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PRACA ORYGINALNA
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Selected teachers' eating habits with regard to frequency of their physical activity

Wybrane zachowania żywieniowe nauczycieli z uwzględnieniem częstości podejmowania przez nich aktywności fizycznej

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ABSTRACT

INTRODUCTION: Teachers are members of a specific work group that is obliged to present positive patterns of behavior also in the aspect of proper nutrition and physical activity. The aim of the research was to evaluate teachers' eating habits and find an answer to the question if there is a correlation between their eating habits and the frequency of their physical activity.
MATERIAL AND METHODS: 459 teachers took part in the study. It was conducted using a survey questionnaire developed by the authors which had some questions about socio-demographic features, selected eating habits, the frequency of consuming food products and undertaking physical activity.
RESULTS: The consumption of 4–5 meals a day was indicated by 51.6% of teachers who undertake physical activity less than once a week, 54.9% – once a week, 58.5% – several times a week and 66.7% – every day. Daily consumption of the first and second breakfast was declared by respectively 70.3% and 38.3% of teachers undertaking physical activity less than once a week, 77.9% and 45.1% who do sports once a week and 79.9% and 44.5% that do it a few times a week. The highest percentage of proper habits was noticed among teachers who practise sports everyday and that is respectively 81.5% and 51.9%.
CONCLUSIONS: Teachers' eating behaviors are diverse, yet the teachers with the best habits are those who undertake physical activity. There is a correlation between the majority of analysed eating habits and the frequency of physical activity every day.

KEY WORDS
physical activity, teachers, eating habits

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STRESZCZENIE

WSTĘP: Nauczyciele stanowią szczególną grupę zawodową, która zobligowana jest do przekazywania pozytywnych wzorców zachowań, także w zakresie prawidłowego odżywiania oraz aktywności fizycznej. Celem badań była ocena zachowań żywieniowych nauczycieli oraz odpowiedź na pytanie, czy istnieje zależność pomiędzy zachowaniami żywieniowymi a częstością podejmowania przez nich aktywności fizycznej.
MATERIAŁ I METODY: Badaniem objęto 459 nauczycieli. Narzędzie badawcze stanowił autorski kwestionariusz ankiety, w którym zawarto pytania dotyczące cech społeczno-demograficznych, wybranych zachowań żywieniowych, częstości spożycia produktów spożywczych oraz podejmowania aktywności fizycznej.
WYNIKI: Na spożycie 4–5 posiłków dziennie wskazało 51,6% pedagogów, którzy aktywność fizyczną podejmują rzadziej niż raz w tygodniu, 54,9% – raz w tygodniu, 58,5% – kilka razy w tygodniu oraz 66,7% – codziennie.
Codzienne spożycie I oraz II śniadania deklarowało odpowiednio 70,3% i 38,3% nauczycieli podejmujących aktywność fizyczną rzadziej, niż raz w tygodniu, 77,9% oraz 45,1% osób podejmujących aktywność fizyczną raz w tygodniu, 79,9% i 44,5% osób deklarujących aktywność fizyczną kilka razy w tygodniu. Najwyższy odsetek prawidłowych zachowań zaobserwowano wśród pedagogów podejmujących aktywność fizyczną codziennie, odpowiednio 81,5% oraz 51,9%.
WNIOSKI: Zachowania żywieniowe badanych nauczycieli są zróżnicowane, przy czym najkorzystniejszymi zachowaniami charakteryzowali się nauczyciele podejmujący aktywność fizyczną codziennie. Stwierdzono występowanie zależności pomiędzy większością analizowanych zachowań żywieniowych oraz częstością podejmowania aktywności fizycznej.

