ANNALES
UNIVERSITATIS MARIE CURIE-SKLODOWSKA
LUBLIN-POLONIA
VOL. LVIII, N 2, 165 SECTIO D 2003

Department of Hygiene, Medical University of Lublin

ILONA OLEJARNIK, GRZEGORZ BORZĘCKI,
MAGDALENA KOWALSKA, ANDRZEJ BORZĘCKI

Selected parameters of physical development of youth from secondary schools of Lublin

Proper physical development is one of the standards of health and appropriate adjustment to environmental conditions. The process can be disturbed under the influence of disadvantageous endogenous and exogenous factors. Physical development parameters are strongly affected by nutritional habits and the applied diet. One of the most frequently found nutritional disorder in children is simple obesity, which constitutes a serious risk factor of a number of diseases (4). Obesity is defined as excess fatty tissue ratio to non-fat body mass. In children the fatty tissue content in organism depends on age and sex. The most frequent variety of obesity (about 98%) is simple obesity appearing as a result of consuming too many calories as opposed to calories expenditure (2). Overweight is defined as excess body mass within 10–25% in relation to age and sex determined on the basis of population specific percentile grids. Obesity is excess body mass over 25% in relation to age and sex determined on the basis of population specific percentile grids. A child's obesity is identified when the BMI exceeds 97 percentile. Values within 90–97 percentile conform to overweight (2, 6).

In both youth aged 18 and adults the border BMI is accepted to be: 25–29.9 for overweight; 30–34.9 for obesity of the 1st degree; 35–39.9 for obesity of the 2nd degree; 40 and above for obesity of the 3rd degree (2,10).

The aim of this research was to assess the parameters of physical development and evaluate the occurrence of overweight and obesity in secondary school youth.

MATERIAL AND METHODS

Research was performed on a group of 948 healthy children aged 16–18 (591 girls and 357 boys) all Lublin's secondary schools students. The researched children's current body mass and height were evaluated. Relative body mass index (BMI) was calculated as square body mass (in kg) to height (in m) ratio. The obtained figures were related to age norms contained in the centile grids designed by the Mother and Child Institute (Instytut Matki i Dziecka) in Warsaw.

RESULTS

Body mass of the researched girls varied from 47 kg to 95 kg, the average being 57.1 kg and stayed within the weight centile channel of 50–75. The girls' height was measured to range from 151 cm to 185 cm, the average being 165.8 which stayed in the height centile channel of 50–75. For boys' the body mass ranged from 43.5 kg to 110 kg the average being 67.4 kg (25–50 centile). The boys' height varied from 156 cm to 198 cm, the average being 177.8 cm which corresponded to 50–75 height centile channel. An average BMI in girls was 20.7 and in boys – 21.3 (Tab. 1).

Table. 1. Parameters of physical development in Lublin's secondary school students

	Groups	Min. – max.	Mean	SD	Percentiles
Height (cm)	girls	151 - 185	165.8	5.7	50 - 75
	boys	156 - 198	177.8	6.3	50 - 75
Body mass (kg)	girls	47 - 95	57.1	8.3	50 - 75
	boys	43.5 - 110	67.4	10.4	25 - 50
BMI (kg/m^2)	girls	11.7 – 31.4	20.7	2.7	50 - 75
	boys	13.0 – 32.7	21.3	2.9	50 - 75

The research showed that 6.1% of girls and 6,7% of boys of Lublin secondary schools had overweight. Obesity was identified in 0.5% of the researched girls and 1.7% boys. Moreover, body mass deficiency was found in 0.5% of girls and 5% boys (Fig. 1).

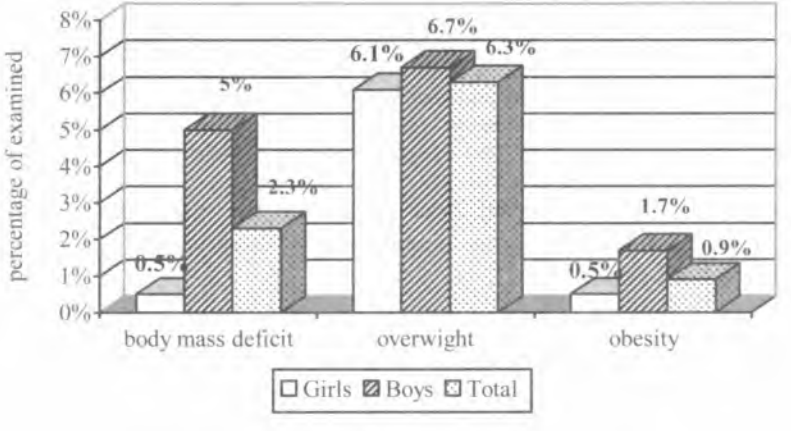

Fig. 1. The occurrence of nutritional irregularities in Lublin's secondary schools youth

DISCUSSION

Disadvantageous influence of obesity on general health condition was once and for all confirmed. Excess body mass causes emotional, carbohydrate balance and lipidic disorders, hypertension and diabetes. Considering its occurrence and remote health consequences, obesity

is classified as a civilizational disease (4). In highly-developed countries obesity is diagnosed in an average of 8–15% of children, and in the USA in as many as 25% of children (5). Recently a steadily rising tendency is being observed. Research by many authors reveals that in Poland overweight concerns about 15% of children and youth, including 5% with obesity (1,2). According to this research, intensification of the phenomenon was a little weaker. Overweight was found to concern 6.3% and obesity 0.9% of Lublin's secondary schools youth. It is worth noting that only those secondary school students were researched whose curriculum included environmental biology with elements of hygiene which covered, among other things, the rules of proper nutrition. Most students came from the intelligentsia with a satisfactory financial status. Swedish authors reveal in their research that obesity occurs more frequently in children from families with a lower economic status than in those whose families are better-off. The reason is probably greater consumption of carbohydrate and fat rich products (3). A number of other researchers confirm the influence of habits and following family traditions that are harmful to health upon nutritional behaviours (9).

