

STUDIES IN PHYSICAL CULTURE AND TOURISM
Vol. 13, No. 2, 2006

JAN FENCZYN, CZESŁAW SZMIGIEL

ATTITUDE TOWARDS PHYSICAL ACTIVITY AMONG BOYS AND GIRLS WITH SIMPLE OBESITY

Key words: simple obesity, young people, physical activity, physical education, adolescence.

ABSTRACT

The aim of the study was to establish whether sex constituted a factor that differentiated physical activity amongst young people with obesity (simple obesity), and amongst non-obese young people during PE classes and during their free time outside school. A subject group of 300 individuals was examined. The experimental group (group E) comprised 75 girls and 75 boys, pupils of primary, lower-secondary and secondary schools from large towns in Poland (Cracow, Katowice, Rzeszów) who suffered from simple obesity. The control group (group C) equaled 150 pupils from the same schools selected at random from among individuals that fitted between 25 and 75 percentiles according to a percentile weight-height grid. The attitudes of the young people towards compulsory physical exercises and active movement outside of school were tested by means of an original questionnaire developed by the authors. The results of the research show that overweight young people of both sexes attempt more often to avoid physical activity (movement) than their non-obese peers, both during physical education classes and outside school. Sex turned out to be a factor that differentiated attitudes towards physical activity. Almost total avoidance of physical activity by obese girls as compared with obese boys was observed. The boys to a greater extent than the girls, did engage in physical exercise. The results of the research show the necessity for increased interaction to strengthen motivation to take up physical activities by obese pupils, particularly girls. What is also worth considering is one's potential for physical fitness amongst young people when choosing activities, which becomes limited due to existing obesity.

INTRODUCTION

Simple obesity is considered to be one of the diseases of modern civilization. It has even been perceived by certain authors [15] in pandemic categories in the United States and other countries with high standards of living.

Genetic disposition, environmental and behavioural factors together with the specific psyche of the individual have been shown as reasons for the incidence of simple obesity [7, 9, 10, 16, 28, 30]. Simple obesity is a consequence of excessive intake of food, higher than the actual needs of the body, with a simultaneous limitation in the subject's

physical activeness [5]. The participation of endocrinological and neurological factors in simple obesity, which lies at the basis of secondary obesity, has so far not been confirmed [27]. Amongst obese children and young people, simple obesity constitutes about 95% cases [18]. According to Radoszewska [29] the 'somatic defect' of obesity influences the psychic functioning of young people and determines their emotional and social behaviour, which is also emphasized by other authors [33, 40, 41].

Obesity, as it is particularly emphasized in British and American literature, is connected with the appearance of psychic traumas which may lead

to the occurrence of mental disturbance manifesting itself in fears and different forms of youth depression [12, 17, 22]. Obesity affects physical attractiveness [19]. The links between physical attractiveness and the results of sociometric tests have already been noticed in pre-school age children [43]. This dependence becomes particularly intensified during adolescence. At this age visual appearance becomes a significant factor that is responsible for the acceptance and popularity of an individual within a peer group [3, 4, 11, 42].

The reactions of obese and non-obese young people to self-evaluation of the appearance of their own bodies are varied. Among obese individuals one witnesses personality defence mechanisms [9], including denial and compensation. The working of these mechanisms can only partially reduce the existing sense of psychic discomfort and difficulty associated with the adaptability of the individual to a peer group.

A clear unwillingness to undertake and do physical activities is also observed among obese young people [37, 49]. Raudsepp and Jürimäe [31] claim that obese boys and girls are less physically active than their non-obese peers. Waxman and Stunkard [44] confirm the above observations amongst boys but have not shown any differences in general energy expenditure between lean and obese children.

The reduced physical activeness (PA) among obese individuals may additionally be connected with their attitude towards PA. Research conducted by Kenrick, Ball and Canary [14] during supervised PA allowed for the observation and classification of obese individuals as apathetic towards and bored by the undertaken effort. Research into the psychological conditions of physical activeness can account for the cognition of the motives for its undertaking [48]. Yet the influence of motivation on the level of PA among children and adolescents has not been clearly established [2, 32, 37].

