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Comparison of occurrence frequency of nutritional status disorders among children of different age groups

Both obesity and body mass deficits are considered disorders of nutritional status. Obesity is a chronic disease that is caused by excessive supply of energy in relation to its demand. It may be a cause of many chronic diseases, mainly cardiovascular diseases, metabolic diseases, skeletal system abnormalities and premature development of atherosclerosis. On the other hand, insufficient supply of essential nutritive components leads to development of deficit states and in consequence to development of many diseases. (7).

Among children and adolescents relative body mass index (BMI) is used to evaluate underweight, overweight and the risk of overweight occurrence. Body mass with children changes together with age and body growth (5, 11). At the moment an increasing prevalence of obesity in childhood and adolescence is observed in the world (15). In Great Britain it is estimated that obesity occurs with 6% of pre-school age children and with 15% of 15 year-olds. (12, 13).

The aim of this study was to compare prevalence of nutritional disorders with children and adolescents of grammar schools and secondary schools of liberal education in Lublin.

MATERIAL AND METHODS

The study included 2,044 children selected at random: 1,140 girls and 904 boys at the age of 14–18 including: 1,096 pupils of grammar schools in Lublin (549 girls and 547 boys) at the age of 14–16 and 948 pupils of secondary schools of liberal education in Lublin (591 girls and 357 boys) at the age of 16–18.

Height and body mass of the studied were measured. Relative body mass index (BMI) was calculated using the formula BMI = weight (kg/height(m)2. The obtained values were compared to standards for age and sex using centile charts elaborated by the Institute of Mother and Child in Warsaw. As obese were considered children whose BMI value exceeded centile 97. States of body mass deficits were recognised; BMI values of the studied children were below centile 3.

RESULTS

Height and body mass of the studied boys and girls were measured and relative body mass index was calculated. (Table 1, Table 2). The conducted study showed that average values of BMI index in all age groups of the studied children were between centile 25 and 75.

Table 1. Parameters of physical development of girls from schools in Lublin

Parameters	Age in years	Min.-max.	Average value	Standard deviation	Centile channel
Height (in cm)	14–15	142.0–185.0	162.5	6.0	50–75
	16–18	151.0–185.0	165.5	5.7	50–75
Body mass (in kg)	14–15	32.0–108.0	53.4	10.3	50–75
	16–18	47.0–95.0	57.1	8.3	50–75
BMI (kg/m^2)	14–15	15.0–35.1	20.5	2.2	50–75
	16–18	11.7–31.4	20.7	2.7	50–75

Table 2. Parameters of physical development of boys from schools in Lublin

Parameters	Age in years	Min.-max.	Average value	Standard deviation	Centile channel
Height (in cm)	14–15	143.0–191.0	168	8.32	25–50
	16–18	156.0–198.0	177.8	6.3	50–75
Body mass (in kg)	14–15	30.0–120.0	57.4	11.9	50–75
	16–18	43.5–110.0	67.4	10.4	25–50
BMI (kg/m^2)	14–15	12.7–33.9	20.3	2.0	50–75
	16–18	13.0–32.7	21.3	2.9	50–75

Obesity was most often observed with 15-year-old children (6% of girls and 5.9% of boys). Obesity features the least often occurred in the age group of 16–18 (0.5% of girls and 1.7% of boys). (Fig. 1). Body mass deficits were most often observed in the group of 14 year-olds (7.7% of girls and 5.3% of boys), and least often in the group of adolescents at the age of 16–18 (0.5% of girls and 5% of boys). (Fig. 2.) In the group of 14 and 15-year-olds both features of obesity and body mass deficits occurred more often with girls than with boys. Only in the group of secondary school children at the age of 18, disorders of physical development parameters were observed more often in the group of boys.

