Ameryk Monika Anna, Sikorski Piotr, Świątkowski Maciej, Augustyniak Agnieszka, Szamocka Małgorzata. The role of socioeconomic factors in selected aspects of nutritional behavior of children and adolescents practicing football in a football club in Bydgoszcz. Journal of Education, Health and Sport. 2017;7(3):280-289. eISSN 2391-8306. DOI http://dx.doi.org/10.5281/zenodo.293191
http://ojs.ukw.edu.pl/index.php/johs/article/view/4264

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26.01.2017).
1223 Journal of Education, Health and Sport eISSN 2391-8306 7

The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 10.01.2017. Revised 10.02.2017. Accepted: 12.02.2017.

The role of socioeconomic factors in selected aspects of nutritional behavior of children and adolescents practicing football in a football club in Bydgoszcz

Monika Anna Ameryk, Piotr Sikorski, Maciej Świątkowski, Agnieszka Augustyniak, Małgorzata Szamocka

Department of Gastroenterology and Nutrition Disorders, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń, Poland

Keywords: Socioeconomic Factors; Nutrition; Sport; Young Athletes; Eating habits

Corresponding author: Monika Ameryk, monika.ameryk@gmail.com

Paper or any part thereof has not been published or submitted for publication. There is no financial support of this article.

Summary

Nutrition habits of children should be adapted to their physiological needs, reflecting their demand for the appropriate nutrients. Nutrition of children and adolescents practicing sports is a particular challenge, much more complex than in their peers and adults. This is related not only with their intensive growth and development and different metabolism, but also with increased physical activity. A correlation between socioeconomic factors in families (parents' poor education, unemployment and low income) and a poor health status with increased incidence of chronic psychosomatic and organic diseases has been reported.

The aim of the study was to assess the impact of socioeconomic factors on selected aspects of nutritional behavior.

The investigated group consisted of 100 boys aged 10–16 years, practicing football in a football club in Bydgoszcz, Poland, whose parents answered questions from the KomPAN questionnaire adopted to the Polish conditions. The obtained results were developed statistically using the Statistica 12.5 software, with Chi-squared test and the statistical significance level at $p < 0.005$.

A significant impact of socioeconomic factors, including family economic status, on the analyzed aspects of nutritional behavior of children and adolescents practicing football in a football club in Bydgoszcz, was demonstrated. The study revealed many improper habits in the nutrition of the investigated children, which indicates the need for appropriate nutritional education at all age levels.

Introduction

Nutrition habits of children should be adapted to their physiological needs, reflecting their demand for the appropriate nutrients. In children and adolescents practicing sports, nutrition is much more complex than in their peers and adults. This is related not only with their intensive growth and development, but also with increased physical activity and different metabolism [2]. Following the principles of proper nutrition is very important for young footballers, but it is recognized only after a few years of practicing sports, when the athlete starts to succeed in sports and achieves high ranks in sporting events. Another problem is the lack of precise guidelines for the Polish population regarding the nutrition of children and adolescents practicing sports. Due to the differences in metabolism (higher metabolic expense due to high mobility, increased use of fat as energy source, differences in thermoregulation), the nutritional recommendations for adult athletes cannot be used in the group of young footballers [2,4]. Therefore, an appropriate and varied diet seems to be the best solution to enable success in sports to young athletes and allow them to develop proper nutritional habits during their adult life [17]. The selection of products and nutrition is affected by numerous factors, mainly of economic, climatic, cultural, psychological and social origin. Socioeconomic status is a reflection of differences in the society and defines the position of an individual or a group in the social structure [19,21]. It is based on the level of income, education, professional status, family structure, place of residence and leisure activities. Studies of the impact of socioeconomic factors indicate that children with a low socioeconomic position (SEP) are more susceptible to overweight and obesity, have a sedentary, less active lifestyle, and their diet is less satisfactory than that of children and adolescents with high SEP [1,19]. Among the factors included in SEP, parents' level of education is considered a very important factor affecting the nutritional behavior of children and adolescents [29,30]. In families with caregivers having lower education, a higher percentage of children and adolescents with excessive weight is observed [6,11]. A correlation between socioeconomic factors in families (parents' poor education, unemployment and low income) and a poor health status with increased incidence of chronic organic and psychosomatic diseases has been reported [5,9,10,22,25]. Moreover, many Polish [14,16,27] and international [10,19,26]studies indicate that family socioeconomic status is reflected in the diet of children and adolescents.

