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The influence of demographic factors on healthy living among adolescents

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Abstract

Adolescent development greatly benefits from regular exercise and a nutritious diet. The aim of this study is to examine the relationship between several demographic variables affecting nutrition and physical activity in adolescents of Tirana. Cross-sectional survey. Participants were 510 adolescents aged 16-19 years, of whom 310 were girls (61.2%) and 198 were boys (38.8%). The school was in the city of Tirana. Adolescents completed a questionnaire that was built on the basis of two subscales of questionnaires that were HPLP II, aiming to assess health-promoting behaviors. The t-test was also applied, which revealed significant differences in statistical value between adolescents who study in different classes, regardless of gender. Furthermore, statistically significant differences were found between classes (males and females) in the nutrition and physical activity variables. However, differences were evident in the level of nutrition and physical activity depending on the parents' education. In general, it can be concluded that adolescents have relatively satisfactory dietary and physical activity habits, but these behaviors still need improvement. In this context, there is a need for better and more effective education of young people for a healthy lifestyle.

Keywords: Adolescents, Nutrition, Parents' education, Physical activity.

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1. Introduction

A major public health concern, early adolescent obesity increases the risk of type 2 diabetes, hypertension, atherosclerosis, and early cardiovascular disease, among other negative outcomes [1]. Recent international and national reports have highlighted the increasing epidemic of obesity among school-age children, especially over the past three decades among children aged 6–19 years [2]. One well-known strategy for the prevention and management of cardio-metabolic disorders is physical activity [3]. Nutritional requirements during the growth of children and adolescents are

regarded as critical factors affecting their physical development and also influencing their health status in future life. It has been shown that both nutritional habits and nutrient intake may, at least partly, prevent some chronic civilization diseases such as obesity, atherosclerosis, hypertension, or osteoporosis [4-6]. Obesity is regarded as a significant public health concern in both industrialized and developing countries, especially considering the increasing prevalence of childhood obesity worldwide. Although the mechanisms underlying childhood and adolescent obesity are complex, poor dietary habits and inadequate physical activity are two major contributing factors to excessive weight gain during growth. Unhealthy eating patterns (such as overeating, irregular meal times, diets high in simple carbohydrates, increased intake of fats, particularly saturated fats, and fiber deficiency), combined with low levels of physical activity, typically lead to increased caloric intake and a positive energy balance. Therefore, the goal of obesity management in adolescents is to achieve a negative energy balance through both quantitative and qualitative dietary modifications and a significant increase in physical and sports activities [7-9].

2. Materials and Methods

Data were collected using the two subscales of the Health-Promoting Lifestyle Profile (HPLP-II) questionnaire [10]. The final sample included 510 adolescents from all middle schools in Tirana. The participants consisted of 310 females (61.2%) and 198 males (38.8%). The study's dependent variables were the mean scores on the subscales measuring physical activity and nutrition. The dependent variables in the study were the scores obtained on the subscales: nutrition (mean score) and physical activity (mean score). Gender and age (school level) were considered independent research variables. The children's lifestyle was assessed by two subscales of the HPLP questionnaire, one related to diet (9 questions) and the other related to physical activity level (8 questions) [10]. The subscales' statements relate to different nutrition and physical exercise practices. "I chose a low-fat diet" is an example of an item from the diet subscale. The following is an example of an item from the physical activity subscale: "I engage in a structured exercise program (such as dancing or sports)." The respondent could select one of the four options provided for each statement: Never 1, Occasionally 2, Frequently 3, Frequently 4. The subscale score is calculated as the respondent's average score obtained after dividing the total score by the number of questions in each subscale [10]. Before completing the questionnaire, the students had brought the declaration signed by the parents in accordance with the Helsinki guidelines. Adolescents filled out the questionnaires on the Google Forms platform. The children completed the questionnaires on the Google Form platform.

3. Results

In this section, the findings of the research study, conducted with (N=510) participants, will be presented. Descriptive statistics were used to analyze the research data. The mean and standard deviation (SD) were calculated for the nutrition and physical activity subscales. The deviation of the results from the normal distribution at the borderline of significance was tested using the Kolmogorov–Smirnov test on the entire sample at the $p < 0.05$ statistical significance level. The t-test was used to determine the differences between groups, as some variables were found to deviate from the normal distribution.