SŁOWA KLUCZOWE
aktywność fizyczna, nauczyciele, zachowania żywieniowe

INTRODUCTION

People who want to work as a teachers have to be aware of the fact that working with children imposes specific behaviors on teachers. Pupils, especially younger ones, imitate and copy the behaviors of their teachers and treat them as an authority [1]. Thus teachers should take care of their health taking into account the well-being of their students and are obliged to convey proper patterns of behavior also in the field of proper nutrition and physical activity [2].
School and thus people working there should disseminate nutrition education using different opportunities to convey knowledge and popularise proper habits. It is achieved by both lessons about proper nutrition and via setting a good example via the consumption of properly selected meals. Eating meals together and eating the same things as children is an important lesson which has an influence on children and their choices [3,4].
Physical activity is an important aspect of the life of every human. A proper amount of physical activity allows one not only to maintain a proper mental and physical condition [5,6] but is also an effective way of delaying the ageing process and its results [7,8,9]. It allows one to maintain a proper body mass and stay healthy for many years [10]. A low level of physical activity and improper eating habits lead to many illnesses, for example obesity, ischemic heart disease, some types of cancers and can also have an impact on the efficiency of the locomotor system [5,7,11,12]. It is vital to ensure that PE classes are interesting and enjoyable for students and that they instill a passion for sports in pupils [13]. One has to pay attention to the quality of performed exercises and the time spent on those exercises. Undertaking physical activity for 30–45 minutes daily is recommended, yet it is even better if it lasts 60 minutes a day [14,15].
Teachers are real propagators of a proper lifestyle, thus it is important that their attitudes are connected with nutrition and physical activity that are worth imitating [16,17].
The aim of the research was to evaluate selected teachers' eating habits and find an answer to the question if there is a dependence between eating habits and the frequency of physical activity.

MATERIAL AND METHODS

The study was conducted in summer 2015 and referred to 30 days before the study. 459 teachers working in Upper Silesia took part in the study.
It was conducted using the authors' own survey questionnaire which had some questions about sociodemographic features, selected eating habits, frequency of consuming selected food groups and undertaking physical activity.
The obtained results were compiled with the use of Microsoft Office Excel 2010 and StatSoft, Inc. Statistica version 2010. The answers were classified

with regard to physical activity. Statistic analysis was carried out by means of Statistica 12.0. The gamma correlation coefficient test was used to analyse the frequency of undertaking physical activity by the participants and selected eating habits and consumption of specific food groups. The value $p < 0.05$ was considered statistically significant.

RESULTS

Characteristics of research group

381 (83%) women – average age 44.4 ± 9.4 years and 78 (17%) men – average age 43.8 ± 9.0 took part in the study. The most numerous group was teachers employed in high school – 47.1% of people, then secondary schools 32.2% , primary schools – 17.5% and post-secondary schools 3.2% people. 11.8% of all the teachers undertook physical activity every day, 35.7% – a few times a week, 24.6% – once a week and 27.9% – less often than once a week. Daily physical activity and physical activity undertaken a few times a week was a characteristic answer of PE teachers, respectively 29.8% and 55.3% of people. Among the most frequently chosen forms of physical activity the researched people enumerated walking – 58.6% of teachers, cycling 28.3%, gymnastics/aerobics 21.6%, other forms of activity such as running, football, basketball were undertaken by 16.1% and swimming by 14.8% of teachers. In Table I the forms of physical activity with regard to their frequency are analysed.

Eating habits of examined teachers

Selected eating habits and the frequency of consuming food are presented in Tables II–IV.

Table I. Forms of undertaken physical activity
Tabela I. Formy podejmowanej aktywności fizycznej

Forms of undertaken physical activity	Undertaking physical activity 30–45 minutes							
	less often than once a week		once a week		a few times a week		every day	
	n = 128	%	n = 113	%	n = 164	%	n = 54	%
Cycling	24	18.8	32	28.3	58	35.4	16	29.6
Walking/marching	96	75.0	66	58.4	75	45.7	32	59.3
Swimming	13	10.2	11	9.7	35	21.3	9	16.7
Gymnastics/aerobics	13	10.2	20	17.7	50	30.5	16	29.6
Other (e.g. running, football)	10	7.8	14	12.4	33	20.1	17	31.5

* respondents could select more than one answer

Table II. Selected teachers' behaviors with regard to frequency of physical activity
Tabela II. Zachowania żywieniowe badanych nauczycieli z uwzględnieniem częstości podejmowania aktywności fizycznej

