., [45] people with chronic disease had obtained higher scores in terms of the total scale score, and scores obtained in health responsibility, physical activity, and nutrition subdomains, compared to those without chronic disease.

Individuals with physician-diagnosed chronic disease have health problems for many years and more knowledgeable about health-related issues, which, in turn, leads to receival of higher scores on some subdomains. Since the individuals who do not have a physician-diagnosed disease can act more freely in the field of sports, they may have a higher score in the physical activity subdomain.

The scores of health responsibility, nutrition, interpersonal relations, stress management subdomains, and total scale scores of the individuals who had a good perception of their health status were higher than those who indicated their health status was of moderate or poor level. The scores of the subdomains of nutrition and spiritual growth increased with increasing levels of perceived health. Another study also supported the results of this study [16]. These scores are expected to be high in those who had a good perception of their health status.

The limitations of the study are limited by the statements of the participants and the fact that the physical activity questions in the lower areas of the scale are not taken into consideration.

Gender, age group, marital status, level of education, income level, history of physician-diagnosed chronic disease, and perceived health status were found as factors affecting healthy lifestyle behaviors. With the impact of factors such as urbanization, aging population, and poverty, it is expected that the frequency of diseases related to worse lifestyle behaviors will increase in the future.

Gaining healthy lifestyle behaviors, which are an individual-based approach to health promotion, will contribute to the reduction of the burden of non-communicable diseases and will also increase the life expectancy and the quality of life of individuals. In this context, to protect and improve the health of individuals, training programs should be prepared on these issues and social needs should be taken into consideration while preparing these programs.

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