

Characteristics of sedentary forms of spending leisure time among adolescents in Krakow

Charakterystyka biernych form spędzania wolnego czasu wśród krakowskiej młodzieży

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Wprowadzenie. Współczesna młodzież znaczną część czasu wolnego przeznaczają na zajęcia bierne, związane głównie z korzystaniem z mediów elektronicznych, uczestnictwem w kulturze masowej, rozrywkę ukierunkowaną na bierny odbiór treści, przy równoczesnym minimalizowaniu aktywnych zajęć kreatywnych, edukacyjnych i kulturalnych.

Cel. Ocena długości czasu wolnego spędzanego w sposób bierny oraz poznanie form zachowań biernych wśród młodzieży szkół ponadpodstawowych.

Materiały i metody. Wśród 1662 uczniów, 21 losowo wybranych szkół średnich w Krakowie przeprowadzono anonimowy kwestionariusz, przeznaczony do samodzielnego wypełnienia. Pytania zawarte w kwestionariuszu dotyczyły form spędzania wolnego czasu, uwzględniając zróżnicowanie aktywności w ciągu tygodnia i weekendów, a także w okresie letnim i zimowym. W analizie statystycznej użyto testu Chi², dla zmiennych nieparametrycznych testu Manna-Whitneya oraz w przypadku bardziej złożonych analiz testu ANOVA oraz testu post-hoc Hochberg gt2.

Wyniki. Badana młodzież na zachowania bierne przeznaczała średnio 27,8 godz./tyg. w okresie letnim i 29,4 godz./tyg. w semestrze zimowym. Niezależnie od pory roku ankietowani najwięcej czasu spędzali przed komputerem i telewizorem. Z aktywności komputerowych zaobserwowano statystycznie istotne większe zainteresowanie korzystaniem z Internetu w celu zdobywania wiadomości ogólnych przez dziewczęta, zaś grami komputerowymi i oglądaniem filmów wśród chłopców. Ponadto, większe zainteresowanie czytaniem książek i czasopism zaobserwowano wśród dziewcząt (4,5 godz./tydz.) w porównaniu z chłopcami (3 godz./tydz.).

Wnioski. Istnieje alarmująca potrzeba wdrożenia zorganizowanej promocji aktywnych form relaksacji i wypoczynku wśród młodzieży.

Słowa kluczowe: młodzież, zajęcia sedentarne, styl życia, czas wolny

Introduction. Modern adolescents devote a significant part of their free time to sedentary activities, mainly involving the use of electronic media, participation in mass culture, entertainment focused on passive reception of the content, while minimizing active creative, educational and cultural activities.

Aim. Assessing the amount of free time spent passively and its description among young people of high school age.

Materials & methods. An anonymous questionnaire was presented to 1662 students from 21 randomly selected secondary schools in Krakow for them to be filled out independently. The questions included concerned forms of spending free time, dividing these between activities during the week and at weekends, as well as in summer and winter. The statistical analysis used the Chi² test, the Mann-Whitney test for nonparametric variables, and for more complex analyses the ANOVA test and the post-hoc Hochberg gt2 test.

Results. The surveyed adolescents spent on average 27.8 hours a week on sedentary behaviour in summer and 29.4 hours a week in the winter. Regardless of the season, the respondents spent most of their time in front of the computer and TV. In terms of computer activities, it was found that statistically, girls showed a significantly greater interest in using the Internet to acquire general knowledge, while boys used it for playing computer games and watching movies. In addition, girls claimed a greater interest in reading books and magazines (4.5 hours a week) compared with boys (3 hours a week).

Conclusion. There is an alarming need to implement organized promotion of active forms of relaxation and recreation among young people.

Key words: adolescents, sedentary activities, lifestyle, leisure time

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Introduction

Leisure time is described as those free spaces in one's life that can be used according to one's wishes. This depends on individual preferences and constitutes an inseparable part of one's lifestyle [1]. Izdebska J. describes leisure time as that spent on

voluntary activities, undertaken for relaxation, fun, self-development or taking part in social activities [2] while more current definitions claim it to be: any behaviour that involves walking, characterised by any energy expenditure of ≤ 1.5 metabolic equivalents while in a sitting or reclining position [3]. Among

the various forms of spending leisure time Pięta lists for example: sport, tourism, mass media, theatre, museums, exhibitions, self-education, play and social activities [4].

Among the various ways in which young people spend their leisure time the most popular are: games and physical activities, use of the computer and Internet, watching TV, walks, meeting with friends, listening to the radio, and reading books and press publications. The forms of spending free time are determined by many factors, such as family environment, belonging to a peer group, school, the local environment, and mass media.