Aim of the study

The aim of the study was to assess the impact of socioeconomic factors on selected aspects of nutritional behavior of young athletes practicing football in a football club in Bydgoszcz, Poland.

Material and methods

The study employed the method of diagnostic survey, and the research tool was an approved KomPAN questionnaire. The was conducted in the autumn-winter period of 2015/2016, after obtaining a written consent from the parents. The investigated group consisted of 100 boys aged 10–16 years, practicing football in a football club in Bydgoszcz, Poland, whose parents answered the pre-selected questions. Nutritional behavior was assessed based on the modified KomPAN questionnaire. The parents also answered questions concerning their education, family structure and family economic status. The obtained results were developed statistically using the Statistica 12.5 software. In order to

check the differences in nutritional behavior depending on the above socioeconomic factors, a Chi-squared test of statistical significance with $p = 0.05$ was used.

Results

Depending on the question, samples size was $N = 76$ to $N = 86$. The age range of the investigated group was 10–16 years. The smallest age group were boys aged 14–15 years (14.1%), while the largest group were boys aged 12–13 years (36.4%). Table 1 presents selected results regarding the socioeconomic status of the families of the investigated children. More than half of the investigated families (50.6%) consisted of four members. The highest percentage of families, nearly 62%, described their economic status as average. As for the household economic status, 45.1% respondents described it as good, and less than one in ten as modest. Most parents were well-educated: higher education prevailed among both mothers and fathers (59.5% and 46.1%, respectively). The analysis showed no statistically significant differences between the socioeconomic factors and age categories. In the investigated group, the athletes usually had four (60%) or five (29%) meals per day. Only one in ten athletes had only three meals per day. The number of family members did not significantly affect the number of meals per day, but in households with 5 or more members, no athletes had only three meals per day, whereas in households with 3 and 4 members, this was the case for almost one in ten athletes. The analysis of family economic status indicated that in families declaring an economic status below average, 1 in 5 boys had only three meals per day, while in the group with an average and above-average economic status, this was the case for only 10% of the boys. No difference in the quantity of meals served to the young athletes was demonstrated with respect to the household economic status. Mothers with vocational education served their children three meals per day much more frequently (18.0%) than those with secondary and higher education (13.0 and 9.6%, respectively). Four and more meals per day were most frequently served by mothers with higher education (90.2%) and more rarely by mothers with secondary and vocational education (86.9 and 81.9%, respectively). Three meals per day were served most frequently by fathers with secondary education (19%), while four and five meals per day were served by fathers with higher education (91.7%). In the study group, 7% of the boys did not consume their meals at fixed times and only 16% of them consumed them regularly every day. In households with 3 and less members, 1 in 10 athletes did not have meals at fixed times. This phenomenon slightly improved with the increase in the number of family members, with only 4.5% of the boys from families consisting of 4 members reporting this problem. The above habit was not reported in families with at least 5 members, with all boys from this group having meals at fixed times, although this did not regard all meals. Most frequently, meals were consumed at fixed times by those athletes, whose families consisted of no more than 3 members. In families declaring their economic status as below average, 1 in 5 athletes did not have meals at fixed times, and the increasing economic status translated into a decreasing number of boys who did not have their meals at fixed times (average status: 7.5%; above-average status: 3.6%). Only 20% of young athletes from families with a below-average economic status, approx. 18% of those from families with an above-average economic status and 13% of those from families with an average financial situation consumed all meals at fixed times. Consumption of some meals at fixed times was demonstrated in all players whose household economic status was modest. In households with an average, good and very good economic status, some meals were consumed at fixed times by ¾ of the investigated group. Analyzing mothers' education, fixed times of some meals were reported most frequently by mothers with secondary education (approx. 83%), slightly less frequently by those with higher education (approx. 80%), and by almost 20% less mothers with vocational education. A reverse situation was observed in the group of fathers with vocational education, in which 90% of the athletes consumed not all meals at fixed times, whereas in the group of fathers with secondary and higher education, the value was 78%. Most athletes had a snack during the day: 46% once a day or more frequently, and only 4.5% less than once a week. In families with 4 members, having a snack once or more times per day occurred

