ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN - POLONIA
VOL.LX, SUPPL. XVI, 644 SECTIO D 2005

Zakład Antropologii, Uniwersytet Jagielloński, Kraków[1]
Department of Anthropology, Jagiellonian Uniwersity, Kraków
Zakład Antropologii Pedagogiki, Akademia Świętokrzyska, Kielce[2]
Department of Anthropology of Pedagogics, Świetokrzyska Academy, Kielce
Zakład Biologii Stosowanej i Eksperymentalnej, Uniwersytet Opolski, Opole[3]
Department of Molecular and Experimental Biology, Opole University, Opole

IWONA WRONKA[1], EDYTA SULIGA[2], ROMANA PAWLIŃSKA-CHMARA[3]

Relationship between socio-economic status and prevalence of overweight and obesity among students

Zależność pomiędzy statusem społeczno-ekonomicznym a częstością występowania nadwagi i otyłości wśród studentów

Many studies indicate, that socio-economic status (SES) is the strongest environmental factor affecting biological condition of people living in industrialized countries [8]. It correlates with living conditions and style of life, as well as nutritional habits. Prevalence of overweight and obesity is a valuable marker of biological condition of a given population. It is a risk factor of many chronic diseases, metabolic disturbances and premature mortality [5].

Recently, significant increase of the prevalence of obesity has been noted in Poland [1, 4, 7]. Monitoring of incidence of overweight and obesity in different age groups, as well as evaluation of coexisting factors, are indispensable for development of preventive programs.

The aim of the present work was to assess prevalence of overweight and obesity in the group of students in relation to their socio-economic status.

MATERIAL AND METHODS

The study included a survey conducted among male 210 students aged 19-24 years. Height and body mass of each of the participants was measured. Body mass index (BMI) was used to define overweight and obesity, according to WHO guidelines. To assess students' socio-economic status, the following criteria were used: place of living before starting university education and education of parents. Information, whether the studied subjects received social scholarship granted in the case of low income per capita, was also analyzed. Additionally, data concerning lifestyle, such as: physical activity, cigarette smoking and alcohol consumption were collected.

Statistical analysis included Chi^2 test and logistic regression model.

RESULTS

In the studied group, mean BMI value equaled 22.79, SD ± 2.29, range 16.46 – 33.66. According to WHO criteria, subjects were assigned to one of the four categories: underweight (BMI<18.5), normal body mass in relation to height (BMI in the range 18.5-24.9), overweight (BMI in the range 25-29.9), and obesity (BMI≥30). Number of subjects belonging to each of the respective categories was the following: 7 (3.34% of the study group), 168 (80%), 27 (12.86), and 8 (3.8%). In the further statistical analysis, due to low strength of subgroups, subjects were grouped into two larger groups: underweight together with normal body mass, and overweight together with obese subjects.

Further step was to test, whether there were differences in prevalence of overweight and obesity in relation to analyzed variables. Results indicate that in groups with higher socio-economic status, described by size of the place of living, mother's education, social scholarship granting and SES index, incidence of overweight and obesity was lower than in the groups with lower status (Table 1). The reverse results were obtained only in relation to father's education. However, Chi^2 test proved that differences between groups were not statistically significant. (Table 1). Logistic regression model was then applied to assess relationship between the probability of obesity and socio-economic status, as well as other lifestyle factors. The probability of overweight and obesity was higher in the groups with lower socio-economic status, excluding the variable of father's education (Table1).

In the group of factors directly related to lifestyle, including smoking, physical activity, rate of beer consumption and rate of strong alcoholic beverages consumption, the only factor affecting incidence of obesity was regular physical activity. Subjects who regularly participate in sports activity were more rarely overweight or obese than subjects who exercise seldom or never (Table 1).

DISCUSSION

Obesity is not only an individual problem but also a public health issue. During the last decades, increasing prevalence of excessive body mass has been noted in many developed countries [3, 9]. Similar trend has been observed in Poland. During the last years, more cases of overweight and obesity in comparison to previous decades were noted [1, 4]. Many epidemiological studies conducted in Poland in the 1990-ties indicate high prevalence of overweight and obesity. Among adult population, 50-70% of all men and women are overweight or obese [1, 2, 4, 7].

All of the published up to date studies indicate that, in addition to well proven genetic determination, obesity is to a great extend related to lifestyle and cultural factors [2, 6, 9]. In developed countries, there is negative correlation between socio-economic status and prevalence of obesity, and in developing countries this relationship is reverse [9].

In Poland, a trend toward decreasing percentage of persons with excessive body mass with increasing socio-economic status was noted during the last years [2, 6, 7]. It should be stressed, however, that none of the social variables affects biological condition of man in a direct way. They may have impact on quantitative and qualitative aspects of nutrition, influence physical activity, including type of work (physical or intellectual), and modulate level of awareness concerning health and prevention. The study group in the presented work consisted exclusively of students. All of them have similar lifestyle, determined by common organization of studies. Moreover, students have close relationships, often share an apartment or students' residence, and their lifestyle and nutritional habits mix, resulting in no significant differences in incidence of overweight and obesity. However, a clear trend toward increasing percentage of students with excessive body mass seen with lowering socio-economic status indicate that reasons for spreading epidemics of obesity in Poland are mainly social and cultural factors.

CONCLUSION

1. Among students aged 19-14 years, prevalence of overweight equals 12.86% and obesity 3.8%, which should be considered high value for young group of people.
2. Socio-economic model of determinants of overweight and obesity indicates that lower socio-economic status promotes higher incidence of overweight and obesity, nevertheless, differences between the studied groups were not statistically significant.