The aim of this work is to establish whether there is a relation among young people with simple obesity, boys and girls in the early stage of adolescence, with sporting recreational activities during compulsory physical education classes at school as well as with spontaneous recreational activeness and sport outside school. Physical education classes at school constitute for 60-70% of children and adolescents in Poland the basic and only form of organized systematic routine of physical activity [49].

The research questions concerned the following areas of behaviour:

1. The relation to compulsory physical education classes, difficulties encountered by the surveyed individuals in carrying out the exercises, the reaction of the respondents and their colleagues to these difficulties.
2. The relation of the individuals under study to spontaneous recreational and sporting activities outside school.
3. The ways of spending free time on the part of the respondent's family.
4. The actual ways in which the subjects spend their free time.

The data gathered was converted into percentages which were subject to statistical analysis. The significance of the differences between the groups was calculated using a test for two structural components, equally called the 'U' test [13].

METHODS

A total group of 300 subjects was examined. The experimental group (group E) consisted of 75 girls and 75 boys, pupils of primary, lower-secondary and secondary schools with simple obesity from large towns in Poland (Cracow, Katowice, Rzeszów). The control group (group C) was made up of 150 pupils from the same schools selected at random from among individuals that fitted between 25 and 75 percentiles according to a percentile weight-height grid. Each of the sex groups were further divided into three 25-person age groups (12, 14 and 16). Simple obesity within group E was confirmed on the basis of anthropometric measurements and pediatric research; the composition of group E comprised individuals whose body weight amounted to more than 95 percentiles according to the percentile weight-height grid. They were patients of a pediatric outpatient clinic who had started diagnostic treatment for already existing simple obesity as well as young people with simple obesity that had been detected during selective tests conducted in schools.

The anthropometric measurements included body height and weight as well as the thickness of fat folds measured in three places: under the shoulder, on the belly and on the triceps of the shoulder. The measurements of body height and weight were carried out using medical scales with a height gauge; the thickness of the fat folds was measured with a fold measuring instrument. The

calculated BMI was compared to the percentile BMI grid. As 'overweight' were taken BMI values greater or equal to 85 percentiles, and lower than 95; while as 'obese' were taken BMI values of equal to or exceeding 95 percentiles for sex and age. The BMI amongst children and young people changes dynamically depending upon age and body height; therefore, there is also the need to employ the appropriate percentile grids for BMI. It is not possible to utilize the interpretation of the BMI index for adults in young people for the due body weight during adolescence significantly differs from the due body mass of a grown individual of the same height, yet which amongst young people is significantly lower. The criteria established for obesity in children following the Clinical Guidelines for Overweight in Adolescent Preventive Services [1, 35] for screen tests in clinical practice are based on the percentile weight-height grids for BMI.

The attitudes in relation to physical activity amongst the young people under study were evaluated on the basis of data derived from an original questionnaire on physical activeness.

RESULTS

Table 1 presents the values of the 'U' test calculated for inter-group comparison of physical activeness during physical education classes at school and spontaneous activeness outside school for young people with simple obesity (questions 1-16 and 35)

Pupils from groups K, both boys and girls, were significantly more willing than the subjects from group E ($p=0.01$) to take part in physical education classes at school (question 1).

In group E girls far more frequently than boys displayed a decisive unwillingness with regard to physical education ($p=0.05$) (question 2).

The boys and girls from group E, significantly more often than subjects from group K ($p=0.01$), were unwilling to participate in physical education classes (question 3).

Equally in group E a clearly higher percentage of girls than boys ($p=0.05$) admitted that during physical education classes there were exercises which they especially did not like to perform (question 4). Both boys and girls from group E indicated statistically more often than their counterparts from group K ($p=0.01$) the presence of

exercises they disliked within the school physical education curriculum (question 4).

Pupils from groups E and K admitted that they disliked difficult exercises to a significant extent; in the inter-group comparisons (E/K) for the appropriate sex groups statistically significant differences were observed (both at $p=0.01$), while always more individuals from groups E than K indicated their unwillingness to perform exercises considered by them to be difficult (question 5).

In group E, boys far more often ($p=0.01$) than girls admitted that they were unable to perform difficult exercises (question 6). While in group K girls far more often ($p=0.01$) than boys stated that difficult exercises exceeded their capabilities of performing them (question 7).