Young people today spend a vast amount of their leisure time in sedentary activities involving the use of electronic devices (computers, Internet, TV). The growing popularity of such activities is becoming dangerous competition for recommended physical activities that are today considered as the obligation of responsible individuals to maintain their physical and mental health. The increasingly popular sedentary lifestyle increases the risk of cardiovascular disease, stroke, hypertension, obesity, diabetes mellitus, back pain and many other problems [1, 5-10].

The use of mass media among young people is a very attractive form of spending leisure time if used in a rational and adequate way, but otherwise may be harmful especially in terms of mental health and human relationships. Spending time alone in front of a TV or a computer may lead to a weakening of relations with family and peers, leading to a feeling of loneliness [5]. Similarly television, if used selectively, has many important functions such as cognitive, entertainment and education. Watching television or using the computer does not have to restrict physical activity, hobby activities or the reading of books. In fact it may support and broaden knowledge gained from books, show interesting and far-off places, and provide closer contact with art and culture. For many individuals, the computer and Internet are important elements of life and constitute a chance for development, a source of information required for learning/studies, developing hobbies and a way of communication, watching films, listening to music etc. Despite all these positive effects, countless hours spent playing computer games or pointless Internet surfing may lead to an addiction that restricts intellectual development, impairs a person's will and personality, and weakens moral values or family relationships. In addition watching too much television may lead to aggressiveness in communication and actions, aggressiveness in imagination and fear among both children and adolescents [11, 12].

Young people are at that stage when their bodies, intellect, emotions and views are developing and it is crucial to imbue them pro-healthy attitudes that

ensure more sustainable effects. At the same time, various new forms of sport and tourism are arising as propositions on how to spend free time actively, though this phenomenon is growing too slowly and is not popular enough to meet the needs of promoting a healthy lifestyle. Encouraging proper, healthy attitudes and interests in sport and relaxation from an early age should improve the psycho-physiological condition of future generations.

Aim

Assessment of the time spent in sedentary activities and the main forms of such activities among adolescents attending secondary school.

Materials and methods

A cross-sectional study of eating disorders and leisure time activity was carried out between January and April 2010 in Krakow, southern Poland. With the cooperation of the local government's Department of Education, a random sample of 21 schools was selected from every type of public secondary schools (middle school, vocational, technical and high school) in various districts of the city.

All first-year students from the selected schools were invited to participate regardless of their activity levels or sedentary habits. Pupils present at school on the day of the interview were asked to fill out an anonymous self-assessment questionnaire. Before they proceeded to complete the questionnaire, they were informed about the context in which the study was being conducted and also that since it was confidential, providing honest answers was important. In accordance with the school's usual policy, it was assumed that voluntary completion of the questionnaire would indicate consent to participation in the study.

Within the framework of leisure time activities, the survey included questions about active and inactive behaviour throughout the day. The amount of leisure time spent on inactive behaviour was determined by means of the following questions: "About how many hours a week of your leisure time do you usually spend on..." (different forms of sedentary behaviour, including: watching TV, playing games, use of the computer, reading, creating, behavioural hobbies, cinema or theatre going, et alia), to an accuracy of half an hour. The questions were divided into weekdays and weekends and also summer and winter time.

Information was obtained from 1662 pupils of which 291 (17.5%) were rejected due to incomplete questionnaires and 138 (8.3%) due to unreliable data, leaving 1233 adolescents (74.2% of the original sample) for analysis purposes.

Statistical analysis

The results were analysed and recorded separately for boys and girls and also for summer and winter time. Differences in the basic characteristics between the groups and the diverse forms of sedentary behaviour declared were subjected to the Chi-square test. Times spent on various sedentary activities were reported descriptively and summed up in order to assess total leisure time spent inactively. Since all the continuous variables were not normally distributed, the nonparametric Mann-Whitney test was applied. The relationship between time spent in inactive behaviour and type of school was assessed using the ANOVA (Analysis of Variance) test. Next, in view of the unequal size of the sample groups, the Hochberg g_{t2} post-hoc test was calculated. The data was analysed using IBM SPSS Statistic 24. All tests were two-sided, with $p < 0.05$ being considered statistically significant.

