PHYSICAL ACTIVITY LEVEL AND HEALTH PROMOTING LIFESTYLE BEHAVIOURS OF ADOLESCENTS: A CROSS-SECTIONAL STUDY
NIVELUL DE ACTIVITATE FIZICĂ ŞI PROMOVAREA UNUI STIL DE VIAŢĂ SĂNĂTOS ÎN RÂNDUL ADOLESCENŢILOR: UN STUDIU TRANS-SECŢIONAL

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Abstract:

Introduction: The Centre for Disease Control and Prevention lists the following as behaviours which lead to morbidity and mortality during adolescence: injury and violence, tobacco use, alcohol and drug use, unplanned pregnancies, sexually transmitted diseases, unhealthy diets and physical inactivity is regarded worldwide as a public health burden during adolescence, which is a foundational period for future health.

Objective: The objective of this study is to identify daily physical activity level (MET/wk), health lifestyle behavior and related factors in high school students.

Materials and Methods: A cross-sectional study was conducted with 926 adolescent. The sociodemographic questionnaire, international physical activity evaluation questionnaire and health promoting lifestyle profile II Scale were used to collect the research data. SPSS 20 program was used to analyze the data.

Results: The percentage of the students included in the study is 92.6%. 361 adolescents (39%) were male and 565 adolescents (61%) were female in the study. The mean age of the participants was 16.80 ± 1.22 (minimum: 16, maximum: 19). The average HPLP II score was 119.32 ± 16.4 for female students and 122.91 ± 14.9 for male students. The mean score of male students in HPLP was significantly higher than the mean score of female students (p=.001). A positive moderate level relationship was found between interpersonal relationships and stress management and total met. There was a positive weak relationship between total Met and HPLP. A significant relationship was observed between physical activity levels and healthy lifestyle behaviors of adolescents.

Conclusion: HPLP and physical activity level vary depending on the sociodemographic characteristics. There is a relationship between HPLP and physical activity level. In addition, the relationship between the level of physical activity and healthy lifestyle behaviors in different groups can be examined.

Key-words: *physical activity; healthy lifestyle, adolescence; sport; dancer; teenager.*
Cuvinte cheie: *activitate fizica; stil de viaţă sănătos, adolescenţă; sport; dansator; adolescent*

Introduction

Physical inactivity is regarded worldwide as a public health burden during adolescence, which is a foundational period for future health. This age-related decline in physical activity is thought to be a major contributor to the increased rates of overweight and obesity observed during this developmental period. Accordingly, many authorities have recommended that public health interventions be launched to promote higher levels of physical activity in young people (*Peltzer & Pengpid 2016*).

Professional advice for promoting physical activity commonly highlights forming routines to support habitual physical activity.

Socially expected life events, like entering and leaving post-secondary education, leaving the parental home, gaining full-time employment, getting married and having a child, are likely to alter one or more aspects of routines and may impact physical activity (*Hekim, 2015*).

The Centre for Disease Control and Prevention lists the following as behaviors which lead to morbidity and mortality during adolescence: injury and violence, tobacco use, alcohol and drug use, unplanned pregnancies, sexually transmitted diseases, unhealthy diets and physical inactivity (*Hekim, 2015*). Healthy lifestyle behaviors can vary depending on the demographic characteristics of people. While the mortality rate

as a result of lifestyle is 70-80% in developed countries, this rate is 40-50% in developing countries (*Murathan, 2013; Akyol et al. 2012*).

Especially increasing use of technological devices during adolescence, insufficient time spent for exercise and sports can lead to a sedentary lifestyle causing coronary heart diseases, hypertension, high blood lipid levels, type II diabetes, obesity and cancer. Therefore, encouraging regular activity behavior starting from childhood, and making exercise a key part of the daily life is critical for protection against health risks (*Musavian et al.2014*).

A study which compared and evaluated physical activity in adolescents and physical activity levels in adults found that participation in physical education lessons and in organized sports activities had a positive effect on participation in physical activities in advanced ages (*Binay & Yiğit, 2016*).