Statistically significant differences were also present in the comparisons between the male groups; obese boys more often ($p=0.01$) than non-obese boys were of the view that they could not manage to do difficult exercises (question 7).

In response to the question what view was held by the boys as to the lack of possibility to do difficult exercises, the girls from group E significantly more often than boys ($p=0.05$) assumed that their female counterparts were of the same opinion as they were (question 8). The results of the inter-group comparison (E/K) indicate that, generally, young obese people more often subscribe to their colleagues' opinions convergent with theirs (girls $p=0.01$; boys $p=0.05$) (question 8).

The frequency of the choice of gymnastics as the favourite form of activity proves that gymnastics is more favored by girls and boys from group K (in both cases $p=0.01$) than from group E (question 9).

In group K ($p=0.01$) non-obese girls chose games and movement activities more frequently, while obese girls from group E were inclined to take part in games and activities significantly less often ($p=0.01$) than their female counterparts from group K (question 10).

Exercises involving elements of competition are more preferred by boys than girls in both groups E and K (a significant difference in both cases) ($p=0.01$) (question 11). Boys from group K more often ($p=0.01$) than their peers from group E chose exercises with elements of competition (question 11).

Other forms welcome by young people during physical education classes turned out to be extremely diverse and clearly dependant on sex. The girls often indicated their preference of ball-

Table 1. The values of the U test calculated for inter-group comparisons of percentage indices of subjects' participation in physical education classes as well as active movement performed outside school

Question	Group average				Test U			
	Group E		Group C		♀E/♀C	♂E/♂C	♀E/♂E	♀C/♂C
	\bar{x} ♀	\bar{x} ♂	\bar{x} ♀	\bar{x} ♂				
1. I like physical education (PE) classes	57.33	66.66	89.33	84.66	-5.120	-2.970	-1.396	0.983
2. I am indifferent to PE	9.33	13.33	5.33	10.66	1.086	0.581	-0.892	-1.391
3. I don't like PE	33.33	20.2	5.33	5.33	5.017	3.121	2.132	0.000
4. There are exercises during PE that I don't like doing	53.33	38.66	18.66	14.66	5.113	3.840	2.083	0.760
5. Exercises you dislike cause you problems (yes)	41.33	38.66	18.66	13.33	3.503	4.085	0.358	1.028
6. Have you tried to do difficult exercises (yes)?	42.66	53.33	50.0	57.33	-1.041	-0.568	1.511	-1.039
7. I think I can't do difficult exercises (yes)	48.0	73.33	44.66	14.66	0.473	8.369	-3.671	4.651
8. My peers agree that I can's do difficult exercises (yes)	38.66	26.66	23.33	16.0	2.347	1.841	1.809	1.304
9. During PE I like gymnastics the best	8.0	12.0	44.0	33.33	-5.806	-3.603	0.943	1.550
10. During PE I like team games the best	50.66	44.0	70.66	48.0	-2.895	-0.568	-0.943	3.265
11. I like exercises with an element of competition	13.33	42.66	18.66	70.66	-1.028	-4.000	-4.626	-7.396
12. I like other exercises	16.0	17.33	37.33	49.33	6.685	8.810	-0.252	-1.714
13. What exercises do you find the most difficult (a)?	58.66	66.66	13.33	6.66	4.692	3.344	-1.169	1.576
14. What exercises do you find the most difficult (b)?	41.33	33.33	12.0	13.33	2.752	4.770	1.156	-0.383
15. If you don't like doing PE, why (a)?	36.0	40.0	18.66	10.66	6.718	4.957	-0.583	1.600
16. If you don't like doing PE, why (b)?	64.0	60.0	17.33	25.33	-0.335	-0.697	0.583	-1.381

* p = 0.05

** p = 0.01

room, folk and disco dancing, but also equally of weight lifting and swimming. Boys, however, preferred elements of combat sports, body building, swimming and competitive sports (question 12). In group K the boys more often ($p=0.05$) expressed their preferences towards different forms of exercise than the girls. Both the girls and the boys from groups E expressed more often ($p=0.01$) their need of other forms of physical activity during PE classes than pupils from group K (question 12).

