

## SELECTED EATING BEHAVIOURS OF GIRLS AND BOYS ATTENDING SPORT-ORIENTED CLASSES

Nicola Szeja, Elżbieta Szczepańska\*, Karolina Janion,  
Anna Szymbkiewicz, Biruta Lenard, Izabela Dudzik, Anna Koldon

Department of Human Nutrition, School of Public Health in Bytom, Medical University of Silesia, Zabrze, Poland

### ABSTRACT

**Background.** Eating behaviours play a key role in lives of young people who stay physically active. They influence both their correct development and performance.

**Objective.** Evaluation of selected eating behaviours of girls and boys attending sport-oriented classes and identification of differences between eating behaviours of studied groups.

**Materials and Methods.** 460 students attending sport-oriented classes in Poland participated in the study. A questionnaire prepared by the author of the study was the research tool. The data was gathered in Microsoft Office Excel 2010 worksheet. Statistical analysis was made with the use of StatSoft, Inc. Statistica version 10.0.

**Results.** The questioned students most often had 4-5 meals a day- such an answer was given by 59.09% of the boys and 41.38% of the girls. 55.59% and 41.95% of them respectively had breakfast within 30 minutes from waking up and 41,96% of the girls and 39.51% of the boys had supper 2-3 hours before going to sleep. Whole meal bread and/or groats were most frequently consumed a few times a day as it was declared by 50.35% of the boys and 45.98% of the girls. The highest percentage of the respondents consumed vegetables at least once a day (31.61% of the girls and 31.47% of the boys). 44.83% of the girls and 40.9% of the boys declared eating fruit a few times a day.

**Conclusions.** Studied eating behaviours of girls and boys in sport-oriented classes are largely wrong and require correction. The analysis of the gathered data indicated statistically significant differences between boys' and girls' eating behaviours, however, the boys' habits were better.

**Key words:** *eating behaviours, students, girls, boys, physical activity, sport*

### STRESZCZENIE

**Wprowadzenie.** Zachowania żywieniowe mają kluczowe znaczenie dla młodych osób aktywnych fizycznie, rzutując zarówno na prawidłowy rozwój, jak i wyniki przez nie osiągnięte.

**Cel.** Ocena wybranych zachowań żywieniowych dziewcząt i chłopców uczęszczających do klas o profilu sportowym oraz identyfikacja różnic pomiędzy zachowaniami żywieniowymi badanych grup.

**Materiał i metodyka.** Badanie przeprowadzono wśród 460 uczniów uczęszczających do klas o profilu sportowym. Narzędzie badawcze stanowił autorski kwestionariusz ankiety. Uzyskane dane zebrano w programie Microsoft Office Excel 2010, a analizę statystyczną przeprowadzono z wykorzystaniem programu StatSoft, Inc. Statistica version 10.0.

**Wyniki.** Badani uczniowie najczęściej spożywali 4-5 posiłków dziennie, takiej odpowiedzi udzieliło 59,09% chłopców oraz 41,38% dziewcząt. Odpowiednio 55,59% oraz 41,95% badanych spożywało śniadanie najczęściej do 30 minut po przebudzeniu, natomiast 41,96% dziewcząt i 39,51% chłopców spożywało kolację na 2-3 godzin przed snem. Pełnoziarniste pieczywo i/lub kasze uczniowie spożywali najczęściej kilka razy dziennie, odpowiedź taką wskazało 50,35% chłopców oraz 45,98% dziewcząt. Codzienne spożycie mięsa i/lub wędlin zadeklarowało 37,06% chłopców i 33,33% dziewcząt. Najliczniejszy odsetek stanowili uczniowie, którzy spożywali warzywa co najmniej raz dziennie (31,61% dziewcząt i 31,47% chłopców). Spożycie owoców kilka razy dziennie deklarowało 44,83% dziewcząt oraz 40,9% chłopców.

**Wnioski.** Badane zachowania żywieniowe dziewcząt i chłopców uczęszczających do klas sportowych są w dużej mierze nieprawidłowe i wymagają korekty. Stwierdzono występowanie istotnych statystycznie różnic w żywieniu dziewcząt i chłopców, przy czym korzystniejsze zachowania odnotowano wśród chłopców.

