

SELECTED LIFESTYLE ELEMENTS IN ADOLESCENTS ATTENDING HIGH SCHOOLS

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ABSTRACT

Background: Lifestyle encompasses, among other things, eating habits, physical activity, and the use of stimulants. Individual choices in this area have a direct impact on human health.

Objective. The aim of this study was to assess the lifestyle in adolescents and to verify whether there is a relationship between selected lifestyle elements and gender.

Materials and methods. A total of 304 students (160 women and 144 men) were included in the study. The study used an original questionnaire. *Chi-square* test was used to assess the correlations between gender and eating habits, physical activity and the use of stimulants among adolescents. A *p*-value <0.05 was considered statistically significant.

Results. The students surveyed usually have 4-5 meals daily at 3-4-hour intervals (50.33% and 53.8%, respectively). They consume confectionery up to several times a week (35.2%), as declared by more women than men (41.9% of women and 27.8% of men). Adolescents usually practise physical exercise several times a week (36.51%), as reported by 29.38% of women and 44.44% of men. Occasional alcohol consumption was reported by 44.38% of women and 42.4% of men. A total of 61.92% of respondents were non-smokers, as declared by more women than men.

Conclusions. The majority of adolescents lead an unhealthy lifestyle in terms of eating habits, alcohol consumption and smoking. Positive behaviours were observed for physical activity. Some lifestyle elements were correlated with gender. Women devote less time to physical activity compared to men. Men have a higher tendency to consume carbonated beverages and higher amounts of alcohol than women. The obtained research results indicate the need for health education.

Key words: *lifestyle, eating habits, adolescents*

STRESZCZENIE

Wprowadzenie: Styl życia obejmuje między innymi sposób odżywiania, podejmowaną aktywność fizyczną, stosowanie używek. Indywidualne wybory w tym zakresie mają bezpośredni wpływ na zdrowie człowieka.

Cel. Celem badań była ocena stylu życia młodzieży oraz odpowiedź na pytanie czy występują zależności pomiędzy wybranymi elementami stylu życia i płcią badanych osób.

Materiał i metody. Badaniem objęto 304 uczniów (160 kobiet oraz 144 mężczyzn). Narzędziem badawczym był autorzki kwestionariusz ankiety. Do oceny zależności między płcią i zachowaniami żywieniowymi, aktywnością fizyczną i stosowaniem używek wśród młodzieży wykorzystano test *Chi-kwadrat*. Dla wszystkich analiz za istotną statystycznie przyjęto wartość *p*<0.05.

Wyniki. Uczniowie najczęściej spożywali 4-5 posiłków dziennie, a przerwy pomiędzy posiłkami wynoszą 3-4 godziny (odpowiednio 50,33% i 53,8% wskazań). Badani uczniowie spożywali słodkie najczęściej kilka razy w tygodniu (35,2% wskazań), na taką odpowiedź wskazało więcej kobiet, niż mężczyzn (odpowiednio 41,9% kobiet i 27,8% mężczyzn). Aktywność fizyczna była podejmowana przez młodzież najczęściej kilka razy w tygodniu (36,51% wskazań), na taką odpowiedź wskazało 29,38% kobiet oraz 44,44% mężczyzn. Alkohol okazjonalnie spożywa 44,38% kobiet i 42,4% mężczyzn. Wśród badanych uczniów 61,92% nie paliło papierosów, takiej odpowiedzi udzieliło więcej kobiet, niż mężczyzn.

Wnioski. Wśród młodzieży przeważał niewłaściwy styl życia, który dotyczył zachowań żywieniowych oraz picia alkoholu i palenia papierosów. Korzystne zachowania młodzieży obserwuje się w zakresie podejmowania aktywności fizycznej. Stwierdzono występowanie zależności pomiędzy niektórymi elementami stylu życia a płcią badanych osób. Kobiety poświęcały mniej czasu na aktywność fizyczną w porównaniu z mężczyznami. Mężczyźni natomiast, wykazywali większe skłonności do picia napojów gazowanych i większych ilości alkoholu, niż kobiety. Uzyskane wyniki badań wskazują na konieczność prowadzenia edukacji zdrowotnej.