The young people under study indicated exercises that constituted the greatest difficulty to them. They were press ups, handstands, bridges, and the splits (questions 13 and 14). In group K the boys significantly more often ($p=0.05$) than the

girls indicated the mentioned exercises to be difficult. In group E these exercises caused more difficulty for obese subjects than for their non-obese peers ($p=0.01$ question 15). The second group of difficult exercises encompassed sit-ups, knee bends, somersaults and forward rolls. Girls significantly more often than boys pointed to these exercises as being difficult.

The lack of gym kit was also mentioned by the subjects as a reason for their lack of willingness towards PE classes. This argument occurred more often in the female groups ($p=0.01$) than the male ones.

Other reasons for the lack of enthusiasm for physical education at school and outside it were

poor physical condition, laziness, the effort involved and abashment.

Table 2 shows the values of a test calculated for inter-group comparisons concerning the models of recreational behaviour and ways of spending free time in the family (questions 17-34).

The families of young people from groups E and K rarely practice sport in their free time (questions 17 and 18); this particularly refers to the fathers. The mothers of obese boys do sport significantly more often ($p=0.01$) than mothers of lean boys.

Table 2. The values of the U test calculated for inter-group comparisons of percentage indices concerning the models of recreational behaviour amongst young people with simple obesity and their spending of free time

Question	Group average				Test U				
	Group E		Group C		φ_E/φ_C	δ_E/δ_C	φ_E/δ_E	φ_C/δ_C	
	\bar{x} ♀	\bar{x} ♂	\bar{x} ♀	\bar{x} ♂					
1. Does your father do any sport in his free time (yes)?	8.0	6.66	9.33	9.33	0.675	-1.266	0.015	0.000	
2. Does your mother do any sport in his free time (yes)?	2.66	2.66	1.33	6.33	1.652	**	0.000	-0.027	
3. Do you do any sport with your mother or father (yes)?	2.66	10.66	0.0	1.33	*	**	*	-1.166	
4. Parents allow you to decide how to spend your free time (yes)	46.66	58.66	62.66	77.33	*	**	*	*	
5. Usually yes	36.0	30.66	21.33	14.66	2.295	2.702	-1.699	-2.263	
6. Usually no	17.33	10.66	16.0	8.0	0.252	0.647	1.361	1.228	
7. In your family, is time at weekends, holidays spent altogether?	86.66	76.0	77.33	72.0	*	0.645	*	*	
8. b) alone	13.33	32.0	22.66	28.0	*	-0.645	-1.934	-0.866	
9. In spending time together we most often: have guests – go visiting	21.33	28.0	20.0	20.0	0.235	1.326	-1.095	0.000	
10. b) go on a trip	44.0	37.33	30.66	34.66	**	4.418	0.393	0.961	
11. c) watch TV	44.0	37.33	25.33	29.33	**	2.778	1.201	0.961	
12. d) go for a walk in the town	29.33	13.33	33.33	18.66	-0.610	1.028	**	**	
13. e) go to work on the allotment	10.66	13.33	6.66	8.0	1.007	1.222	-0.581	-0.364	
14. f) do extensive homework	35.33	9.33	12.0	4.0	**	2.423	1.514	**	
15. g) sit at home, talking, reading books	32.0	25.33	14.66	1.33	**	2.899	**	**	
16. i) argue	8.0	5.33	14.66	6.666	-1.486	-0.397	1.043	3.480	
17. j) go to the cinema, theatre, concerts	8.0	6.66	5.33	2.66	*	1.283	0.738	*	
18. k) other forms of activity	8.0	4.0	4.0	5.33	*	2.238	1.342	0.364	
19. During your free time, do you do sport in clubs, outdoors, at a cultural center (institute)?	9.33	14.66	5.33	21.33	1.086	-1.228	-1.118	**	
								-3.333	

* $p = 0.05$

** $p = 0.01$

Obese girls significantly less often than obese boys ($p=0.05$) take part in the recreational-sporting activities of their parents (question 19). Both girls and boys from group E are significantly less likely ($p=0.01$) than pupils from group K to participate in the recreational activities of their parents (question 19).

In both groups E and K boys were given significantly more freedom than girls ($p=0.05$) by their parents in the choice of free time activities (question 20). Girls from group E significantly more often ($p=0.05$) than boys spend their free time with the family. Equally the girls from group E significantly more often ($p=0.05$) than their female peers from group K spend their free time together with their family (question 23).

