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Eating habits of children and adolescents from rural regions depending on gender, education, and economic status of parents

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Abstract

The proper lifestyle of a child, including proper eating habits, should be monitored to ensure proper physical and psychological development. This applies particularly to rural areas which are economically, socially and educationally backward. The study included 1,341 rural schoolchildren and adolescents aged 9-13 years (734 females, 607 males). The representative survey research was conducted in 2008, making use of an original survey questionnaire. The results showed that the majority of respondents eat improperly. 83.2% of them have regular breakfast, and 62.6% have regular light lunch. Most respondents do not eat more than 4 meals a day (usually 3-4). It is worrying that the consumption of sweets is high (34.9% of the surveyed group eat them regularly), whereas fruit and vegetable consumption is low. In this study, relationships between types of diet and such descriptive variables as gender, parents' educational status, and economic situation of the households are described. In families where the parents have a higher education and the household situation is good, the eating habits are much better. The list of poor dietary habits of pupils from rural schools includes skipping breakfast and/or light lunch, high consumption of sweets and low consumption of fruit and vegetables. There are correlations between improper dietary habits and gender of the children and adolescents, educational status of parents, economic situation of households, and housing conditions.

Key words

Eating habits, children, adolescents, rural regions, economic status, education level

INTRODUCTION

Healthy behaviours of children and young people have been of interest to many researchers, especially in recent years [1-5]. A proper lifestyle, which also includes proper eating habits which are the basis for the health status of adolescents and adults [6], should be monitored to ensure children`s correct physical and psychological development. This is especially important in rural areas. A rational diet is considered an important element of a healthy lifestyle. Many studies indicate the existence of numerous irregularities in the nutrition of children and adolescents [7-9], which results in their being overweight and obese [5, 10].

Although these problems are reported in academic publications in relation to urban areas [2, 9,11, 12], healthy behaviours of children living in rural regions have not been subjected to thorough, in-depth analyses so far. Hence, an attempt has been made to carry out sample surveys in the rural environment to become acquainted with the eating behaviours of the children, as well as adolescents, and determine their interdependences with reference to certain selected descriptive variables, such as gender, education of the parents, and economic situation of the households.

MATERIALS AND METHODS

The study comprised 1, 341 rural schoolchildren and adolescents aged 9-13 years. The group of respondents consisted of 734 (54.3%) female and 607 (45.5%) male young rural inhabitants. 3.7% of all the 9-13-year-olds were primary school pupils in the rural regions of Zachodniopomorski Province. Selection of schools was random. Subsequently, school-classes were also randomly selected. The sampling frame was information obtained from the Board of Education in Szczecin concerning the number of primary schools, as well as the sizes of individual school-classes. The selection of school-classes was performed in a way that made it possible to obtain a group of respondents with an age structure proportional to the age structure of all the students attending selected primary schools. The survey research was conducted in 2008 and made use of an original survey questionnaire.

The obtained data were analysed with the use of statistical methods, including Pearson's Chi-square test of independence (data in rows and columns of contingency tables, degree of freedom ≥1). The two-sample z-test for difference between proportions was used to compare data presented as percentages (proportions).

The most important percentage data were supplemented by calculated 95-percent confidence intervals for the population (placed in brackets). Significance was accepted as a p-value of less than 0.05.

RESULTS

Standards of living and social situation of families of surveyed young rural inhabitants. Obtained data showed that 84.7% of the surveyed rural children and adolescents aged 9-13 years came from dual-parent families and 15.3% from single-parent families. The majority of them lived in non-agricultural households (49.5%).

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Only 3.2% of respondents declared a very good financial situation of the household, i.e. sufficient financial means for all purposes (no necessity to economize), 57.6% of respondents declared a fairly good or good financial situation, i.e. their households had sufficient money only for everyday necessities, and no resources sufficient to purchase relatively expensive goods, 8.6% of them could afford to buy only the cheapest food, but not clothes (Table 1).