Słowa kluczowe: *styl życia, zachowania żywieniowe, młodzież*

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INTRODUCTION

Lifestyle encompasses, among other things, eating habits, physical activity, and the use of stimulants. Choices in this area have a direct impact on human health [2, 3].

An appropriate number of 4-5 meals per day consumed at 3-4-hour intervals is needed for maintaining proper health [11]. It is also important to consume vegetables, fruit and nuts, which provide vitamins, minerals, flavonoids and other compounds that support the proper functioning of the body [8, 25]. Dietary intake of fish ensures the supply of anti-inflammatory polyunsaturated fatty acids [30], while milk and dairy products increase bone density [14]. Consumption of fast foods, which promote gastrointestinal disorders associated with, among other things, insufficient dietary fibre supply, has negative effects on health [28]. Sugar contained in high energy density products, such as confectionery, promotes metabolic diseases [10]. Energy drinks contain taurine and caffeine, which may increase heart rate and blood pressure [4].

Physical activity, which should be undertaken on a daily basis (150 minutes per week) is crucial for maintaining health [6]. Proper level of physical activity improves thought processes and reduces stress, which is the main cause of modern-age diseases [15, 32]. Alcohol consumption has a strong addictive effect on the body, contributing to chronic diseases, including fatty liver disease, depressive states and suicides [37]. Smoking cigarettes is associated with exposure to toxic substances, such as heavy metals, including cadmium, arsenic and polycyclic aromatic hydrocarbons. All these substances contribute to carcinogenesis, as well as the development of nervous system disorders and renal dysfunction [34].

A healthy lifestyle has beneficial effects on life quality and helps maintain health. Poor diet, limited or no physical activity, and a tendency to addiction reduce life quality, and thus contribute to the development of diseases.

The aim of this study was to assess lifestyle in adolescents and to verify whether there is a relationship between selected lifestyle elements and gender.

MATERIALS AND METHODS

The study was conducted in 2018 among 355 adolescents (16-19 years old) attending high schools in the Silesian Voivodeship (south of Poland). The study was preceded by a pilot study, which included 10 students. Questionnaires completed by 304 students (160 women (52.63%) and 144 men (47.37%)), were included in the analysis. An original questionnaire including demographic data and questions on eating

habits, consumption frequency for selected food products, physical activity and use of stimulants were used. The answers were analysed overall and by gender. The obtained results pooled using Microsoft Excel 2010. Statistica 13.1. (TIBCO Inc.) were used for statistical analysis. Correlations between gender and eating habits, physical activity and the use of stimulants were assessed using the *Chi-square* test. A p -value <0.05 was considered statistically significant in all analyses.

RESULTS

Chosen nutritional behaviours are shown in figures 1-5.

The students surveyed usually have 4-5 meals daily with 3-4-hour intervals between meals (50.33% and 53.8%, respectively). Consumption of 4-5 meals per day was reported by a comparable number of men and women (49.3% vs. 51.3%), whereas 3-4-hour intervals between meals were declared by more women than men (58.8% vs. 47.9%). The most popular snacks chosen by respondents included confectionery (33.22%), followed by fruit and vegetables (29.93%), with women more likely to consume confectionery (38.8%), followed by fruit or vegetables (30.6%) between meals. Men, on the other hand, are more likely to choose fruit or vegetables (29.2%), followed by confectionery (27.1%). Most students take extra salt in their meals (59.54%), as declared by more men (62.5%) than women (56.9%). The students usually drink more than 6 glasses of water daily, and this practice is more common among men (47.2%) than women (32.5%).

Statistically significant correlations were found between the amount of consumed water per day and gender, with more men than women having more than 6 glasses of water per day ($p=0.001$) (Figures 1-5).