Eating habits	Possible answers	Undertaking physical activity 30–45 minutes								Test result
		less often than once a week		once a week		a few times a week		every day		
		n = 128	%	n = 113	%	n = 164	%	n = 54	%	
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
Number of consumed meals	< 3 meals	9	7.0	4	3.5	10	6.1	2	3.7	p = 0.001 y = 0.16
	3 meals	48	37.5	44	38.9	52	31.7	11	20.4	
	4–5 meals	66	51.6	62	54.9	96	58.5	36	66.7	
	> 5 meals	5	3.9	3	2.7	6	3.7	5	9.3	
Consume first breakfast	no, never	6	4.7	4	3.5	4	2.4	2	3.7	p = 0.006 y = 0.16
	yes, sometimes	32	25.0	21	18.6	29	17.7	8	14.8	
	yes, always	90	70.3	88	77.9	131	79.9	44	81.5	

cd. tab. II

1	2	3	4	5	6	7	8	9	10	11
Consume second breakfast	no, never	18	14.1	12	10.6	16	9.8	5	9.3	p = 0.024 y = 0.11
	yes, sometimes	61	47.7	50	44.2	75	45.7	21	38.9	
	yes, always	49	38.3	51	45.1	73	44.5	28	51.9	
Amount of drunk liquids	< 2 liters	121	94.5	103	91.2	117	71.3	35	64.8	$p < 10^{-6}$ y = 0.56
	2–3 liters	6	4.7	10	8.8	40	24.4	17	31.5	
	> 3 liters	1	0.8	0	0.0	7	4.3	2	3.7	

p – significance level for gamma correlation test
y – gamma coefficient value

Table III. Consumption frequency of animal products with regard to frequency of physical activity
Tabela III. Częstość spożycia produktów pochodzenia zwierzęcego z uwzględnieniem częstości podejmowania aktywności fizycznej

Food product group	Frequency of consumption	Undertaking physical activity 30–45 minutes								Test result
		less often than once a week		once a week		a few times a week		every day		
		n = 128	%	n = 113	%	n = 164	%	n = 54	%	
Milk and dairy products	never	24	18.8	22	19.5	31	18.9	15	27.8	p = 0.241
	occasionally	31	24.2	32	28.3	34	20.7	9	16.7	
	a few times a month	19	14.8	20	17.7	18	11.0	1	1.9	
	a few times a week	28	21.9	23	20.4	42	25.6	15	27.8	
	every day	26	20.3	16	14.2	39	23.8	14	25.9	
Fermented dairy drinks	never	21	16.4	13	11.5	25	15.2	9	16.7	p = 0.006 y = 0.11
	occasionally	33	25.8	30	26.5	39	23.8	8	14.8	
	a few times a month	29	22.7	26	23.0	25	15.2	12	22.2	
	a few times a week	32	25.0	32	28.3	41	25.0	8	14.8	
	every day	13	10.2	12	10.6	34	20.7	17	31.5	
Yellow cheese	never	8	6.3	5	4.4	10	6.1	3	5.6	p = 0.499
	occasionally	53	41.4	33	29.2	48	29.3	19	35.2	
	a few times a month	20	15.6	25	22.1	39	23.8	10	18.5	
	a few times a week	30	23.4	38	33.6	57	34.8	17	31.5	
	every day	17	13.3	12	10.6	10	6.1	5	9.3	
Fish	never	3	2.3	1	0.9	4	2.4	1	1.9	p = 0.711
	occasionally	21	16.4	22	19.5	23	14.0	8	14.8	
	a few times a month	70	54.7	64	56.6	104	63.4	27	50.0	
	a few times a week	30	23.4	26	23.0	30	18.3	17	31.5	
	every day	4	3.1	0	0.0	3	1.8	1	1.9	