Another study in adolescent groups found that physical activity behavior of male students was better than female students whereas health responsibility, diet and interpersonal relationships in female students were better than male students. It was concluded that healthy lifestyle behaviors of adolescents were not at the desired level (*Özakgül et al. 2016*). Determining factors which can directly affect health such as lifestyle behaviors and physical activity habits of adolescents and comparing different groups in this respect will contribute to the literature and provide guidance.

The objective of this study is to identify daily physical activity level, health lifestyle behavior and related factors in adolescence who were folk dancers and who were not folk dancers in the city center of Aydın, which is a town on the west of Turkey.

Method
Design and Settings
This is a descriptive cross-sectional study. There are 45 schools in the city of Aydın. The study was carried out with students in five high schools in the city center of Aydın.

Study Participants
The study population consists of 6993 male and 5613 female, which makes a total 12607 high school students in the city center of Aydın. With the effect size of 0.20 and 95% power and 0.05 margin error, the minimum study sample was calculated as 542 with the G power program. Schools to be included in the study were selected using the stratification method based on the inclusion criteria such as being in the city center, and having high number of students. The biggest five high schools in Aydın city center were included in the study and no sampling was done for students in these high schools and the study was carried out with a total of 926 students who agreed to be included in the study.

Data Collection
After obtaining necessary permission from the Provincial Directorate of Education the researcher went to the five selected high school included in the study and obtained written consents of students. To collect data, students who were folk dancers were asked to fill out the questionnaires after their folk dancing activity and the students who were not dancers were asked to fill out the questionnaires at the end of lessons in the classroom. The researcher was always with the students when they were filling out the questionnaires. The time to complete the questionnaires was approximately 20 minutes. Students who did not want to be included in the study and those who did not complete the questionnaires were not included in the study.

Measurements
Sociodemographic Questionnaire
Sociodemographic questionnaire was used to collect personal information of students and information about factors which are thought to affect daily life. This questionnaire includes questions about the age, gender, social environment, education level of parents and economic level of students' families; questions asking whether they are folk dancers.

International Physical Activity Evaluation Questionnaire (IPAEQ)
This was designed by Dr. Micheal Booth in 1996 to investigate health and physical activity level of people and the relationship between these two factors. The validity and reliability study of the Turkish version of the questionnaire was done by Öztürk (2005)

(*Öztürk, 2005*). This questionnaire consists of six sections which have questions about descriptive information such as age, height, body weight; about work related activities within the last seven days; questions about transportation, about climbing stairs, housework and sports/exercise. MET/week (kcal/kg/kcal/week) and MET/hour values can be calculated. Cronbach's alpha coefficient of the scale is between 0.84 and 0.98.

Health Promoting Lifestyle Profile -II Scale (HPLP II)

The scale was developed by Walker, Sechrist and Pender (1987) and revised again by Walker, Hill Polorecky and named HPLP II (*Walker et al. 1987*). The validity and reliability study of Turkish version of the scale was done by Bahar et al. in 2008. The scale measures behaviors promoting health in terms of healthy lifestyles (*Bahar et al. 2008*). The general score in the scale refers to the health lifestyle behavior scores. The scale consists of 52 questions and six sub-dimensions. Sub-dimensions are health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. All questions of the HPLP are positive. Scoring is done using a 4-point Likert type scale. 1 point is given for "Never"; 2 point is given for "Sometimes"; 3 point is given for "Frequently" and 4 point is given for "Always". The minimum score in the scale is 52 and the highest score is 208. Cronbach's alpha coefficient of the scale is 0.92.

Ethics Statement

This study was approved by the Non-interventional Clinical Research Ethics Committee of the Nursing Department in Aydın Adnan Menderes University (No. 2019/062). Necessary permission was obtained from the Provincial Directorate of National Education responsible for high schools before starting data collection. This article was based on the dissertation titled „Factors Related with Daily Physical Activity Level and Healthy Lifestyle Behavior of Students Who are Folk Dancers and of the Students who are not Folk Dancers" This research is in compliance with the Declaration of Helsinki. A written consent form which explained the purpose and details of the research was given to and signed by each person included in the research.

