



ORIGINAL PAPER

DOI: <https://doi.org/10.20883/jms.2016.152>

Evaluation of the effect of selected social and demographic criteria on the frequency of the consumption of lunch and products purchased at school by pupils

Małgorzata Kwiatkowska^{1,3}, Zbigniew Walczak^{1,2}, Agata Wawrzyniak³

¹ Nicolaus Copernicus School Complex No. 1 in Koszalin, Poland

² Department of Biochemistry and Biotechnology, Koszalin University of Technology, Poland

³ Nutrition Assessment Institute, Department of Human Nutrition, Warsaw University of Life Sciences, Poland

ABSTRACT

Introduction. The research shows that eating disorders currently occur in 22% of girls and 28% of boys. Such high overweight and obesity rates are often caused by unbalanced diet, low nutritional awareness of students and parents and, in consequence, bad nutritional habits developed at home. Nutritional awareness of mothers can affect the dietary behaviour and choices of children and, in consequence, their proper nutritional status.

Aim. The aim of the research was to evaluate the frequency of the consumption of breakfast and lunch prepared at home and the frequency of purchases in school shops and vending machines in relation to the child's sex and the mother's educational level.

Material and Methods. The research material consisted of a survey questionnaire from 76 children aged 9 years, containing questions related to the frequency of consuming breakfast and lunch prepared at home, the frequency of purchasing food products in school shops/vending machines in the past three months and the types of those products.

Results. On the basis of conducted research, it was found that the sex of a child did not have any effect on the number of meals consumed ($p = 0.14$), the frequency of consuming breakfast at home ($p = 0.44$), the frequency of consuming lunch (brought from home) at school ($p = 0.46$), or the frequency of purchasing products in school shops/vending machines ($p = 0.50$). It was found that mothers' educational level had an effect on dietary habits of children ($p < 0.001$). Children of mothers with vocational education significantly more often did not consume breakfast at home. Mother's education also showed a statistically significant effect on the frequency of consuming lunch at school ($p = 0.02$) and the frequency of purchasing food products in school shops ($p < 0.001$).

Conclusions. The frequency of consuming breakfast and lunch and the frequency of buying food products in school shops/vending machines was significantly statistically dependent on the mother's level of education.

Keywords: students, frequency, breakfast consumption, purchase of products at school, sex, mother's educational level, nutritional status.

Introduction

For many years there has been an increase in the number of overweight and obese children in Poland. The research shows that those disorders occur in 22% of

girls and 28% of boys [9]. Such high overweight and obesity rates are often caused by an unbalanced diet rich in highly processed products, with a significant share of fat and/or sugar, i.e. "fast-food" products,

sweets, sweetened beverages, low in fruit, vegetables and dairy products [9]. What is also alarming is an excessively high calorific value of meals consumed and their improper distribution during a day which, combined with low physical activity, is the main cause of improper nutrition status of children in Poland [23, 17].

Breakfast is the first meal after the night break and its consumption is particularly important for children of school age. The research conducted in Poland indicates that some school-age children do not have breakfast and are not properly prepared for an increased mental effort in school, which can affect their school results [1, 6, 18]. On the other hand, a growing trend for energy value consumed at school has been observed, particularly with no control of the range of products sold at school, which was, first of all, the fault of school shops/vending machines providing pupils with easy access to products high in fat and monosaccharides [20, 25]. This can also result from low nutritional awareness of pupils and parents and, in consequence, poor nutritional habits developed, among others, at home [10], including skipping breakfast at home and not bringing lunch from home to school [19, 30]. Since it is mothers who are most often responsible for preparing meals for their children, the nutritional awareness of mothers can translate into dietary behaviours and choices of children, and, in consequence, to their proper nutritional status.

Aim

The aim of the research was to evaluate the frequency of consumption of breakfast and lunch prepared at home, and the frequency of purchases in school shops and vending machines in relation to the child's sex and the mother's level of education, as well as to analyse the effect of the above-mentioned factors and eating habits on the nutritional status of pupils from two primary schools in Koszalin.

Material and Methods

The study was carried out in spring 2015 among 76 pupils aged 9 years. The survey questionnaire contained questions related to the frequency of consuming breakfast and lunch prepared at home, the frequency of purchasing food products in school shops/vending machines in the past three months and the types of those products. School shops in two primary schools in Koszalin offered a similar range of food products. Food products purchased by students were considered as consumed. Additionally, the children's body weights

and heights were measured and body mass index (BMI) value were calculated (necessary to calculate the Cole index), which permitted the degree of obesity or underweight in children to be evaluated according to the McLaren and Red classification scheme [13].