p – significance level for gamma correlation test
y – of gamma coefficient value

Analysis of teachers' selected eating habits showed that people undertaking physical activity less often than once a week consume 4–5 meals daily (51.6%). More beneficial behaviors in this scope are presented by people who undertake physical activity once a week (54.9%), a few times a week (58.5%) or daily (66.7%). Daily consumption of the first and second breakfast was declared by respectively 70.3% and 38.3% of teachers who undertake physical activity less than once a week, 77.9% and 45.1% of those who do sports once a week and 79.9% and 44.5% of them that do it a few times a week. The highest percentage of good habits was noticed among teachers who practise sports everyday and that is respectively 81.5% and 51.9%. Only 4.7% of teachers that undertake physical activity less often than once a week consume 2––3 liters of water per day but the highest percentage was observed among teachers who undertake physical activity daily (31.5%) (Tab. II).

The analysis proves that the more frequently physical activity is undertaken, the bigger number of meals consumed; there is higher consumption of the the first and the second breakfast and there is a higher amount of liquids which are drunk by teachers (Tab. II).

The analysis showed that the daily consumption of milk and milk products was declared by 20.3% of those who undertake physical activity less than once a week, 14.2% of those who undertake physical activity once a week and 23.8% of those who undertake physical activity a few times a week. The highest percentage of people who daily consumed milk and milk products was noticed among teachers who undertake physical activity everyday (25.9% of the research group). Among the teachers who undertake physical activity less than once a week or once a week, the daily consumption of fermented diary drinks was declared respectively by 10.2% and 10.6% of them. Among teachers who practise sports once a week and every day, this percentage is higher and that is respectively 20.7% and 31.5%. Eating cheese every day is most often declared by people who exercise less than once a week (13.3%), and least often by people who exercise several times a week (6.1%). The consumption of fish with the desired frequency (at least once a week) was declared by 31.5% who undertake physical activity every day, yet among people who do sports a few times a week, once a week or rarely, this percentage was lower and was respectively 18.3%, 23% and 23.4% (Tab. III).

The analysis proves that the more frequently physical activity is undertaken, the greater the consumption of fermented diary drinks is. There is no correlation between the frequency of undertaken physical activity and the frequency of consuming milk and milk products, cheese and fish (Tab. III).

The analysis proved that the daily consumption of whole-wheat bread and grits among the research group who undertake physical activity a few times a week, once a week or rarely is respectively 26.2%, 19.5% and 20.3%. The highest percentage was noticed among teachers who undertake physical activity every day (38.9%). The daily consumption of vegetables and fruit was declared by respectively 24.2% and 23.4% of teachers who undertake physical activity less than once a week, 27.4% and 29.2% that do sports once a week and 36.6% and 37.8% those who do it a few times a week. The highest percentage of appropriate behavior in this scope was shown by teachers who undertake physical activity every day; such a frequency of vegetable consumption was indicated by 48.1%, and fruit 55.6% of them. Eating legume seeds several times a week was declared in the highest percentage by teachers who undertake physical activity every day (29.6%) and once a week (28.3%) (Tab. IV).

The analysis proves that the more frequently physical activity is undertaken, the greater the consumption is of whole-wheat products, vegetables and fruit. Such a trend was not observed in the case of legume seeds (Tab. IV).

Figure 1 shows the frequency of reading food product labels by the surveyed teachers, Figure 2 shows the self-assessment of the teachers in the context of perceiving oneself as an authority for students in the field of nutrition.

The analysis showed that teachers who undertake physical activity daily declared that they always read labels (57.4% of the research group) or sometimes (42.6%). It was found that that with an increase in undertaking physical activity, the frequency of reading the labels of food products is higher (gamma correlation test $p < 10^{-4}$; $\gamma = 0.20$) (Fig. 1).

The teachers' self-assessment showed that people who undertake physical activity less often than once a week chose the answer 'rather not' and the teachers who undertake physical activity daily chose the answer 'rather yes' , respectively 61.6% and 59.3% of the study group. It was found that that with an increase in undertaking of the physical activity, the frequency of perceiving teachers as an authority is higher (gamma correlation test $p < 10^{-4}$; $\gamma = 0.33$) (Fig. 2).