**Słowa kluczowe:** *zachowania żywieniowe, uczniowie, dziewczęta, chłopcy, płeć, aktywność fizyczna, sport*

\* **Corresponding author:** Elżbieta Szczepańska, Department of Human Nutrition, School of Public Health in Bytom, Medical University of Silesia, 19 Jordana Street, 41-808 Zabrze, Poland, phone: +48 32 275 51 97, e-mail: [eszczepanska@sum.edu.pl](mailto:eszczepanska@sum.edu.pl)

## INTRODUCTION

Diet conditions one's health, development and functioning of the organism. It is strictly connected with eating behaviours, which determine its correctness [12]. Eating behaviours play a key role for people physically active, whose bodies have high demand for nutrients, minerals, vitamins and liquids [5, 17, 19]. In the case of young sports people this issue is especially important due to increased organism needs related to its development and growth, which combined with high level of physical activity requires special attention to be paid to nutrition [1, 8]. Proper supply of energy and covering the demand for all of the indispensable nutrients are a key issue determining sports people's performance and achievements [14, 17, 28]. Hydration is a crucial issue as it is related to improvement of one's performance in several sport disciplines [21]. Therefore, the role of eating behaviours of students in sport-oriented classes is so important and they should be formed in a way that allows to increase effectiveness during training by consumption of proper products [24]. Young people very often find selecting them problematic and eat high-energy snacks and small amounts of fruit and vegetables, which may adversely influence their health [6]. Rational and balanced diet, which should satisfy the need for protein, antioxidant vitamins and minerals not only improves sports people's performance but also prevents deficits resulting from increased organism activity [25].

In spite of physically active people's high awareness, many of them do not pay enough attention to everyday diet and that is why monitoring eating behaviours is such a significant issue, especially among young sports people. Moreover, it seems to be important to take into account gender differences due to different body build and as a consequence- different demand for particular nutrients, but also choices they make [10].

The aim of the study was the evaluation of selected eating behaviours of girls and boys in sport-oriented classes and identification of differences between eating behaviours of studied group.

## MATERIALS AND METHODS

460 students (37,83% girls and 62,17% boys) attending sport-oriented classes in the Upper Silesia region in Poland, participated in the study. Middle-school students constituted 89.57% of the total number of respondents and secondary-school 10.43%. 71.30% of the students were 13-15 years old and 28.70% were aged 16-17.

The first stage of the study was designing a questionnaire, which consisted of the respondent's particulars part and questions concerning among others: behaviours before, during and after training as well as eating behaviours and self-assessment in this respect. The second stage was pilot research including 20

people, the objective of which was to verify whether the questions were comprehensible for students. The next stage was filling in the questionnaires by the subjects of the study. The data was gathered in Microsoft Office Excel 2010 worksheet. Statistical analysis was made with the use of StatSoft, Inc. Statistica version 10.0. In order to evaluate differences between studied aspect and a gender of students, chi-squared test was applied. The value of statistical significance was  $p \leq 0.05$ .

## RESULTS

Figure 1 presents the number of meals consumed daily. The highest percentage of both the boys and girls had 4-5 meals a day- such an answer was given by 59.09% and 41.38% of them respectively. It is alarming that 16.67% of the girls had less than 3 meals daily, this result was lower in the group of boys: 3.50% (Figure 1).

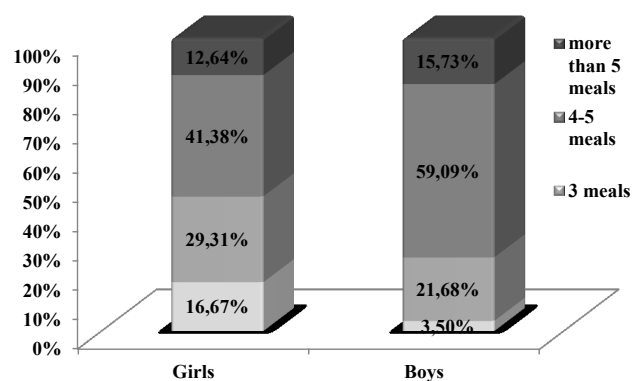


Figure 1. Number of meals consumed daily by studied boys and girls (*Chi*-squared test:  $p \leq 0.05$ )