The frequency of selected food products consumption is presented in Tables 1-2.

Most of respondents consume vegetables every day, but not in all meals (38.82%); such consumption rates were reported by more women (42%) than men (34.7%). The surveyed students usually consume fruit and milk several times weekly (44.74% and 39.8%, respectively), as declared by more men (50% and 42.4%, respectively) than women (40% and 37.5%, respectively). Fish is usually consumed several times per month (39.47%), as reported by more women (43.1%). Men are more likely to occasionally consume fish (39.6%) (Table 1).

The majority of respondents reported occasional consumption of fast-food products (52.96%), as declared by more women (55%) than men (50.7%). The students usually consume confectionery several times a week (35.2%), with more women than men reporting this rate (41.9% and 27.8%, respectively). Occasional

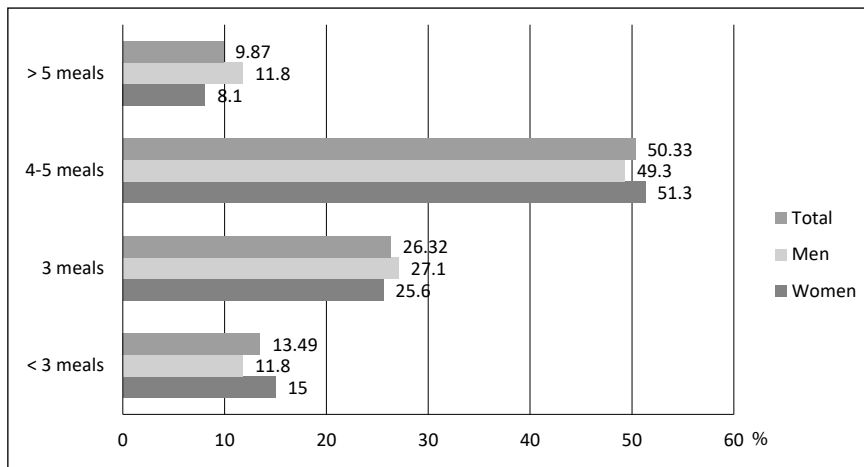


Figure 1. Number of meals consumed daily

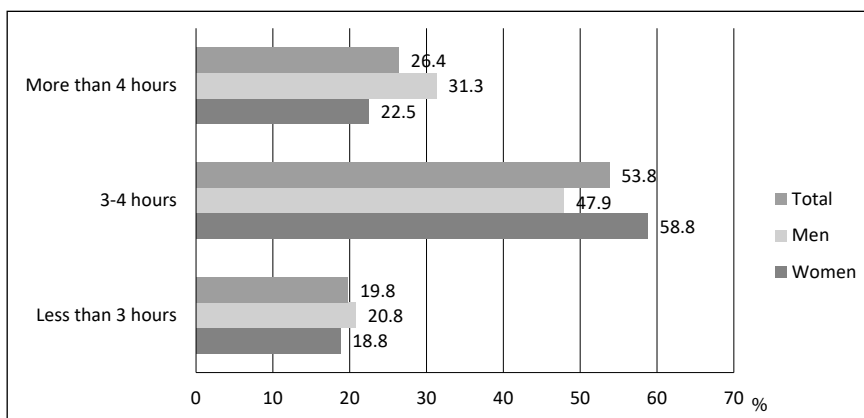


Figure 2. Breaks between consumption of the meals

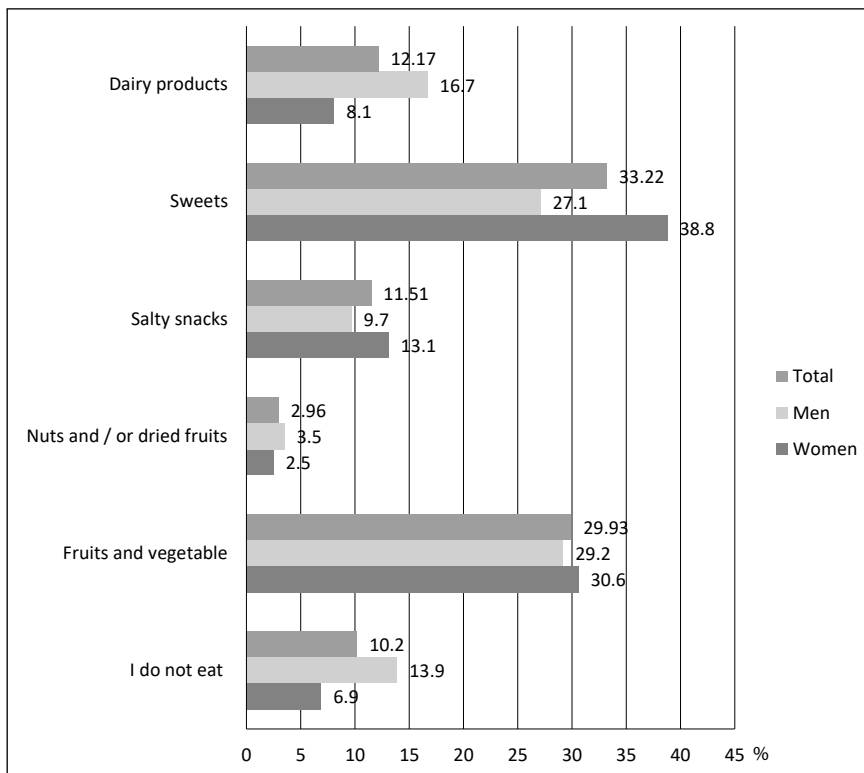


Figure 3. Type of snacks consumed between meals

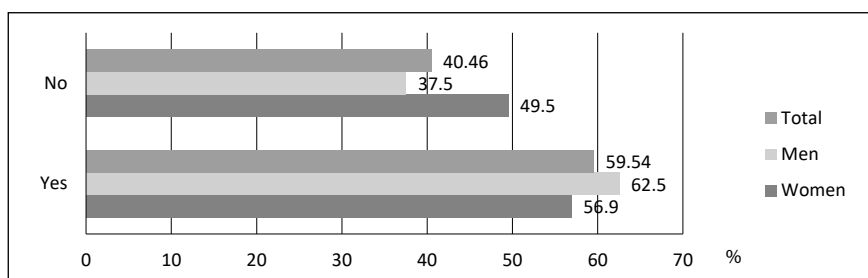


Figure 4. Salting dishes

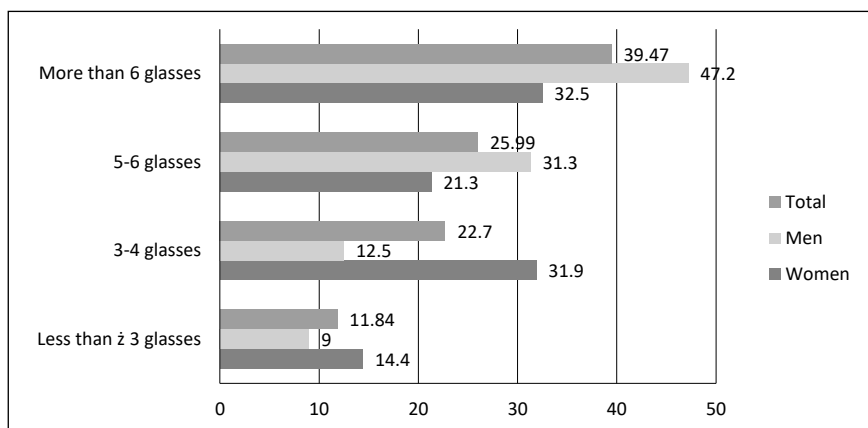


Figure 5. Amount of water consumed daily

Table 1. Frequency of consumption of food products recommended in the young people's diet

