

The relationship between selected socioeconomic factors and basic anthropometric parameters of school-aged children and adolescents in Poland

Beata Gurzkowska · Zbigniew Kułaga · Mieczysław Litwin ·
Aneta Grajda · Anna Świąder · Katarzyna Kułaga · Magdalena Gózdź ·
Małgorzata Wojtyło

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Abstract The aim of the present paper was to examine the associations between anthropometric parameters, overweight, obesity, and socioeconomic status (SES) of children and adolescents in Poland. Data were collected in the “Elaboration of reference blood pressure ranges for children and adolescents in Poland” OLAF-PL0080 (OLAF) study, a nationally representative survey on growth and blood pressure references for children and adolescents aged 7–18 years. Body height, weight, and waist circumference (WC) were measured, and body mass index (BMI) was calculated. Anthropometric parameters were standardized for age and gender and expressed as *z*-scores. Statistical analyses were conducted on 10,950 children and adolescents whose parents provided socioeconomic questionnaires. The associations between anthropometric parameters, overweight (including obesity), and SES were analyzed using multiple regression and multiple logistic regression. The height was positively associated with higher levels of maternal education and, in the case of girls, also with paternal education. Higher level of income per capita, but not the highest, was associated with higher weight, BMI, and WC

and, in the case of boys, also tall stature. The height, weight, BMI, and waist were significantly inversely associated with number of children in the family. Lower number of children in the family and higher level of income, but not the highest, increased odds of overweight and obesity. In the case of girls, the odds of obesity decreased with paternal higher level of education. **Conclusion:** The social position associated with parents’ education, better environment, and SES correlate with body height and weight of a child. However, it is associated with higher risk of overweight and abdominal obesity.

Keywords Growth · Children · Socioeconomic factors · Overweight · Obesity

Abbreviations

BMI	Body mass index
CI	Confidence interval
CMHI	Children’s Memorial Health Institute
IOTF	International Obesity Task Force
OLAF	The “Elaboration of reference blood pressure ranges for children and adolescents in Poland” PL0080 study
OR	Odds ratio
WC	Waist circumference

B. Gurzkowska · Z. Kułaga · A. Grajda · M. Gózdź · M. Wojtyło
Public Health Division, The Children’s Memorial Health Institute, al.
Dzieci Polskich 20, 04-730 Warsaw, Poland

M. Litwin (✉)
Department of Nephrology and Arterial Hypertension, The
Children’s Memorial Health Institute, al. Dzieci Polskich 20,
04-730 Warsaw, Poland
e-mail: m.litwin@czd.pl

A. Świąder
Anthropometry Unit, Division of Pediatrics, The Children’s
Memorial Health Institute, al. Dzieci Polskich 20, 04-730 Warsaw,
Poland

K. Kułaga
Department of Healthcare Services, Central Office of the National
Health Fund, ul. Grójecka 186, 02-390 Warsaw, Poland

Introduction

Body height and weight attained by children and adolescents during growth and development are sensitive indicators of an individual’s health and nutritional status, as well as a mirror of the country’s social and economic prosperity [24].

The biological development of humans has been the subject of research since the eighteenth century [22]. In 1833, the Belgian mathematician and anthropologist, Adolphe Quetelet,

conducted a study in Brussels and was the first to conclude that socioeconomic factors can influence the size of newborns [21]. In the subsequent years of the nineteenth century, many studies were conducted on the development of children, including studies performed in Germany, France, and the USA [27]. In Poland, the physical development of children and adolescents has been the subject of study since the nineteenth century. Jędrzej Śniadecki, a pioneer in the field of physical education and child development, in his study entitled “On the physical education of a child” published in 1803, stressed the influence of a child’s environment on his or her development [23].

Research is being continued on the influence of the environment on the development of an individual and on achieving genetically determined potential. Studies point to place of residence, socioeconomic status (SES), and lifestyle as important factors affecting biological development and differentiating health in various stages of life [8, 9, 13, 17, 20, 26]. In Poland, significant changes in children’s height were observed in connection with social and economic transition during the second half of the twentieth century [3, 6]. Overweight and obesity prevalence among children increased in many countries. In Poland, overweight (including obesity) prevalence reached 20 % among primary school children [18]. Family SES is an important predictor of children’s overweight [2, 5, 16, 29].

The aim of the present paper was to examine the associations between anthropometric parameters, overweight, obesity, and SES of Polish children and adolescents aged 7–18 years.