Table IV. Consumption frequency of plant products with regard to frequency of physical activity
Tabela IV. Częstość spożycia produktów pochodzenia roślinnego z uwzględnieniem częstości podejmowania aktywności fizycznej

Food product group	Frequency of consumption	Undertaking physical activity 30–45 minutes								Test result
		less often than once a week		once a week		a few times a week		every day		
		n = 128	%	n = 113	%	n = 164	%	n = 54	%	
Whole-wheat bread, grits	never	25	19.5	21	18.6	42	25.6	5	9.3	p = 0.004 y = 0.12
	occasionally	23	18.0	26	23.0	23	14.0	9	16.7	
	a few times a month	30	23.4	22	19.5	16	9.8	4	7.4	
	a few times a week	24	18.8	22	19.5	40	24.4	15	27.8	
	every day	26	20.3	22	19.5	43	26.2	21	38.9	
Vegetables	never	28	21.9	25	22.1	38	23.2	14	25.9	p = 0.004 y = 0.12
	occasionally	36	28.1	31	27.4	28	17.1	6	11.1	
	a few times a month	7	5.5	2	1.8	5	3.0	1	1.9	
	a few times a week	26	20.3	24	21.2	33	20.1	7	13.0	
	every day	31	24.2	31	27.4	60	36.6	26	48.1	
Fruits	never	33	25.8	22	19.5	45	27.4	13	24.1	p = 0.001 y = 0.15
	occasionally	35	27.3	32	28.3	22	13.4	5	9.3	
	a few times a month	4	3.1	3	2.7	11	6.7	2	3.7	
	a few times a week	26	20.3	23	20.4	24	14.6	4	7.4	
	every day	30	23.4	33	29.2	62	37.8	30	55.6	
Leguminous plant seeds	never	1	0.8	3	2.7	8	4.9	2	3.7	p = 0.550
	occasionally	25	19.5	34	30.1	36	22.0	7	13.0	
	a few times a month	67	52.3	39	34.5	70	42.7	26	48.1	
	a few times a week	30	23.4	32	28.3	39	23.8	16	29.6	
	every day	5	3.9	5	4.4	11	6.7	3	5.6	

p – significance level for gamma correlation test
y – gamma coefficient value

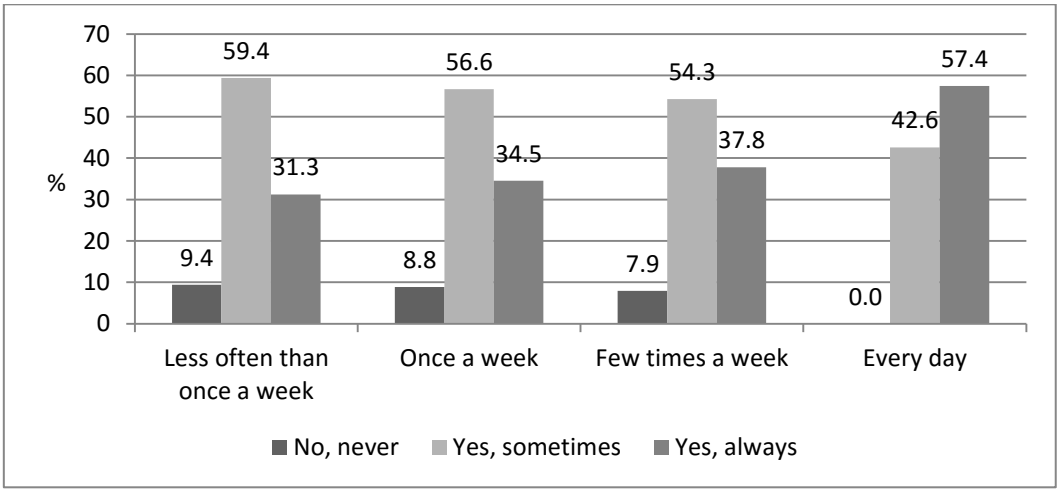

Fig. 1. Reading food product labels.
Ryc. 1. Czytanie etykiet produktów spożywczych.

