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Zachowania sedenteryjne dziewcząt i chłopców w wieku 7-15 lat

Sedentary behaviours of girls and boys aged 7-15

Streszczenie

Wstęp. Zachowania sedenteryjne są konkurencją dla aktywności fizycznej. Nieprawidłowa relacja między nimi prowadzi do szerzenia się wielu zaburzeń zdrowotnych u dzieci i młodzieży. Istotna jest więc obserwacja zachowań sedenteryjnych oraz czynników, które je determinują w celu podejmowania właściwych działań profilaktycznych i terapeutycznych.

Cel. Celem pracy było określenie czasu spędzanego przez dziewczęta i chłopców w wieku 7-15 lat na zachowaniach o charakterze sedenteryjnym oraz ocena różnic w ich poziomie między obiema płciami.

Materiał i metody. Grupę badaną stanowiło 273 dziewcząt i 323 chłopców z klas I-VI szkoły podstawowej oraz I-III gimnazjum. Metoda: sondaż diagnostyczny (narzędzie kwestionariusz ankiety). Zebrane dane poddano analizie statystycznej wykorzystując program Statistica 7.1. (Stat Soft, USA).

Wyniki. Dziewczęta spędzały na zachowaniach sedenteryjnych 83,8 (±25,2), natomiast chłopcy 81,2 (±21,0) godziny w ciągu tygodnia (p>0,05). Zaobserwowano istotne wydłużanie z wiekiem czasu poświęcanego na wszystkie zajęcia sedenteryjnie łącznie a także na przebywanie w szkole, naukę oraz korzystanie z komputera. Chłopcy spędzali istotnie więcej czasu na korzystaniu z komputera, natomiast dziewczęta przeznaczały znamiennie więcej czasu na naukę, czytanie oraz rysowanie. Analiza wykazała istotny związek między płcią i klasą do której uczęszczały dzieci a średnią liczbą godzin przeznaczanych na poszczególne formy zachowań sedenteryjnych, jedynie w przypadku nauki pozalekcyjnej.

Wnioski. Czas przeznaczany przez dzieci i młodzież na zachowania sedenteryjne ulega systematycznemu wydłużaniu wraz z wiekiem.Czas przeznaczany na naukę, czytanie, rysowanie oraz korzystanie z komputera jest determinowany przez płeć dzieci i młodzieży. Przy planowaniu zajęć o charakterze sportowo-rekreacyjnym z dziećmi i młodzieżą należy określić również rodzaj zachowań o charakterze sedenteryjnym.

Słowa kluczowe: zachowania sedenteryjne, dzieci, młodzież, wiek, płeć.

Abstract

Introduction. Sedentary behaviours are in opposition to physical activity. An improper balance between them leads to the spreading of numerous health disorders in children and youth. Thus, it is significant to observe sedentary behaviours and factors which determine them in order to undertake proper prophylactic and therapeutic activities.

Aim. The aim of the work was to define the amount of time spent by girls and boys aged 7-15 on sedentary behaviours and to evaluate differences concerning their levels between both genders.

Material and methods The group under research included 273 girls and 323 boys aged 1-6 of primary school and aged 1-3 of lower secondary school. Method: diagnostic poll (tool: questionnaire). The data collected were analysed statistically with the use of the software Statistica 7.1. (Stat Soft, USA).

Results. Girls spent 83.8 (±25.2) hours while boys 81.2 (±21.0) hours per week on sedentary behaviours (p>0.05). It was observed that with age total time devoted to all sedentary activities and time spent at school, learning and using a computer lengthened. Boys spent significantly more time using a computer, whereas girls devoted considerably more time to learning, reading and drawing. The analysis revealed a significant relationship between gender, year at school and an average number of hours spent on particular sedentary behaviours only as far as time devoted to after-school learning is concerned.

Conclusions. Time devoted by children and youth to sedentary behaviours lengthens systematically with age. Time devoted to learning, reading, drawing and using a computer is determined by the gender of children and youth. While planning sports and recreational activities for children and youth, types of sedentary behaviours must also be defined.

Key words: sedentary behaviours, children, youth, age, gender.

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INTRODUCTION

An appropriate level of physical activity is significant for proper physical, motor, mental and social development of children and youth. Activities which nowadays compete with physical activity include watching television, using a computer or studying. They are connected with sitting still and thus they are defined as sedentary behaviours [1].