Table 1.
Description of the sample according to demographic variables (gender, level, parents' education).

	n	Percentage %	95% Confidence interval	
Gender	510			
Female	312	61.2	57.6	64.8
Male	198	38.8	35.2	42.4
Level	510			
10(16 y)	130	25.5	21	29.5
11(17 y)	189	37.1	32.6	41.6
12(18 y)	191	37.5	33.5	42.5
Father´s education	510			
Incomplete primary	2	.4	-0.1	0.9
Complete primary	70	13.7	11.2	16.2
Complete secondary	244	47.8	45.3	50.3
Complete higher	194	38.0	35.5	40.5
Mother´s education	507			
Incomplete primary	0	0	0	0
Complete primary	56	11.0	7.8	14.2
Complete secondary	200	39.4	36.2	42.6
Complete higher	251	49.5	46.3	52.7

All data were processed using the statistical program IBM SPSS version 20. The analyses and results are organized according to the objectives of the study, in order to achieve them. Also, the results in this chapter will be presented in order according to the objectives of the study. The statistical methods used for this study consist of descriptive and inferential analyses, depending on the aim, questions, and assumptions of the study. Generally speaking, the statistical methods used

include: M, SD, Frequency, Percentage, t-test. Based on these analyses, the data are presented in this chapter at the level of their verbalism, while the interpretations for the same arguments are made in the chapter of interpretations and discussion.

The total number of respondents is 510. More females, 61.2% (n=312), than males, 38.8% (n=198), completed the questionnaire. The adolescents were divided according to their grade: 25.5% (n=130) are in tenth grade; 37.1% (n=189) are in eleventh grade; and 37.5% (n=191) are in twelfth grade. Regarding the fathers' education, only 0.4% (n=2) have a father without schooling; 13.7% (n=70) have fathers with low education; 47.8% (n=244) have fathers with secondary education; and approximately 38.0% (n=194) have fathers with higher education. Regarding mothers' education, 11.0% (n=56) have mothers with low education; 39.4% (n=200) have mothers with secondary education; and 49.5% (n=251) have mothers with higher education Table 1.

Table 2.
Analysis of descriptive statistics and differences between genders in nutrition and physical activity scores.

Variable	**F n= (312)**		**M n= (198)**			
	Mean	**SD**	**Mean**	**SD**	**t**	**p**
Nutrition	22.92	4.73	25.17	5.38	-4.951	0.000
Physical Activity	20.07	5.31	24.22	5.66	-8.364	0.000

Abbreviations: n, number of subjects; F, female; M, male; SD, standard deviation; KSP, level of statistical significance in the Kolmogorov–Smirnov test; p-level of statistical significance in the Mann–Whitney U test.

The item analysis in Table 2 presents the gender differences in nutrition and physical activity scores. Nutrition: for females (n=198), the mean nutrition score is 22.92 with a standard deviation (SD) of 4.73; for males (n=312), the mean nutrition score is 25.17 with an SD of 5.38. The t-statistic is -4.951, and the p-value is 0.000, indicating a statistically significant difference in nutrition scores between genders. Specifically, males tend to have higher nutrition scores compared to females. For females (n=198), the mean physical activity score is 20.07 with an SD of 5.31; for males (n=312), the mean physical activity score is 24.22 with an SD of 5.66. The t-statistic is -8.364, and the p-value is 0.000, indicating a statistically significant difference in physical activity scores between genders. In both nutrition and physical activity, there are significant gender differences, with males having higher mean scores than females. These findings suggest variations in nutritional habits and physical activity levels between the two genders within the sample.

Table 3.
Descriptive statistics and correlations between the items of HPLP.

Variables		**Min.**	**Max.**	**Mean**	**Std. Deviation**	**Skewness**		**Kurtosis**	
						Statistic	**Std. Err**	**Statistic**	**Std. Err**
Nutrition	510	12.00	38.00	23.7961	5.11264	0.335	0.108	-0.342	0.216
Eat breakfast	510	1	4	2.67	1.065	-0.044	0.108	-1.299	0.216
Choose a diet that is low in fat	510	1	4	2.32	0.848	0.437	0.108	-0.347	0.216
Limit the use of sugars and foods containing sugar	510	1	4	2.41	0.882	0.408	0.108	-0.570	0.216
Eat 6–11 servings of bread and cereal each day	510	1	4	1.88	1.035	0.921	0.108	-0.385	0.216
Eat 2–4 servings of fruit each day	510	1	4	2.60	0.947	0.224	0.108	-1.044	0.216
Eat 3–5 servings of vegetables each day	510	1	4	2.40	0.869	0.499	0.108	-0.473	0.216
Eat 2–3 servings of milk, cheese, and yogurt each day	510	1	4	2.64	1.024	-0.041	0.108	-1.185	0.216
Eat up to 2–3 servings of meat and eggs each day	510	1	4	2.51	1.024	0.090	0.108	-1.129	0.216
Read labels to identify nutrients, fats, and sodium content	510	1	4	2.25	1.024	0.308	0.108	-1.042	0.216

Skewness: Measures how data is distributed asymmetrically. Positive skewness indicates data is skewed to the right (long tail on the right), while negative skewness indicates it is skewed to the left (long tail on the left). Zero skewness signifies a symmetric distribution. References include mean, standard deviation, and kurtosis.