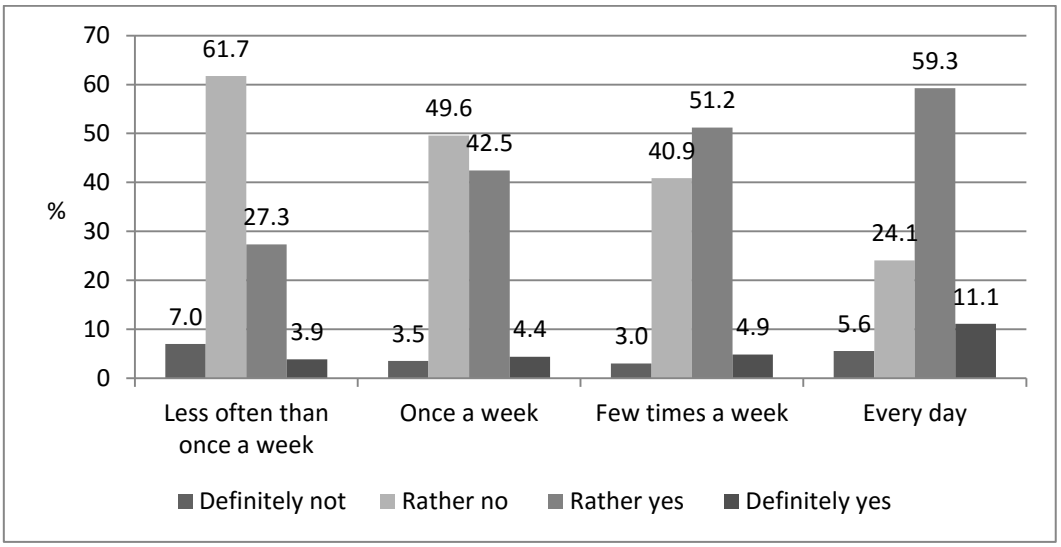

Fig. 2. Perception of oneself as authority for students in field of nutrition.
Ryc. 2. Postrzeganie własnej osoby jako autorytetu dla uczniów w dziedzinie żywienia.

DISCUSSION

Physical activity should be an inseparable part of our life. Including exercise in our daily schedule is not only a form of preventing overweight and obesity but also a form of taking care of physical and mental health [16]. Despite the noticeable increase in awareness of active participation in physical culture, the majority of the society does not recognise the relationship between health and physical activity [4]. Yet there are some advantages of moderate physical activity which are emphasized by the World Health Organization (WHO). Each adult person should undertake physical activity 30–45 minutes daily and do it his entire life. As a form of moderate activity, WHO recommends quick marching, swimming, cycling or even gardening [18].

In the authors' own research, the undertaking of physical activity everyday was declared by 11.8% of teachers, while Zysnarska and Bernad who evaluated the pro-health behaviors of teachers from the Greater Poland Voivodeship discovered the fact that physical activity in the form of active leisure is practised daily by only 4.61% teachers [19]. In contrast, Prażmowska et al. who examined the behaviors of high school teachers in the Nowy Sącz Voivodeship reported that the daily undertaking of physical activity was declared by 14.9% of women and 36.6% of men, and at the same time respectively 46.8% and 65.8% of them stated that they treat physical activity as a way of dealing with stress [16].

Baj-Korpak et al. in their research disclosed the fact that undertaking physical activity depends on belonging to a particular social-work group and in many cases it may have a significant influence, especially in the case of PE teachers [5]. It is confirmed by the results of research according to which daily activity is mostly undertaken by teachers of this subject. Analysis of the authors' own research results showed that over 75% of teachers, regardless of the frequency of undertaking physical activity, daily consumes the first breakfast. Similar results were obtained from the research carried out by the Centre for Public Opinion Research (CPOR) according to which this meal is consumed by 79% of the research group [6]. As Prażmowska et al. revealed, the first breakfast is consumed by 76.6% of women and 58.5% men [16].