A low level of physical activity makes it easier for civilisation diseases to spread. Numerous cases of scientific research revealed a significant relationship between sedentary behaviours and the risk of such health disorders as high blood pressure, lipidic and carbohydrate metabolism disorders, overweight and obesity or faulty body postures and musculoskeletal pains [2-5].

The results of research conducted in 1979-1999 among the youth aged 7.5-19.5 indicate a clear regress in their physical fitness and physical efficiency [6]. A growing level of sedentary behaviours is perceived as one of the reasons for this state. More and more duties connected with education which are imposed on children and youth, the pressure of achieving higher intellectual development as well as a passive way of spending free time frequently sustained by parents, are becoming the major reasons for the increase in the amount of time spent by young people in a sitting position. Negative consequences of these behaviours appear after many years, while they do not show negative, physically noticeable effects in childhood years. Therefore, this is a group which pays little attention to health education and prophylactic programmes [7]. Thus it is so significant to observe the level of sedentary behaviours in children and youth, also taking into consideration gender as a factor determining this level, in order to implement proper prophylactic and therapeutic activities.

AIM

The aim of the work was to define the time devoted to sedentary behaviours by girls and boys aged 7-15 and to assess differences in their levels between both genders.

MATERIAL AND METHODS

The research included 596 pupils (273 girls and 323 boys) attending 1st-6th years of primary school and 1st-3rd years of lower-secondary school in Skierniewice. In order to identify the time devoted by the subjects to sedentary behaviours, the author's questionnaire was used. The questionnaire was completed by parents together with the examined pupils. An average number of hours per week devoted to eating meals, presence at school, watching television, using a computer, drawing, reading and playing in a sitting position was calculated. Moreover, the relation between time devoted to sedentary behaviours and the educational level (year at school) as well as pupils' gender was identified.

The collected data were analysed statistically with the use of Statistica 7.1 (Stat Soft, USA) software. The accordance of the variables distribution with normal distribution was assessed by means of Kolmogorov-Smirnov test. Additionally, the Student's t-test and the analysis of variance were used. The significance of differences was accepted at the level of $p<0.05$.

RESULTS

While analysing the collected results, in the first place an average number of hours devoted to particular sedentary behaviour both by girls and boys was determined. Additionally, the level of the significance of differences between both genders was defined. A statistical analysis revealed that the examined boys devoted significantly more time to using a computer per week. Girls, however, spent significantly more time studying, drawing or reading (Table 1).

Next, the relationship between gender, year at school and time devoted to particular sedentary behaviours was identified. First, time devoted to eating meals was assessed (Table 2).

The analysis did not reveal a significant relationship (p.0.05) both between year at school (subjects' age) and time spent eating meals as well as between level at school, gender and an average number of hours spent eating meals during a week.

Another variable assessed in the research was the number of hours spent by the examined students at school. It was revealed that time spent at school increased significantly with the age of the examined pupils ($p<0.001$). However, no significant relationship between the level at school, gender and an average number of hours spent at school per week was observed ($p>0.05$) (Table 2).

At a further stage the relationship between the time spent watching television during a week and the educational level of the examined pupils as well as the influence of gender on an average number of hours devoted to this activity were defined. A statistical analysis revealed no significant influence of the child's level at school on the time spent in front of TV ($p>0.05$). Moreover, no significant influence of gender on the changes in the time devoted to watching television occurring with the subjects' age was noted ($p>0.05$).

The next variable assessed was average time spent by the examined children and youth in front of a computer. It was observed that it lengthened significantly with age ($p<0.001$). However, no significant relationship between gender, level at school and an average number of hours devoted to using a computer during the week was noted ($p>0.05$) (Table 2).

Another element of the analysis of the collected data was to define the significance of the influence of children's and youth's age on the time devoted to studying at home and private tutorials during a week. Additionally, the relationship between gender, level at school and an average number of hours spent studying was assessed. In both cases a statistical analysis revealed a significant relationship ($p<0.001$ for the assessment of the relationship between the level at school and time spent studying and $p<0.05$ for the assessment of the relationship between gender, level at school and time spent studying during a week).

Moreover, a significant influence of age on the time spent on drawing was noted in the examined children and youth. Time devoted to this activity shortened significantly with age ($p<0.001$). However, no significant influence of gender on

the change in the time devoted to drawing occurring with age was noted (p>0.05) (Table 2).