Materials and methods

Study population and sampling

This study used data from the “Elaboration of reference blood pressure ranges for children and adolescents in Poland” OLAF-PL0080 (OLAF) study conducted by the Children’s Memorial Health Institute (CMHI) in cooperation with researchers nationwide. The study protocol was approved by the Bioethics Commission of the CMHI.

The studied population comprised school pupils aged 7 to 18 years, who between school years 2007–2008 and 2009–2010 attended primary, middle, and secondary schools located in all of Poland’s administrative regions. Participants were selected in a two-stage random sampling procedure. The primary sampling unit was a school sampled from an all-schools-in-Poland sampling frame provided by the Polish Ministry of Education. The schools were selected by stratified sampling with probability proportional to the size of the unit. In respect to primary and middle schools, the strata were urban/rural, whereas for secondary schools, the kind of

school. In the second stage, the participants were randomly selected based on the number of pupils in a given school.

Data collection

Informed consent for participation in the study was obtained in writing from the parents of pupils under the age of 18 years, as well as from participants over the age of 16 years. Body height, body weight, and waist circumference (WC) were measured according to the procedures delineated in the OLAF study protocol and described previously [19]. Height was measured in duplicate using a stadiometer (SECA 214) in the standing position (with no shoes), to the nearest millimeter; if the difference between measurements exceeded 4 mm, a third measurement was taken. Body weight was measured in light underwear twice, using a digital, medical scale (Radwag WPT 100/200) and was recorded to the nearest 0.05 kg. In the case of a difference between measurements equal to or exceeding 0.3 kg, a third measurement was taken. Waist circumference was measured with anthropometric tape, in duplicate, to the nearest millimeter; in the case of a difference between measurements exceeding 3 cm, a third measurement was taken. Arithmetic averages of two or three height, weight, and WC measurements were analyzed. Body mass index was calculated as body weight divided by height in meters squared.

Age was calculated as the difference between the date of measurement and date of birth. The results were recorded as a decimal, and the midpoint of the age range was taken as the child’s age (e.g., children in the range ≥ 11.5 and < 12.5 years were considered to be 12 years old).

Overweight and obesity were defined depending on gender and age using the BMI cutoffs according to the IOTF [10]. Data on SES and environment of a pupil were collected from questionnaires filled out by parents or an adult study participant. The questionnaire contained questions about maternal education, paternal education, household per capita monthly income, and number of children in the family. Dwelling, urban or rural, was determined on the basis of the school’s localization (urban/rural) in accordance with the Central Statistical Office (CSO) territorial classification. Only primary and middle schools were included in the dwelling analysis because almost all tertiary schools were located in urban areas.

Data inclusion and exclusion criteria

The data inclusion criteria were signed informed consent and age from 7 to 18 years. Exclusion from the analysis was lack of anthropometry measurements or SES data. Furthermore, data on weight and waist were excluded from pregnant women. There was no data exclusion based on health status of study participants.

Statistical analysis

Statistical analyses were performed separately for boys and girls using SAS 9.2 software. Height, weight, BMI, WC z-scores were calculated relative to the Polish 2010 growth references [18]. Data were grouped according to sex and socioeconomic categories and analyzed using descriptive statistics. SES variables were categorized into education: primary, vocational, secondary, and university; household monthly income per capita: ≤500 PLN, 501–1,000 PLN, 1,001–1,500 PLN, and >1,500 PLN; number of children in the family: one, two, three, four, or more; and dwelling: rural, urban. Final dummy variables were created for each, nonbinary SES variable category. The associations between continuous dependent variables: height, weight, BMI, waist (all variables expressed as z-scores), and independent SES variables were analyzed using forward stepwise multiple regression. In the multiple regression models, dwelling (rural/urban) was introduced, but due to the lack of statistical significance, it was not included in final regression models. A multivariable logistic regression analysis was performed with overweight (including obesity) and obesity as the dependent variables. In this analysis, dwelling also did not show statistically significant associations and was removed from the model. Values of $p < 0.05$ were considered significant.