Frequency of consumption		Women		Men		Total	
		n=160	%	n=144	%	n=304	%
Vegetable	Daily, at every meal	16	10	11	7.6	27	8.88
	Daily, but not at every meal	68	42	50	34.7	118	38.82
	Few times a week	48	30	50	34.7	98	32.24
	Few times a month	20	12.5	19	13.2	39	12.83
	Occasionally	5	3.1	11	7.6	16	5.26
	Not at all	3	1.9	3	2.1	6	1.97
Fruit	Daily, at every meal	6	3.8	4	2.8	10	3.29
	Daily, but not at every meal	62	38.8	39	27.1	101	33.22
	Few times a week	64	40	72	50	136	44.74
	Few times a month	22	13.8	20	13.9	42	13.82
	Occasionally	6	3.8	6	4.2	12	3.95
	Not at all	0	0	3	2.1	3	0.99
Dairy products (milk, yogurt, buttermilk, cheese etc.)	Few times a day	13	8.1	18	12.5	31	10.20
	Once a day	25	15.6	29	20.1	54	17.76
	Few times a week	60	37.5	61	42.4	121	39.80
	Few times a month	33	20.6	23	16	56	18.42
	Occasionally	19	11.9	8	5.6	27	8.88
	Not at all	10	6.3	5	3.5	15	4.93
Fish	Daily	0	0	2	1.4	2	0.66
	2-3 times a week	6	3.8	14	9.7	20	6.58
	Few times a month	68	43.1	51	35.4	120	39.47
	Occasionally	58	36.3	57	39.6	115	37.83
	Not at all	27	16.9	20	13.9	47	15.46

consumption of sweetened carbonated beverages and energy drinks was declared by 30.26% and 28.95% of students, respectively, with higher consumption of sweetened carbonated beverages among women (38.1%) than men (21.5%) and higher consumption of energy drinks among men (30.6%) than women (27.5%).

Statistically significant correlations were found between consumption rates for sweetened carbonated beverages and gender, with more men than women declaring consumption of these products several times per week ($p=0.006$) (Table 2).

Behaviours related to physical activity and the use of stimulants by adolescents are presented in Tables 3 and 4.

Physical activity was most often undertaken several times a week (36.51%), as declared by 29.38% of females and 44.44% of males. The surveyed students most often devote 1-2 hours weekly (27.7%) for physical activity, as declared by a lower proportion of women (26.53%) than men (29%). Cycling (50.72%) and walking (47.48%) were the most common forms of physical activity, with the latter one more popular among women (60.54%); cycling (55.72%) and team sports (41.22%) were more common among men.

Statistically significant correlations were found between the time spent on physical activity and gender, with more men than women practising physical exercise at least 5 hours per week ($p<10^{-5}$) (Table 3).

Table 2. Frequency of food products consumption unrecommended in the young people's diet

Frequency of consumption		Women		Men		Total	
		n=160	%	n=144	%	n=304	%
Fast-food products	Daily	2	1.3	2	1.4	4	1.32
	Few times a week	15	9.4	16	11.1	31	10.20
	Few times a month	48	30	49	34	97	31.91
	Occasionally	88	55	73	50.7	161	52.96
	Not at all	7	4.4	4	2.8	11	3.62
Sweets	Daily	36	22.5	34	23.6	70	23.03
	Few times a week	67	41.9	40	27.8	107	35.20
	Few times a month	29	18.1	33	22.9	62	20.39
	Occasionally	25	15.6	34	23.6	59	19.41
	Not at all	3	1.9	3	2.1	6	1.97
Sweetened carbonated drinks	Daily	20	12.5	15	10.4	35	11.51
	Few times a week	22	13.8	36	25	58	19.08
	Few times a month	35	21.9	44	30.6	79	25.99
	Occasionally	61	38.1	31	21.5	92	30.26
	Not at all	22	13.8	18	12.5	40	13.6
Energy drinks	Daily	12	7.5	16	11.1	28	9.21
	Few times a week	6	3.8	17	11.8	23	7.57
	Few times a month	18	11.4	21	14.6	39	12.83
	Occasionally	44	27.5	44	30.6	88	28.95
	Not at all	80	50	46	31.9	126	41.45