A comparison of the ways of spending free time by obese young people of both sexes shows that girls significantly more often than boys choose such forms of activity as walks in the town ($p=0.01$ question 28) as well as doing extensive homework ($p=0.01$ question 30).

Girls from group K significantly more often than their other colleagues take walks around the town ($p=0.05$ question 29), do extensive homework ($p=0.05$, question 30) stay at home reading and talking to family members ($p=0.01$ question 31) and argue with those at home ($p=0.05$, question 31).

Obese girls significantly more often than their non-obese female colleagues take part in trips ($p=0.01$, question 26), do extensive homework ($p=0.01$, question 30), spend time at home talking and reading ($p=0.01$, question 31) as equally doing other activities ($p=0.05$) amongst which often mentioned were working on the computer and listening to music.

Obese boys significantly more often ($p=0.01$, question 31) than their lean peers spend time at home talking and reading.

DISCUSSION

Amongst young people with simple obesity aged 12-16 both sex body weight determine the subjects' attitudes to movement activity including activeness during physical education classes at school more than their non-obese peers' from the control group. These differences are statistically significant.

The results of our research show that young people with simple obesity (group E) attempt to avoid physical activity at school motivating their

actions by their dislike for physical education classes. Both girls and boys avoid physical activity outside school. The results obtained by us are convergent with the results of earlier studies by other authors [8, 21, 26, 31, 34, 44, 46].

Obese girls significantly more often than boys avoid physical activity; they do not like to participate in physical education classes at school. The motives for their behaviour, excluding those already indicated, are poor physical condition, shame of being laughed at, and laziness. Such behaviour on the part of the girls could (additionally) be connected, besides obesity, with the cultural tradition as well as with a different approach to bringing up girls than boys [11, 24, 46].

It can be concluded from the general opinions expressed by the subjects with simple obesity that there can be observed an increased fall in physical attractiveness, which is different from that experienced in the non-obese group. Because obesity is perceived by young people as a feature that is not attractive and negative, [30] the changes in behaviour connected with it become enhanced particularly during adolescence. This phenomenon is also conducive to excessive criticism that is characteristic for adolescents. This also results in a lack of acceptance of the appearance of one's own body [11, 42] among a significant percentage of non-obese young people (mostly girls).

In the search for the actual reasons for avoidance of movement activity amongst young people with obesity attention was drawn to the fact that in the opinion of the boys and girls with obesity there are physical education exercises at school which they do not like and which they are unable to do because they find them difficult. The first group of exercises indicated as causing the most difficulties to the young people included press ups, i.e. lifting the body up from a lying position by means of straightening out the arms and straightening the legs, repeated several times; maintaining a standing position on one's arms; bridges – the body is bent over in an arch with the shoulders downwards and supported on the hands and feet on the floor; and the splits – maintaining a sitting position with extended legs one forward and the other backwards. The second group of difficult exercises included sit ups, somersaults – jumps backwards through landing on ones hands and flips – backward head over jumps performed without any support.

It can be concluded from our research that girls and boys mostly like gymnastics, team games,

and exercises with elements of competition as well as other forms of simple gymnastics during their physical education classes.

According to Wojnarowski and Kozłowski et al. [49] participation in physical education classes constitutes a greater effort for young obese people than for their non-obese peers, which is reflected in a quickened heart beat. This can be connected with the existing excess in body mass which constitutes an additional burden during effort conducted chiefly in a straightened-out position (running, jumping and other exercises require the movement of the body through various positions and planes). One may also assume that a greater effort is connected with the reduced physical condition and with the reduced movement abilities amongst obese children requiring involvement of a larger group of muscles and reducing the coefficient of the usable work [49]. According to Parizkova [25] just small efficiency in effort may result in greater energy expenditure in individuals with a greater quantity of fat tissue.

Danielczuk et al. [5] noted lower participation of obese children in physical exercises of greater intensity, or in situations when such exercises exceeded the physical possibilities of obese children.

Our research has also shown that a very small percentage of the respondents' parents engage in any recreational-sporting activity in their free time. Consequently these young people are deprived of any models of active ways to spend their free time amongst their immediate family environment [23, 24, 38, 45]. Analogically, this opinion has been also presented by other authors [39].