The statistical analysis was accomplished with Statistica 12 software. An evaluation of the effect of the child's sex and the mother's level of education on the examined dietary behaviours and evaluation of the nutritional status of the surveyed children was prepared with the use of the chi-square test and by calculating Spearman's correlation index to determine the relations within the dietary behaviours of the children. The significance level of $\alpha = 0.05$ was assumed for all calculations.

Results and discussion

Boys made up 53% of the examined group and girls accounted for 47%. The sex of a child did not have any effect on the number of meals consumed ($p = 0.14$), the frequency of eating breakfast at home ($p = 0.44$), the frequency of consuming lunch at school (brought from home) ($p = 0.46$), or the frequency of purchasing food products in school shops/vending machines ($p = 0.50$) (Table 1). However, it should be emphasized that 17% girls and 20% boys had a lower number of meals per day than the recommended 4–5 [27, 29], which could result in lower school results and a higher level of fatigue among children during mental work and physical activity [1, 6]. What is also alarming is the fact that only 3/4 of children, on average, had breakfast every day (14% more boys than girls) and the same percentage took their lunch every day to school (18% more girls than boys). As many as 38% of children bought food products in school shops/vending machines during the day, several times a day or every day (14% more girls than boys).

The mothers' educational level had an effect on the dietary habits of children ($p < 0.001$). Children of mothers with vocational education significantly more frequently did not have their breakfast at home, while as many as 86% children in this group did not have breakfast at all or had it twice a week. In the group of mothers with secondary and higher education, no cases of skipping breakfast or having it less frequently than several times a week were recorded. Mothers' education also had a statistically significant effect on the frequency of lunch consumption at school ($p = 0.02$). Only 29% children of mothers with vocational education were aware of the importance of proper nutrition

Table 1. Eating habits of studied group of children according to gender and mother's education

The tested factor		Total n = 76	Gender		p*	Mother's education			p*
			Girls n = 36 (47%)	Boys n = 40 (53%)		Vocational n = 14 (18%)	secondary n = 24 (32%)	higher n = 38 (50%)	
Number of meals eaten during the day	1-2	2 (3%)	0 (0%)	2 (5%)	0,14	2 (14%)	0 (0%)	0 (0%)	0,91
	3	12 (16%)	6 (17%)	6 (15%)		2 (14%)	4 (17%)	6 (16%)	
	4	40(53%)	24 (66%)	16 (40%)		6 (43%)	14 (58%)	20 (52%)	
	≥ 5	22 (28%)	6 (17%)	16 (40%)		4 (29%)	6 (25%)	12 (32%)	
Frequency of consumption of breakfast at home	I do not consume	10 (13%)	6 (17%)	4 (10%)	0,44	10 (72%)	0 (0%)	0 (0%)	< 0,001
	2 times / week.	2 (3%)	0 (0%)	2 (5%)		2 (14%)	0 (0%)	0 (0%)	
	every other day	8 (10%)	6 (17%)	2 (5%)		0 (0%)	4 (17%)	4 (12%)	
	daily	56 (74%)	24 (66%)	32 (80%)		2 (14%)	20 (93%)	34 (88%)	
Frequency of consumption of second breakfast brought from home	I do not consume	6 (8%)	0 (0%)	6 (15%)	0,46	2 (14%)	2 (9%)	2 (6%)	0,02
	2 times / week.	10 (13%)	4 (11%)	6 (15%)		6 (43%)	4 (17%)	0 (0%)	
	every other day	4 (5%)	2 (6%)	2 (5%)		2 (14%)	0 (0%)	2 (6%)	
	daily	56 (74%)	30 (83%)	26 (65%)		4 (29%)	18 (74%)	34 (88%)	
Frequency of purchase products in school shop/machine	I'm not buying	8 (10%)	4 (11%)	4 (10%)	0,50	0 (0%)	8 (33%)	0 (0%)	<0,001
	several times /month	26 (34%)	10 (28%)	16 (40%)		0 (0%)	8 (33%)	18 (47%)	
	1 time / week.	14 (18%)	6 (17%)	8 (20%)		0 (0%)	2 (9%)	12 (32%)	
	several Times/week.	20 (28%)	14 (39%)	6 (15%)		6 (43%)	6 (25%)	8 (21%)	
daily	8 (10%)	2 (5%)	6 (15%)	8 (57%)	0 (0%)	0 (0%)			