Śmiechowska while examining a group of 50 teachers and administration workers noted that half of the respondents drink milk less often than once a week and almost 40% do not drink it [20]. Yet Woynarowska-Sołdan and Więziak-Białowolska who carried out research regarding the self-assessment of health and taking care of health of 567 teachers participating in teacher training in seven centres in Poland discovered that teachers always or almost always drink at least 2 glasses of milk, kefir, yoghurt daily which was indicated by 11.4% of the survey group [21]. The analysis of animal product consumption showed that the daily consumption of milk and milk products was declared by 25.9% of those who undertake physical activity less than once a week, 14.2% of those who undertake physical activity once a week and 20.3% of those who undertake physical activity a few times a week.

The conclusion of the research carried out by CPOR regarding the eating habits of Poles is that 1% of the examined group consumes fish daily, 29% a few times

a week and 48% a few times a month. In the authors' own research, the recommended consumption of fish was declared by 31.5% of teachers who daily undertake physical activity, 18.3% few times a week, 23% once a week and 23.4% less often than once a week.
Analysing the frequency of consuming food products by the research group of teachers, one may notice that whole-wheat bread and grits are consumed daily by 38.9%, vegetables 48.1% and fruit by 55.6% of people who undertake physical activity every day. Similarly, Prażmowska et al. P reported in their research that 31.8% of the examined teachers daily consume dark bread, 43.2% vegetables and 55% fruit [16]. Zysnarska and Bernad found that only 4% of the respondents does not include vegetables and fruit in their daily diet [19]. Yet less advantageous results were obtained by Woynarowska-Sołdan and Węziak-Białowolska [21]. An insufficient supply of liquids can lead to dehydration, whose effects might be an electrolyte balance, cardiovascular or urinary illnesses. In the authors' own research, the recommended consumption of liquid in the amount of over 2 liters was declared by 94.5% of teachers who daily undertake physical activity less than once a week, 91.2% once a week and 71.3% a few times a week and 64.8% daily. Results which show that an insufficient amount of water is consumed were obtained by Śmiechowska in the research which she carried out among 50 teachers who work in the Pomeranian Voivodeship. She noticed that the more frequently teachers undertook physical activity, the more liquid they would drink during the day [20]. A similar correlation was revealed in the authors' own research.
A very good habit is reading the labels placed on food products and paying attention to their nutritional value during shopping. Analysis of the authors' own research proved that the majority of the surveyed teachers read labels (always or sometimes). A bit different results were obtained by CPOR in which it was found that 29% of the examined people never pay attention to the ingredients of food products, 31% do it sometimes and 40% usually check them [6]. In the the authors' own research it was found that there is a correlation between the frequency of undertaking physical activity and the frequency of reading labels on food products. Walentukiewicz emphasized the relation between the level of the nutritional knowledge and the approach of the consumer to nutrition. The higher the awareness is, the better the food choices are. Walentukiewicz also emphasizes that consumer choices depend on the experiences connected with eating gained in childhood [22].
In the group of teachers who undertake physical activity daily and also a few times a week, the percentage of teachers who perceive themselves as an authority in nutrition (rather yes and yes) is respectively 70.4% and 56.1%. In the research by Piżmowska et al. in which teachers were asked if they perceive themselves as an authority for students regarding their own healthy habits, 96.6% of them said that they do [16].

CONCLUSIONS

1. Teachers' eating habits are diverse, yet the teachers with the best habits are those who undertake physical activity everyday.
2. There is a correlation between the majority of analysed eating habits and the frequency of undertaking physical activity.

Author's contribution

Study designe – E. Szczepańska
Data collection – B. Lenard, K. Janion, K. Toczyńska, B. Stanuch
Data interpretation – E. Szczepańska, B. Stanuch, K. Janion, K. Toczyńska
Statistical analysis – B. Stanuch, K. Janion
Manuscript preparation – E. Szczepańska, K. Toczyńska, K. Janion, B. Stanuch, B. Lenard
Literature research – K. Toczyńska, K. Janion, B. Stanuch

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