A large number of authors [6, 20, 35, 36] have emphasized in literature that the negative behaviour of young people with simple obesity in relation to physical activity has its roots in the psycho-social aspects of obesity. Many times obese children and young people are rejected in their social environment, they do not experience acceptance within their peer groups at school, and sometimes they encounter a lack of acceptance on the part of teachers, which consequently increases within their behavioural reactions of psycho-social nature [47]. Rejection, lack of acceptance, shame in relation to their own appearance bring forth dislike towards themselves and their surroundings, low self-esteem, and unwillingness to participate in group sporting activities at school and spending their free time with their peers. The results of our

research substantiate also the behaviour of obese young people during physical education classes at school. During adolescence an affective disturbance occurs in young people with simple obesity [35, 36].

The correct treatment of adolescent obesity should be based upon dietary treatment (1500-1700 kcal per day), an increase in physical activity as well as behavioural therapy and psychotherapy. In order to reduce the body mass it is always necessary to achieve a negative energy balance.

The results of our research show the need to change the attitudes of obese young people towards physical activities undertaken during physical education classes. This change in attitude is equally valid for extracurricular recreational-sporting activities. This requires a breakdown of the barriers of shame and lack of faith prevalent amongst young people in relation to their own capabilities; as well as strong and long-lasting motivation to undertake physical activity and see it put into practice. The therapeutic approach adopted for obese girls should specifically take into account the individual nature of each case.

* The study was supported by authors' own funds.

REFERENCES

- [1] Arslanian S.A., Nutritional disorders, integration of energy metabolism and its disorders in childhood, (in:) M.A. Sperling, W.B. Saunders, eds, *Endocrinology*, Company Philadelphia, Pennsylvania, 1996, 19: 535-541.
- [2] Bar-Or., Physical activity and physical training in childhood obesity, *The Journal of Sports Medicine and Physical Fitness*, 1993, 33, 4: 323-329.
- [3] Birch A., Malim T., *Psychologia rozwojowa od niemowlęctwa do dorosłości (Developmental Psychology from Infancy to Adulthood)*, Wyd. PWN, Warszawa 1998.
- [4] Bryant P.E., Colman A.M., *Psychologia rozwojowa (Developmental Psychology)*, Wyd. Zysk i S-ka, Poznań 1997.
- [5] Danielczuk J., Charzewska J., Rogalska-Niedźwiedz M., Chabros E., Związek cech somatycznych z żywieniem i aktywnością fizyczną uczniów szkół warszawskich (The relation between somatic features and nutrition and physical activity of pupils in Warsaw schools, *Wychowanie Fizyczne i Sport*, 1987, 27 (3): 51-61.