REFERENCES

1. Bielicki T. *et al.* Variation in the body mass index among young adult Polish males between 1965 and 1995. Int. J. Obesity, 2000,24, 658-662.
2. Chrzanowska M. Niektóre epidemiologiczne i społeczno-kulturowe aspekty nadwagi i otyłości na przykładzie populacji dorosłych z regionu Polski południowo-wschodniej. w: Społeczne kontrasty w stanie zdrowia Polaków. Red. Charzewski J. Wydawnictwo AWF w Warszawie, 1998, 41-54.
3. Flegal K.M *et al.* Overweight and obesity in the United States: prevalence and trends 1960-1994. Int. J. Obesity, 1998, 22, 39-47.

4. Kaczmarczyk-Chałas K., Drygas W. Trendy zmian cech antropometrycznych nadwagi i otyłości wśród mieszkańców Łodzi 1991-2001. Med. Metabol., 2003, 7, 42-46
5. Kopelman PG. Obesity as a medical problem. Nature, 2000, 101, 635-643.
6. Rogucka E., Bielicki T., Social contrast in the evidence of obesity among adult large-dwellers in Poland. J.Biosol.Sci,. 1999, 419-423.
7. Rywik S. *et al.* Częstość występowania nadwagi i otyłości w wybranych populacjach Polski - Pol Monica Bis Projekt. Med. Metabol. 2003, 7, 2 , 8-14.
8. Smith GD. *et al.* The black report on socioeconomic inequalities in health 10 years on. BMJ, 1990, 301, 353-377.
9. Sobal J., Stunkard AJ. Socioeconomic status and obesity: a review of literature. Psychol. Bull, 1989, 105, 260-275.

STRESZCZENIE

Celem prezentowanej pracy było określenie częstości występowania nadwagi i otyłości wśród mężczyzn w wieku 19-24 lata lat oraz sprawdzenie czy są one skorelowane ze statusem społeczno-ekonomiczny. Badaniami objęto 210 studentów. Nadwagę wyznaczoną na podstawie wartości BMI, zgodnie z kryteriami WHO stwierdzono u 12,86% ogółu badanych, a otyłość u 3,8%. Analizowano także związek pomiędzy częstością występowania nadwagi i otyłości a czynnikami społeczno-ekonomicznymi: miejscem zamieszkania przed okresem studiów, wykształceniem rodziców oraz czynnikami związanymi z trybem życia: aktywnością fizyczna, paleniem papierosów i spożyciem alkoholu. Nadmierna masa ciała charakteryzowała częściej osoby z niższych klas społecznych, różnice nie były jednak statystycznie istotne. Ze zmiennych związanych ze stylem życia istotnie na zmniejszenie ryzyka wystąpienia nadwagi i otyłości miało regularne uprawianie sportu.

ABSTRACT

The aim of the present study was to assess prevalence of overweight and obesity among males aged 19-24 years and to test correlation of excessive body mass with socio-economic status. The study group consisted of 210 students. According to WHO criteria, 12.86% of the subjects were classified as overweight and 3.8% as obese. Correlation between incidence of overweight and obesity and socio-economic factors, including place of living before the beginning of studies and education of parents, as well as factors related to lifestyle, such as physical activity, cigarette smoking and alcohol consumption were analyzed. Excessive body mass was more prevalent among students with lower socio-economic class, however, the difference was not statistically significant. Regular participation in sports activities had significant impact on lowering risk of overweight and obesity.

Table 1. Incidence of overweight and obesity in relation to analyzed variables

Factor	Category	Normal weight		Overweight and obesity		Chi^2 Test Results	OR and 95% CI
		N	%	N	%		
Place of living	city	67	85.89	11	14.10	χ^2=2.03 p=0.3616	1
	town	64	75.30	21	24.70		1.82 (0.36-1.56))
	village	38	80.86	9	19.14		1.52 (0.81-1.66)
Mother's education	university	66	87.42	9	12.31	χ^2=4.65 p=0.0980	1
	secondary	68	73.12	25	26.88		3.12 (0.12-4.26)
	primary	35	83.84	7	16.66		2.22 (0.69-2.29
Father's education	university	60	78.95	16	21.05	χ^2=0.22 p=0.8939	1
	secondary	66	81.48	10	18.52		0.38 (-1.98-0.09)
	primary	43	81.25	15	18.56		0.41 (-2.12-0.37)
Social scholarship	no	136	80.95	32	19.05	χ^2=0.20 p=0.8946	1
	yes	32	76.19	10	23.81		1.28 (0.92-1.42)
Sports	regular	111	91.73	10	8.26	**χ^2=8.21 p=0.0487**	**1**
	incidental	71	79.78	18	20.25		**4.68 (1.92-5.42)**
Beer consumption	incidental	65	78.31	18	21.69	χ^2=0.31 p=0.3616	1
	often	103	81.11	24	18.89		0.64 (-1.29-0.41)
Alcohol consumption	incidental	134	79.52	34	20.48	χ^2=0.15 p=0.7013	1
	often	35	83.34	7	16.66		0.95 (-1.10-1.03)
Smoking	no	111	82.84	23	17.16	χ^2=2.03 p=0.3616	1
	yes	64	84.22	12	15.78		0.98 (-1.21-1.32)

Statistically significant results with $p< 0.05$ were marked with bold letters
χ^2 – value of Chi ^{2} Test
p- probability
OR – odds ratio for risk of overweight and obesity
95 % CI – 95 % confidence interval