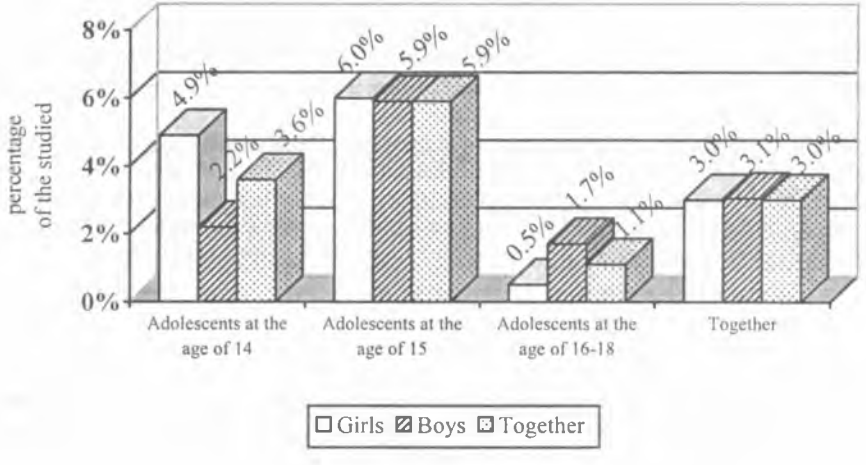

Fig. 1. Prevalence of obesity among adolescents from schools in Lublin

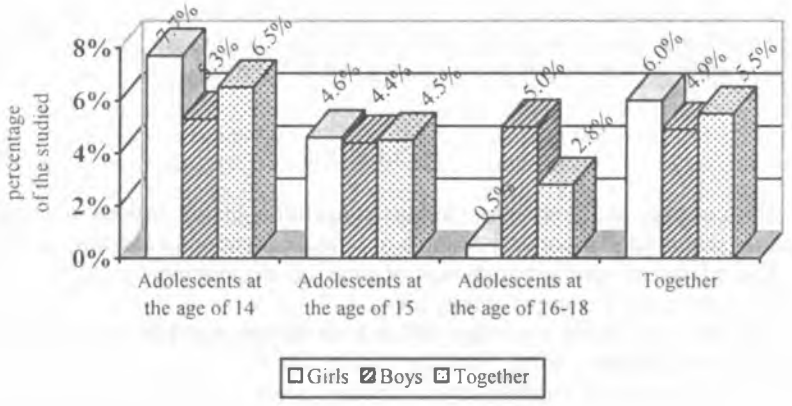

Fig. 2. Prevalence of body mass deficits among adolescents from schools in Lublin

DISCUSSION

Obesity is a disease conditioned by many factors. Its occurrence and development is influenced by genetic and environmental factors. The influence of genetic factors is estimated for 35–40% and environmental factors for 25–48% (1). Obesity is a major problem of health because of numerous medical complications that result from this disease. Research shows that about half of obese children become obese adults, which increases the risk of other degenerative and chronic diseases in adulthood (2). Consequences of obesity may be motor development disorders, motor system overload, disorders of psychosocial development (complexes, the feeling of inferiority, cardiovascular diseases, hypertension, metabolic diseases (hyperlipidaemia, diabetes), liver diseases (steatosis with inflammatory state), neoplastic diseases (breast carcinoma), abnormalities in skeletal system (aseptic necrosis of coxa), deformation of bones (varus deformity or valgity), the risk of obesity maintenance in adulthood (four times greater than with children without overweight) and of premature development of atherosclerosis (10, 11). A consequence of obesity is also pulmonary incompetence, which may even cause death of an obese child who breathes incorrectly during sleep (6).

Boys and girls have different motivations for a considerable physical effort. With boys they are more often related to striving after increasing the muscular mass. A lot of research showed that physical activity, especially when continued for many years, favoured lower fat amount in the organism and lowered the risk of obesity (3, 4, 14). Girls more often increase their physical activity during slimming diet (8).

The study compared such parameters as height, body mass and BMI index among adolescents of grammar schools and secondary schools of liberal education in Lublin. Analysing the study concerning disorders of physical development parameters (9) and studies of other authors it was stated that they more often occur in younger age groups and they refer mainly to girls. Body mass deficits were greatest at the age of 14 with girls (7.7%) with boys (5.3%) and lowest with girls at the age of 16–18 (0.5%) and with boys at the age of 15 (4.4%). Obesity occurred most often with adolescents at the age of 15 equally with girls (6.0%) and boys (5.9%). The least frequently obesity occurred with adolescents at the age 16–18, with girls (0.5%), with boys (1.7%). In the case of secondary school adolescents the parameters of physical development were more disturbed with boys than with girls. In studies concerning the evaluation of physical development parameters of grammar school children from Mysłowice (9) the obtained results concerning body mass deficits with children at the age of 14 were similar. But in the same age group obesity occurred in Mys-

łowice with 6.3% of girls and 3.5% of boys and in the research conducted in grammar schools of Lublin the observed values were lower 4.9% with boys and 2.2% with girls.

We should widespread educational activities aiming at shaping pro-health behaviour among children and adolescents in order to prevent obesity and deficit states.