- [6] Doleżał-Ołtarzewska K., Rybakowa M., Psychologiczne aspekty otyłości (The Psychological Aspects of Obesity), (in:) *Medycyna Wieków Młodzieńczego* (The Medicine of Adolescence), Wydawnictwo Medyczne Kraków, 2001, vol. 1: 156-163.
- [7] Fajęcka-Demińska E., Otyłość prosta – przyczyny, diagnozowanie (Simple Obesity – reasons, diagnosis) In: A. Oblacińska, B. Woynarowska, eds, *Obesity*, The Institute of the Mother and Child, Warszawa. 1995.
- [8] Fenczyn J., Szmigiel Cz., O potrzebie rehabilitacji młodzieży z otyłością prostą w wieku 12-16 lat (About the need of rehabilitating teenagers with simple obesity), *Postępy Rehabilitacji*, 2001, 2: 49-58.
- [9] Fenczyn J., Szmigiel Cz., Podobieństwa i różnice samooceny chłopców i dziewcząt z otyłością prostą (Similarities and differences in self-evaluation of boys and girls with simple obesity), *Medicina Sportiva*, 2003, Vol. 7 (1): 31-47.
- [10] Fenczyn J., Szmigiel Cz., Self-evaluation amongst adolescents with simple obesity, *Archives of Psychiatry and Psychotherapy*, 2004, 1.
- [11] Fenczyn J., Woźniak M., Akceptacja własnego ciała przez osoby w wieku 15-15 i 23-24 lata (The acceptance of one's own appearance by individuals aged 15-16 and 23-24), *Psychiatria i Psychologia Kliniczna*, 2004, Vol. 4, 1.
- [12] Goodman E., Whitaker R., A prospective study of the role of depression in the developmental and persistence of adolescent obesity, *Pediatrics*, 2002, 110: 497-504.
- [13] Greń J., Statystyka matematyczna. Modele i zadania (Mathematical Statistics. Models and Tasks), Państwowe Wydawnictwo Ekonomiczne, Warszawa 1976.
- [14] Kenrick M.M., Ball M.F., Canary J.J., Exercise and expenditure of obese boys, *Journal of Pediatrics*, 1980, 96: 187-193.
- [15] Kimm S., Obarzanek E., Childhood Obesity: A New Pandemic of the New Millennium, *Pediatrics*, 2002, 110 (5): 1003-1007.
- [16] Klish W.J., Otyłość w dzieciństwie (Obesity in childhood), *Pediatrics in Review*, 1999, 3, 2: 989-995.
- [17] Kostanski M., Gullone E., Adolescent body image dissatisfaction: relationships with self-esteem, anxiety and depression controlling for body mass, *Journal of Child Psychology and Psychiatry*, 1998, 39: 255-262.
- [18] Krawczyński M., Borski K., Badania długofalowe nad rozwojem fizycznym dzieci z otyłością prostą (Long-term Research into Physical Development of Children with Simple Obesity), *Endokrynologia Polska*, 1983, 34: 383-396.
- [19] Lissau I., Psychosocial developments in obesity, *International Journal of Obesity*, 1997, 21, supplement 2: 23-26.
- [20] Mellin A.E., Neumark-Sztainer D. et al., Unhealthy behaviors and psychosocial difficulties among overweight adolescents. The potential impact of familial factors. *Journal of Adolescence Health*, 2002, 31, 145-153.
- [21] Międlar P., Obraz samego siebie u młodzieży męskiej 12-16 lat, mieszczącej się powyżej 90 centyla według wagowo-wzrostowej siatki centylowej (The Image of One's self amongst Young Males between 12-16 years over 90 percentiles according to a percentile weight-height grid), MA dissertation, AWF Kraków, 1994.
- [22] Mustillo S., Worthman C., Erkanli A. et al., Obesity and psychiatric disorder: developmental trajectories, *Pediatrics*, 2003, 111: 851-859.
- [23] Nalepa M., Rola rodziny w kształtowaniu nawyków związanych ze sposobem spędzania wolnego czasu (The Role of the Family in the Development of Habits Associated with Spending Free Time), MA dissertation, AWF Kraków 1994.
- [24] Neumark-Sztajner M., Story M., Hannan P.J., Perry C.L., Irving L.M., Weight-related concerns and behaviors among overweight and non-overweight adolescents, *Archives Pediatrics Adolescence Medicine*, 2002, 156: 171-178.
- [25] Parizkova J., Body fat and physical fitness, M. Nijkoff B. V. Medical Division the Hague, 1977, pp. 159-163.
- [26] Pervin L.A., Psychologia osobowości (The Science of personality), Gdańsk 2002.
- [27] Pyrzak B., Otyłość wtórna (Secondary obesity), (in:) A. Oblacińska, B. Woynarowska, eds, *Obesity*. The Institute of the Mother and Child. Warszawa 1995.
- [28] Rabe-Jabłońska J., Przyczyny i leczenie otyłości u pacjentów z zaburzeniami psychicznymi (Causes and treatment of obesity in patients with mental disorders), *Psychiatria i Psychologia Kliniczna*, 2003, 2, 3: 64-80.
- [29] Radoszewska J., Psychiczne i społeczne konsekwencje otyłości. (The Psychic and Social Consequences of Obesity), (in:) A. Oblacińska, B. Woynarowska, eds, *Otyłość jak leczyć i wspierać dzieci i młodzież. (Obesity How to Treat and Support Children and Young People)* The Institute of the Mother and Child. Warszawa, 1995, pp. 33-34.
- [30] Radoszewska J., Jestem gruby, więc jestem (I'm fat, therefore I am), *Nowiny Psychologiczne*, 2000, 1: 65-73.