Statistical Analyses

SPSS 20 program was used to analyze the data. Descriptive statistical methods (number, percentage, mean) and standard deviation were used for data evaluation. T-test was used to compare quantitative continuous data between two independent groups; one way Anova test was used to compare quantitative continuous data between more than two independent groups. Following the Anova test, Scheffe test was used as a post-hoc analysis to determine the differences. Pearson's correlation coefficient was used for correlation analysis of continuous variables of the study.

Results

Characteristics of the Participants

A total of 1000 students from five high schools were invited to participate in the study; and 926 students completed the study and the remaining 74 students refused to participate, did not fill out the questionnaires or did not fill them out completely.

The percentage of the students included in the study is 92.6%. 361 adolescents (39%) were male and 565 adolescents (61%) were female in the study. The mean age of the participants was 16.80 ± 1.22 (minimum: 16, maximum: 19). 613 students (66.2%) lived in the city center. 626 students (67.6%) lived in a family with 2 or less children. 746 adolescents (80.6%) had nuclear families. Income of the Students' families was higher than their expenses. 68.6% of the students' mothers and 48.4% of the students' fathers had primary or less education. Mothers of 42.3 percent and fathers of 55.7 percent of the students were workers. 380 students (41%) were described as sociable-outgoing. 682 students (73.7%) were normal and 172 (18.6%) were underweight according to their BMI scores. 45.4% of the adolescents (n:420) were folk dancers. 74.5% (n: 313) of the folk dancers had been dancing for 1-3 years and 25.5% of the folk dancers had been dancing for 4 years or more (Table 1).

Characteristics	(%)	HPLP	p
Gender			
Male	565(61)	122.91±14.9	**.001**
Female	361(39)	119.32±16.4	
Place of residence			
City	613(66.2)	120.91±14.7	
Town	219(23.7)	120.84±17.3	**.002**
Village	94(10.2)	126.97±16.1	
Family structure			
Nuclear	746(80.6)	123.06±15.7	**.000**
Single parent	180(19.4)	115.07±13.3	
Number of children in the family			
1	297(32.1)	117.49±15.9	
2	329(35.5)	127.07±14.7	**.000**
3	196(21.2)	118.51±14.7	
4 and over	104(11.2)	121.02±14.4	
Mother's Education			
Primary or less education	543(58.6)	122.45±15.5	**.000**
High school	297(32.1)	118.03±14.3	
University	86(9.3)	127.60±17.7	
Father's education			
Primary or less education	448(48.4)	123.60±15.3	**.000**
High school	341(36.8)	117.03±15.07	
University	137(14.8)	125.83±15.65	
Mother's occupation			
Unemployed	346(37.4)	119.41±16.25	**.008**
Worker	392(42.3)	122.15±14.17	
Civil Servant	158(17.1)	124.03±17.3	
Shopkeeper	30(3.2)	124.06±15.57	
Father's occupation			
Unemployed	14(1.5)	122.42±15.15	
Worker	516(55.7)	122.04±15.06	**.002**
Civil Servant	249(26.9)	122.95±17.40	
Shopkeeper	147(15.9)	117.11±13.88	
Income Level			
Income is less than expenditure	52(5.6)	113.48±19.55	
Income is equal to expenditure	440(47.5)	117.01±15.18	**.000**
Income is more than expenditure	434(46.9)	127.03±13.62	
Personality trait			
Sociable	380(41)	122.84±16.45	
Outgoing			
Quiet-reserved	378(40.8)	119.11±14.77	**.001**
Emotional	110(11.9)	124.01±15.18	
Sensitive/edgy			
Introvert	58(6.3)	123.70±14.95	
BMI			
Underweight	72(7.8)	117.11±14.98	
Normal	682(73.7)	120.23±15.55	**.000**
Overweight	172(18.6)	128.40±14.35	
Number of years of folk dancing			
1-3 Years	313(74.5)	122.36±13.22	
4 years and over	107(25.5)	125.92±20.16	.102