Table 3. Physical activity behaviors

Frequency of physical activity	Women		Men		Total	
	n=160	%	n=144	%	n=304	%
Not at all	13	8.13	13	9.02	26	8.55
Less, than 1 time a month	14	8.75	13	9.02	27	8.88
1-3 times a month	22	13.75	12	8.33	34	11.18
1 time a week	22	13.75	12	8.33	34	11.18
Few times a week	47	29.38	64	44.44	111	36.51
Daily	42	26.25	30	20.83	72	23.68

Time spent on physical activity during the week	Women		Men		Total	
	n=147	%	n=131	%	n=278	%
I do not exercise every week	22	14.97	12	9.16	34	12.23
Up to 1 hour	28	19.05	21	16.03	49	17.63
1-2 hours	39	26.53	38	29.00	77	27.70
3-4 hours	26	17.69	28	21.37	54	19.43
5 hours or more	32	21.77	32	24.43	64	23.01
Type of physical activity *	Women		Men		Total	
	n=147	%	n=131	%	n=278	%
Walking	82	60.54	43	32.82	132	47.48
Running	52	35.37	40	30.53	92	33.09
Biking	68	46.26	73	55.72	141	50.72
Swimming	27	18.37	24	18.32	51	18.35
Team sport	40	27.21	54	41.22	94	33.81
Gym exercises	54	36.73	44	33.58	98	35.25

The majority of respondents consume alcohol occasionally (43.42%), with comparable rates among women (44.38%) and men (42.4%). Beer was the most common type of alcohol among the students surveyed (75.43%). This type of alcohol was more popular among men than women (81.42% and 68.91%, respectively). A one-time consumption usually involves 1-2 portions of alcohol (27.27%), as declared by more women (30.51%) than men (23.89%). The fact that 21.21% of respondents, including 11.86% of females and 30.97% of males have 9 or more portions of alcohol at one time raises concerns.

A total of 61.92% of respondents are non-smokers, as declared by more women (63.8%) than men (59.9%). Of those declaring smoking, 53.57% reported less than 20 cigarettes a week (43.6% of women vs 44.4% of men).

Statistically significant correlations were found between:

- the most common type of alcohol and gender, with wine more popular among women than men ($p=0.001$);
- the amount of alcohol consumed at a time and gender, with men more likely than women to consume at least 9 portions of alcohol at a time ($p=0.01$) (Table 4).

Table 4. Alcohol consumption and smoking

Frequency of alcohol consumption	Women		Men		Total	
	n=160	%	n=144	%	n=304	%
Not at all	42	26.25	31	21.5	73	24.01
Occasionally	71	44.38	61	42.4	132	43.42
Few times a month	39	24.38	27	18.8	66	21.71
Few times a week	6	4.38	20	13.9	26	8.88
Daily	2	0.66	5	3.5	7	2.30
Kind of alcohol consumed the most*	Women		Men		Total	
	n=118	%	n=113	%	n=231	%
Vodka	58	49.15	58	51.33	116	50.21
Wine	63	52.94	22	19.47	86	37.07
Beer	82	68.91	92	81.42	175	75.43
Another one	14	11.76	24	21.24	38	16.38
Amount of alcohol consumed during 1 consumption **	Women		Men		Total	
	n=118	%	n=113	%	n=231	%
1-2 portions	36	30.51	27	23.89	63	27.27
3-4 portions	35	29.66	27	23.89	62	26.84
5-6 portions	22	18.64	13	11.50	35	15.15
7-8 portions	11	9.32	11	9.73	22	9.52
9 portions or more	14	11.86	35	30.97	49	21.21