Figure 2 presents the amount of fluids consumed daily. Both the girls and boys most frequently consumed 1-2 liters of liquids daily (52.87% and 40.21% respectively). It is worth noting that only 6.90% of the girls and 16.44% of the boys had more than 3 liters of liquids a day, which can be alarming taken into consideration increased physical activity. Similarly worrying is the fact that 13.22% of the girls and 5.59% of the boys declared drinking less than 1 liter of liquids a day (Figure 2).

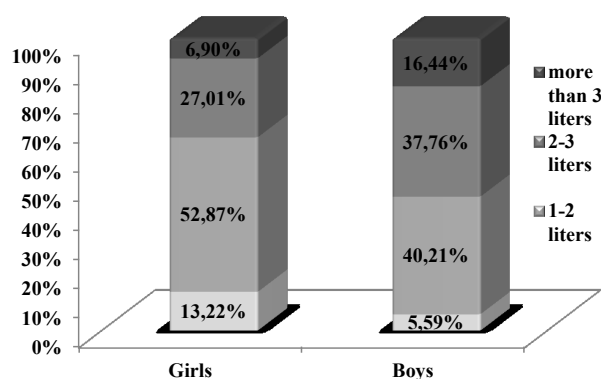


Figure 2. Amount of fluids consumed daily by studied boys and girls (*Chi*-squared test:  $p \leq 0.05$ )

Figure 3 presents information about time between waking up and having breakfast. The largest group of respondents, both among the boys and the girls, declared having breakfast 30 minutes after waking up, 55.59% and 41.95% respectively. What is alarming, 20.69% of the girls and 5.25% of the boys did not have this meal at all (Figure 3).

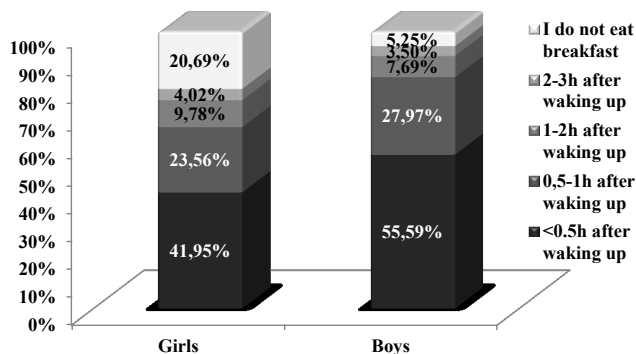


Figure 3. Time between waking up and having breakfast for studied boys and girls (*Chi*-squared test:  $p \leq 0.05$ )

Figure 4 presents information about time between having supper and going to sleep. The respondents most often had their last meal 2-3 hours before going to sleep as it was declared by 41.9% of the girls and 39.51% of the boys. Having supper at 6 p.m. the latest was declared by 12.64% of the girls and 8.74% of the boys (Figure 4).

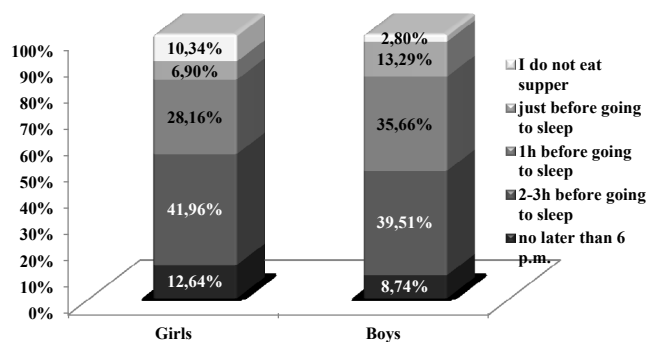


Figure 4. Time between having supper and going to sleep for studied boys and girls (*Chi*-squared test:  $p \leq 0.05$ ).