Furthermore, the influence of the level at school of the examined children on the time spent reading books was assessed and the interdependence between gender, level at school and an average number of hours devoted to this activity was identified. Pupils from the 5th and 6th form of primary school devoted most time to reading, whereas the pupils from the 1st form of primary school and the 3rd form of lower-secondary school devoted the lowest amount of time to this activity. A significant difference (p<0.001) was observed between particular form. No significant influence

TABLE 1. Average standard deviations and the level of the significance of differences concerning sedentary behaviours during a week between girls and boys (n=596).

Variable	Time (h) ±SD		p
	Girls n=273	Boys n=323	
Meals	8.54 ±5.62	8.22 ±4.55	0.44
Schoolw	30.0 ±7.19	30.1 ±7.0	0.9
Television	11.24 ±6.5	11.42 ±7.37	0.75
Computer	9.59 ±7.22	11.01 ±8.41	0.03*
Studying	12.69 ±6.63	10.93 ±6.1	0.001*
Drawing	3.21 ±4.51	1.87 ±3.21	0.000*
Reading	5.27 ±4.65	4.36 ±3.77	0.009*
Playing in a sitting position	2.35 ±4.68	2.46 ±3.79	0.75
Getting to school-transport	0.92 ±1.59	0.87 ±1.51	0.66
Total	83.82 ±25.2	81.21 ±20.97	0.17

*Statistically significant differences are written in bold

TABLE 2. Average standard deviations and the level of the significance of relations between gender, year at school and time devoted to various sedentary activities during a week (n=596).

Form (n)	Eating meals		p	Time spent at school		p	Watching television		p
	$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD		
	Girls	Boys		Girls	Boys		Girls	Boys	
1st PS(n=52)	7.56±1.7	8.11±1.5	0.52	26.0±1.9	26.0±2.0	0.87	11.67±2.4	11.8±1.8	0.96
2nd PS(n=66)	11.11±3.7	8.32±1.6		25.39±2.9	26.1±3.2		11.76±3.2	12.0±2.0	
3rd PS(n=85)	7.73±1.8	8.49±1.5		25.41±3.1	26.07±2.1		11.02±1.7	12.07±2.9	
4th PS(n=59)	9.14±1.4	8.48±1.7		28.39±1.8	28.64±1.6		10.29±2.5	12.0±3.4	
5th PS(n=47)	8.65±2.2	10.31±2.5		29.4±1.0	29.63±1.2		12.7±3.8	11.61±2.5	
6th PS(n=76)	7.85±1.4	7.24±1.4		32.25±1.8	31.4±1.3		11.65±1.8	12.19±2.3	
1st LSS(n=76)	8.03±1.2	7.45±1.3		33.35±1.6	33.76±1.8		10.38±1.9	10.72±2.0	
2nd LSS(n=62)	8.36±1.7	8.24±1.3		35.9±2.9	33.85±2.8		11.52±3.0	10.73±1.7	
3rd LSS(n=73)	8.5±2.3	8.01±1.2		32.78±2.3	34.31±1.7		10.82±2.0	10.84±2.1	
Form (n)	Using a computer		p	Studying		p	Drawing		p
	$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD		
	Girls	Boys		Girls	Boys		Girls	boys	
1st PS(n=52)	6.79±1.8	7.7±1.9	0.29	9.65±2.4	9.2±1.4	0.01*	4.61±1.6	4.23±1.7	w0.32
2nd PS(n=66)	5.74±2.1	7.39±1.7		12.42±1.9	9.24±1.5		3.67±1.2	3.65±1.5	
3rd PS(n=85)	8.87±2.7	11.27±2.9		10.44±1.5	9.52±1.6		5.08±2.4	2.2±0.6	
4th PS(n=59)	8.16±3.4	10.34±2.8		12.91±3.6	12.76±3.1		2.8±0.9	2.04±1.0	
5th PS(n=47)	9.37±3.5	10.33±2.5		13.9±3.7	11.68±2.6		4.12±2.5	1.96±1.0	
6th PS(n=76)	10.01±2.0	10.51±2.2		11.75±1.6	11.77±2.1		2.96±1.8	2.15±1.4	
1st LSS(n=76)	11.97±2.6	10.2±2.0		12.35±1.9	13.26±2.2		1.75±1.0	1.58±1.5	
2nd LSS(n=62)	11.93±2.3	14.67±2.5		15.0±3.0	10.26±1.7		1.88±1.1	0.23±0.3	
3rd LSS(n=73)	12.83±2.7	16.59±3.4		16.47±2.4	10.59±1.7		2.67±1.8	0.76±0.6	
Form (n)	Reading		p	Playing in a sitting position		p	Getting to and from school		p
	$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD			$\bar{x}$ (h) ±SD		
	Girls	Boys		Girls	Boys		Girls	Boys	
1st PS(n=52)	3.87±1.2	3.71±1.1	0.18	2.78±1.3	3.11±1.4	0.44	0.98±0.5	1.1±0.4	0.76
2nd PS(n=66)	4.94±2.3	4.71±1.0		6.3±3.2	5.29±1.8		0.72±0.4	0.63±0.4	
3rd PS(n=85)	4.62±1.3	4.67±0.9		3.19±0.9	3.13±0.8		1.01±0.6	1.1±0.5	
4th PS(n=59)	5.29±1.8	4.85±1.1		2.7±1.6	2.63±1.1		1.19±0.9	0.92±0.6	
5th PS(n=47)	6.25±2.2	5.18±1.3		2.32±1.6	2.61±1.0		0.45±0.4	1.05±0.7	
6th PS(n=76)	5.06±1.1	5.9±1.9		1.15±1.0	2.51±1.7		0.45±0.3	0.44±0.3	
1st LSS(n=76)	6.5±1.6	3.58±1.0		0.62±0.6	1.66±1.2		0.95±0.4	0.79±0.5	
2nd LSS(n=62)	5.78±2.3	3.5±1.3		1.64±2.1	0.32±0.5		1.29±0.9	1.04±0.6	
3rd LSS(n=73)	5.08±1.5	3.53±1.2		0.7±1.0	0.49±0.5		1.23±0.6	0.71±0.4	