These statistics provide an overview of the distribution of nutrition practices for the study sample. The mean score for nutrition practices is approximately 23.80, with a standard deviation of about 5.11. The skewness of the data is positive (0.335), indicating a slight skew, and the kurtosis is negative (-0.342), suggesting that the distribution may be somewhat skewed but is not exceptional Table 3.

Table 4.
Descriptive statistics and correlations between the items of MVPA.

	n	Min.	Max.	Mean	SD	Skewness		Kurtosis	
						Statistic	Std. Er	Stati	Std. Er
Physical Activity	510	10.0	36.00	21.686	5.81236	0.385	0.108	-0.560	0.216
Follow a planned exercise program.	510	1	4	2.19	1.112	0.381	0.108	-1.233	0.216
Exercise vigorously for 20 or more minutes, at least three times a week.	509	1	4	2.57	1.073	0.010	0.108	-1.271	0.216
Take part in MVPA * 30–40 min, 5 or more times a week.	510	1	4	2.03	1.103	0.712	0.108	-0.861	0.216
Take part in recreational physical activities.	510	1	4	2.27	0.961	0.400	0.108	-0.755	0.216
Do stretching exercises at least 3 times per week.	510	1	4	2.18	1.041	0.436	0.108	-0.990	0.216
Get exercise during your usual daily activities.	510	1	4	2.93	0.909	-0.440	0.108	-0.670	0.216
Check my pulse rate when exercising.	508	1	4	1.79	0.926	0.969	0.108	-0.029	0.216
Play active games with my friends.	507	1	4	2.79	0.935	-0.180	0.108	-0.959	0.216

These statistics provide an overview of the distribution of physical activity practices in the study sample. Physical activity's mean is approximately 21.69, with a standard deviation of about 5.81. The skewness of the data is positive (0.385), indicating a distribution that is somewhat skewed to the right, and the kurtosis is negative (-0.560), suggesting a distribution that is flatter than a normal distribution. For each element of physical activity, the table displays the recorded minimum and maximum, mean, standard deviation, skewness, and kurtosis. These descriptive data are important for understanding the variability in nutritional and physical activity practices among participants and the nature of their distribution Table 4.

Table 5.
The descriptive analysis related to the differences in the level of nutrition and physical activity depending on the level.

						95% Confidence Interval for Mean			
	Variable	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Min.	Max.
	10(16 y)	130	24.49	5.073	0.44497	23.6119	25.3727	14.00	35.00
Nutrition	11(17 y)	189	23.44	5.100	0.37100	22.7179	24.1816	12.00	38.00
	12(18 y)	191	23.66	5.132	0.37135	22.9324	24.3974	13.00	36.00
	Total	510	23.79	5.112	0.22639	23.3513	24.2409	12.00	38.00
	10(16 y)	130	22.29	5.672	0.49751	21.3080	23.2766	12.00	34.00
Physical activity	11(17 y)	189	22.37	6.082	0.44247	21.5028	23.2485	11.00	36.00
	12(18y)	191	20.59	5.487	0.39709	19.8084	21.3749	10.00	33.00
	Total	510	21.68	5.812	0.25738	21.1806	22.1919	10.00	36.00

The tenth-grade mean nutritional level is 24.49, with a standard deviation of 5.073. The mean level of physical activity is 22.29, with a standard deviation of 5.672. In eleventh grade, the mean nutritional level is 23.44, with a standard deviation of 5.100. The average level of physical activity is 22.37, with a standard deviation of 6.082. In twelfth grade, the mean nutritional level is 23.66, with a standard deviation of 5.132. The mean level of physical activity is 20.59, with a standard deviation of 5.487. For all groups combined, the average nutritional level is 23.79, with a standard deviation of 5.112. The average level of physical activity for all groups is 21.68, with a standard deviation of 5.812. These data show that there are

differences in the levels of nutrition and physical activity depending on the school grade. Nutrition and physical activity levels have little variation between grades, but all grades have similar means for both variables.