Table 1. Standards of living and social situation of families of surveyed rural children and adolescents

Family structure		Kind of household		Economic family status one person (PLN)		Average income per month of			Main source of income		
Dual-parent family	One-parent family	Agricultural	Non-agricultural	Very good	Tragic	Up to 200	201-299	300-399	Agricultural production	Pension	Other
84.7%	15.3%	50.5%	49.5%	3.2%	8.6%	43.7%	37.7%	13.9%	10.3%	4.6%	74.1%

Average income (per month per person) in the studied households was as follows: up to 200 PLN (Polish currency) in 43.74% of the households, 201-299 PLN in 37.7% of the households, 300-391 PLN in 13.9% of the households. A household income per month per person equal to 600 PLN or higher was reported only by 4.7 % of the respondents. Certainly surprising were the declared sources of income of the households, the option 'agricultural production' was ticked only by 10.3% of the respondents, pension by 4.6% and 'other sources of income' were declared by 74.1% -the majority of the respondents (Table 1).

Dietary habits reported by rural children and adolescents. 83.1% of the surveyed were in the habit of eating their first meal of the day before school (95% confidence interval for the population: 81.1%-85.1%). Almost 17% of the surveyed group denied drinking anything, and eating breakfast before leaving for school (Figure 1). The difference between mentioned fractions (percentages) was statistically significant.

In the light of the conducted analysis, almost 3/5 (62.2%) of the surveyed rural children and adolescents aged 9-13 years (95% confidence interval for the population: 59.6%-64.8%) regularly take a light lunch to school. Altogether, 16.8% (14.8%-18.8%) of them are in the rare habit of taking a light lunch (6.4%) or take it irregularly (10.4%). Almost 1/10 of respondents denied taking any light lunch to school (Figure 2).

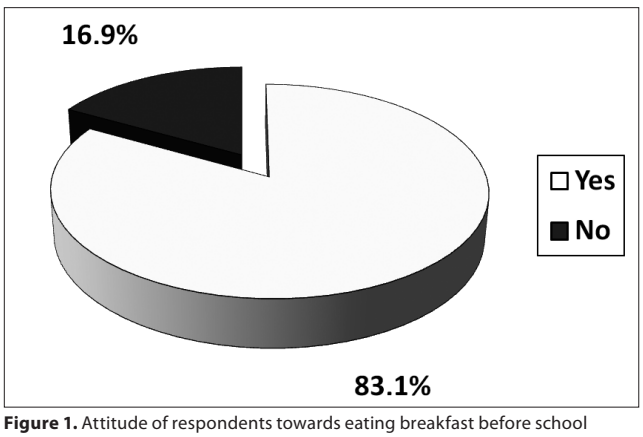

Figure 1. Attitude of respondents towards eating breakfast before school

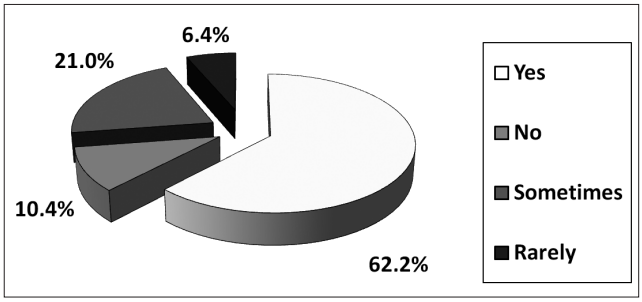

Figure 2. Attitude of respondents to taking light lunches to school

44.2% (41.54-46.86) of the studied children and adolescents living in the rural areas eat 4 meals a day, but 2.4% (1.58%-2.22%) of them declared that they eat only 1 - 2 meals a day (Figure 3). It seems alarming that more than 26% (24.0%+2.4% = 26.4%) of respondents eat less than 4 meals a day. Only 29.4% of respondents declared having 5 or more meals a day (WHO recommends 4-5 meals a day).