CONCLUSIONS

1. Both obesity and body mass deficits constitute a major problem among students of grammar schools and secondary schools of liberal education in Lublin.
2. Disorders concerning parameters of physical development more often occur in younger age groups and concern mainly girls.
3. Among adolescents at the age of 18, both obesity and body mass deficits more often occur in the group of boys.
4. It is necessary to widespread educational activities aiming at formation of pro-health behaviour among children and adolescents as an effective prevention of obesity and deficit states.

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SUMMARY

Both obesity and body mass deficits are considered disorders of nutritional status. Obesity is a chronic disease that is caused by excessive supply of energy in relation to its demand. It may be a cause of many chronic diseases, mainly cardiovascular diseases. On the other hand, insufficient supply of essential nutritive components leads to development of deficit states and in consequence to development of many diseases. The aim of the study was to compare prevalence of nutritional disorders with children in the group of 14–15-year-olds and 16–18-year-olds. The study included 2,044 children (1,140 girls and 904 boys) at the age of 14–18. Measurements of height and body mass were taken and from the obtained data a relative body mass index (BMI) was calculated. The obtained results were then related to age standards contained in centile charts elaborated by the Institute of Mother and Child in Warsaw. The conducted study showed that average values of BMI index in all age groups of the studied children were between centile 25 and 75. Obesity was most often observed with 15–year-old children (6% of girls and 5,9% of boys). Obesity features the least often occurred in the age group of 16–18 (0.5% of girls and 1.7% of boys). Body mass deficits were most often observed in the group of 14 year-olds (7.7% of girls and 5.3% of boys), and least often in the group of adolescents at the age of 16–18 (0.5% of girls and 5% of boys). In the group of 14 and 15-year-olds both features of obesity and body mass deficits occurred more often with girls than with boys. Only in the group of secondary school children disorders of physical development parameters were observed more often in the group of boys. The conducted studies allowed isolation of a group of children that requires keen observation and indicated the necessity of widespread educational activities aiming at formation of pro-health behaviour with children and adolescents.

Porównanie częstości występowania zaburzeń stanu odżywienia u dzieci w różnych grupach wiekowych

Za zaburzenia stanu odżywienia uznaje się zarówno otyłość, jak i niedobory masy ciała. Otyłość jest przewlekłą choroba, która spowodowana jest nadmierną podażą energii w stosunku do jej zapotrzebowania. Może ona być przyczyną wielu schorzeń, głównie układu sercowo-naczyniowego. Zbyt mała podaż niezbędnych składników odżywczych prowadzi natomiast do powstania stanów niedoborowych, a w konsekwencji do rozwoju wielu chorób. Celem pracy było porównanie częstości występowania zaburzeń odżywienia u dzieci w grupie 14–15 latków i 16–18-latków. Badaniami objęto 2044 dzieci (1140 dziewczynek i 904 chłopców) w wieku od 14 do 18 lat. Dokonano pomiarów wzrostu i masy ciała, a z uzyskanych danych obliczono wskaźnik względnej masy ciała (BMI). Otrzymane wyniki odniesiono do norm wiekowych, zawartych w siatkach centylowych opracowanych przez Instytut Matki i Dziecka w Warszawie. Przeprowadzone badania wykazały, że średnie wartości wskaźnika BMI we wszystkich grupach wiekowych badanych dzieci kształtowały się w kanale między 25 a 75 centylem. Otyłość najczęściej obserwowano u dzieci 15-letnich (6% dziewcząt i 5,9% chłopców). Najrzadziej cechy otyłości występowały w przedziale wiekowym 16–18 lat (0,5% dziewcząt i 1,7% chłopców). Niedobory masy ciała najczęściej obserwowano w grupie 14-latków (7,7% dziewcząt i 5,3% chłopców), najrzadziej zaś w grupie młodzieży w wieku 16–18 lat (0,5% dziewcząt i 5% chłopców). W grupie 14 i 15-latków zarówno cechy otyłości, jak i niedoborów masy ciała występowały częściej u dziewcząt niż u chłopców. Jedynie w grupie młodzieży licealnej zaburzenia parametrów rozwoju fizycznego częściej obserwowano w grupie chłopców. Badania pozwoliły na wyodrębnienie grupy dzieci wymagającej wnikliwej obserwacji i wskazują na konieczność rozszerzenia działań edukacyjnych, mających na celu kształtowanie zachowań prozdrowotnych dzieci i młodzieży.