Results

The amount of free time spent on various sedentary activities varied significantly according to type of school and sex. 43.4% of respondents were attending high school (38.0% of boys and 46.9% of girls) and 6.2% were attending vocational school (10.8% of boys and 3.1% of girls). More than 22.0% were attending technical school (22.1% of boys and 27.6% of girls) and middle school (29.0% of boys and 22.4% of girls). The difference between boys and girls in terms of type of school was statistically significant.

Among the sedentary forms of spending free time by the analysed group, the most popular were: using computers, the Internet and television (more than 85% of boys and girls), along with reading books and magazines (80% of surveyed individuals). Only 50% of participants spent their free time on hobbies (Table 1).

Overall, the surveyed adolescents spent on average 27.8 ± 15.4 hours a week in summer and

29.4 ± 16.4 hours a week during the cold months on sedentary activities. Both in summer and winter, the most popular activity was computer usage the computer (12.9 ± 10.0 hours a week in the summer semester and 13.4 ± 10.6 hours a week in the winter semester) and watching TV (6.5 ± 5.7 hours a week in the summer semester and 7.4 ± 6.4 hours a week in the winter semester). Boys spent more time on the computer (15.5 ± 11.6 hours a week compared to girls: 11.1 ± 8.5 hours a week; $p < 0.001$), while girls were more engaged in watching television (6.6 ± 5.6 hours a week compared to boys: 6.2 ± 5.8 hours a week; $p < 0.05$ in the summer semester, and in the winter semester girls spent 7.7 ± 6.5 hours a week compared to boys: 6.9 ± 6.2 hours a week; $p < 0.01$).

Of all types of computer usage, the most popular was surfing the Internet, games and video. A statistically significant difference was noted in terms of gender: with girls preferring Internet surfing (28% of their overall free time dedicated to sedentary activities compared to 23% for boys; $p < 0.001$) and with boys preferring games and video (20% of their overall free time dedicated to sedentary activities compared to 4% for girls; $p < 0.001$). Reading books and magazines was more popular among girls (4.5 ± 4.2 hours a week compared to 3.0 ± 4.3 hours a week for boys; $p < 0.001$ during both semesters). Among the analysed adolescents, cinema and theatre were not popular: on average this was about 2.2 ± 2.1 hours a week for girls, while for boys it was even less than 1.6 ± 1.9 hours a week ($p < 0.001$).

In the case of both sexes we noticed an increased tendency to spend more time using the computer, which means more hours spent on additional sedentary activities during the day. This increase was regardless of the season of the year. Girls spent the same amount of free time using the computer as boys, but at the same time spent more time on other sedentary activities compared to their peers.

Table 1. Percentage of respondents declaring particular forms of sedentary behaviour
Tabela 1. Odsetek respondentów deklarujących poszczególne formy biernych zachowań

	Total /Ogółem		boys /chłopcy		girls /dziewczęta		$p_{(\chi^2)}$
	N	%	N	%	N	%	
TV	1134	92.0	425	86.9	709	95.3	<0.001
Computer – total activities /komputer – wszystkie aktywności	1188	96.3	464	94.9	724	97.3	0.027
Internet	1141	92.5	432	88.3	709	95.3	<0.001
Computer/video games /gry komputerowe/wideo	635	51.5	377	77.0	258	34.7	<0.001
Computer for other purpose /komputer do innych celów	681	55.2	280	57.2	402	54.0	0.271
Reading books, magazines etc. /czytane książki, czasopism itp.	985	79.9	329	67.3	656	88.1	<0.001
Cinema/theatre /kino/teatr	887	72.0	305	62.4	583	78.3	<0.001
Hobbies /hobby	657	53.3	225	46.0	432	58.1	<0.001
Other sedentary activities /inne bierne zachowania	126	10.2	58	11.9	68	9.1	0.123

The ANOVA test results revealed significant differences in average time spent in an inactive way according to type of school attended by the respondents (fig. 1). The lowest average time spent on sedentary activities in both gender groups was observed among students of vocational school, for girls about 20 hours a week and for boys below 20 hours a week, in both the warm and cold season. Other students spent on average about 10 hours more on sedentary activities. Statistically significant differences were observed between boys attending vocational school and boys attending all other types of school (Hochberg g_{t2} post-hoc test $p=0.001$), whereas among girls significant differences were observed only in wintertime between vocational and technical and high school students ($p=0.006$ and $p=0.049$, respectively).

More than 80% of young people attending the various types of secondary school (middle school, technical college, high school) spent more than 2 hours a day on sedentary activities. Among those activities the most popular were again watching TV and using the computer. More than 60% of middle school and technical college students and about 50% of students of high schools and technical colleges chose to watch TV and use the computer during summertime, while during winter these percentages increased. It is worth emphasizing that technical college students were less likely to choose sedentary behaviours (58%).