Table 6.
Analysis of descriptive data related to the differences in the level of nutrition and physical activity depending on the fathers´ education.

						95% Confidence Interval for Mean			
		n	Mean	S D	S E	Lower Bound	Upper Bound	Min	Max
	Incomplete primary	2	17.50	0.707	0.50000	11.1469	23.8531	17.00	18.00
Nutrition	Complete primary	70	20.12	3.247	0.38819	19.3542	20.9030	12.00	28.00
	Complete secondary	244	24.73	3.925	0.25133	24.2426	25.2328	15.00	36.00
	Complete higher	194	24.00	6.269	0.45012	23.1122	24.8878	13.00	38.00
	Total	510	23.79	5.112	0.22639	23.3513	24.2409	12.00	38.00
	Incomplete primary	2	21.50	2.121	1.50000	2.4407	40.5593	20.00	23.00
Physical activity	Complete primary	70	19.08	3.429	0.40989	18.2680	19.9034	11.00	30.00
	Complete secondary	244	22.27	5.964	0.38183	21.5225	23.0267	11.00	35.00
	Complete higher	194	21.88	6.094	0.43759	21.0235	22.7497	10.00	36.00
	Total	510	21.68	5.812	0.25738	21.1806	22.1919	10.00	36.00

The data are divided into four different categories of fathers' education, including incomplete primary education. For this group, the mean nutritional level is 17.50, with a very low standard deviation of 0.707. The mean physical activity level is 21.50, with a standard deviation of 2.121. For fathers with complete primary education, the average nutritional level is 20.12, with a standard deviation of 3.247. The average physical activity level is 19.08, with a standard deviation of 3.429. For fathers with complete secondary education, the average nutritional level is 24.73, with a standard deviation of 3.925. The average physical activity level is 22.27, with a standard deviation of 5.964. Fathers with complete higher education have an average nutritional level of 24.00, with a standard deviation of 6.269. Their average physical activity level is 21.88, with a standard deviation of 6.094. For all groups combined, the average nutritional level is 23.79, with a standard deviation of 5.112, and the average physical activity level is 21.68, with a standard deviation of 5.812 Table 6.

Table 7.
Analysis of descriptive data related to the differences in the level of nutrition and physical activity depending on the mothers´ education.

						95% Confidence Interval for Mean			
		n	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Nutrition	Complete primary	56	21.35	3.45584	.46181	20.4317	22.2826	16.00	29.00
	Complete secondary	200	22.52	4.43032	.31327	21.9022	23.1378	12.00	35.00
	Complete higher	251	25.39	5.44351	.34359	24.7177	26.0711	13.00	38.00
	Total	507	23.81	5.12117	.22744	23.3678	24.2614	12.00	38.00
Physical activity	Complete primary	56	19.73	3.84467	.51377	18.7025	20.7618	12.00	38.00
	Complete secondary	200	19.91	5.42115	.38333	19.1541	20.6659	12.00	30.00
	Complete higher	251	23.53	5.93918	.37488	22.7955	24.2722	10.00	35.00
	Total	507	21.68	5.82714	.25879	21.1760	22.1929	10.00	36.00

The data are divided into four different categories of mothers' education, including an incomplete primary. For this group, there is no incomplete primary. For mothers with complete primary, the average nutritional level is 21.35, with a standard deviation of 3.4; the average level of physical activity is 19.73, with a standard deviation of 3.84. For mothers with complete secondary education, the average level of nutrition is 22.52, with a standard deviation of 4.43; the average level of physical activity is 19.91, with a standard deviation of 5.42. Mothers with complete higher education have an average level of nutrition of 25.39, with a standard deviation of 5.44; and an average level of physical activity of 23.53, with a standard deviation of 5.93. For all groups together, the average nutritional level is 23.81, with a standard deviation of 5.12, and the average level of physical activity is 21.68, with a standard deviation of 5.82 Table 7.

4. Discussion

This study analyzes the correlates of physical activity and nutrition habits in adolescents, highlighting the influence of demographic factors. The findings of this review are consistent with those of previous studies on factors influencing physical activity and nutrition habits in adolescents. Differences in physical activity habits among adolescents of different sexes have been observed before [11-13], which may be attributed to differences in the selection of physical activity, methods, and attitudes among adolescents of different sexes. A significant statistical difference was found in physical activity participation between male and female adolescents, with girls reporting significantly lower levels of participation than boys [14]. The boys participate more frequently in physical activities, including outdoor sports, than girls, with a significant difference between the two sexes [14-16] as our research also revealed. Boys reported better physical activity, which is consistent with Yanez-Silva et al. In that study, males also had higher physical activity scores than females [17].