in more than half of the athletes (55%). The same frequency of having a snack was observed in athletes whose families consist of three members or less members (40.7%). Analyzing the impact of family economic status, it was shown that 20% of the athletes with the family economic status described as below average had a snack 1–3 times per month. Only 4% of the athletes from families with a good and above-average economic status ate snacks 1–3 times per month. Most often—once a day—snacks were consumed by athletes from families with below-average economic status (40%).

Table 1 Characteristics (SEP) of the families of the athletes, including age group**.**

Selected socioeconomic factors	Totality of the investigated group (%)	Age (years)			
		10–11 (%)	12–13 (%)	14–15 (%)	16 (%)
Number of household members (n=83)					
3 or less	32.5	29.0	33.3	41.7	30.8
4	50.6	58.1	48.2	41.7	46.2
5 and more	16.9	12.9	18.5	16.7	23.1
Family economic status (n=84)					
Below average	6.0	12.1	3.8	0.0	0.0
Average	61.9	57.6	65.4	75.0	53.8
Above average	32.1	30.3	30.8	25.0	46.2
Household economic status (n=82)					
We live modestly	7.3	9.1	7.7	0.0	9.1
We live at an average level	36.6	39.4	30.8	41.7	36.4
We live well	45.1	39.4	53.8	58.3	27.3
We live very well	11	12.1	7.7	0.0	27.3
Mother's education (n=84)					
Vocational	13.1	9.1	7.4	33.3	16.7
Secondary (general or technical)	27.4	33.3	25.9	25.0	16.7
Higher (bachelor, engineering studies, master)	59.5	57.6	66.7	41.7	66.7
Father's education (n=76)					
Vocational	11.8	10.7	8.0	27.3	8.3
Secondary (general or technical)	42.1	28.6	44.0	45.5	66.7
Higher (bachelor, engineering studies, master)	46.1	0.7	48.0	27.3	25.0

- No statistically significant differences were demonstrated between the age groups ($p > 0.05$)

With the increase in the wealth of the households, a decrease in the incidence of having a snack once a day and more often was observed. In households with an economic status identified by the parents as modest, over 83% of the athletes had a snack once a day or more often. In households of average and good economic status, having a snack at the above frequency was reported in 58 and 50% of the young athletes, respectively. In households with a very good economic status, only just over 20% boys reported the above habit. Having a snack several times per day was most frequent in those athletes whose mothers and fathers have secondary education (26.25%). In the investigated group of athletes, as many as 87% of the boys added sugar to their drinks and 42% used two or more teaspoons of sugar. In families with 4 members or smaller, no additional sugar was used by 15–16% of the investigated athletes, while in larger households, there were no boys who did not use extra sugar. In the larger families, nearly 65% of the athletes used two or more teaspoons of sugar, while in families with 4 or less members, 37–38% of the athletes used this amount of sugar. Almost half of the boys whose parents