* Chi2 test; p-values > 0.05 indicate no statistically significant differences

in providing their children with lunch for school. For mothers with secondary or higher education, those values were significantly higher and amounted to 74% and 88%, respectively. It should be presumed that the fact of not having breakfast at home or lunch at school by a higher percentage of children of mothers with vocational education was the reason why all children in this group purchased products in the school shop at least a few times a week, which was recorded for only 21–25% of the examined children in the group of mothers with secondary or higher education ($p < 0.001$). The educational level of mothers did not have a significant effect on the number of meals consumed ($p = 0.91$), although it was only in the group of mothers with vocational education that children had less than 3 meals a day (14%), which should be described as improper.

Similar results concerning breakfast consumption frequency were obtained by Sadowska [16], who reported that in the group of children aged 7–9 years, breakfast was consumed every day or often by 74% girls and 72% boys, and lunch was always consumed by 67% of girls and 83% of boys. In a study by Czezelewski [2], carried out among children at the average age of 11, about 88% children had breakfast, and in a study by Wawrzyniak et al. [22], the consumption of breakfast every day was found for 60% children aged 11–13, while 33% of the examined children had breakfast only sometimes and 7% of children never had breakfast. The research carried out by the WHO in 2013/2014 demonstrated that breakfast was consumed every day by 70% of girls and 71% of boys aged 11 [8].

The education of the mother, as a person in the family with a major impact on the child's nutrition, was reflected in the dietary habits of a child in relation to having breakfast and lunch, or purchasing food products in school shops, as it has been demonstrated in own research and research by other authors. This was also confirmed by analyses carried out among junior secondary school students in Bytom [26], in which it was proven that children of mothers with higher education had breakfast more often and ate fewer sweets than children of mothers with vocational education. A similar trend was also demonstrated in research carried out in Brazil regarding the relationship between the mother's education and her care about the quality of child nutrition [5]. Dutch children whose mothers had higher education also consumed more fruit and vegetables than children of mothers with vocational education [24]. In turn, in the research carried out among American children from rural areas, a relationship was demonstrated between the proper dietary habits of boys whose mothers had higher education level [14].

In own research, as regards products purchased most often in school shops, children most often declared buying sweets (65% boys and 33% girls), juices (55% boys and 50% girls), lollipops (50% boys, 44% girls), mineral water (40% boys and 50% girls), crisps (45% boys and 28% girls) and jellies (40% boys and 39% girls). When buying products in school shops, children were driven primarily by the taste (sweet, salty) and external appearance (colour), without paying attention to nutritional value [20]. Shop assistants from primary

schools in Wrocław confirmed that children most often bought sweets (bars, jellies, lollipops) and products high in fat (crisps) [25]. It is a highly important issue since own research demonstrated an inverse relation between consuming breakfast and lunch prepared at home and the frequency of purchasing products in school shops/vending machines ($p < 0.001$) (**Table 2**).

Family environment exerts a significant effect on the dietary habits of children. Many behaviours observed at home become the children's own habits [28, 7]. The nutritional value of meals consumed by

children depends on the nutritional knowledge of the children and their parents [21]. American research carried out among 12-year-old children showed that parents often did not know what their children bought or ate at school [14]. Very often, adults do not realize that the money given to the child for buying lunch was used to buy products high in fat and sugar, purchased in a shop at or near the school. It should also be emphasized that children making purchases on their own feel more adult and independent and are, therefore, particularly exposed to making dietary mistakes [21]. The

Table 2. The relationship between eating habits of studied

Tested parameter	Frequency of consumption of breakfast at home	Frequency of consumption of second breakfast brought from home	Frequency of purchase products in school shop/machine
Number of meals eaten during the day	0,01* p = 0,97	0,01 p = 0,99	-0,10 p = 0,53
Frequency of consumption of breakfast at home		0,48 p = 0,002	-0,64 p < 0,001
Frequency of consumption of second breakfast brought from home			-0,58 p < 0,001

* Spearman correlation coefficients; $p \leq 0.05$ values indicate statistically significant differences