Table II. Average time spent on various forms of sedentary behaviour (hours a week and the average percentage of total time spent on sedentary behaviour) depending on the season of the year – Me (IQR)

Tabela II. Przeciętna ilość czasu spędzana na różnych formach biernych zachowań (godziny/tydzień i przeciętny odsetek z całkowitego czasu spędzanego w sposób bierny) w zależności od sezonu – Me (IQR)

	Number of hours a week /Liczba godziny/tydzień				% of total time spent on sedentary behavior /% ogólnego czasu spędzanego w sposób bierny			
	Total /Ogółem Me (IQR)	boys /chłopcy Me (IQR)	girls /dziewczeta Me (IQR)	P(Mann- -Whitney U test)	Total /Ogółem Me (IQR)	boys /chłopcy Me (IQR)	girls /dziewczeta Me (IQR)	P(Mann- -Whitney U test)
summertime /okres letni								
All forms of sedentary behavior /wszystkie rodzaje biernych zachowań	27.8 (15.4)	28.5 (16.8)	27.3 (14.4)	0.238				
TV	6.5 (5.7)	6.2 (5.8)	6.6 (5.6)	0.035	23.4 (15.4)	21.5 (15.8)	24.6 (15.1)	0.006
Computer – all activities /komputer – wszystkie aktywności	12.9 (10.0)	15.5 (11.6)	11.1 (8.5)	<0.001	45.4 (20.0)	54.0 (21.2)	40.0 (17.1)	<0.001
Internet	7.4 (6.5)	6.8 (6.8)	7.7 (6.3)	<0.001	26.7 (17.5)	23.7 (18.6)	28.6 (16.4)	<0.001
Video, games /video, gry komputerowe	3.1 (5.2)	5.8 (6.7)	1.2 (2.9)	<0.001	10.2(14.8)	20.1 (17.7)	3.9 (7.5)	<0.001
Computer for other purposes /komputer do innych celów	2.5 (4.3)	2.9 (4.7)	2.2 (4.0)	0.034	8.5 (12.6)	10.1 (14.4)	7.5 (11.3)	0.041
Reading books, magazines etc. /czytanie książek, czasopism itp.	3.8 (4.2)	2.7 (3.8)	4.5 (4.2)	<0.001	14.4 (13.6)	10.0 (12.3)	17.3 (13.7)	<0.001
Cinema, theatre /kino, teatr	1.9 (2.1)	1.6 (1.9)	2.2 (2.1)	<0.001	7.7 (8.2)	6.0 (7.6)	8.7 (8.5)	<0.001
Hobbies /hobby	2.1 (3.4)	1.9 (3.6)	2.3 (3.2)	0.001	7.4 (10.0)	6.7 (10.3)	7.8 (9.8)	0.001
Other sedentary behaviors /inne bierne zachowania	0.6 (2.6)	0.5 (1.8)	0.6 (3.0)	0.998	1.7 (7.1)	1.8 (7.2)	1.6 (7.0)	0.992
wintertime /okres zimowy								
All forms of sedentary behavior /wszystkie rodzaje biernych zachowań	29.4 (16.4)	29.6 (17.4)	29.3 (15.8)	0.420				
TV	7.4 (6.4)	6.9 (6.2)	7.7 (6.5)	0.005	25.4 (16.6)	23.1 (16.2)	27.0 (16.8)	0.013
Computer – all activities /komputer – wszystkie aktywności	13.7 (10.6)	16.0 (11.9)	12.2 (9.4)	<0.001	45.1 (19.3)	53.1 (20.3)	40.1 (16.9)	<0.001
Internet	7.9 (7.1)	7.0 (7.0)	8.4 (7.1)	<0.001	26.3 (17.0)	23.3 (17.7)	28.4(16.2)	<0.001
Video, games /video, gry komputerowe	3.2 (5.4)	6.1 (6.7)	1.4 (3.1)	<0.001	10.2 (14.5)	19.8 (17.0)	4.2 (8.0)	<0.001
Computer for other purposes /komputer do innych celów	2.6 (4.4)	3.0 (4.8)	2.4 (4.2)	0.207	8.6 (12.7)	10.0 (14.5)	7.6 (11.3)	0.048
Reading books, magazines etc. /czytanie książek, czasopism itp.	4.0 (4.3)	3.0 (4.3)	4.6 (4.3)	<0.001	14.3 (13.5)	10.8 (13.8)	16.4(12.8)	<0.001
Cinema, theatre /kino, teatr	1.9 (2.1)	1.6 (2.0)	2.1 (2.1)	<0.001	6.9 (7.5)	5.6 (7.2)	7.6 (7.6)	<0.001
Hobbies /hobby	2.0 (3.1)	1.6 (2.8)	2.2 (3.3)	<0.001	6.7 (9.7)	5.6 (9.7)	7.4 (9.7)	<0.001
Other sedentary behaviors /inne bierne zachowania	0.5 (2.3)	0.5 (2.0)	0.6 (2.6)	1.000	1.6 (6.6)	1.8 (7.2)	1.5 (6.2)	1.000