Results

Among the 17,573 participants, 123 did not fulfill the age criteria (≥ 6.5 and < 18.5 years). Seven women in the sample were pregnant, and their data on weight and waist, and consequently BMI, were excluded from the weight, BMI, and waist analysis, but kept for the height analysis. For the multivariate analysis, the number of participants was smaller due to missing data for SES characteristics: 459 for mother education, and/or 1,447 for father education, and/or 5,348 for income per capita, and/or 385 for number of children in the family. Thus, the sample, for the multivariable models, comprised 5,278 boys (48.2 %) and 5,672 girls. Height measurement was missing in the case of two boys, weight measurement was missing in the case of four boys and three girls, and waist measurement was missing in the case of three boys and six girls. Thus, final multivariable models concerning height, weight, BMI, and waist included 10,948, 10,943, 10,942, and 10,941 children and adolescents with complete data, respectively. The multivariable model with dwelling as independent variable included data from 8,247 primary and middle school pupils aged 7–15 years. Table 1 provides a summary of study sample dependent variable characteristics and sample size by sex and SES. Table 2 provides descriptive statistics of height, weight, BMI, waist z-score, and overweight and obesity prevalence according to the SES variables.

Parental education

Maternal secondary and university education were significantly positively associated with taller stature in both genders, whereas paternal secondary and university education were significantly positively associated with the height of girls (Table 3). In the case of boys, there was positive association between maternal secondary education and weight z-score. In the case of girls, the associations between maternal secondary education and WC, paternal secondary education and BMI, and paternal secondary and university education and WC were significantly inverse.

Income

Monthly income per capita higher than the lowest level reported by almost 50 % of study participants was significantly positively associated with weight, BMI, and waist in both genders. In the case of girls, height was not associated with income, whereas in the case of boys, there was a positive association between height and income in the range 501–1,000 PLN. The highest level of income was insignificantly associated with anthropometric variables (Table 3).

Number of children in the family

The height, weight, BMI, and waist were significantly inversely associated with number of children in the family (Table 3).

Dwelling (localization of school)

No significant associations were found for anthropometric variables, overweight and obesity prevalence, and dwelling in multivariable regression models.

Overweight and obesity

Maternal education was not associated with overweight and obesity in both genders. Higher levels of paternal education (secondary or university) significantly decreased odds of obesity in girls. Monthly income per capita higher than the lowest level increased odds of overweight and obesity in both genders. Although not significant, the highest income level was associated with lower risk of obesity among boys and girls and lower risk of overweight among girls. There was a strong, significant inverse relationship between risk of overweight (including obesity) and number of children in the family (Table 4).

Table 1 Summary of study sample characteristics

Variable	Boys			Girls		
	<i>N</i>	Mean or proportion	SD	<i>N</i>	Mean or proportion	SD
Age (years)	5,278	12.9	3.5	5,672	13.2	3.5
Height (cm)	5,276	157.4	19.6	5,672	153.2	15.0
Weight (kg)	5,274	49.8	18.4	5,669	46.4	14.6
BMI (kg/m ²)	5,273	19.3	3.7	5,669	19.2	3.6
Waist (cm)	5,275	68.0	10.0	5,666	64.8	8.3
SDS_height	5,276	−0.01	1.00	5,672	−0.05	1.01
SDS_weight	5,274	−0.01	1.00	5,669	−0.03	1.02
SDS_BMI	5,273	−0.01	1.00	5,669	−0.01	1.02
SDS_waist	5,275	−0.01	1.00	5,666	0.01	1.02
Overweight (incl. obesity)	974	18.2	–	829	14.6	–
Obesity	230	4.1	–	171	3.0	–
Maternal education						
Primary	400	7.6	–	450	7.9	–
Vocational	1,656	31.4	–	1,921	33.9	–
Secondary	2,155	40.8	–	2,234	39.4	–
University	1,067	20.2	–	1,067	18.8	–
Paternal education						
Primary	420	8.0	–	472	8.3	–
Vocational	2,551	48.3	–	2,878	50.7	–
Secondary	1,636	31.0	–	1,616	29.3	–
University	671	12.7	–	661	11.7	–
Income per capita						
≤500 PLN	2,496	47.3	–	2,768	48.8	–
501–1,000 PLN	1,719	32.6	–	1,778	31.4	–
1,001–1,500 PLN	598	11.3	–	654	11.5	–
>1,500 PLN	465	8.8	–	472	8.3	–
Number of children						
1	620	11.8	–	687	12.1	–
2	2,336	44.3	–	2,405	42.4	–
3	1,312	24.9	–	1,422	25.1	–
4 and more	1,010	19.1	–	1,158	20.4	–
Dwelling ^a						
Rural	1,659	40.7	–	1,664	39.9	–
Urban	2,422	59.3	–	2,502	60.1	–

SD standard deviation, SDS standard deviation score

^a Only pupils from primary and middle schools

Discussion

Our data confirm associations between basic anthropometric parameters of school-aged children and adolescents, overweight (including obesity), and many of the supposed SES determinants.