Table 3. The nutritional status of the studied group of children on the basis of the Cole's index depending on gender and mother's education

Nutritional status	Total n = 76	Gender		p*	Mother's education			p*
		Girls n = 36 (47%)	Boys n = 40 (53%)		vocational n = 14 (18%)	secondary n = 24 (32%)	higher n = 38 (50%)	
Malnutrition/Destruction	8 (11%)	2 (6%)	6 (15%)	0,40	0 (0%)	4 (17%)	4 (12%)	0,49
Normal values	28 (37%)	14 (39%)	14 (35%)		4 (29%)	10 (42%)	14 (36%)	
Overweight	18 (24%)	12 (33%)	6 (15%)		6 (42%)	2 (9%)	10 (26%)	
Obesity	22 (28%)	8 (22%)	14 (35%)		4 (29%)	8 (32%)	10 (26%)	

* Chi2 test; p-values > 0.05 indicate no statistically significant differences

Table 4. The impact of eating habits in the studied group of children on the nutritional status

The tested factor		Total n = 76	Nutritional status				p*
			Malnutrition/ Destruction n = 8 (11%)	Normal values n = 28 (37%)	Overweight n = 18 (24%)	Obesity n = 22 (28%)	
Number of meals eaten during the day	1-2	2 (3%)	0 (0%)	0 (0%)	0 (0%)	2 (9%)	0,98
	3	12 (16%)	0 (0%)	4 (14%)	4 (22%)	4 (18%)	
	4	40 (53%)	6 (75%)	14 (50%)	10 (56%)	10 (45%)	
	≥ 5	22 (28%)	2 (25%)	10 (36%)	4 (22%)	6 (28%)	
Frequency of consumption of breakfast at home	I do not consume	10 (13%)	0 (0%)	4 (14%)	4 (22%)	2 (9%)	0,85
	2 times/week	2 (3%)	0 (0%)	0 (0%)	0 (0%)	2 (9%)	
	every other day	8 (10%)	0 (0%)	4 (14%)	2 (11%)	2 (9%)	
	daily	56 (74%)	8 (100%)	20 (72%)	12 (67%)	16 (73%)	
Frequency of consumption of second breakfast brought from home	I do not consume	6 (8%)	0 (0%)	2 (7%)	0 (0%)	6 (28%)	0,31
	2 times/week	10 (13%)	0 (0%)	6 (21%)	0 (0%)	2 (9%)	
	every other day	4 (5%)	0 (0%)	0 (0%)	2 (11%)	2 (9%)	
	daily	56 (74%)	8 (100%)	20 (72%)	16 (89%)	12 (54%)	
Frequency of purchase products in school shop/machine	I'm not buying	8 (10%)	2 (25%)	2 (7%)	0 (0%)	4 (18%)	0,13
	several times/month	26 (34%)	6 (75%)	14 (50%)	2 (11%)	4 (18%)	
	1 time/week	14 (18%)	0 (0%)	2 (7%)	6 (33%)	6 (28%)	
	several times/week	20 (28%)	0 (0%)	6 (21%)	10 (56%)	4 (18%)	
	daily	8 (10%)	0 (0%)	4 (15%)	0 (0%)	4 (18%)	

* Chi2 test; p-values > 0.05 indicate no statistically significant differences

research conducted in 2007 in Warsaw among pupils of the fourth grade of primary school and their parents revealed differences in the evaluation of lunch consumption by children (28% children declared having lunch while 69% of parents declared that their children had lunch). This discrepancy also concerned the consumption of sweets (79% children declared consumption of sweets, while 60% of parents declared that their children consumed sweets) [4].

The nutritional status of children was not related to the sex of the subjects or to the level of education of mothers ($p > 0.05$) (**Table 3**), although a higher percentage of girls than boys were overweight (by 18%), while a reverse trend was observed in the case of obesity, where 13% more boys than girls were characterized by this nutritional status. Only 37% of the subjects were characterized by proper body mass, with significant obesity (28%) and overweight (24%) among children. The current results demonstrated that the examined group of 9-year-old pupils from Koszalin follows the growing trend in the number of children with eating disorders [8]. Jończyk et al. [11], examining a group of 11-year-old children from Piekary Śląskie observed overweight in 15% and obesity in 20% of children. In turn, Kolarczyk et al. [12] on the basis of the research concerning children from Kraków, found a shift in the BMI values in children aged 9–10 towards higher values. It should also be emphasized that, despite a lack of statistically significant differences, up to 71% of children in the group of mothers with vocational education in this study had excessive body weight, and this was a much higher index than in the group of mothers with secondary (41%) or higher education (52%).