Table 1.Demographic Data and Health Promotion Behaviors

HPLP II according to sociodemographic characteristics

The average HPLP II score was 119.32 ± 16.4 for female students and 122.91 ± 14.9 for male students. The mean score of male students in HPLP was significantly higher than the mean score of female students (p=.001). The mean HPLP score of the students living in villages was 126.97 ± 16.1, the mean HPLP score of the students living in the city was 120.91±14.7, and of the students living in the town was 120.84 ± 17.3. The mean HPLP score of the students living in villages was statistically significantly higher than those of the students living in the city or town (p=.002).

The mean HPLP score of the students who had a nuclear family was 123.06 ± 15.7; the mean HPLP score of the students who had a single parent was 115.07 ± 13.3 and the difference was statistically significant (p=.000). The mean HPLP scores according to the number of children in the family were: 117.49 ± 15.9 for families with one child; 127.07 ± 14.7 for families with two children; 118.51 ± 14.7 for families with three children and 121.02 ± 14.4 for families with four children. Accordingly, students with families with two children had significantly higher mean HPLP scores compared to the other groups (p=.000). The mean HPLP scores according to the education level of mothers of the students were: 122.45 ± 15.5 for the students whose mothers had primary or less education; 118.03±14.3 for the students whose mothers had a high school degree and 127.60 ± 17.7 for the students whose mothers had a university degree and students whose mothers had a university degree had statistically significantly higher mean HPLP scores compared to other groups (p=.000). The mean HPLP scores according to the education level of the students' fathers were 123.60 ± 15.3, for those whose fathers had primary or less education; 117.03 ± 15.07 for those whose fathers had a high school degree and 125.83 ± 15.65 for those whose fathers had a university degree. The mean HPLP score of the students whose fathers had a university degree was significantly higher than those of the students whose fathers had primary or less education or were high school graduate (p=.000). The mean HPLP scores of the students according to their mothers' occupation were:

119.41 ± 16.25 for students whose mothers were homemakers; 122.15 ± 14.17 for students whose mothers were workers; 124.03 ± 17.3 students whose mothers were civil servants and 124.06 ± 15.57 for students whose mothers were shopkeepers. The mean HPLP score of the students whose mothers were workers was lower than those whose mothers had other occupations (p=.008). The study found that the mean HPLP score changed depending on the occupation of the fathers of the students and this change was found to be significant. The mean HPLP scores were; 122.42 ± 15.15 for students whose fathers were unemployed; 122.04 ± 15.06 for students whose fathers were civil servants; 117.11 ± 13.88 for students whose fathers were shopkeepers. The mean HPLP score of the students whose fathers were shopkeepers was lower than those whose fathers had other occupations (p=.002). The students who had an income level less than their expenditure had a mean HPLP score of 113.48 ± 19.55; students who had an income level equal to their expenditure had a mean HPLP score of 117.01 ± 15.18, and students whose income was higher than their expenditure had a mean HPLP score of 127.03 ± 13.62 and accordingly those who had an income higher than their expenditure had a higher HPLP score than the other two groups (p=.000). The mean HPLP scores of the students according to their personality traits were: 122.84 ± 16.45 for those who described themselves as sociable and outgoing; 124.01 ± 15.18 for those who described themselves as quiet and reserved; 124.01 ± 15.18 for those who described themselves as sensitive and edgy; 123.70 ± 14.95 for those who described themselves as introvert and those who described themselves as quiet and reserved had the lowest HPLP scores (p=.001). The mean HPLP scores according to the BMI scores were: 117.11±14.98 for the students who were underweight; 120.23±15.55 for the students who were normal and 128.40±14.35 for the students who were overweight and those who were underweight had the lowest HPLP score compared to other groups (p=.000). The HPLP score of the folk dancers for four or more years was 125.92±20.16, for 1-3 years was 122.36±13.22 and the difference between these two was not statistically significant (p=.102) (Table 1)

Physical Activity Level according to Some Sociodemographic Characteristics

There was a statistically significant relationship between gender and BMI and physical activity levels (low, moderate, high) Female students were found to have higher physical activity levels compared to male students (p=.000). Students who are underweight had a higher physical activity levels compared to the students who are normal and overweight (p=.000). No statistically significant relationship was found between being a folk dancer and physical activity level (p=.122) (Table 2).