Frequency of smoking	Women		Men		Total	
	n=160	%	n=142	%	n=302	%
Not at all	102	63.8	85	59.9	189	61.92
Occasionally	23	14.4	15	10.6	38	12.58
Few times a month	4	2,5	5	3.5	9	2.98
Few times a week	8	5	3	2.1	11	3.64
Daily	23	14.4	34	23.9	57	18.87
Number of cigarettes smoked per week	Women		Men		Total	
	n=39	%	n=45	%	n=84	%
Less than 20	17	43.6	20	44.4	45	53.57
20-39	7	17.9	6	13.3	10	11.90
0-59	6	15.4	4	8.9	9	10.71
60-79	6	15.4	7	15.6	10	11.90
80 or more	3	7.7	8	17.8	10	11.90

* Multiple choice question, ** 1 portion of alcohol = 1 shot of vodka (25 g) or a glass of beer (200 g) or a glass of wine (100 g)

DISCUSSION

Lifestyle is an important factor of life quality in adults. Understanding the lifestyle of young people allows for early identification of harmful behaviours that can be eliminated at a young age through health education [36].

Our study showed that students usually comply with the recommended 4-5 meals daily, as declared by 50.33% of respondents, including 49.3% of men and 51.3% of women. Similar results were presented by *Cipora* et al. who assessed eating habits in 115 (78 girls and 37 boys) middle-school students. According to the authors, 64.3% of students, including 70.5% of girls and 60.3% of boys, reported the same number of meals [3]. *Szeja* et al. [33] who assessed eating habits in 460 school-age girls and boys showed that they usually had 4-5 meals a day, as declared by 59.09% of boys and 41.38% of girls.

There were usually 3-4-hour intervals between meals (53.8%). The most common snacks included confectionery (33.22%), followed by fruit and vegetables (29.93%). *Michota- Katulska* et al. [21] showed that 39.4% of respondents consumed meals at 3-4-hour intervals, with confectionery (34%) and fruit (38%) reported as the most common snacks, which is in line with our findings.

Excessive intake of salt leads to cardiovascular diseases and water and electrolyte imbalance [29]. Adding salt to ready meals was declared by 59.54% of respondents. *Kucharska* et al. [16] who assessed implementation of healthy eating habits by the students of Warsaw universities, showed that adding salt to meals was less common compared to our findings (26.4%). Similar findings were presented by *Ostrówka* et al. [24] who assessed the knowledge of cardiovascular risk factors, and showed that adding salt to meals was less common compared to our study (35.1%).

Water is necessary for multiple processes and transformations in the body. Insufficient supply of water may induce somatic symptoms, fatigue, headache and learning problems [7]. Our study showed that 65.46% of students have at least 5 glasses of water per day. Different results were presented by *Mendyk* et al. [20] who assessed healthy eating behaviours among children and adolescents. The authors demonstrated that 82.5% of respondents had less than 5 glasses of water per day.

Fruit and vegetables are a dietary source of vitamins, minerals and fibre. These compounds help maintain proper gut function and show anti-cancer activity [1, 38]. Our findings indicate that 47.7% of students consume vegetables on a daily basis, including 8.88% at each meal as opposed to 38.82%. Slightly less favourable results were obtained by *Kulik* et al., who assessed healthy and risky behaviours among Silesian middle-school students. According to the authors, daily vegetable consumption was declared by 35.98% of students [18]. In our study, 10% of women and 7.6% of men consume vegetables in each meal every day. More optimistic findings were presented by *Szeja* et al. [33] who showed daily vegetable intake in 28.74% of girls and 26.92% of boys participating in the study. Our study showed that 3.8% of women and 2.8% of men consumed fruit more often than once daily. Different findings were obtained by *Jasińska*, indicating everyday consumption of fruit by 17.3% of girls and 13.3% of boys [12].