No effect of the investigated dietary habits on the nutritional status of children was found for the examined group of children ($p > 0.05$) (**Table 4**), although in the group with obesity, the largest percentage of children had 3 or less meals (27%), which is incorrect in regard to healthy nutrition and could lead to obesity [17, 3]. Additionally, none of the children demonstrating malnutrition status made purchases in school shops/vending machines more often than several times a month.

Findings and conclusions

1. The frequency of consuming breakfast and lunch and the frequency of buying food products in school shops/vending machines was significantly statistically dependent on the mother's level of education. Children who consumed breakfast and

lunch prepared at home rarely purchased products in school shops/vending machines.

2. No statistical relationships were found between the educational level of the mother, sex, dietary habits of children or their nutritional status.
3. It seems appropriate to increase the nutritional awareness of parents and children.

Acknowledgements

Conflict of interest statement

The authors declare no conflict of interest.

Funding sources

There are no sources of funding to declare.

References

1. Białokoz-Kalinowska I, Ambramowicz P, Konstynowicz J, Piotrowska-Jastrzębska J. Ocena stanu odżywienia dzieci w wieku wczesnoszkolnym z regionu Podlasia. *Pediatrica Współczesna, Gastroenterologia, Hepatologia i Żywienie Dziecka*. 2007;9:127–129.
2. Czeczulewski J. Częstotliwość spożywania pierwszych i drugich śniadań przez uczniów klas IV–VI na przykładzie szkół podstawowych miasta Biała Podlaska. *Roczn PZH*. 2001;52(4):27–32.
3. Czeczulewski J. Sposób żywienia a wartość BMI u dorastającej młodzieży wiejskiej. *Roczn PZH*. 2007;58(1):253–258.
4. Gajewska M, Zawieska D. Zachowania żywieniowe uczniów szkoły podstawowej w opinii dzieci i ich rodziców. *Roczn PZH*. 2009;60(4):347–351.
5. Garrett JL, Ruel MT. Are determinants of rural and urban food security and nutritional status different? Some insights from Mozambique. *World Dev*. 1999;27:1955–1975.
6. Hamułka J, Gronowska-Senger A, Witkowska K. Częstotliwość spożywania i wartość energetyczna śniadań u uczniów wybranych szkół podstawowych w Warszawie. *Roczn PZH*. 2000;51(3):279–290.
7. Horodyski M, Stommel M, Brophy-Herb H, Xie Y, Weatherspoon L. Low-Income African American and Non-Hispanic white mothers' self-efficacy, "Picky Eater" perception, and toddler fruit and vegetable consumption. *Public Health Nursing*. 2010;27(5):408–417.
8. Inchley J, Currie D, Young T, Samdal O, Torsheim T, Augustson L, Mathison F, Aleman-Diaz A, Molcho M, Webe M, Barnekow V. Growing up unequal: gender and socioeconomic differences in young people's health and well-being. World Health Organization. 2016.
9. Jarosz M. Ogólnopolskie działania w zakresie zwalczania nadwagi i otyłości ze szczególnym uwzględnieniem dzieci i młodzieży. *IŻŻ*. 2013.
10. Jeżewska-Zychowicz M. Zachowania żywieniowe konsumentów a proces edukacji żywieniowej. SGGW, Warszawa 1996.
11. Jonczyk P, Potempa M, Kajdaniuk D. Analiza stopnia odżywienia oraz zaburzeń odżywiania wśród dzieci szkolnych w wieku od 11 do 13 lat w mieście Piekary Śląskie. *Medycyna Metaboliczna*. 2015;19(4):44–52.