*Statistically significant differences are written in bold

of gender and year on time spent reading was observed (p>0.05).

The subjects also defined the amount of time devoted to playing in a sitting position. The statistical analysis revealed that this time shortens significantly (p<0.001) with age. However, no significant influence of gender on time devoted to this form of sedentary behaviours was noted (p>0.05).

Next, the relationship between the form at school and time spent commuting to and from school by car during a week was analysed. The analysis revealed big differences between particular years. Pupils from the 2nd and 6th forms of primary school spent the smallest amount of time on their way to and from school, while pupils from the 3rd and 4th forms of primary school and the 2nd form of lower-secondary school travelled longest hours. However, these differences were not statistically significant (p>0.05). Similarly, no significant relationship between gender, year at school and an average number of hours needed for travelling to and from school by car was observed (p>0.05) (Table 2).

The last element of the analysis was to define a relation between the form at school of the examined children and total time devoted to sedentary activities during a week. A significant increase in an average number of hours spent in sitting positions coming with age was observed (p<0.001). Pupils from the 1st, 2nd and 3rd forms of primary school devoted the smallest number of hours to sedentary behaviours, whereas it was observed that later this time lengthened gradually until it reached its highest level at the end of lower-secondary school. However, a statistical analysis did not reveal any significant influence of gender on the changes in the level of sedentary behaviours which occurred with age (p>0.05) (Table 3).

TABLE 3. Average standard deviations and the level of the significance of relations between gender, form at school and an average number of hours devoted to various sedentary activities during a week.

Form (n)	$\bar{x}$ (h) ±SD		p
	Girls (n=273)	Boys (n=323)	
	73.89±8.1	74.23±8.5	
1st PS(n=52)	82.06±15.5	78.14±7.1	
2nd PS(n=66)	77.38±7.8	78.64±8.4	
3rd PS(n=85)	80.88±9.8	82.65±7.2	
4th PS(n=59)	87.18±14.5	84.35±8.0	0.86
5th PS(n=47)	83.14±5.8	84.11±6.8	
6th PS(n=76)	85.91±5.2	83.0±5.2	
1st LSS(n=76)	93.29±7.4	82.89±4.6	
2nd LSS(n=62)	91.08±7.1	85.84±5.7	

DISCUSSION

The notion of sedentary behaviours includes all activities connected with sitting still [1]. Therefore, they may include both the time spent at school, studying at home or in front of a computer and time devoted to eating meals or commuting to and from school by different means of transport. Nowadays it is claimed that this type of behaviours competes with physical activity and its extent is systematically lengthened over the years [6,8].