Comparison of frequency of selected products consumption among the boys and the girls is presented in Tables 1-3. Wholemeal bread and/or groats were most frequently eaten a few times a day as it was declared by 50.35% of the boys and 45.98% of the girls. The highest percentage of students consumed vegetables once a day- such an answer was given by 31.61% of the girls and 31.47% of the boys. Eating fruit a few times a day was declared by 44.83% of the girls and 40.90% of the boys. Dry leguminous plant seeds most frequently were eaten a few times a month as it was declared by 41.38% of the girls and 31.82% of the boys (Table 1).

Table 1. Comparison of frequency of selected products consumption among studies boys and girls. Part I

Food products	Possible responses	Girls		Boys		p*
		n	%	n	%	
Wholemeal bread and/or groats	few times a day	80	45.98	144	50.35	0.10
	once a day	35	20.11	49	17.13	
	few times a week	23	13.22	52	18.18	
	few times a month	17	9.77	14	4.90	
	occasionally	17	9.77	19	6.64	
	not at all	2	1.15	8	2.80	
Vegetables	few times a day	50	28.74	77	26.92	0.75
	once a day	55	31.61	90	31.47	
	few times a week	43	24.71	75	26.22	
	few times a month	11	6.32	27	9.44	
	occasionally	11	6.32	13	4.55	
	not at all	4	2.30	4	1.40	
Fruit	few times a day	78	44.83	117	40.90	0.87
	once a day	49	28.16	89	31.12	
	few times a week	32	18.39	60	20.98	
	few times a month	8	4.60	12	4.20	
	occasionally	6	3.45	6	2.10	
	not at all	1	0.57	2	0.70	
Dry leguminous plant seeds	few times a day	3	1.72	9	3.15	0.08
	once a day	6	3.45	10	3.50	
	few times a week	24	13.79	70	24.48	
	few times a month	72	41.38	91	31.82	
	occasionally	44	25.29	65	22.71	
	not at all	25	14.37	41	14.34	

\* *Chi*-squared test

Curd cheese was most frequently eaten a few times a week as it was declared by 35.06% of the girls and 35.32% of the boys. The frequency is similar for cheese and/or processed cheese for 39.08% of the girls and 27.27% of the boys as well as for eggs- as declared by

50.58% and 50% of them respectively. Meat and/or cold meat were eaten once a day by 37.06% of the boys and 33.34% of the girls. Fish was in most cases consumed a few times a month as declared by 38.51% of the girls and 36.36% of the boys. It is worth noting that 12.64% of the girls did not have fish at all (Table 2).

Table 2. Comparison of frequency of selected food products consumption among studied boys and girls. Part II

Food products	Possible responses	Girls		Boys		p*
		n	%	n	%	
Fermented milk drinks	few times a day	11	6.32	62	21.68	<0.01
	once a day	41	23.56	74	25.87	
	few times a week	75	43.10	85	29.72	
	few times a month	23	13.22	38	13.29	
	occasionally	20	11.49	23	8.04	
	not at all	4	2.31	4	1.40	
Curd cheese	few times a day	8	4.60	24	8.39	<0.01
	once a day	13	7.46	52	18.18	
	few times a week	61	35.06	101	35.32	
	few times a month	42	24.14	52	18.18	
	occasionally	34	19.54	39	13.64	
	not at all	16	9.20	18	6.29	
Cheese and/or processed cheese	few times a day	26	14.94	78	27.27	<0.01
	once a day	42	24.14	81	28.32	
	few times a week	68	39.08	78	27.27	
	few times a month	14	8.05	28	9.79	
	occasionally	13	7.47	11	3.85	
	not at all	11	6.32	10	3.50	
Meat and/or cold meat	few times a day	43	24.71	118	41.26	<0.01
	once a day	58	33.34	106	37.06	
	few times a week	56	32.18	49	17.13	
	few times a month	8	4.60	7	2.45	
	occasionally	1	0.57	2	0.70	
	not at all	8	4.60	4	1.40	
Eggs	few times a day	6	3.45	21	7.34	<0.01
	once a day	14	8.05	49	17.13	
	few times a week	88	50.58	143	50.00	
	few times a month	43	24.71	47	16.43	
	occasionally	18	10.34	17	5.94	
	not at all	5	2.87	9	3.16	
Fish	few times a day	1	0.57	7	2.45	0.04
	once a day	2	1.15	16	5.59	
	few times a week	50	28.74	95	33.22	
	few times a month	67	38.51	104	36.36	
	occasionally	32	18.39	40	13.99	
	not at all	22	12.64	24	8.39	