12. Kolarczyk E, Helbin J, Kwiatkowski J, Lang-Młynarska D, Potocki A, Wojtowicz D. Ocena wskaźników wzrostowo-wagowych dzieci krakowskich w wieku 6–14 lat. *Probl Hig i Epid.* 2007;88(3):336–342.
13. Książyk J. Antropometryczna ocena stanu odżywienia. *Standardy Medyczne.* 2007;4:499–503.
14. Lee EJ, McBride Murry V, Brody G, Parker V. Maternal resources, parenting, and dietary patterns among rural african american children in single-parent families. *Public Health Nursing.* 2002;19(2):104–111.
15. Moag-Stahlberg A, Miles A, Marcello M. What kids say they do and what parents think kids are doing. *J Am Diet Assoc.* 2003;103:1541–1546.
16. Sadowska J, Zakrzewska A. Ocena częstotliwości oraz wartości energetycznej śniadań spożywanych przez uczniów wybranych szkół podstawowych i gimnazjalnych w Pile. *Roczn PZH.* 2010;61(4):413–418.
17. Stefańska E, Falkowska A, Ostrowska L, Waszczeniuk M. Wartość odżywcza całodziennych posiłków 10-letnich dzieci o zróżnicowanej masie ciała. *Roczn PZH.* 2011;62(4):419–425.
18. Suliga E. Częstość spożycia i wartość energetyczna śniadań wśród dzieci i młodzieży w wieku szkolnym. *Roczn PZH.* 2006;57(1):73–79.
19. Trojanowska A, Trojanowska P, Bernat K, Oleszczuk-Tobiszewska K. Ocena sposobu żywienia i aktywności fizycznej u dzieci w wieku szkolnym w aspekcie zagrożeń otyłością. *Pediatr Endocrinol.* 2015;14(4):35–42.
20. Urbańska I, Czarniecka-Skubina E. Częstość spożycia przez młodzież produktów żywnościowych oferowanych w sklepikach szkolnych. *Żywność. Nauka. Technologia. Jakość.* 2007;3(52):193–204.
21. Wawrzyniak A, Hamułka J, Sadurska J. Częstość zakupu produktów spożywczych w sklepikach szkolnych w kontekście nieprawidłowości masy ciała uczniów. *Hygeia Public Health.* 2010;45(2):173–176.
22. Wawrzyniak A, Sadurska J, Hamułka J. Ocena spożycia śniadań oraz spożycia energii z produktami kupowanymi w sklepikach szkolnych przez uczniów. *Probl Hig Epidemiol.* 2015;96(1):254–258.
23. Weker H, Barańska M, Riahi A. Problem otyłości a wiedza żywieniowa u młodzieży w wieku 13–15 lat. *Roczn PZH.* 2007;58(1):321–326.
24. van Ansem W. Children's Food Environment Studies on environmental determinants of primary school children's dietary behaviour. Erasmus Universiteit Rotterdam. 2015.
25. Wójta-Kempa M, Lewandowska O. Środowiskowe uwarunkowania otyłości u dzieci ze szczególnym uwzględnieniem środowiska szkolnego. *Piel Zdr Publ.* 2011;1(4):333–342.
26. Wypych-Ślusarska A, Czech E, Kasznia-Kocot J, Słowiński J, Kowalska M, Niewiadomska E, Skrzypek M, Malinowska-Borowska J. Sytuacja społeczno-ekonomiczna rodzin a zachowania żywieniowe uczniów szkół gimnazjalnych w Bytomiu. *Environmental Medicine.* 2013;16(4):43–51.
27. Zbrońska I. Ocena sposobu żywienia uczniów szkoły podstawowej w Jędrzejowie pod kątem jego prawidłowości. *Probl Hig Epidemiol.* 2014;95(4):985–990.
28. Zielińska M, Hamułka J, Gajda K. Family influences on breakfast frequency and quality among primary school pupils In Warsaw and its surrounding areas. *Rocz PZH.* 2015;66(2):143–149.
29. Ziemiański Ś. Podstawy prawidłowego żywienia człowieka. Zalecenia żywieniowe dla ludności w Polsce. Instytut Danone, Warszawa 1998.
30. Zimna-Walendzik E, Kolmaga A, Tafalska E. Styl życia – aktywność fizyczna, preferencje żywieniowe dzieci kończących szkołę podstawową. *Żywność. Nauka. Technologia. Jakość.* 2009;4(65):195–203.

Acceptance for editing: 2017-01-10
Acceptance for publication: 2017-03-27

Correspondence address:

Małgorzata Kwiatkowska
Nicolaus Copernicus School Complex No. 1 in Koszalin
30 Andersa Street, 75-626 Koszalin
phone: +48 94 3422218, fax +48 943426836
email: malgorzata1kwiatkowska@wp.pl