ORIGINAL ARTICLE

Annals of Agricultural and Environmental Medicine 2012, Vol 19, No 3, 557-561
www.aaem.pl

Lifestyle as an important factor in control of overweight and obesity among schoolchildren from the rural environment

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Sygit K, Kołłątaj W, Goździewska M, Sygit M, Kołłątaj B, Karwat ID. Lifestyle as an important factor in control of overweight and obesity among schoolchildren from the rural environment. Ann Agric Environ Med. 2012; 19(3): 557-561.

Abstract

Introduction: Lifestyle of an individual is responsible for sixty percent of his/her state of health. Many studies of this problem indicate that in the style of life of schoolchildren, anti-health behaviours dominate over health promoting behaviours.

Objective: The objective of the presented study was recognition of the lifestyle of the rural adolescents with overweight and obesity.

Material and methods: The study covered adolescents aged 15-19, living in the rural environments of the West Pomeranian Region. Finally, the analysis covered 2,165 schoolchildren, and was performed with the use of a self-designed questionnaire form and the BMI was applied.

Results: The study showed that overweight occurred more often in the group of examined girls than boys, while obesity was twice as frequent among boys than among girls. Overweight schoolchildren (35.1%) had an adequate diet, while those obese – inadequate (78.3%). In the group of schoolchildren with overweight, passive leisure prevailed over active forms of leisure, 83.8% and 16.2%, respectively. Passive leisure was also dominant among obese respondents. Among as many as 81.8% of schoolchildren with overweight, physical activity was mediocre, while only 8.1% of them were active. The highest percentage of respondents with obesity were totally inactive physically. Obese schoolchildren relatively often experienced stressful situations. It is an alarming fact that both overweight and obese schoolchildren relatively often used psychoactive substances.

Conclusions: A considerable number of respondents with overweight and obesity applied an adequate diet, preferred passive forms of leisure, experienced stressful situations, were characterized by low physical activity, and systematically used psychoactive substances.

Key words

lifestyle, rural environment, overweight, obesity.

INTRODUCTION

The lifestyle of an individual is responsible for 60% for his/her state of health [1]. Lifestyle may be health promoting or anti-health. Many studies of this problem show that among children and school adolescents, living in both the rural and urban environments, anti-health behaviours unfortunately dominate over those that are health promoting [2].

However, the lifestyle of the rural adolescents differs in some aspects from the lifestyle of their urban contemporaries [3].

Overweight and obesity concern adolescents living both in the rural and urban areas [4].

Overweight and obesity are a great epidemiological problem among adolescents both in Poland and worldwide. Both overweight and obesity are risk factors of many diseases, such as: cardiovascular diseases, some types of cancer, type 2 diabetes, hyperlipidaemia or gastrointestinal diseases [5]. Researchers warn that if the situation in this area does not change, the average life span will become shorter [6]. Overweight and obesity at the age of adolescence increase the risk of occurrence of obesity in adulthood [7]. British studies confirmed that an increase in body weight during the period of puberty enhances the risk of falling ill with cardiovascular diseases and type 2 diabetes, while this risk is smaller when body weight is maintained on the level of BMI within 20-23.9 kg/m^2 [8].

The frequency of consumption of food products during the day exerts a significant effect on the maintenance of adequate body weight, and in the case of adolescents the consumption of the first breakfast is especially important [9]. Researchers [10, 11] explain that the consumption of breakfast at home limits the consumption of additional food portions

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Received: 10 June 2012; accepted: 3 September 2012

during the day in the form of snacks. Adolescents who do not consume breakfast at home have a higher body weight, are often overweight or obese, more rarely consume fruits and vegetables, more seldom consume fruit and vegetables, eat unhealthy meals of the fast food type, and in addition prefer a sedentary lifestyle [12].

Physical activity is an equally important element of lifestyle of schoolchildren from rural environments. Physical activity allows the maintenance of normal body weight, and also enables the change of own body image. In other words, teenagers who practice sports and perform physical exercises have a lower body weight (rarely suffer from overweight and obesity), possess a higher self-esteem, perceive their body in positive terms and are more satisfied with own body image [13, 14, 15].

What lifestyle do overweight and obese adolescents lead? Does lifestyle determine the occurrence of overweight and obesity, or it is the presence of overweight and obesity which determine lifestyle? These problems are an objective of the presented report.

MATERIAL AND METHODS

The study was conducted in 2008-2010, and covered a group of 2,335 adolescents aged 15-19, from the rural environments of the West Pomeranian Region in seven selected provinces.