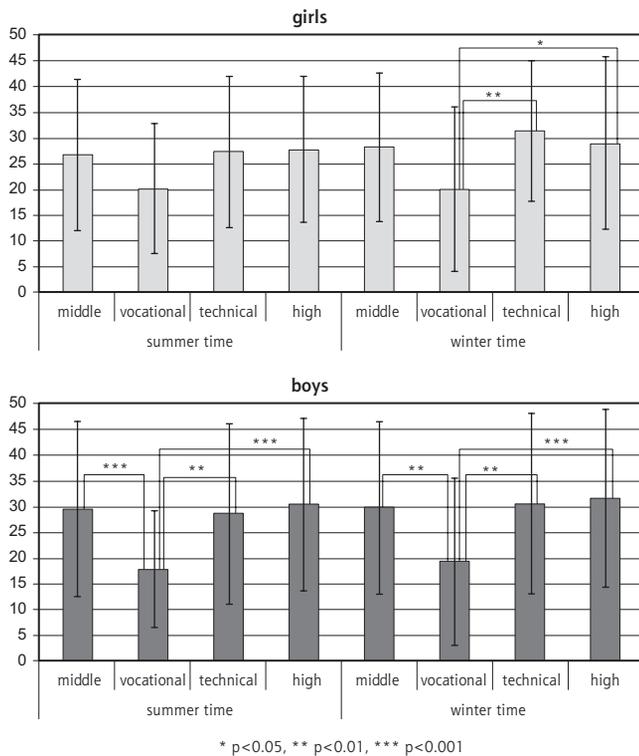


Fig. 1. Average time spent on sedentary behaviour by girls and boys according to season and type of school (M±SD)

Ryc. 1. Przeciętny czas spędzany na biernych zachowaniach przez chłopców i dziewczęta w zależności od sezonu i typu szkoły (M±SD)

Discussion

The fact that the young people surveyed in the study spent an enormous amount of time on electronic devices is alarming, as these activities are competitors and alternatives for time engaged in reading, developing a hobby or cultural activities (theatre or cinema).

For young people, the mass media are very attractive (a rapid increase in the attraction of TV and the mass media for young people can be observed), which potentially can be simultaneously harmful to various aspects of health (psychological, physical, emotional). Anxiety concerning the negative effects of long hours spent in front of the TV has led the American Academy of Paediatrics (AAP) to construct a recommendation that no more than 2 hours a day should be spent watching TV or using the computer [10].

From the presented study and from other survey studies we can draw the same conclusion that the most popular forms of spending leisure time (>2 hours spent on sedentary activities) regardless of the season of the year, are using the computer and watching television. Similar results were reported in a cross-sectional study conducted by Jodkowska, et al. A studied group of 13 year-olds led to the conclusion that a vast amount of their free time is spent watching TV, using the computer, and that the least amount of their free time is spent on homework. The average

total amount of time spent watching TV or using the computer was 4 hours a day during school days and 6 hours a day at weekends. A large percentage of the young people (>70%) exceeded the limit set by experts for the amount of time that can be safely spent in front of a screen (<2 hours) both during week days and at weekends [13], as we can observe in our study.