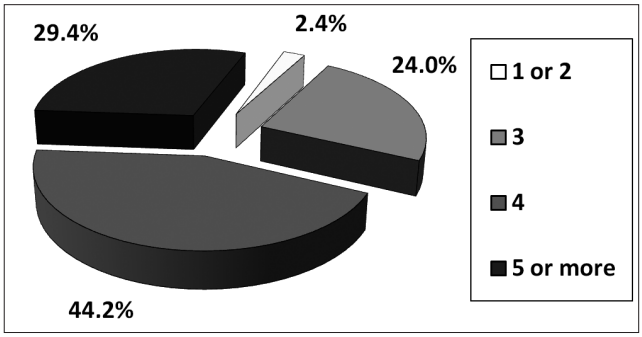

Figure 3. Number of daily meals

The consumption of sweets by children and teenagers is a very important health problem all over Europe. It is worrying that 34.9% (32.25%-37.45% - 95% confidence interval for the population) of the respondents are used to eating sweets every day, and 45.4% of them eat sweets a few times a week (Figure 4).

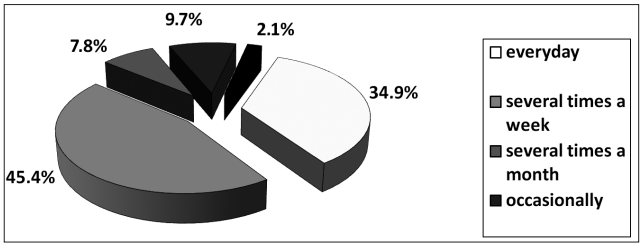

Figure 4. Consumption of sweets by the surveyed group

Health authorities recommend eating at least 2 portions of fruit and 5 portions of vegetables every day. More than 50% of the surveyed group (56.3%) declared eating fruit and vegetables every day, but 4.4% of respondents consumed fruit and vegetables a few times a month, and 3.5% only occasionally or never (Figure 5).

Relationships between eating habits and selected descriptive variables. Data analysis revealed that 86.6%

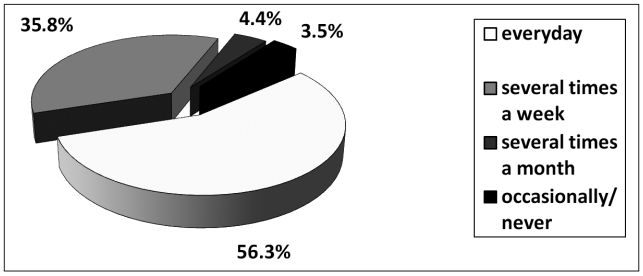

Figure 5. Consumption of vegetables and fruit by the surveyed group

(76.9%-83.7%) of male school children and adolescents aged 9-13 years, as well as 80.3% (77.1%-83.5%) of their female peers, admitted to eating breakfast (Table 2). Such observation allows the conclusion that male youngers eat breakfasts more eagerly than the females (z-value: -2.814; one-tailed p-value: 0.0025). 65.5% (61.2%-69.7) of female respondents and only 58.2% (53.1%-63.3%) of male respondents declared eating regular light lunches. There is also no statistical difference between such data (z-value: 2.507; one-tailed p-value: 0.0062).

In the questionnaire, most of respondents ticked the options 'sometimes' or 'rarely', which was suggestive of irregular eating patterns (Table 3).