In this research excess body mass was observed more frequently in boys than in girls. Body mass deficiency concerned 2.3% of the researched children and again was identified more often in boys (5%) than in girls (0.5%). This, however, could be a result of a growing concern in adolescent girls to keep a good figure. Proper nutrition, physical activity, body shaping exercises are a more and more widely preferred lifestyle. This is further confirmed in other authors' research results (10). In younger children, overweight concerns girls more often than boys (6,8). Research evaluating the parameters such as height, body mass or the BMI are crucial in assessing physical development and general health condition in the researched children. It enables early diagnosis of the disorder of physical development rate, obesity proneness and it ought to result in diagnostic and therapeutic actions. The role of the therapeutic team treating obesity is also to educate in order to promote pro-health behaviours (1).

CONCLUSIONS

1. Obesity is found in 0.9%, overweight in 6.3% and body mass deficiency in 2.3% of youth aged 16–18 from Lublin's secondary schools.
2. Disorders in the parameters of physical development are found in boys more often than in girls.
3. Educational activity on a wider scale meant to develop healthy behaviours in secondary school youth is highly advisable.

REFERENCES

1. Buczek S.: Zmiana wskaźników nadwagi u dzieci z obesitas simplex leczonych dietą redukcyjną w krótkim okresie obserwacji. Ped. Pol., 77, 5, 403, 2002.
2. Kopelmann P. G.: Obesity as a medical problem. Nature, 404, 635, 2000.
3. Kozieł S., Kołodziej H.: BMI i frakcje względnie otyłych chłopców i dziewcząt w wieku 13-15 lat. Ped. Pol., 74, 10, 991, 1998.
4. Pediatria, pod red. K. Kubickiej, W. Kawalec, PZWL, Warszawa 1999.
5. Lissau-Lund-Sorensen. I., Sorensen T. I.A.: Prospoective study of the influence of sicial factors in childhood on risk of overweight in young adulthoody. Int. J. Obes.,16, 169, 1991.
6. Livingstone B.: Epidemiology of childhood obesity in Europe. Eur. J. Pediatr., 159, (supl. 1) 14, 2000.

7. Oblacińska A. Wrocławska M., Woynarowska B.: Częstość występowania nadwagi i otyłości w populacji w wieku szkolnym w Polsce oraz opieka zdrowotna nad uczniami z tymi zaburzeniami. Ped. Pol., 72, 3, 241, 1997.
8. Rymkiewicz-Kluczyńska B. et al.: Otyłość u dzieci i młodzieży. Pediatria Medipress, 5, 1, 3, 1999.
9. Smoraczewska-Czupryńska B. et al.: Ocena występowania nadwagi i otyłości u dzieci szkół podstawowych Białegostoku i okolic. Przegl. Ped., 30, 4, 304, 2000.
10. Socha P., Socha J.: Otyłość prosta i możliwości jej zapobiegania. Ped. Pol., 78, 1, 7, 2003.

SUMMARY

The purpose of the study was to assess physical development parameters in teenagers. The study comprised 948 healthy teenagers aged 16–18 years (591 girls and 357 boys) attending secondary schools in Lublin. The current body mass and body height of the examined teenagers were assessed and compared to reference values expressed in percentiles and elaborated by Mother and Child Institute in Warsaw. Body mass indices were also calculated. In girls the body mass ranged from 47.0 to 95.0 kg. The mean value of body mass was 57.1kg and it was located within 50–75 percentiles. Body height ranged from 151 to 185 cm. The mean value of body height was 165.8 cm and it was located within 50–75 percentiles. In boys, the body mass ranged from 43.5 to 110.0 kg. The mean value of body mass was 67.4kg and it was located within 25-50 percentiles. Body height ranged from 156 to 198cm. The mean value of height was 177.8 cm and it was located within 50-75 percentiles. The mean body mass index in girls was 20.7 and in boys it was 21.3. Obesity was diagnosed in 0.9% and overweight in 6.3% of the examined teenagers. 2.3 % of the examined teenagers had body mass deficit.

Wybrane parametry rozwoju fizycznego młodzieży ze szkół średnich miasta Lublina

Celem badań była ocena parametrów rozwoju fizycznego u młodzieży w wieku licealnym. Badaniami objęto 948 zdrowych dzieci w wieku 16–18 lat (591 dziewczynek i 357chłopców), uczniów z lubelskich liceów ogólnokształcących. Oceniano masę ciała i wysokość badanych. Uzyskane wartości odnoszono do norm wiekowych zawartych w siatkach centylowych opracowanych przez Instytut Matki i Dziecka w Warszawie. Obliczano także wskaźnik względnej masy ciała (BMI). Przeprowadzone badania wykazały, że masa ciała dziewcząt wahała się w granicach od 47,0 do 95 kg, średnio 57,1kg i mieściła się w kanale centylowym 50–75. Wysokość dziewcząt kształtowała się w granicach od 151 do 185 cm, średnio 165,8, co odpowiadało centylom 50–75. U chłopców masa ciała wynosiła od 43,5 do 110,0 kg i wynosiła średnio 67,4 kg (25–50 centyl). Wysokość chłopców kształtowała się na poziomie od 156,0 do 198,0 cm, średnio 177,8 cm, co odpowiadało 50–75 centylowi. Średnia wartość wskaźnika BMI wynosiła u dziewcząt 20,7, a u chłopców 21,3. Wśród badanych dzieci 0,9% uznano za otyłe, 6,3% miało nadwagę, a 2,3 % było z niedoborem masy ciała.