The qualitative differences among the analyzed indicators of physical development should be noted. Height is determined by the size of the skeletal system and does not change once the growth period is over. The values of three of the remaining parameters, weight, BMI, and WC, may undergo even short-term changes depending on nutrition, physical activity, and disease. BMI is a good indicator of the degree of an individual's under- or overweight. Excessive weight has

numerous negative health implications (arterial hypertension, type II diabetes, diseases of the musculoskeletal system, atherosclerosis and heart disease, psychological problems) [1, 7]. However BMI gives no indication of body fat distribution. It is WC that is an index of central adiposity both in adults and in children [25]. Central adiposity is related with a less favorable metabolic profile and is an important determinant of cardiovascular risk factor [11, 12].

We found differences in BMI, WC, and the prevalence of overweight and obesity depending on household per capita income, parental education, and family size. Analysis by gender showed that some socioeconomic factors may influence boys and girls differently, particularly in relation to WC and BMI. In Poland, according to the CSO, the average

Table 2 Descriptive statistics for the height, weight, BMI, waist, prevalence of overweight including obesity, and obesity according to the independent variables

Variable		Height Mean (SD)	Weight Mean (SD)	BMI Mean (SD)	Waist Mean (SD)	Overweight (including obesity) %	Obesity %
Boys							
Maternal education	Primary	-0.27 (1.00)	-0.23 (1.02)	-0.12 (0.99)	-0.15 (1.00)	14.5	3.0
	Vocational	-0.15 (1.01)	-0.09 (1.02)	-0.03 (1.02)	-0.06 (1.03)	18.5	4.1
	Secondary	0.07 (0.98)	0.06 (0.98)	0.03 (1.00)	0.04 (0.98)	19.5	5.2
	University	0.13 (0.99)	0.05 (0.97)	-0.01 (0.99)	-0.01 (1.00)	18.0	3.6
Paternal education	Primary	-0.14 (1.02)	-0.13 (0.97)	-0.07 (0.95)	-0.07 (0.96)	16.7	2.6
	Vocational	-0.09 (1.01)	-0.05 (1.04)	-0.01 (1.03)	-0.02 (1.02)	18.7	4.8
	Secondary	0.06 (0.98)	0.05 (0.98)	0.02 (1.00)	0.01 (1.00)	18.9	4.8
	University	0.17 (0.96)	0.06 (0.92)	-0.02 (0.96)	-0.01 (0.96)	17.6	2.8
Income per capita	≤500 PLN	-0.12 (1.01)	-0.12 (1.01)	-0.08 (1.00)	-0.10 (1.00)	16.5	3.8
	501–1,000 PLN	0.07 (0.99)	0.06 (0.99)	0.04 (1.00)	0.04 (1.00)	19.6	5.0
	1,001–1,500 PLN	0.10 (0.97)	0.14 (1.00)	0.12 (1.02)	0.12 (1.01)	23.0	5.4
	>1,500 PLN	0.13 (0.95)	0.10 (0.95)	0.04 (0.98)	0.03 (0.99)	19.4	3.9
Number of children	1	0.15 (0.97)	0.24 (1.02)	0.22 (1.05)	0.21 (1.05)	27.9	7.7
	2	0.05 (0.99)	0.06 (0.98)	0.04 (1.00)	0.04 (1.00)	19.9	4.7
	3	-0.01 (1.01)	-0.03 (0.99)	-0.04 (0.99)	-0.06 (0.99)	16.5	4.0
	4 or more	-0.26 (0.98)	-0.29 (0.97)	-0.22 (0.97)	-0.23 (0.95)	11.9	1.9
Dwelling	Rural	-0.07 (1.00)	-0.07 (1.00)	-0.04 (0.99)	-0.06 (0.98)	17.7	4.1
	Urban	0.02 (1.00)	0.03 (1.00)	0.02 (1.02)	0.02 (1.01)	18.9	4.5
Girls							
Maternal education	Primary	-0.28 (1.06)	-0.06 (1.07)	0.09 (1.00)	0.10 (1.03)	16.9	2.2
	Vocational	-0.17 (1.01)	-0.08 (1.06)	-0.01 (1.05)	0.02 (1.06)	14.3	3.2
	Secondary	0.00 (0.99)	-0.01 (1.00)	-0.01 (1.03)	-0.01 (1.02)	14.6	3.3
	University	0.16 (0.98)	0.06 (0.96)	-0.03 (0.98)	-0.01 (0.96)	14.3	2.4
Paternal education	Primary	-0.26 (1.02)	-0.04 (1.07)	0.09 (1.02)	0.11 (1.05)	16.4	3.4
	Vocational	-0.12 (1.02)	-0.05 (1.05)	0.00 (1.04)	0.02 (1.04)	15.0	3.5
	Secondary	0.03 (0.97)	-0.02 (1.00)	-0.04 (1.02)	-0.02 (1.01)	14.2	2.5
	University	0.19 (1.02)	0.05 (0.93)	-0.03 (0.93)	-0.04 (0.94)	13.0	1.7
Income per capita	≤500 PLN	-0.15 (1.02)	-0.09 (1.03)	-0.03 (1.02)	-0.02 (1.03)	13.7	2.7
	501–1,000 PLN	0.03 (0.98)	0.07 (1.04)	0.06 (1.07)	0.08 (1.04)	17.2	4.1
	1,001–1,500 PLN	0.12 (0.98)	0.00 (0.97)	-0.06 (0.99)	-0.04 (0.99)	13.6	2.6
	>1,500 PLN	0.02 (1.05)	-0.01 (0.93)	-0.02 (0.90)	-0.07 (0.94)	12.1	1.5
Number of children	1	0.11 (1.00)	0.12 (1.03)	0.09 (1.04)	0.12 (1.06)	20.1	4.1
	2	0.01 (1.01)	0.04 (1.02)	0.04 (1.04)	0.04 (1.03)	15.8	3.7
	3	-0.10 (0.97)	-0.11 (1.01)	-0.09 (1.02)	-0.05 (1.00)	12.8	2.4
	4 or more	-0.21 (1.03)	-0.14 (1.00)	-0.05 (0.97)	-0.05 (1.00)	11.3	1.7
Dwelling ^a	Rural	-0.14 (1.01)	-0.08 (1.03)	-0.02 (1.03)	-0.01 (1.03)	16.1	3.3
	Urban	-0.03 (1.01)	-0.02 (1.02)	-0.01 (1.02)	0.01 (1.01)	14.0	2.9