Table 2. Attitude towards eating breakfast in relation to gender of surveyed children and adolescents

Gender		Breakfasts consumption		Total
	Yes	No		
Female	No.	589	145	734
	%	80.3	19.7	100.0
Male	No.	526	81	607
	%	86.6	13.4	100.0
Total	**No.**	**1,115**	**226**	**1341**
	%	83.1	16.9	100.0
	95%ci	81.1-85.1	14.9-18.9	
Pearson's chi-square test		Chi^2= 9.74; p=0.018; Df=1		

95%ci – 95% confidence interval
Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

Table 3. Attitude of surveyed children and adolescents towards eating light lunches, according to gender

Gender		Eating light lunches				Total
		Regularly	Never	Sometimes	Rarely	
Female	No.	481	60	147	46	734
	%	65.5	8.2	20.0	6.3	100.0
Male	No.	353	80	134	40	607
	%	58.2	13.2	22.1	6.6	100.0
Total	**No.**	**834**	**140**	**281**	**86**	**1341**
	%	62.2	10.4	21.0	6.4	100.0
	95%ci	59.6-64.8	8.77-12.03	18.82-23.118	5.09-7.71	
Pearson's chi-square test		Chi^2= 11.6, p=0.86; Df=3				

95%ci – 95% confidence interval
Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

The data in Table 4 suggest the influence of parents' education status on the attitude of children and adolescents towards eating light lunches (Person's chi square test: p=0.04). The respondents with at least one parent with a university education declared eating light lunches more frequently (69.7%) than those whose parents had only primary education (55.5%) (Table 4). The difference between percentages was significant (z-value: 1.862; one-tailed p-value: 0.0313).

Table 4. Attitude of children and adolescents towards eating light lunches in relation to parents' level of education

Parents' level of education. Level of education of better educated parent		Eating light lunches				Total
		Regularly	Never	Sometimes	Rarely	
Primary education	No.	196	46	81	30	353
	%	55.5	13.0	23.0	8.5	100.0
Secondary education	No.	247	34	62	24	367
	%	67.3	9.3	16.9	6.5	100.0
Vocational secondary education	No.	338	53	126	28	545
	%	62.0	9.7	23.1	5.1	100.0
Higher education or incomplete higher education	No.	53	7	12	4	76
	%	69.7	9.2	15.8	5.3	100.0
Total	**No.**	**834**	**140**	**281**	**86**	**1,341**
Pearson's chi-square test		Chi^2= 17.6 p=0.04; Df=9				

Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

A correlation was noticed between eating light lunches by rural primary school students and their living standards. Children and adolescents living in very good and good housing conditions declared eating light lunches more frequently than those who ticked the options 'bad housing conditions' and 'very bad housing conditions' (Table 5). The differences between percentages were statistically significant (very good and good housing conditions declared by 665 respondents, bad and very bad housing conditions by 169 youngsters. Corresponding percentages were as follows: 64.00% and 55.96% (z-value: 2.536; one-tailed p-value: 0.006).

Table 5. Attitude of children and adolescents towards eating light lunches in relation to living standards

Family housing conditions		Eating light lunches				Total
		Regularly	Never	Sometimes	Rarely	
Very good	N	62	8	11	1	82
	%	75.6	9.8	13.4	1.2	100.0
Good	N	603	98	202	54	957
	%	63.0	10.2	21.1	5.6	100.0
Bad	N	157	28	61	25	271
	%	57.9	10.3	22.5	9.2	100.0
Very bad	N	12	6	7	6	31
	%	38.7	19.4	22.6	19.4	100.0
Total	**N**	**834**	**140**	**281**	**86**	**1341**
Pearson's chi-square test		Chi^2= 26.8 p=0.002; Df=9				

Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

Data analysis revealed a significant correlation between gender and the number of daily meals consumed by the surveyed group. Surveyed young boys and male adolescents ate more meals per day than their female peers. 34.6% of the male and only 25.1% of female respondents declared

that the number of meals exceeded 4 (difference between percentages is significant; z-value: 3.801, one-tailed p-value: 0.000). The majority of the studied male and female primary school students declared eating at least 3 meals a day (Table 6; Figure 3). 26.4% (2.4%+24.0%) of the surveyed subjects declared that the number of their daily meals was less than 4.