identified their family economic status as average and 10% less boys with a below-average family economic status added two or more teaspoons of sugar. In the group of athletes with the family economic status above average, only less than 30% of the footballers used two teaspoons of sugar. Regardless of the household economic status (average, good and very good), only 9.7–13.2% of the boys did not add extra sugar, while in families whose household economic status was modest, all boys used extra sugar. Sugar was added most frequently by those athletes whose mothers have secondary (100%) and vocational (90.9%) education. In the group with mothers having higher education, nearly 20% of the footballers did not use extra sugar. In the group with fathers having vocational education, all boys added extra sugar, while among those with fathers having secondary and higher education, 15% and *7.5%* of the athletes, respectively, added sugar. The study revealed that the greater the number of family members is, the less footballers do not add extra salt to their dishes. A similar relationship was noted in adding extra salt only to certain dishes: in families with 3 members, 22% of the boys added extra salt, in slightly larger families with 4 members, the value was 27%, while in families with 5 or more members, the value was nearly 10% higher. The analysis indicates a statistically significant correlation ($p = 0.00125$) between adding extra salt to dishes and family economic status. Most dishes were supplemented with salt by 1 in 5 athletes in families with a below-average economic status, while among the other footballers from families with an average and above-average economic status, this habit was not present. In turn, some dishes were supplemented with salt in an increasing manner along with the improving family economic status, starting from below average (0; 26.32%, respectively). A similar, statistically significant correlation ($p = 0.003$) was demonstrated between adding extra salt and household economic status. Only in 'modest' households extra salt was added to most dishes (approx. 17% of the footballers). Starting from the modest household economic status, improvement in household economic status correlated with a decreasing number of athletes adding extra salt (83%; 84.63%; 56%, respectively). Most dishes were supplemented with salt by those footballers, whose both mothers and fathers have secondary education (3–4%). Extra salt was avoided most frequently by those players, whose parents have vocational education (82–90%).

Table 3. Characteristics of the socioeconomic (SEP) factors concerning families and selected aspects of nutritional behavior

Selected socioeconomic factors	**Number of meals**			**Meals at fixed times**			**Frequency of eating snacks**						**Adding sugar to dishes**			**Adding salt to dishes**		
	3	4	5	No	Yes, but some	Yes, all	Never	1–3 times per month	Once a week	Several times per week	Once a day	Several times per day	No	Yes, adding 1 teaspoon of sugar	Yes, adding 2 teaspoons of sugar	No	Yes, but only sometimes	Yes, most dishes
Number of household members																		
3 or less	11.1	70.4	18.5	11.1	63.0	25.9	x	7.4	18.5	33.3	33.3	7.4	14.8	48.1	37	77.8	22.2	0
4	13.6	50.0	36.4	4.5	79.5	15.9	x	2.3	9.1	34.1	25	29.5	15.9	45.5	38.6	70.5	27.3	2.3
5 and more	0.00	64.3	35.7	0.0	100.0	0	x	7.1	7.1	42.9	28.6	14.3	0	35.7	64.3	64.3	35.7	0
			NS			NS						NS			NS			NS
Family economic status																		
Below average	20.0	60.0	20.0	20.0	60.0	20	x	20	0	20	40	0	0	60	40	80	0	20
Average	11.3	60.4	28.3	7.5	79.2	13.2	x	3.8	11.3	24.5	37.7	22.7	13.2	35.8	50.9	73.6	26.4	0
Above average	10.7	60.7	28.6	3.6	78.6	17.9	x	3.6	17.9	46.5	17.9	14.3	10.7	60.7	28.6	67.9	32.1	0
			NS			NS						NS			NS			p = 0.00125
Household economic status																		
Modest	0	66.7	33.3	0.0	100.0	0	x	0	16.7	0	50	33.3	0	66.7	33.3	83.3	0	16.7
Average	9.7	71.0	19.4	9.7	74.2	16.1	x	6.5	19.4	16.1	38.7	19.3	9.7	41.9	48.4	83.9	16.1	0
Good	16	50.0	34.2	5.3	76.3	18.4	x	5.3	34.2	10.5	26.3	23.7	13.2	44.7	42.1	63.2	36.8	0
Very good	0	66.7	33.3	11.1	77.8	11.1	x	0	55.6	22.2	11.1	11.1	11.1	55.6	33.3	55.6	44.4	0
			NS			NS						NS			NS			p = 0.00307
Mother's education																		
Vocational	18	45.5	36.4	27.3	63.6	9.1	x	9.1	9.1	36.4	27.3	18.2	9.1	27.3	63.6	81.8	18.2	0
Secondary	13	65.2	21.7	0.0	82.6	17.4	x	8.7	21.7	8.7	34.8	26.1	0	47.8	52.2	65.2	30.4	4.3
Higher	9.6	61.5	28.8	5.8	76.9	17.3	x	1.9	9.6	42.3	26.9	19.2	17.3	48.1	34.6	73.1	26.9	0
			NS			NS						NS			NS			NS
Father's education																		
Vocational	10	70.0	20.0	10.0	90.0	0	x	10	20	30	20	20	0	60	40	90	10	0
Secondary	19	56.3	25.0	12.5	78.1	9.4	x	0	3.1	43.8	28.1	25	15.6	28.1	56.3	65.5	31.3	3.1
Higher	8.3	63.9	27.8	2.8	77.8	19.4	x	2.8	19.4	22.2	36.1	19.5	8.3	63.9	27.8	75	25	0
			NS			NS						NS			NS			NS