Dairy products are a source of elements necessary for proper skeletal structure [35]. Our study showed that milk and dairy products were consumed several times a week by 39.8% of respondents. These findings correspond with those presented by *Całyniuk* et al., who assessed milk and dairy product consumption among 16-18-year-olds. The authors showed that

37.67% of respondents consumed dairy products with the same frequency [2].

Sea fish are a natural dietary source of iodine, which is necessary, among others, to ensure optimal thyroid function [23]. Our study showed that 39.47% of students consume fish several times a month. Similar results were obtained by *Kula* and *Śmiechowska* [17], who assessed fish intake in students. The authors showed that 43% of respondents consumed fish at this frequency. Our study showed that 43.1% of women and 35.4% of men consume fish several times a month. Different findings were presented by *Rusinek-Prystupa* et al. [27], who showed that 21.3% of women and 27% of men (high-school students from Lublin) consumed fish 2-3 times a month.

Physical activity is crucial for normal bone tissue formation during the developmental process. Achieving high bone density in childhood and adolescence is crucial for a healthy skeleton in adulthood. Furthermore, physically active individuals have a reduced risk of multiple diseases, such as atherosclerosis, hypertension, myocardial infarction or stroke [22]. Our study showed that most respondents undertook physical exercise several times a week (36.51%). In their study in 428 middle-school students from Bydgoszcz, *Żukowska* et al. [39] demonstrated that physical activity was usually practised 1-2 times a week (43%) and 3-4 times a week (38%). *Dąbrowska* et al. [5], on the other hand, who assessed physical activity in rural children and adolescents, showed that 49.29% of respondents practise sports several times a week, including 11.27% of respondents exercising 2-3 times a week and 38.02% of respondents exercising 4-5 times a week. In our study, walking was the most common form of physical activity among women (60.54%), while cycling was more popular among men (55.72%). Similar findings were presented by *Żukowska* et al. [39], who showed that cycling was the most popular form of exercise among boys (27%), as well as by *Kaczor-Szkodna* et al. [13] who showed that 56.1% of girls usually choose walking and 56.8% of boys practise cycling.

Alcohol and smoking contribute to substance dependency and multiple pathologies, including cardiovascular diseases [11, 31]. Our study showed that 8.88% of respondents consumed alcohol several times a week. More disturbing findings were presented by *Kusiak* et al. [19] who evaluated biosocial factors and alcohol consumption rates among adolescents. According to this authors, alcohol consumption several times per week, once a week and once a month was declared by 43.8%, 25.3% and 15.4% of middle-school students, respectively. Our study showed, that alcohol consumption occurred more often in man, than in women, and was declared by 78.5% man and 73.75% woman. *Jakubiec* et al. [9], who analysed

students lifestyle, observed that 90.6% of man and 91.8% of woman drink alcohol. Our respondents usually consume 1-2 portions of alcohol, as declared by 27.27% of the students surveyed. *Przybylska* et al. [26] observed that students participating in their study most often consume 1-2 portions of alcohol at a time (one portion of alcohol corresponds to two portions in our study). Such portion is consumed at a time by up to 48% of respondents, which indicates higher consumption rates compared to our findings. Our study showed that 61.92% of respondents were non-smokers. Similar results were obtained by *Przybylska* et al. [26], who found that 70% of respondents were non-smokers. Also *Jakubiec* et al. [9] show, that 75.8% of their respondents were non-smokers. Different findings were presented by *Ostrówka* et al. [24], who conducted their study in high-school students from Gdańsk, Gdynia and Sopot (Tricity in Poland). According to this authors, smokers accounted for 4.2% of respondents.

CONCLUSIONS

The majority of adolescents lead an unhealthy lifestyle in terms of eating behaviours, alcohol consumption and smoking. Healthy behaviour was observed in relation to physical activity.

Some lifestyle elements were correlated with gender. Women spend less time practising sports compared to men. Men, on the other hand, were more likely to consume carbonated beverages and higher amounts of alcohol than women.

The obtained research results indicate the need for health education.

Conflict of interest

The authors declare no conflict of interest.

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