Finally, the analysis covered 2,165 individuals; a representative sample of adolescents from the rural areas. The study was conducted with the use of a self-designed questionnaire form, and the Body Mass Index was applied (BMI). The majority of experts emphasize that this indicator highly correlates with the amount of fatty tissue in the human body [13]. In the presented study, excessive body weight among the population at developmental age was evaluated with the use of centile nets of the BMI value for gender and age, according to recommendations by the WHO and expert centres in Poland [16, 17]. Overweight among the schoolchildren examined is defined as a disorder, in which the BMI value is equal to or higher than 85 centiles, and lower than 95 centiles, with consideration of age and gender. Obesity was diagnosed when the BMI value was equal to or higher than 95 centiles.

Based on the collected data, statistical analyses were carried out by means of STATISTICA software. In order to verify the value of the $X2$ function was calculated, adopting the value of error p=0.05. The following characteristics were analyzed while investigating the lifestyle of rural adolescents: rational nutrition, use of stimulants, leisure, stress, use of salt, and physical activity.

RESULTS

The compilation of data in Table 1 shows that overweight more frequently occurred among girls than boys (p<0.05).

However, obesity was twice as frequent among boys than girls (p<0.05).

In the group of 135 girls, overweight was observed significantly more often statistically than obesity (p<0.05). In the group of 165 investigated boys, obesity occurred significantly more often statistically than overweight (p<0.05).

Table 1. Compilation of data concerning respondents with overweight and obesity

Body weight	Gender				Σ	
	Girls		Boys			
	n	%	n	%	n	%
Overweight n=185	100	54.0	85	45.9	185	51.6
Obesity n=115	35	30.4	80	69.6	115	48.4
Σ n=300	135	45.0	165	55.9	300	100.0

Rational nutrition was practised by 30% of respondents, whereas 70% of them applied an inadequate diet (the difference being statistically significant, p<0.05).

Overweight respondents applied an inadequate diet (64.9%), and only 35.1% – correctly (Tab. 2). The difference was statistically significant, p<0.05.

As many as 78.3% of obese respondents applied an inadequate diet, while only 21.7% of them applied an adequate nutrition (the difference being statistically significant, p< 0.05).

The use of salt is an important factor of cardiovascular risk. As many as 70.2% of adolescents who were overweight used a lot of salt, 26.5% – small amounts of salt, and only 3.3% did not apply salt at all, the difference being statistically significant; whereas among obese respondents 69.2% used a lot of salt, 17.4 – small amounts, and 13% did not use salt at all.

Among all the respondents with overweight and obesity as many as 70% used a lot of salt, 23% – small amounts, and 7% did not use salt at all.

Table 2. Rational nutrition among respondents with overweight and obesity

Body weight	Nutrition				Use of salt					
	*Normal		**Abnormal		High (over 10 g)		Low (approx. 1 g)		Not at all	
	n	%	n	%	n	%	n	%	n	%
Overweight n=185	65	35.1	120	64.9	130	70.2	49	26.5	6	3.3
Obesity n=115	25	21.7	90	78.3	80	69.6	20	17.4	15	13.0
Σ n=300	90	30.0	210	70	210	70.0	69	23.0	21	7.0

*as 'adequate nutrition', the following was adopted: number of meals consumed, time during the day when meals are consumed, types of products consumed (including amount of consumed fruits, vegetables, dairy products, sweets, etc.).
** as 'inadequate nutrition', the following was adopted: number of meals consumed /less than 3/, consumption of meals late during the day, snacking between meals, /snacks of the type of a sweet, fast-food/, types of meals consumed.

Among the adolescents in the study, passive leisure dominated over active forms of spending free time: 85% and 15%, respectively; the difference was statistically significant, p<0.05 (Tab. 3).

Also among the respondents who were overweight, passive leisure prevailed over active recreation: 83.8% and 16.2%, respectively; the difference being statistically significant p<0.05.

A similar situation was observed among obese adolescents, among whom passive leisure also dominated over active forms of recreation: 86.9% and 13.1%, respectively; the difference being statistically significant, p<0.05.

Table 3. Leisure among respondents with overweight and obesity

Body weight	Leisure				Σ	
	*Passive		**Active			
	n	%	n	%	n	%
Overweight n=185	155	83.8	30	16.2	185	61.7
Obesity n=115	100	86.9	15	13.1	115	38.3
Σ n=300	255	85.0	45	15.0	300	100.0

* passive leisure – reading books, listening to music, playing computer games.
**active leisure undertaken at least 3 time a week for 30 minutes, e.g. marching, riding a bicycle, recreational swimming, household jobs, etc.