NS—no statistical significance

Discussion:

Correct diet is a very important factor that affects the exercise capacity of young athletes. Children and adolescents practicing sports require particular attention due to their high physical activity, but also due to the rate and intensity of their development processes. Numerous studies have indicated a series of improper dietary habits in young athletes, which may have health consequences [4,17,18]. Professional adult athletes are very often provided a comprehensive care, while young athletes, in whom nutrition is extremely important for physical and sports development, rely on the knowledge of their parents/guardians [8,15]. Shaping the dietary habits is heavily affected by socioeconomic factors, including family-related factors and influence of the immediate environment [3,11]. Family environment has a very large impact on the shaping of the dietary habits of children and adolescents. The number of household members, family and household economic status, as well as parents' nutritional knowledge play a significant role in the shaping of the dietary habits, particularly health-promoting ones [13,29,30]. The number of family members did not have a statistically significant effect on the number of meals, consuming them at fixed times, having snacks, adding extra salt and sugar. However, it was observed that with more people in the household, more athletes ate 5 meals per day, while with lower education, more boys ate all meals regularly. The study demonstrated that with the increase in the number of household members, the number of young footballers adding two or more spoons of extra sugar increased, while an inverse correlation was demonstrated for extra salt. The poorer the education, the more boys did not use extra salt at all. Mothers are particularly important in shaping the dietary habits of children as they transfer their own dietary habits to their children [3,7,23,28]. Parents' education is another aspect considered as an important factor that affects the nutritional behavior of children and adolescents. Usually, parents with better education more frequently have a healthy lifestyle and, as has been indicated in the literature, can allocate more financial resources on behaviors improving health (recreation, hygiene, health protection) [24]. A study by Kozioł-Kozakowska indicated that higher level of parents' education correlated with lower incidence of poor dietary habits in children [21]. In their study, North and Emmett found a relationship between mother's education and selection of unhealthy products, with higher education translating into smaller quantities of food with low nutritional value [20]. The higher the mother's education was, the less children—young athletes—consumed an inappropriate number of meals (3 meals). However, 5 meals were usually eaten by those players whose mothers had vocational education. With the increase in education, the number of footballers having meals at fixed times increased. In the group of athletes adding two or more teaspoons of extra sugar, there are significantly less boys whose mothers have higher education than those with mothers having vocational education. In the literature from the second half of the 20th century, no significant effect of father's education on the nutritional behavior of children and adolescents was observed [24]. However, a study from 2014 conducted in pre-school children showed that father's education has an effect on the dietary habits of children. This change can be associated with the changing family model in which an increasing participation of fathers in the care and nutrition of children can be seen [12]. The study indicates that, similarly as in the case of mothers, fathers' education has an effect on the incorrect number of meals in the diet of the young athletes, but the correlation is exactly the opposite: the greatest number of boys eating the correct number of meals were those with fathers having higher education (vocational education in the case of mothers). Family economic status and household economic status can have a significant impact on the quality of life of the household members, which may be reflected in the types of food products that are selected. Insufficient economic status restricts the access to or