- [31] Raudepp L., Jürimäe T., Physical activity, aerobic fitness and fatness in preadolescent children, *Sports Medicine Training and Rehabilitation*, 1998, 8, 2: 123-131.
- [32] Raviv S., Geron E., Competitive sport in the leisure time of children and youth. Proceedings of The 1995 AIESEP World Congress, Wingate Institute, Israel, 1995, pp. 363-376.
- [33] Reynolds K.D., Killen J.D., Bryson S.W. et al., Psychosocial predictors of physical activity in adolescents, *Preventive Medicine*, 1990, 19: 541-551.
- [34] Rojowski P., Obraz samego siebie u młodzieży męskiej 12-16 lat, mieszczącej się pomiędzy 25-75 centylem według wagowo-wzrostowej siatki centylowej (The Image of One's self amongst Young Males between 12-16 years between 25-75 percentiles according to a percentile weight-height grid), MA dissertation, AWF Cracow, 1993.
- [35] Rybakowa M., Fizjologia i specyfika rozwoju w okresie młodzieńczym (The Physiology and Specifics of Development in Adolescence. In: The Medicine of Adolescence), Wydawnictwo Medyczne, Kraków, vol. 1, 13-24.
- [36] Rzońca H., Dojrzewanie psychiczne i społeczne w okresie młodzieńczym (Psychic and Social Maturing in Adolescence), (in:) *Medycyna Wieku Młodzieńczego (The Medicine of Adolescence)*, Wydawnictwo Medyczne Cracow, 2001, vol. 1: 35-53.
- [37] Sallis J.F., Simon-Morton B.G., Stone E.J. et al., Determinants of physical activity and interventions in youth, *Medicine and Science in Sport and Exercise*, 1992, 24 (6): 248-257
- [38] Sperling A.P., *Psychologia (Psychology)*, Wyd. Zysk i Ska, Poznań 1995.
- [39] Story M.T., Sztainer D.R., Sherwood N.E., Holt K., Sofka D., Trowbridge L., Barlow S.E., Management of child and adolescent obesity: attitudes, barriers, skills and training needs among health care professionals, *Pediatrics*, 2002, 110: 1-12.
- [40] Strauss R.S., Childhood obesity and self-esteem, *Pediatrics*, 2000, Vol. 105, 1: 1-5.
- [41] Szecklicki R., Osiński W., Stemplewski R., Motywy podejmowania aktywności fizycznej przez dzieci i młodzież o różnym stopniu otluszczenia ciała (The Motives for the Undertaking of Physical Activity by Children and Young People with Varied Degrees of Body Fatness), *Wychowanie Fizyczne i Sport*, 1999, 3: 17-25.
- [42] Szmigiel Cz., Fenczyn J., Self-evaluation among girls aged 12-16 suffering from simple obesity and the resulting therapeutic proposals, *Studies in Physical Culture and Tourism*, 2004, 11, 1: 75-82.
- [43] Vaughn B.E., Langlois J.E., Physical attractiveness as correlate of peer status and social competence in preschool children, *Developmental Psychology*, 1983, 19: 561-567.
- [44] Waxman M., Stunkard A.J., Caloric intake and expenditure of obese boys, *Journal of Pediatrics*, 1980, 96: 187-193.
- [45] Winefield H.R., Peay M.Y., Behavioural science in Medicine, G. Allen Beaconsfield Publisher, London-Sydney 1980.
- [46] Wing G., Dietz W., Economic burden of obesity in Youths aged 6 to 17 years, *Pediatrics*, 2002, 109: 5-18.
- [47] Wladen T.A., Stunkard A.J., Social and psychological consequences of obesity, *Annals Internal Medicine*, 1985, 103: 1062-1067.
- [48] Woynarowska B., Aktywność ruchowa dzieci i młodzieży w Polsce (The Motor Activity of Children and Young People in Poland), *Wychowanie Fizyczne i Sport*, 1979, 23: 13-20.
- [49] Woynarowska B., Kozłowski S., Kamińska K., Brzeziński M., Obciążenie wysiłkiem fizycznym na lekcjach wychowania fizycznego chłopców otyłych i bez nadwagi (The Burden of Physical Exertion during Physical Education Lessons for Obese and Non-Obese Boys), *Wychowanie Fizyczne i Sport*, 2002, 3: 35-41.