Stress is a very important risk factor in cardiovascular diseases, and it is also among the major risk factors of cancerous diseases.

Every day, adolescents are exposed to various stressful situations associated with school and family situation, illness of significant others, lack of acceptance in the group of contemporaries, while the growing stress favours frequent aggression and violence among this population group.

As many as 51.7% of the adolescents in the study reported that they often experienced stress, whereas 24.3% of respondents mentioned that they were rarely exposed to stressful situations, this difference being statistically significant. among the respondents with overweight, as many as 54% experienced stress frequently, 31.4% – rarely, while 14.7% – never (the difference being statistically significant, p<0.05) (Tab. 4).

In the group of obese respondents, as many as 73.9% of respondents were often exposed to stressful situations, 13% rarely and 13% never; the difference being statistically significant, p<0.05. Obese adolescents more frequently experience stress (often, rarely) those who were overweight (the differences being statistically significant, p<0.05).

Table 4. Stress among children and adolescents with overweight and obesity

Body weight	Stress						Stress avoidance			
	*I frequently experience stress		**I am rarely exposed to stress		I never experience stress		I can control myself		I cannot control myself	
	n	%	n	%	n	%	n	%	n	%
Overweight n=185	100	54.0	58	31.4	27	14.7	158	85.4	27	14.6
Obesity n=115	85	73.9	15	13.0	15	13.0	105	91.3	10	8.7
Σ n=300	185	51.7	73	24.3	42	14.0	263	87.7	37	12.3

* I often experience stress – exposure to a stressful situation more frequently than 3 times a week.
** I am rarely exposed to stress – experiencing a stressful situation not more often than twice a week.

Only 6.6% of the total number of respondents were physically active, while the largest number of them indicated mediocre physical activity – 6.7% (Tab. 5). Those who were entirely inactive physically constituted 26.7% of the total number of adolescents in the study; the difference being statistically significant, p<0.05.

As many as 81.8% of adolescents with overweight reported mediocre physical activity, while 8.1% of respondents in this group mentioned that they were highly active physically. Those who were inactive constituted 10.8% of respondents in this group; the difference being statistically significant, p<0.05. Among obese adolescents the highest percentage (52.2%) were those who were physically inactive, 43.5% indicated a mediocre physical activity, whereas 4.3% admitted that their physical activity was high (p<0.05). In the group of obese adolescents, the percentage of those totally inactive was the highest (five times as many as in the group with overweight). Also, mediocre physical activity was twice less frequent among the obese than overweight adolescents.

Table 5. Physical activity among adolescents with overweight and obesity

Body weight	Physical activity						Σ	
	Lack of physical activity		*Physical activity – very good		** Physical activity – mediocre			
	n	%	n	%	n	%	n	%
Overweight n=185	20	10.8	15	8.1	150	81.8	185	61.7
Obesity n=115	60	52.2	5	4.3	50	43.5	115	38.3
Σ n=300	80	26.7	20	6.7	200	66.6	300	100.0

* as 'very good physical activity', the following was adopted: various forms of activity undertaken more often than 3 times a week for not less than 30 minutes.
** as 'mediocre physical activity', the following was adopted: various forms of activity undertaken not more often than twice a week and for not less than 30 minutes.

From among 300 respondents, as many as 46.3% smoked cigarettes, 46.7% consumed alcohol, and as many as 38.3% used narcotics; the difference being statistically significant, p<0.05 (Tab. 6).

In the group of adolescents with overweight, as many as 21.0% smoked cigarettes, 48.6% consumed alcohol, and 43.2% used narcotics (the difference being statistically significant, p<0.05).

Table 6. Stimulants used by adolescents with overweight and obesity

Body weight	Stimulants					
	*Cigarettes smoking		**Alcohol consumption		Use of narcotics - occasionally	
	n	%	n	%	n	%
Overweight n=185	39	21.0	90	48.6	80	43.2
Obesity n=115	100	86.9	50	43.5	35	30.4
Σ n=300	139	46.3	140	46.7	115	38.3

*cigarette smoking – tobacco smoking every day (at least 5 cigarettes daily).
** alcohol consumption – consumption of alcoholic beverages more often than twice a week

As many as 86.9% of obese adolescents smoked cigarettes, 43.5% consumed alcohol, and 30.4% used drugs (p<0.05) (Tab. 6). Thus, a higher percentage of obese respondents smoked cigarettes, compared to those with overweight, whereas a higher percentage of overweight than obese adolescents consumed alcohol and used narcotics.