Age plausibly plays a more notable role in shaping physical activity behaviors, and the likelihood of sustained participation in a particular activity decreases throughout adolescence [18] which is consistent with previous findings of health-promoting exercise habits that diminished once individuals reach adolescence [19] as our research also revealed Sima Zach et al. [16] indicated a clear negative correlation between physical activity levels and age in both boys and girls; those classified as inactive had a significantly higher mean age, whereas those who were sufficiently active exhibited the lowest mean age [20].

Additionally, Kim et al. [21] revealed that physical activity habits among adolescents in Mozambique show a decreasing trend with age. Our data analysis indicates that the ages of physical activity and nutrition depend on the school class (the ages of adolescents). There is minimal difference in physical exercise and nutrition between levels and ages. Kim et al. [21], suggested that physical activity levels can be influenced by support from multiple sources, including parents, teachers, friends, and classmates [22]. Especially, the role of parents was crucial in the development of physical activity among adolescent girls, who helped them in developing an interest in initiating and sustaining physical activity [23]. Conversely, another study contended that adolescents whose family members, specifically their parents and siblings, had never been physically active, were more likely to refrain from engaging in regular physical activity [24]. Adolescents with parents who have higher education, especially mothers, performed better in our study regarding food intake than teenagers with less educated parents. Promoting healthy lifestyles through regular physical activity and proper nutrition during childhood and adolescence, while implementing professional preventive measures to reduce overweight and obesity, is critical to public health. Regular physical activity should be incorporated into daily life, combined with an appropriate diet [24].

Adolescents from high-income families tend to have better lifestyle profiles [25]. Highly educated parents seem to pass their cultural capital to their children, helping them adopt healthy behaviors and school values [25]. The evidence also shows that poverty affects people's ability to adopt healthy lifestyles [26]. For example, high-fat, energy-dense diets are cheaper and more affordable than diets based on lean meats, fish, fresh vegetables, and fruit. This may partly explain why the highest obesity rates are found in populations with the highest poverty rates and the least education [27]. Based on the study's findings, specific dietary and physical activity recommendations for pupils can be developed, and successful educational initiatives can be emphasized. A significant part of lifelong health education should involve teaching physical education and health, which requires motivated and skilled teachers.

The research findings did not show statistically significant differences between adolescents of different genders, but there are age differences when it comes to diet and exercise behaviors. Eleven- and twelve-year-old students had higher mean scores on the variables studied compared to 13- and 14-year-olds, especially in girls, which may indicate a trend that health habits worsen with age, more so in girls who enter puberty earlier in comparison to boys. These findings confirm those of other researchers who reported a decline in physical activity with age, with the greatest decline occurring during adolescence [28]. Even while the WHO and other organizations are leading the way globally [4], promoting physical activity through schools: a toolbox, Global Action Plan on Physical Activity 2018–2030, etc.), more needs to be done to advance the global PA agenda [29]. To interpret findings about PA behavior (sport, physical education, active transportation, etc.) into settings (schools, communities) through various channels (mass media/advertising, policy), a significant amount of translational work has not yet been implemented [30]. More funding is needed for implementation science and sustainability research in PA to identify ways to maximize the health effects of evidence-based research [27].

An estimated 80% of young people worldwide do not get the necessary 60 minutes of MVPA each day [31]. At the same time, there is evidence that children and adolescents who are physically inactive have poorer physical, mental, social, and cognitive health outcomes, including being overweight or obese. Therefore, raising young people's PA levels ought to be a far higher public health priority. The same is true for nutrition. There is still work to be done to protect our children's health, even with the World Health Organization [4] nutrition guidelines. In 2019, 38.3 million children were overweight, 47 million were wasting, and 144 million children under five suffered from stunting [4].

5. Conclusion

We can assess nutrition and physical activity based on several demographic variables through this questionnaire. It is important to note that there is a positive correlation between physical exercise and nutrition, but maintaining this relationship requires strong family and school support. This approach is ideal for young people. By raising awareness among these young individuals now, we can prevent many health issues in the future. A healthy diet and regular exercise should be part of daily routines. In addition to encouraging family and community involvement, middle schools are likely the most effective venues for promoting healthy eating and consistent physical activity. Adolescents who engage in regular physical activity and improve their diets are making a valuable investment in the health of future generations.

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