\* Chi-squared test

Having sweets a few times a week was declared by 27.97% of the boys and 27.02% of the girls. 43.68% of the girls and 42.30% of the boys occasionally ate fast-food products. Sweetened sparkling drinks were consumed a few times a week by 27.02% of the girls

and 25.52 % of the boys and 18.18% of the boys and 16.09% of the girls had them a few times a day. Occasional consumption of instant products was declared by 37.94% of the girls and 31.82% of the boys (Table 3).

Table 3. Comparison of frequency of selected products consumption among studied boys and girls. Part III

Food products	Possible responses	Girls		Boys		p*
		n	%	n	%	
Sweets	few times a day	37	21.26	59	20.63	0.74
	once a day	43	24.71	61	21.33	
	few times a week	47	27.02	80	27.97	
	few times a month	21	12.07	29	10.14	
	occasionally	21	12.07	43	15.03	
	not at all	5	2.87	14	4.90	
Fast-food products	few times a day	6	3.45	12	4.20	0.72
	once a day	6	3.45	9	3.15	
	few times a week	21	12.07	36	12.59	
	few times a month	54	31.03	78	27.27	
	occasionally	76	43.68	121	42.30	
	not at all	11	6.32	30	10.49	
Sweetened drinks	few times a day	28	16.09	52	18.18	0.41
	once a day	20	11.49	41	14.34	
	few times a week	47	27.02	73	25.52	
	few times a month	34	19.54	43	15.04	
	occasionally	34	19.54	47	16.43	
	not at all	11	6.32	30	10.49	
Instant products	few times a day	5	2.87	8	2.80	0.08
	once a day	7	4.02	11	3.85	
	few times a week	15	8.62	32	11.19	
	few times a month	46	26.44	54	18.88	
	occasionally	66	37.94	91	31.82	
	not at all	35	20.11	90	31.46	

\* *Chi-squared test*

Figure 5 presents students' self-assessment concerning their eating behaviours. 52.45% of the boys and 28.89% of the girls considered their eating behaviours correct. It is worth noting that more than a third of the girl group (36.78%) are not able to evaluate their behaviours and 33.33% of them consider them to be incorrect. The percentage of the boys who provided such answers was lower (Figure 5).

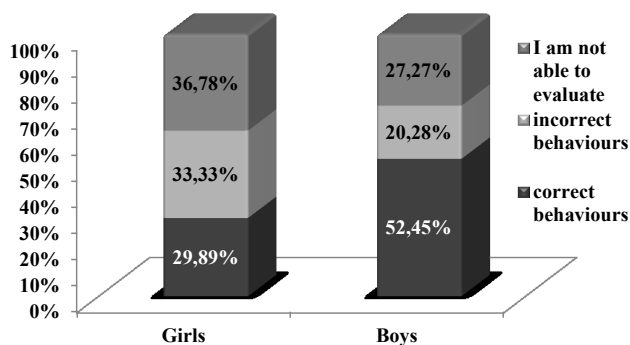


Figure 5. Students' self-assessment on their eating behaviours for studied boys and girls (*Chi-squared test*:  $p \leq 0.05$ ).

## DISCUSSION

Well-balanced diet should deliver necessary energy and nutrients, which is significant in the period of intense growth and development of the organism.

Proper diet is also an important aspect influencing young people's performance in sport, irrespective of the stage of their career.