DISCUSSION

The most frequent cause of abnormal body weight is an excessively high calorific value of meals with respect to the energy demand of the organism, and the low physical activity. Physical activity is not only a pleasure in itself, but also protects against cardiovascular diseases, cancer and obesity [15]. In his studies, A. Jakubek [18] found that a gradual increase in 'the dose' of physical activity to at least one hour daily, and the limitation of physical inactivity, may considerably reduce the occurrence of overweight and obesity among children and adolescents.. In about 5% of children, the obesity is accompanied by other disorders, e.g. thyroid, nervous system, etc. [19].

Investigations by HBSC show that in the countries of the European Union, about two-thirds of adolescents do not attain the recommended level of physical activity [20]. This phenomenon is health threatening, disturbs the normal development of the young organism, and above all, results in the development of obesity in later life. The WHO recommends for adolescents aged 15-17, 60 minutes of physical activity of moderate to vigorous physical daily (MVPA), based on scientific evidence [21, 22].

The World Health Organization and the European Union Platform for Action on Diet, Physical Activity and Health, in response to the phenomenon of unsatisfactory physical activity, exhort societies of all countries of the world to increase physical activity [23]. In Poland, following international recommendations, a document has been elaborated concerning nutrition and physical activity among children and adolescents [24]. In this document, in the section concerning recommendations in the area of physical activity, special attention is attached to the role of school and parents in the formation of health-promotion.

The studies conducted by Świderska-Kopacz et al. [21] in a group of schoolchildren attending junior high schools in Gorzów in the school year 2005/2006, showed that during their free time only 40% of adolescents undertook physical activity at least 3 times weekly.

Analysis of trends in health behaviours of adolescents from the rural environment, carried out based on the results of the HBSC studies, showed that in Poland there occurs an intensification of unfavourable trends concerning nutritional behaviours, such as [25]: rare consumption of the first breakfast, snacking in-between meals, an excessive consumption of sweets and red meat.

The studies show that 70% of the rural adolescents examined have an inadequate diet. Similar results were obtained by M. Charzewska [26] who found that the rural children consume too much fats and sugar. These findings suggest that with respect to fats, this is rather a high content of its specific types: saturated fats and trans isomers, than the gross amount. The diet of rural children is low in fibre, antioxidants and some trace elements.

In compliance with the WHO report, overweight and obesity is a serious problem in Europe. It is estimated that over 14 million children in the UE are overweight, including 3 million of whom are obese [27].

In 1994-1995 in Poland, population studies were carried out which covered children and adolescents aged 6-17. Overweight was observed in 8.7%, while obesity in 3.4% of the children and adolescents examined. An excessive body weight was found in girls. These percentages were higher in the urban than rural areas [28].

In the presented study, overweight was noted in 51.6% and obesity in 48.4% of the examined schoolchildren who had an excessive body weight. This shows that among 2,165 schoolchildren examined, 13.5% had an excessive body weight.

The more obese the children, the worse the quality of their life. According to the WHO, physical, psychical and social wellbeing contribute to the health-related quality of life [29]. These gradually deteriorate with an increase in the BMI, when a child exceeds a weight which is an average weight for his/her age group. This is clearly evident in the case of obese children, who are usually characterized by low physical activity, spend free time in a passive way, and are susceptible to stressful situations (many of them suffer from depressive states), or use stimulants [30]. The WHO reports that in Poland, 6% of children and adolescents attending elementary and secondary schools are overweight, while 4% are obese. If similar trends continue to be maintained in the future, it is estimated that in 2020 one-third of the adult population will be obese [31, 32].

Since 2006 in Poland, a population programme 'Keep Fit' has been carried out which promotes a balanced diet and physical activity. In 2009, population studies were conducted to evaluate the results of this project [33]. Only three years after implementation of the project it was noted that the participating adolescents more often consumed vegetables and salads, more rarely snacked during the day, and performed physical exercises. Since 2010, this programme has been expanded by the participation also of parents. The 'Keep Fit' project has been considered by the European Union as the most comprehensive and most effective programme in the area of control of overweight and obesity.

CONCLUSIONS

1. A considerable percentage of children and adolescents in the study had an inadequate diet.
2. The majority of respondents preferred passive leisure.
3. In the group of obese respondents, a frequent occurrence of stressful situations was observed.
4. The lack of physical activity was dominant in the group of respondents with overweight.

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