Our own nationwide studies assessing the sedentary activities of college students [10] found that 60% of overweight adolescents were spending every day at least 4 hours watching TV or using a computer. Similar conclusions were drawn by Świdorska-Kopacz, et al. [7], where the authors focused on pro-healthy activities among college age adolescents. The authors found that 51% of the analysed group spent 4 hours or more a week watching TV and films and 49% spent >4 hours a week using the computer. Boys were more keen on using the computer (57.4%) than girls (41%). Similar results were obtained in a study conducted in Jarosław among adolescents 12-15 years old, where these adolescents declared that they used the computer every day for: a few minutes (6.4%), about an hour (37.6%), about 2-3 hours (38.4%) and more than 3 hours (17.6%) [14]. HBSC studies focusing on time spent by 11-15 year-old adolescents sitting motionless in front of a screen found that in 2014 only 40% of adolescents had spent <2 hours watching TV and 42.6% of adolescents had spent 2 to 3 hours watching TV. In the case of computer games, 65.9% of adolescents had spent less than 2 hours a day and 24.3% – between 2 to 3 hours a day. As for other computer activities, 31.3% of the participants interviewed had spent 2-3 hours a day and 10% more than 6 hours a day. Differences between the sexes were noticed: young women watch TV more often than they play computer games, a finding that is comparable with the study here presented. The amount of time spent watching TV was found to increase with age. Moreover, the study reported that during school days adolescents spent on average 2.15 hours watching TV, 1.35 hours playing computer games and 2.3 hours on other computer activities (learning and communication with their peers) [15].

In an article by Wojtyła-Buciora, et al. [16], where secondary students constituted the study group, more than 70% of participants used the computer every day or nearly every day, and in the case of watching TV, the percentage was only 48%. The data collected in Poland is comparable to the preferred ways of spending free time reported among European adolescents [1]. Young people in Belgium spend on average 232 minutes a day on sedentary activities, including 110 minutes watching TV, with comparable amounts of time for boys and girls. Belgian boys spent more time playing computer games than girls (89 minutes a day compared to 69 minutes a day) [17] and similar

percentages were observed in the study presented here. Adolescents in Austria usually spent 2.2 hours a day watching TV; >1 hour a day playing computer games, an activity found to be more typical of boys than girls, the percentages being 45% compared to 16% [18]. In Greece, the watching of TV consumed on average 120 minutes a day while computer games consumed 88 minutes a day among boys and 60 minutes a day among girls [19]. On the other hand, German adolescents spent 43 minutes a day watching TV each weekday and 65 minutes a day at weekends. Computer games consumed only 9 minutes a day during weekdays and 15 minutes a day at weekends [20]. A study by Ponczek [21] reported that adolescents spent about 27% of their free time with their peers, spending about 22% of their free time watching TV and using the computer. On school days adolescents use the computer on average about 2 hours a day and 3 hours a day at weekends. Also alarming is the fact that the majority of them had already tried nicotine (67.2%), alcohol (98.1%) and psychoactive substances such as marijuana (30.8%). Moreover, overweight adolescents spent more time using the computer than their colleagues with a normal BMI index.

Studies conducted in Iława among adolescents between 14-17 years of age found that there was a connection between regular organized activities: educational, artistic, scouts or church activities and a reduced likelihood of risky activities [22].

It is alarming that today's adolescents spend so much time on electronic media, which constitute strong competition for the reading of books, seeking and developing one's own hobby or cultural activities (e.g. theatre or cinema). Among the analysed group only 14% spent on average 4 hours a week reading, and less than 7% attended the cinema/theatre (on average, this group spent about 2 hours a week on the latter activity, regardless of the season).

Among important forms of spending free time, taking part in cultural events can be found, such as: visiting museums, attending philharmonic or theatre performances, and reading books or magazines.

A study conducted by Szafrńska, et al. [22] assessing attendance at cinemas and theatres in Lodz reported that among audiences the majority were women over 50 years of age (67%), while cinema audiences were definitely younger (pupils and students), regardless of gender. The frequency of such activities was less than once a month, mainly due to the high cost of tickets.

It seems that for adolescents it is crucial to promote cultural activities (cinema, theatre, books, and magazines), social activities (meeting with family or friends, watching sporting events) and individual hobbies [22]. The attention of adolescents needs to be focused on other free and attractive activities such as: artistic activities, paintings, installations, and concerts in their close neighbourhood. Moreover, it seems that the aim of local authorities should be to promote various active forms of spending leisure time, e.g. sport, recreation, tourism. Studies conducted by the Institute of Tourism in Warsaw focusing on the tourist activities of Polish adolescents between 15 and 19 years of age found that 67% of the studied group took part in tourist activities. This suggests that tourism could constitute an important lifestyle element for adolescents, helping to fulfil for instance their cognitive, social or health needs [23].

Conclusion

The amount of time spent by adolescents on sedentary activities during free time is vast, the average time spent passively being more than 4 hours a day. The preferred form of sedentary activities is the use of electronic media, although the time spent in front of computers is about twice as long as that spent for watching TV. Since this is a phenomenon observed worldwide, there is a clearly need for organized promotion of physical activities during leisure time.

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