prevents the purchase of the proper quantities of high quality food [21,24]. The conducted analyses indicate that a better economic status of a family and household translates into a greater number of the young athletes having the recommended quantity of 5 meals per day. The better the family and household economic status, the less boys have a snack once a day and more often. The following correlation was demonstrated: the worse the family and household economic status, the more young footballers do not add extra salt to their dishes. Socioeconomic status (SEP) has a significant influence on nutritional behavior and on the quality of the food products selected.

Conclusions:

The observed improper dietary habits of the young athletes require the implementation of a properly prepared education program for children and adolescents, as well as for their parents/guardians and trainers.

References:

1. Belsky J., B. Bell, R.H. Bradley, N. Stallard, S.L. Stewart-Brown (2006) Socioeconomic risk, parenting during the preschool years and child health age 6 years. Eur J Public Health, 17(5): 508-513. doi 10.1093/eurpub/ckl261
2. Benardot D. (2000) Nutrition for serious athletes, An advanced guide foods, fluids and supplements for training and performance. Human Kinetics, USA
3. Benton D. (2004) Role of parents in the determination of the food preferences of children and the development of obesity. International Journal of Obesity, 28, 858–869. doi:10.1038/sj.ijo.0802532
4. Bonci, L. (2010) Sports nutrition for young athletes. Pediatric Annals, 39 (5): 300-305. DOI: 10.3928/00904481-20100422-11
5. Emerson E, H. Graham, C. Hatton (2005) Household income and health status in children and adolescents in Britain. Eur J Public Health, 16: 354-360. doi: 10.1093/eurpub/cki200
6. Falkowska A., E. Stefańska, L. Ostrowska (2011) Ocena sposobu żywienia dzieci w wieku 10-12 lat o zróżnicowanym stopniu odżywienia. Endokrynol. Otył. Zab. Przem. Mat., 7(4):222-228.
7. Fisher J.O., Mitchell D. C., Smisklas-Wright H., Birch L.L. 2000. Maternal milk consumption predicts the trade off between milk and soft drinks in young girls' diet. J. Nutr., 131, 246-250.
8. Gacek M. (2007). Knowledge and behavior habits of young people in sport in the school athletic in Krakow, Annals National Institute of Hygiene, 58 (4): 641-648.
9. Halldórsson M, A.E. Kunst, L. Köhler, J. Mackenbach (2000) Socioeconomic inequalities in the health of children and adolescents. A comparative study of the five Nordic countries. Eur J Public Health, 10 (4): 281-288. doi 10.1093/eurpub/10.4.281.
10. Hanson M. D., E. Chen (2007) Socioeconomic status and health behaviors in adolescence: A review of the literature. J. Behav. Med., 30(3): 263-285.