^a Only pupils from primary and middle schools; height, weight, BMI, and waist expressed as z-score

monthly household per capita income in 2008 was 1,046 PLN, i.e., about 250 Euro. In boys, above-average household per capita income was associated with significantly higher weight, WC, and BMI values, as well as higher risk of overweight including obesity; such a relationship was not found in girls. In the analysis of four levels of household per capita income,

the lowest prevalence of overweight and obesity was found in boys from families with the lowest per capita monthly incomes, whereas in the case of girls—in families with the highest per capita monthly incomes.

It is noteworthy that children (both boys and girls) having more siblings had significantly lower BMI and WC values and

Table 3 Results of multiple regression models of children's and adolescents' height, weight, BMI, and waist (all dependent variables expressed as z-scores)

		Height		Weight		BMI		Waist	
		Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>
Boys									
	Intercept	-0.078	0.303	0.072	0.339	0.155	0.043	0.132	0.084
Maternal education	Primary—ref.	—	—	—	—	—	—	—	—
	Vocational	0.067	0.241	0.055	0.334	0.024	0.678	0.034	0.550
	Secondary	0.230	<0.001	0.151	0.010	0.051	0.385	0.091	0.123
	University	0.224	0.001	0.086	0.209	-0.026	0.710	-0.004	0.954
Paternal education	Primary—ref.	—	—	—	—	—	—	—	—
	Vocational	-0.042	0.440	-0.009	0.863	0.004	0.944	-0.017	0.752
	Secondary	-0.003	0.962	-0.018	0.758	-0.025	0.673	-0.060	0.312
	University	0.051	0.481	-0.043	0.554	-0.082	0.259	-0.092	0.208
Income per capita	≤500 PLN—ref.	—	—	—	—	—	—	—	—
	501–1,000 PLN	0.070	0.038	0.084	0.013	0.062	0.070	0.081	0.017
	1,001–1,500 PLN	0.063	0.206	0.148	0.003	0.143	0.004	0.163	0.001
	>1,500 PLN	0.066	0.240	0.108	0.054	0.084	0.139	0.085	0.134
Number of children	1—ref.	—	—	—	—	—	—	—	—
	2	-0.077	0.085	-0.166	<0.001	-0.168	<0.001	-0.158	<0.001
	3	-0.104	0.036	-0.231	<0.001	-0.240	<0.001	-0.243	<0.001
	4 or more	-0.296	<0.001	-0.455	<0.001	-0.411	<0.001	-0.400	<0.001
Girls									
	Intercept	-0.191	0.008	0.140	0.057	0.282	0.000	0.327	<0.001
Maternal education	Primary—ref.	—	—	—	—	—	—	—	—
	Vocational	0.057	0.292	-0.052	0.344	-0.101	0.069	-0.092	0.098
	Secondary	0.164	0.004	-0.004	0.944	-0.105	0.067	-0.123	0.033
	University	0.247	<0.001	0.027	0.690	-0.120	0.078	-0.115	0.091
Paternal education	Primary—ref.	—	—	—	—	—	—	—	—
	Vocational	0.062	0.231	-0.050	0.345	-0.089	0.095	-0.093	0.081
	Secondary	0.114	0.049	-0.082	0.165	-0.154	0.009	-0.144	0.014
	University	0.208	0.004	-0.034	0.637	-0.134	0.066	-0.143	0.050
Income per capita	≤500 PLN—ref.	—	—	—	—	—	—	—	—
	501–1,000 PLN	0.059	0.075	0.104	0.002	0.085	0.012	0.092	0.007
	1,001–1,500 PLN	0.079	0.100	0.003	0.956	-0.038	0.436	-0.035	0.471