According to the author's study, the recommended number of 4-5 meals a day was consumed by 41.38% of the girls and 59.09% the boys. However, the analysis by *Zabrocki* and *Kaczyński*, who studied young swimmers' behaviours, showed that only 20% of them regularly had 4-5 meals a day, most frequently they ate meals 3-4 times a day, as declared by 52% of them [30]. The study by *Fraczek* et al. in which team players were the subject group, showed that they had at least 3 meals a day (82.7% of women and 85.3% of men) [4].

Delivering to one's organism the correct amount of liquid facilitates temperature regulation and helps to compensate water loss resulting from training. Dehydration may decrease one's effectiveness and put sports people at higher risk of injury [17,18]. Correct hydration requires drinking liquid before, during and after physical activity. It is important to pay attention to type and quality of consumed liquids and bear in mind that the required amount depends on several factors, including one's body mass. The members of Medical Section of Canadian Paediatric Society recommend drinking 150-300 ml of liquids every 15-20 minutes during physical activity. In case of trainings

shorter than 1 hour it is sufficient to drink only water, however, if training takes place in a hot and humid place, one should consume liquids delivering 6% of carbohydrates and correct amounts of sodium in order to compensate for their loss resulting from sweating [17]. The importance of hydration for sports people is also confirmed by other authors [17, 20, 21].

The author's study results concerning liquid consumption correspond with the results obtained by *Kozirok* and *Babicz-Zielińska* [9], who studied water and drink consumption by sports people training different disciplines. In both the studies respondents most often declared consuming 1-2 liters of liquids a day- such an answer was provided by 52.87% of the girls and 40.21% of the boys in the author's study and by 41.3% of the respondents in *Kozirok* and *Babicz-Zielińska's* study [9]. Furthermore, *Zabrocki* and *Kaczyński's* analysis showed that 20% of the swimmers consumed definitely too low amounts of liquid and 50% of the respondents drank amounts sufficient only for people who did not train [30].

41.95% of the girls and 55.59% of the boys had their breakfast within half an hour after waking up and 23.56% and 27.97% of them respectively declared having this meal between 0.5-1 hour after waking up, whereas *Szczepańska* and *Spalkowska's* study focusing on volleyball and basketball players, showed that the first meal was consumed 1-2 hours after first training (52%) [24].

According to the author's study results, 41.96% of the girls and 39.51% of the boys had their last meal 2-3 hours before going to sleep. Similarly, *Macysiak* et al. showed in their study concerning eating behaviours and physical activity of students in sports classes and general profile classes that only 37% of the students had supper 2-3 hours before going to sleep, 19% of the respondents had their last meal just before going to bed and 11% did not have it at all [12].

Everyday consumption of wholemeal bread and/or groats, which as recommended for sports people [23], should be present in all main meals, was declared by 67.48% of the boys and 66.09% of the girls. It is far more better result than in *Szczepańska* and *Spalkowska's* study, in which only 35% of the sports people declared having these products everyday [24]. Similar results were obtained by *Frączek et al.*, studying team players' eating behaviours. According to them only 39.8% of women and 36.2% of men declared consuming wholemeal products twice a day [4]. The study by *Całyniuk* et al., conducted among students in sports schools showed that only 1.1% of the respondents had wholemeal bread every day, 21.5%- never and 50% of the young people did not consume groats at all [2].

Milk and milk products, including fermented milk drinks which are - among others- the source

of protein and easily assimilated calcium, should be present in young sports people diet every day. Daily consumption of fermented milk drinks was declared by higher percentage of the boys (47.55%), than the girls (29.88%). Having curd cheese every day or more often was declared by 26.57% of the boys and 12.06% of the girls. In *Szczepańska* and *Spalkowska's* study 71% of the sports people had milk and fermented milk drinks every day and 21% had curd cheese daily [24]. However, *Gacek* studied behaviours of young people from Sport Championship School in Cracow, Poland, showed that 43.9% of the girls and 43.2% of the boys consumed milk products everyday [7].