11. Jeżewska-Zychowicz M. (2004) Ocena poziomu wiedzy żywieniowej i jej wpływu na częstotliwość spożywania wybranych produktów spożywczych wśród uczennic szkoły gastronomicznej. Żywienie Człowieka i Metabolizm, XXXI, 1, 33-48.
12. Kozioł – Kozakowska A., B. Piórecka, J. Żwirska, et al. (2007) Assessment of eating habits of pre-school children attending kindergatrens in region of Krakow with referral to cocio-economic characteristics. Probl. Hig. Epidemiol., 88(4): 422-427.
13. Kozioł – Kozakowska A., B. Piórecka, M. Schlegel – Zawadzka (2014) Wpływ postaw rodzicielskich na sposób żywienia dzieci w wieku przedszkolnym w Krakowie na tle uwarunkowań socjodemograficznych. Zdrowie Publiczne i Zarzadzanie, 12 (1): 82-89. doi:10.4467/20842627OZ.14.009.2901
14. Kwiatkowska E. (2010) Wpływ wykształcenia rodziców na częstotliwość spożywania warzyw i owoców przez ich dzieci. Roczn. PZH, 61(2): 179-182.
15. Leonkiewicz M., M. Gacek, B. Frączek (2015) Wiedza i zachowania żywieniowe młodzieży uprawiającej sport – konieczność edukacji. WSIiZ, Warszawa.
16. Leszczyńska T., R. Bieżanowska- Kopeć (2005) Ocena sposobu żywienia w gospodarstwach domowych prowadzonych przez osoby z wyższym wykształceniem. Żywność – Nauka Technologia Jakość, 4(45) Supl.: 151-161.
17. Montfort -Steiger V. & Williams C.A. (2007). Carbohydrate intake considerations for young athletes. Journal of Sports Science and Medicine, 6, 343 – 352.
18. Murat K, M. Żurek, M. Michno, C. Michalski (2012) Wpływ diety o różnych zawartościach węglowodanów na metabolizm człowieka podczas spoczynku i wysiłku fizycznego. Aktywność Ruchowa Ludzi w Różnym Wieku, 16, 103-111
19. Nelson M., K. Dick, B. Holmes (2002) Food budget standards and dietary adequacy in low-income families. P. Nutr. Soc., 61(4): 569-577.
20. North K., P. Emmet (2000) Multivariate analysis of diet among three-year-old children and associations with socio-demographic characteristics. The Avon Longitudinal Study of Pregnancy and Childhood (ALSPAC) Study Team. Eur J Clin Nutr.,54(1):73-80.
21. Piotrowska E., A. Broniecka, M. Frańczak, et al. (2014) Wpływ warunków socjoekonomicznych na sposób żywienia i zwyczaje żywieniowe młodzieży 13-15-letniej z Wrocławia i okolic. Bromat. Chem. Toksykol., (2): 186-195.
22. Siponen S.M., R.S. Ahonen, P.H. Savolainen, K.P Hameen – Anttila (2011) Children's health and parental socioeconomic factors: a population – based survey in Finland. Public Health, 11:457. **doi:** 10.1186/1471-2458-11-457
23. Skinner J.D., Carruth B.R., Bounds W., Ziegler P., Reidy K. 2002. Do food-related experiences in the first 2 years of life predict dietary variety in school-aged children? J.Nutr. Educ. Behav. 34, 310-315.
24. Tomaszewska I. (2014) Wpływ czynników środowiskowych na zachowania żywieniowe młodzieży w wieku 13-16 lat. Rozprawa doktorska, Gdański Uniwersytet Medyczny.
25. Victorino C. C, A.H. Gauthier (2009) The social determinants of child health: variations across health outcomes- a population-based cross-sectional analysis. BMC Pediatrics, 9:53. doi 10.1186/1471-2431-9-53
26. Von Rueden U., A. Gosch, L. Rajmil, et al. (2006) Socioeconomic determinants of health related quality of life in childhood and adolescence: results from a European study. J. Epidemiol. Commun. H.,60(2): 130-135.

27. Waluś A., L. Wądołowska, R. Cichoń R. (2003) Stan odżywienia 16-letniej młodzieży z regionu suwalskiego o różnym statusie ekonomicznym. Żyw. Człow. Metab., 30(1-2): 209-214.
28. Wardle J., Carnell S., Cooke L. 2005. Parental control over feeding and children's fruit and vegetable intake: how are they related? J. Am. Diet. Assoc., 105, 2, 227-232.
29. Zarnowiecki DM., N. Parletta, J. Dollman (2016) Socio-economic position as a moderator of 9-13-year- old children's non- core food intake. Public Health Nutr., 19(1):55-70. doi: 10.1017/S1368980015001081
30. Zarnowiecki DM., N. Parletta, J. Dollman (2016) The role of socio-economic positionas a moderator children's healthly food intake. Br J Nutr., 14;112(5):830-40. doi: 10.1017/S0007114514001