Characteristics	Low n(%)	Moderate n(%)	High n(%)	p value
Gender				
Male	200(35.3)	300(53.0)	65(11.7)	**.000**
Female	100(27.7)	81(22.5)	180(49.8)	
BMI				
Underweight	10(13.8)	12(16.7)	50(69.5)	**.000**
Normal	250(36.6)	400(58.7)	32(4.7)	
Overweight	100(58.1)	62(36.0)	10(5.81)	
Folk Dancer				
Yes	102(26.4)	112(29.0)	271(70.3)	**.122**
No	150(31.1)	200(41.4)	133(27.5)	

Table 2. Sociodemographic Characteristics of the Adolescents according to their level of physical activity

Relationship between Physical Activity Level and HPLP II

A positive moderate level relationship was found between health responsibility and physical activity, nutrition (r= .616, .626, p=.000). A positive weak level relationship was found between personal health responsibility and spiritual growth, interpersonal relations and total met (r=.210-.412, p=.000). There was a positive moderate level relationship between physical activity and nutrition and spiritual growth (r=.572, .415, p=.000). A positive weak relationship was found between physical activity and interpersonal relations, stress management and total met (r=.197, .307, .297, p=.000). A positive moderate level relationship was found between nutrition and spiritual growth (r= .416, p=.000). A positive weak relationship was found between nutrition and interpersonal relations, stress management and total met (r= .270, .355, .245, p=.000). A positive moderate level relationship was deter-

mined between spiritual growth and interpersonal relations and stress management (r=.589, .527, p=.000). A positive moderate level relationship was found between interpersonal relations and stress management and total met (r=.439, .060, p=.000). A positive and strong relationship was observed between HPLP and personal health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management (r=.770, .760, .755, .751, .606, .668, p=.000). There was a positive weak relationship between total Met and HPLP (r=.257, p=.000) (Table 3)

		Health Responsibility	Physical Activity	Nutrition	Spiritual growth	Interpersonal relations	Stress Management	HPLP Total	Total Met
Health Responsibility	r	1.000	.626	.616	.342	.248	.412	.770	.210
	p	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**
Physical Activity	r	-	1.000	.572	.415	.197	.307	.760	.297
	p	-	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**
Nutrition	r	-	-	1.000	.416	.270	.355	.755	.245
	p	-	-	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**
Spiritual growth	r	-	-	-	1.000	.589	.527	.751	.189
	p	-	-	-	**.000**	**.000**	**.000**	**.000**	**.000**
Interpersonal relations	r	-	-	-	-	1.000	.439	.606	.060
	p	-	-	-	-	**.000**	**.000**	**.000**	.077
Stress Management	r	-	-	-	-	-	1.000	.668	.189
	p	-	-	-	-	-	**.000**	**.000**	**.000**
HPLP Total	r	-	-	-	-	-	-	1.000	.257
	p	-	-	-	-	-	-	**.000**	**.000**
Total Met	r	-	-	-	-	-	-	-	1.000
	p	-	-	-	-	-	-	-	**.000**

Table 3.Analysis of Correlation between Total Met and HPLP

Discussion

Healthy lifestyle habits were found to be influenced by gender, place of residence, family structure, number of children in the family, education level of parents, occupations of parents, income level, personality, BMI variables.