Numerous authors indicate that age and gender are the major determinants of the level of sedentary behaviours. Woynarowska [1] observed that in upper-secondary-school students time devoted to doing homework lengthens with age achieving its highest level in the final period of school education. The author also claims that boys devote less time to doing homework than their female counterparts. Boys spend significantly more time watching television and using a computer. Świderska-Kopacz et al. [9] analysed the level of physical activity and selected sedentary behaviours in lower-secondary-school youth. The research indicated the advantage of passive forms of spending free time among older students. A basic form of entertainment of 3rd form lower-secondary-school students was watching television (52.9% of students spent four or more hours in this way) and using a computer (57.4% of the subjects devoted 4 or more hours to this activity). The authors also noted a significant influence of gender on physical activity and on time devoted to activities of a sedentary character. Boys spent significantly more time in front of a computer but they were more physically active, which indicates the lack of a clear connection between the time devoted to various forms of passive behaviours and the level of physical activity. However, what seems interesting is the analysis of changes in the level of sedentary behaviours in the period of not only lower or upper-secondary school but also of primary school.

In their own research the authors analysed changes in the time devoted to different forms of passive activities in the period of primary and lower-secondary school. It revealed that with age there occurred a significant increase in an average number of hours devoted to sedentary activities. The youngest pupils (1st form of primary school) spent slightly over 71 hours per week in passive positions, while at the end of lower-secondary school it was nearly 88 hours. From among the analysed sedentary activities significantly negative influence of age on spending time at school, studying or using a computer was observed. Moreover, significant influence of age on the time devoted to reading during a week was noted. However, in this case its gradual increase in primary school and decrease in lower-secondary school was observed. Interestingly, no significant influence of age on watching television was noted. The examined children and youth devoted a similar number of hours to this activity in particular years of school. Moreover, the analysis revealed that with age there occurred a significant decrease in time devoted to drawing and playing in a sitting position. Significant is also the conclusion concerning the influence of gender on the amount of time spent in sitting positions. The analysis revealed that boys spend significantly more time during a week using a computer (11.01±8.41 vs. 9.59±7.22, p=0.03). Girls, however, devote significantly more time to studying, drawing and reading. It is important that only in the case of the time devoted to studying a significant relationship between gender, year at school and an average number of hours devoted to this activity during a week was revealed.

There is no doubt that the lack of physical activity exerts negative influence on human health. Numerous authors indicate the fact that health disorders which until recently were typical of adults have become more and more common among children and youth. They include, for instance, high blood pressure, high level of cholesterol or overweight [1,2,7,10]. Nowadays it is believed that about 70-80% of

humans below 20 years of age suffer from pains in a lower segment of the spine. The reasons for this state include, inter alia, the lack of physical activity and a sitting lifestyle of children and youth [5].

A basic suggestion resulting from research identifying the time devoted to physical activity and sedentary behaviours is the need for increasing the level of physical activity and decreasing the amount of time devoted to the latter form of spending time by children and youth [11-13]. In order to make these activities possibly most efficient, the structure of sedentary behaviours of children and youth must be learned. The research in this field shows that the subjects devote the most time to school and studying. Taking into consideration the attention paid to the intellectual development of children, the verification of this time is virtually impossible. People who conduct various forms of physical classes for children often observe the phenomenon of a child coming straight from private tutorials to physical education classes, and then going quickly to another hobby club. In connection with that, both time and financial pressure put on a child and parents is huge. Frequently, when facing a dilemma of which classes to give up, families decide to limit physical education classes since they are treated as less significant from the point of view of a child's future [9,12].

Using a computer and watching television took up a significant part of a week of the examined children. As Maciaszczyk [14] indicates, the possibility of using these media is connected with a number of unfavourable phenomena such as spending time in a sitting position by a child. Nevertheless, it must be remembered that using them has obvious advantages such as facilitating everyday activities, providing entertainment or improving work efficiency. Therefore, attempts at reorganising daily and weekly schedule of a young person should be made in order to find time for physical activity. While analysing the collected results it seems difficult to fit in additional classes of sports and recreational character without being convinced of the necessity of changes in the time devoted to sedentary behaviours.

CONCLUSIONS

1. Time devoted by children and youth to sedentary behaviours lengthens systematically with age.
2. Time devoted to studying, reading, drawing and using a computer is determined by the gender of children and youth.
3. While planning activities of sports and recreational character with children and youth the type of sedentary behaviours should also be defined.

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