Table 6. Number of daily meals in relation to gender of surveyed children and adolescents

Gender		Number of daily meals				Total
		1 or 2	3	4	≥5	
Female	No.	19	189	342	184	734
	%	2.6	25.8	46.6	25.1	100.0
Male	No.	14	133	250	210	607
	%	2.3	21.9	41.2	34.6	100.0
Total	**No.**	**33**	**322**	**592**	**394**	**1,341**
	%	2.4	24.0	44.2	29.4	100.0
	95%ci	1.6-3.2	21.7-26.3	41.5-46.9	27.0-31.8	
Pearson's chi-square test		Chi^2= 682,7 p=0.000; Df=9				

95%ci – 95% confidence interval
Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

A statistically significant correlation was found between the number of meals eaten daily by the surveyed group and their parents' level of education (Table 7; chi square 682.7, p=0.000). The maximum number of meals (≥ 5 meals a day) was eaten by primary school students who had at least one parent with a primary (32.2%) or higher (34.2) level of education (Table 7).

Table 7. Number of daily meals in relation to parents' level of education

Parents' level of education. Level of education of better educated parent		Number of daily meals				Total
		1 or 2	3	4	≥5	
Primary education	No.	16	78	145	114	353
	%	4.5	22.1	41.1	32.3	100.0
Secondary education	No.	7	100	158	102	367
	%	1.9	27.3	43.1	27 .8	100.0
Vocational secondary education	No.	9	131	253	152	545
	%	1.7	24.0	46.4	27 .9	100.0
Higher education or incomplete higher education	No.	1	13	36	26	76
	%	1.3	17.1	47.4	34 .2	100.0
Total	**No.**	**33**	**322**	**592**	**394**	**1341**
Pearson's chi-square test		Chi^2= 682.7 p=0.000; Df=9				

Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

A correlation between the number of daily meals and economic situation of the households was also found. The lowest percentage of respondents eating less than 4 meals a day was found in the subgroup of pupils with very good and good economic situations, the highest in the subgroup with a 'tragic' situation (Table 8) ((The difference between percentages ((10+2+72)/(43+306)*100%= 24.1% and ((34+10)/115)*100%= 38.26%) was significant (z-value: 2.966, one-tailed p-value: 0.002).

Table 8. Number of daily meals in relation to financial situation of households

Financial situation of households		Number of daily meals				Total
		1 or 2	3	4	≥5	
Very good. There is money for all purposes. There is no necessity to economize	No.	0	10	18	15	43
	%	0.0	23.3	41.9	34.9	100.0
Good. There is money for basic needs, but there is a necessity to economize	No.	2	72	143	89	306
	%	0.7	23.5	46.7	29.1	100.0
Quite good. There is money for basic needs, but not money for purchasing more expensive items	No.	9	111	208	138	466
	%	1.9	23.8	44.6	29.6	100.0
Poor. The income is sufficient for only the cheapest food and clothing	No.	6	39	92	54	191
	%	3.1	20.4	48.2	28.2	100.0
Very poor. The income is sufficient for only the cheapest food, but not for clothing	No.	6	56	89	69	220
	%	2.7	25.5	40.5	31.4	100.0
Tragic. There is not enough money for even the cheapest food and clothing	No.	10	34	42	29	115
	%	8.7	29.6	36.5	25.2	100.0
Total	**No.**	**33**	**322**	**592**	**394**	**1,341**
Pearson's chi-square test		Chi^2= 31.9 p=0.007; Df=15				

Chi^2 – Chi-square value
Df – degrees of freedom
n – subgroup size
p – p-value

DISCUSSION

Good nutrition is the bedrock of lifelong health, and it begins in infancy.

Nutrition-related health problems often start in childhood, and are increasingly significant causes of disability and premature death worldwide. Under-nutrition and low energy intake are the major problems in developing countries. In such countries, the real health hazard results from the consumption of high energy foods, an unbalanced diet, and improper eating habits. The problems of unhealthy diets and improper feeding of children and adolescents have been reported in the literature since the early 1960s [13-17].