	>1,500 PLN	-0.032	0.556	-0.011	0.841	0.009	0.875	-0.064	0.251
Number of children	1—ref.	—	—	—	—	—	—	—	—
	2	-0.071	0.102	-0.072	0.105	-0.055	0.214	-0.092	0.038
	3	-0.143	0.003	-0.211	<0.001	-0.190	<0.001	-0.191	<0.001
	4 or more	-0.187	<0.001	-0.228	<0.001	-0.175	0.001	-0.217	<0.001

ref. reference value

a lower prevalence of overweight and obesity. This finding is in line with results from other studies [15].

Similar relationships of family size and level of parents' education with greater height, weight, and BMI of young adults (19–20 years) were reported by researchers in Hungary, who also demonstrated a rise in average BMI over the studied period. Higher BMI values have been related, among others,

to such variables as place of birth in the national capital and residence in a large city [14].

Education level, income, and place of residence are considered by some social-science theoreticians to be the basic factors forming a social structure. Factors modifying the physical development of children and adolescents may, therefore, be considered in relation to social stratification [4, 28].

Table 4 Results of multivariable logistic regression models with overweight (including obesity) and obesity as dependent variables

	Overweight including obesity				Obesity			
	Boys		Girls		Boys		Girls	
	OR (95 % CI)	<i>p</i>	OR (95 % CI)	<i>p</i>	OR (95 % CI)	<i>p</i>	OR (95 % CI)	<i>p</i>
Maternal education								
Primary	1		1		1		1	
Vocational	1.15 (0.84 1.58)	0.392	0.76 (0.57 1.02)	0.070	1.03 (0.54 1.95)	0.939	1.32 (0.65 2.65)	0.443
Secondary	1.14 (0.82 1.57)	0.435	0.75 (0.55 1.01)	0.061	1.22 (0.64 2.31)	0.551	1.37 (0.67 2.81)	0.387
University	0.96 (0.67 1.39)	0.840	0.77 (0.54 1.11)	0.159	0.86 (0.42 1.80)	0.697	1.27 (0.55 2.93)	0.570
Paternal education								
Primary	1		1		1		1	
Vocational	1.00 (0.75 1.33)	0.998	0.86 (0.65 1.14)	0.304	1.56 (0.82 2.97)	0.175	0.79 (0.45 1.39)	0.423
Secondary	0.90 (0.66 1.23)	0.519	0.76 (0.55 1.04)	0.082	1.36 (0.69 2.69)	0.373	0.49 (0.26 0.93)	0.028
University	0.82 (0.56 1.20)	0.313	0.71 (0.47 1.05)	0.085	0.84 (0.37 1.93)	0.681	0.35 (0.14 0.84)	0.018
Income per capita								
≤500 PLN	1		1		1		1	
501–1,000	1.11 (0.93 1.32)	0.252	1.22 (1.02 1.46)	0.034	1.13 (0.82 1.56)	0.463	1.44 (1.01 2.07)	0.045
1,001–1,500	1.34 (1.05 1.71)	0.018	0.91 (0.69 1.19)	0.475	1.27 (0.80 1.99)	0.309	1.04 (0.59 1.84)	0.886
>1,500	1.12 (0.84 1.49)	0.434	0.80 (0.58 1.11)	0.186	0.98 (0.56 1.72)	0.948	0.62 (0.27 1.42)	0.260
Number of children								
1	1		1		1		1	
2	0.65 (0.53 0.80)	<0.001	0.72 (0.58 0.90)	0.004	0.59 (0.41 0.84)	0.003	0.87 (0.56 1.35)	0.538
3	0.52 (0.41 0.66)	<0.001	0.55 (0.43 0.71)	<0.001	0.49 (0.33 0.75)	0.001	0.55 (0.32 0.92)	0.023
4	0.36 (0.27 0.47)	<0.001	0.45 (0.34 0.60)	<0.001	0.23 (0.13 0.41)	<0.001	0.38 (0.20 0.70)	0.002