Studies have reported that demographic factors affect health promoting lifestyles (*Binay & Yiğit, 2016; Noh et al. 2015; Mohammadian & Mousavi, 2015*). Physical activity level was found to be higher in women and lean individuals. Studies support that those that have lower BMI has higher physical activity levels compared to overweight people (*Suija et al. 2010; Soyuer et al. 2010*). A negative relationship was found between physical activity and BMI in studies conducted with young people (*Clement et al. 2004; Anding et al. 2001*). Mestek et al (2008) found that there was a relationship between physical activity level and BMI in their study (*Mestek et al. 2008*). The findings of this study are comparable with the literature.

The percentages of population who are engaged in physical activities and sports are 56% in the Netherlands, 53% in Germany, 41% in the UK, 39% in France, 35% in Italy and 28% in Spain (*Van Bottenburg, 2011*). Turkey is the country with the lowest physical activity level with 3.5% (*Turkey Ministry of Health Public Agency, 2014*). The mean total HPLP score of adolescent folk dancers for nutrition, spiritual growth, and interpersonal relations was higher than the adolescents who were not folk dancers. Folk dances have always been an important part of Turkish culture. Folk dancers use their body in harmony with the music. Folk dance which can be considered as a group activity is a tool that allows communication between dancers and strengthens their social relations. At the same time regular and rhythmic movements allow burning of calories and have a positive effect on nutrition habits.

63% of the 15-19 age group is inactive (*Turkey Ministry of Health Public Agency, 2014*). Folk dance which is a form of sports activity is believed to have a positive effect on health promoting lifestyle behaviors. In the study of Özkan et al.(2013) conducted with folk dancers, the authors reported that folk dancers had significantly increased level of interpersonal

relations and mean HPLP score (*Özkan et al. 2013*). In a study conducted with 30.284 adolescents between the ages of 13-15 in 7 member states of the Association of Southeast Asian Nations (ASEAN), high number of physical inactivity (80.4%) and sedentary behavior (33.0%) were reported (*Peltzer & Pengpid, 2016*). It was reported that 36% of men and 42.2% of women do not regularly exercise in Taiwan. The study conducted in the city of TaoYuan reported that students' preference to take a vehicle instead of walking to school and lack of daily physical education classes led to a decreased level of physical activity (*Chen & Chou, 2005*). Increasing exercise and sports activities to prevent physical inactivity is important for young people to have a healthy lifestyle.

A positive and weak relationship was found between personal health responsibility, physical activity, nutrition and HPLP and total met (physical activity level) score. A positive moderate level relationship was found between interpersonal relations and total met level. In a study, there was a positive weak relationship between physical activity level and interpersonal relations, HPLP score (*Özkan et al. 2013*). This finding is comparable with our study findings. A study conducted with adolescents reported that students in the study sample generally engaged in moderate level physical activity (*Grygiel et al. 2016*). The study carried out to determine physical activity of the students was found to be higher than the average physical activity of the European Union populations, and a general tendency of lowering level of physical activity with age was observed (*Savcı et al. 2006*). In the study conducted by Uçar to determine physical activity levels of female and male adolescents; 16.7% of the subjects were active; 32.2% of the subjects had moderate activity level and a larger percentage of the subjects with 51.1% were physically inactive (*Ucar, 2014*). Physical activity is one of the health promoting lifestyle behaviors. A relationship was observed between HPLP and physical activity. There is limited number of studies that investigate the relationship between HPLP and physical activity in the literature (*Özkan et al. 2013*). It should be noted that findings of the studies in the literature and our findings are comparable.

Limitations

Limitations of the Study; this is a descriptive cross-sectional study and does not include long term monitoring. Additionally, study population consists of the students in five high schools. The study findings cannot be generalized for all high school students in Turkey. Data was collected through self-reporting, therefore there could be participants who did not remember or provided missing information.

Conclusion

HPLP and physical activity level vary depending on the sociodemographic characteristics. There is a relationship between HPLP and physical activity level. High school students who are folk dancers had better HPLP scores. Studies on this subject could include evaluation of the results of the interventions on HPLP and physical activity. This subject could be evaluated in different populations and the results could be included in the literature.

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