In Poland, as in other high-income countries, high energy intake seems to be a leading dietary problem [18, 19]. Yet the problems of under-nutrition, imbalanced diet, and improper pattern of daily meals, which are important quantitative issues, seem to be underestimated.

According to Polish nutritional recommendations, children and adolescents should have 4-5 meals a day [18]. The data obtained from the survey questionnaire indicate that even though the majority of rural children and adolescents eat 4-5 meals a day, a considerable percentage of them eats 3 meals a day (24%) or even fewer (2.4%) (Table 6). Similar conclusions have been published by M. Gajewska and M. Jarosz [6, 20].

An improper dietary pattern of daily meals seems to be one of the main reasons for under-nutrition, over-nutrition and problems arising from the consumption of imbalanced diets.

In the course of conducting the present study, 83.1% of the surveyed young people confessed that they were used to eating breakfast (Table 2), and 62.6% of them declared regular eating light lunches (Table 3). Such conclusions coincide with the calculations by Woynarowska [21] who is of the opinion that 18% of Polish children skip breakfast, and 21% of them do not bring light lunches to school. It is supposed that this attitude toward diet, as well as dietary negligence, may affect the physical and mental state of the children, and have an impact on their quality of learning.

The obtained data make it possible to draw a conclusion that as much as 34.94% of the rural children and adolescents aged 9-13 years are used to eating sweets every day, only 32.2% of them have a habit of regularly drinking milk (every day), and 56.4% eat fruit and/or vegetables on a daily basis. The suggestion that the high consumption of sweets by Polish children and adolescents is a basic dietary problem is confirmed by reports published by other Polish authors. Woynarowska assessed the percentage of children and adolescents eating sweets daily at 33 [21], Witkowski J. [17] at about 30.

The danger resulting from improper diet was described by a Commission of the European Communities [22] while bringing up problems of the health status of young people living in Common Europe.

Nearly half of the Polish children and adolescents below the age of 14 are exposed to at least one of the factors taking part in the pathogenesis of cardiovascular disease. The statistics show that the health state of the younger generation of Poles is bad. Almost 20% of children and adolescents weigh too much as a result of improper nutrition, 11% of such Poles already suffer from hypertension, almost 10% of 15-year-old adolescents have serum cholesterol level that is too high [23, 24].

Permanent monitoring of the health status condition of the Polish young generation, especially country dwellers (living in backward regions), should be the main objective of our Health Service System. It seems to be essential to work out easy to use, reliable and accurate diagnostic tools. The lack of such tools causes problems, which is reflected in different data obtained by various authors who used incompatible methods.

Analysis of the causes of failure of many health-related initiatives may indicate the lack of funding, lack of consistency in action, and impoverishment of society; but it may also reflect the impact of advertising, cultural changes, and the lack of reliable methods of monitoring the effects of health-promotion actions [25, 26].

Devising effective monitoring tools should not limit the efforts to develop better and more efficient health education methods. Health education takes place in a variety of settings, both in and out of school, but school education should be crucial. Secondary school, as well as high school graduates, should have sufficient knowledge to enable them to make a good choice of a healthy lifestyle, and know healthy nutrition rules. Of course, these are only wishes to be fulfilled. Nowadays, the Polish education system is in urgent need improvement. The problem may be defined in the simplest way by using the dictum preached by Marcin Kacprzak: 'The Polish school functions as if only the brain of a child attended school, but not his whole body' [24].

CONCLUSIONS

Research into the dietary habits of children and adolescents aged 9-13 living the rural environment has revealed the following dietary negligence:

1. Poor dietary habits of children and adolescents aged 9-13 years living in rural regions are common.
2. The list of poor dietary patterns includes: skipping breakfast and/or light lunch, high consumption of sweets, and low consumption of fruit and vegetables
3. There are correlations between improper dietary habits and gender of the children and adolescents, educational status of parents, economic situation of households, and housing conditions.

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