OR odds ratio, CI confidence interval

The conducted analysis confirms that a higher social position of a family related to the higher parental education and higher SES contribute to the fuller development of genetic potential in terms of the height and weight of a child. It must, however, be stressed that a better economic situation may result in health hazards related to overweight and obesity. It is noteworthy that the prevalence of overweight and obesity increased with the monthly household per capita income, but not in the highest income group, in which it is especially noticeable in the case of girls; girls from the highest SES group were not only the tallest but also the thinnest.

Components of social status, such as parental education, income, place of residence, and family size, indirectly affect the development of the individual, with the commonly accepted direct stimuli being: the quality and quantity of food, morbidity, physical activity, health habits, and stress level.

Therefore, an important social and cultural factor influencing the physical development of children and adolescents is lifestyle, which is formed during socialization, as well as during later interactions of the individual, and is highly related to membership in a social class. This includes ways of interpreting social situations and patterns of everyday behavior. Lifestyle also comprises ways of eating and spending

leisure time (including physical activity). A prohealth lifestyle that promotes the physical activity of the young generation requires an appropriate level of knowledge, motivation, and skills, as well as financial resources.

The anthropometric indicators of physical development considered above—height, weight, WC, and BMI—were analyzed in respect to one not isolated socioeconomic factor, whereas social variables are usually interrelated. In the studied group, there was a relationship between the level of parental education, monthly household per capita income, and family size.

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The OLAF Study Group: Medical University of Białystok: Agnieszka Rybi-Szumińska, Michał Szumiński, Katarzyna Taranta-Janusz, Edyta Tenderenda, Anna Wasilewska; Regional Children's Hospital in Bydgoszcz: Beata Jasińska; Medical University of Gdańsk: Piotr Czarniak, Dominik Świętoń, Przemysław Szcześniak; Jagiellonian University Medical College in Kraków: Monika Miklaszewska, Anna Moczulska, Katarzyna Wilkosz, Katarzyna Zachwieja, Iwona Ogarek; Medical University of Lublin: Marek Majewski, Aleksandra Sobieszkańska-Droździel, Izabela Szlązak, Paweł Szlązak, Małgorzata Zajączkowska;

Polish Mother's Memorial Hospital Research Institute in Łódź: Monika Pawlak-Bratkowska, Anna Półtorak-Krawczyk, Marcin Tkaczyk; District Hospital in Kędzierzyn-Koźle: Danuta Gmyrek; Poznan University of Medical Sciences: Tomasz Krynicki, Jolanta Sołtysiak; Regional Children's Hospital in Toruń: Roman Stankiewicz, Sława Zbucka; The Children's Memorial Health Institute in Warszawa: Robert Pietruczuk, Agnieszka Rózdzyńska-Świątkowska, Jan Szpor; Wrocław Medical University: Jacek Kleszczyński, Magdalena Naleśniak, Anna Wawro, Irena Wikiera-Magott, Danuta Zwolińska; Medical University of Silesia: Piotr Adamczyk, Tatiana Augustyn-Iwachów, Beata Banaszak, Omar Bjanid, Katarzyna Broll-Waśka, Aurelia Morawiec-Knysak.

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