Vegetables and fruit are a good source of fiber, antioxidant vitamins as well as they deliver carbohydrates and that is why they are recommended to be consumed 5 times a day. However, the study results are not satisfying in this respect. Everyday consumption of vegetables was declared by 58.39% of the boys (only 26.92% of them had vegetables a few times a day) and 60.35% of the girls (only 28.74% of them had vegetables a few times a day). Slightly better results were obtained by *Frączek* et al., who showed that 36.70% of the team players had a few portions of vegetables or fruit daily [4]. *Smith* et al. analysis concerning children and youth aged 9-18 presented different results - 84.6% of the respondents consumed several portions of fruit and vegetables the day before conducting the study [22]. It was also confirmed by *McAloney* et al., who studied fruit and vegetable consumption as well as physical activity among British youth. As the authors showed- these products were eaten by 93.9% of the respondents daily [15].

As far as fruit consumption is concerned, the author's study shows that more than 70% of the sports people include these products in their diet (several times a day- 44.83% of the girls and 40.91% of the boys). Similar trends were observed by *Pilch* and *Szygula*, who showed that 80% of long distance runners consumed fruit everyday [16], and *Gacek* - according to her study this frequency of fruit consumption was declared by 81% of the respondents [6].

Meat and meat products are the source of balanced protein and their consumption was declared by 58.04% of the girls and 78.32% of the boys. The study by *Szczepańska* and *Spalkowska* also showed that 70% of the respondents had meat daily [24]. Different results were obtained by *Całyniuk* et al. [2] in which only 18.3% of the respondents declared daily meat consumption.

Fish plays an important role in one's diet as it is a valuable source not only of protein but also polyunsaturated fatty acids *omega-3*. Only 28.74% of the girls and 33.22% of the boys participating in the study had fish with recommended frequency- a few times a week. These results are far worse than the

ones obtained by *Frączek* et al., in whose study fish consumption once or twice a week was declared by 60% of the respondents [4].

Fast food and instant products, sweets and sweetened sparkling drinks are the products which should be avoided by sports people, however, the author's study results point to too high frequency of including them in the respondents' diet.

According to the author's study, sweets are more often eaten by the girls- they daily consumption was declared by 45.97% of them. A high level of sweets consumption was also observed among rowers, as showed by *Durkalec-Michalski* et al. 60.9% of the respondents eat them every day [3]. Also *Mariscal-Arcas* et al., who analysed differences in food consumption and eating behaviours between a group of students who skied and a group of students who did not, observed that regular sweets consumption was declared by 72.7% and 79.3% of the girls respectively and 73.6% and 75.7% of the boys respectively [13].

According to the author's study results, 50% of the girls and 52.79% of the boys had fast-food products occasionally or did not eat them at all. These products are highly processed and contain high amounts of fat, including isomers of trans-fatty acids, and that is why they should be eliminated from sports people's diets. Similar results were obtained also by other authors. 64.5% of the young people studied by *Calyniuk* et al. had fast-food products occasionally [2]. 46% of the respondents in *Szczepańska* and *Spalkowska's* study declared having this kind of products occasionally or not eating them at all [24]. *Frączek* et al. showed that 74.2% of the respondents declared avoiding this type of food [4].

27.58% of the girls and 32.52% of the boys included sweetened sparkling drinks in their diet daily. In the study by *Loboda* and *Gawęcki* 38% of the respondents stated that sweetened sparkling drinks were the most often chosen ones [11]. *Wanat* et al. showed that 70% of middle school students consumed 1 liter of sweetened sparkling drinks a day [27]. *Vanderlee* et al. studies also showed that 80.3% of Canadian students aged 13-18 declared that they had a sweetened drink the day before and 44.1% consumed 3 or more portions. Moreover, the analysis of the results showed that the boys drank sweetened drinks far more often than the girls [26]. Similarly, a study by *Wuenstel* et al. conducted among young people aged 13-19 showed that everyday consumption of sweetened drinks was declared by 17% of the respondents and the boys had them more often (22.0%) than the girls (13.0%) [29].

## CONCLUSIONS

1. Studied eating behaviours of girls and boys in sport-oriented classes are largely wrong and require correction.

2. Statistically significant differences between eating behaviours of the boys and the girls were observed, with the boys having better habits.

## Conflict of interest

*The authors declare no conflict of interest.*

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