

## Prevention of Overweight and Obesity among Children and Youth in Local Government Health Policy Programs in between 2009-2015

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### Abstract

**Background:** Overweight and obesity are among the so-called epidemics of the 21<sup>st</sup> century. An increasing number of children and youth are also affected by them. According to the forecasts of the “Institute of Mother and Child”, over the next decade each year the number of overweight children will increase by 400 thousand, including approximately 80 thousand obese children. Overweight and obesity are particularly dangerous for children at pre-school and school age as it increases the risk of numerous diseases as well as physical and emotional problems.

**Objective:** The objective of this article is to present implementation of health policy programs concerning prevention and treatment of overweight and obesity among children and youth between 2009-2015 by local government units.

**Methods:** The study was conducted based on desk research. Databases of the Ministry of Health prepared by each voivodeship containing information about implemented health policy programs with regards to overweight and obesity among children and youth were used.

**Results:** Between 2009-2015, local government units at all levels implemented 215 health policy programs concerning overweight and obesity among children and youth. Most programs were implemented by municipalities and counties. The costs incurred by counties and voivodeships were significantly higher than costs incurred by municipalities. Most programs were implemented in the West Pomeranian, Silesian and Masovian Voivodeships. The most common activities included consultations with a dietician, group trainings for children within school classes and various competitions concerning healthy diet and physical activity. The Podlaskie and Świętokrzyskie Voivodeships implemented the smallest number of programs.

**Conclusion:** Programs implemented by local government units were poorly adjusted to the actual health needs of children and youth in terms of prevention and treatment of overweight and obesity. Local government units indicated insufficient engagement in prevention and treatment of overweight and obesity among children and youth. Programs implemented by local government units is have not any casual relationship on obesity prevalence. An insufficient number of program participants were observed. It demonstrates the need to evaluate the activities aimed at fighting overweight and obesity among children and youth. The number of health policy programs should be increased and the forms of program implementation should be more attractive-this will allow more people to be included in the activities.

**Keywords:** Health policy program; Overweight; Obesity; Healthy diet; Physical activity

### Introduction

Overweight and obesity are among the most common diseases in developed communities [1]. Obesity is a condition characterized by increased body mass through an increase in fat tissue caused by hypertrophy or/and hyperplasia [2]. The index most often used in population studies to recognize and evaluate the degree of obesity is BMI (body mass index). According to “World Health Organization”, overweight is recognized when the BMI value is around 25-29.9 kg/m<sup>2</sup> and obesity is recognized when BMI is  $\geq 30.0$  kg/m<sup>2</sup> [2]. To a large extent, the problem of overweight and obesity concerns children and youth [3,4]. Overweight and obesity are particularly dangerous for

children at pre-school and school age as they increase the risk of numerous diseases as well as physical and emotional problems [5,6]. Numerous studies also indicate that obese children grow up to be obese adults [7]. Prospective studies prove that obesity at the age of 15-17 is associated with a 17.5 times higher risk of obesity in adulthood [8]. It means that over 80% of obese teenagers will become obese adults [7].

Globally, approximately 155 million children at school age are overweight or obese. Among them, 30-45 million children and youth at the age of 5-17 are obese. Up to 22 million children below the age of 5 are obese [9]. According to the health behavior school-aged children studies conducted in Poland in the 2009/2010 school year, according to the referential values of IOTF (International Obesity Task Force) nearly 19% of children aged 11-12 are overweight and 4% of children are

obese. In the next age range (13-14) 15% of children are overweight and approx. 4% of children are obese. The problem of overweight and obesity concerns boys more often than girls [10,11]. Additionally, the percentage of children and youth with excess weight in each age group is increasing. According to forecasts, over the next decade, in Poland each year the number of overweight children will grow by 400 thousand, including approx. 80 thousand of obese children. The number of children and youth with overweight and obesity increases both in European countries and in the United States. However, in the United States the number of obese children is nearly twice as high as the average value in the European Union [10].

Within the activities related to prevention of overweight and obesity in resolution 57 of the World Health Assembly of 22 May 2004 on "Global strategy on diet, physical activity and health", it was indicated that the member states should prepare, implement and evaluate purposeful activities to improve health of their societies by promoting proper diet and increased physical activity. After the above-mentioned strategy, in December 2005 the "Council of the European Union" prepared a document entitled Green Paper "Promoting healthy diets and physical activity: A European dimension for the prevention of overweight, obesity and chronic diseases" and then in 2007 a document entitled White Paper "A strategy for Europe on nutrition, overweight and obesity related health issues" [12]. Prevention of overweight and obesity in Poland was implemented most of all by "The National Program for Prevention of Overweight and Obesity and Chronic Non-Infectious Diseases through Improvements in Nutrition and Physical Activity 2007-2015". The program assumed implementation of prevention of overweight and obesity at the national and local levels. Regardless of implementation of this

Program, local government units undertook activities in terms of prevention and treatment of overweight and obesity. Within these activities, local government units developed, implemented and financed health policy programs.

## Objective

The objective of this article was to evaluate implementation of health policy programs concerning prevention and treatment of overweight and obesity among children and youth between 2009-2015 developed, implemented and financed by local government units.

## Methods

The study was conducted based on desk research. Data from annual reports on health policy program developed, implemented and financed by local government units was used. All programs which contained information concerning prevention and treatment of overweight and obesity among children and youth in their name, objective, description of assumptions, tasks or target groups were used for the analysis.

The implementation of programs by territorial self-government units at all levels, by the largest units of territorial division (the so-called voivodships), by local self-government units, which cover part of the voivodship (district) and by local self-government units (commune).

## Results

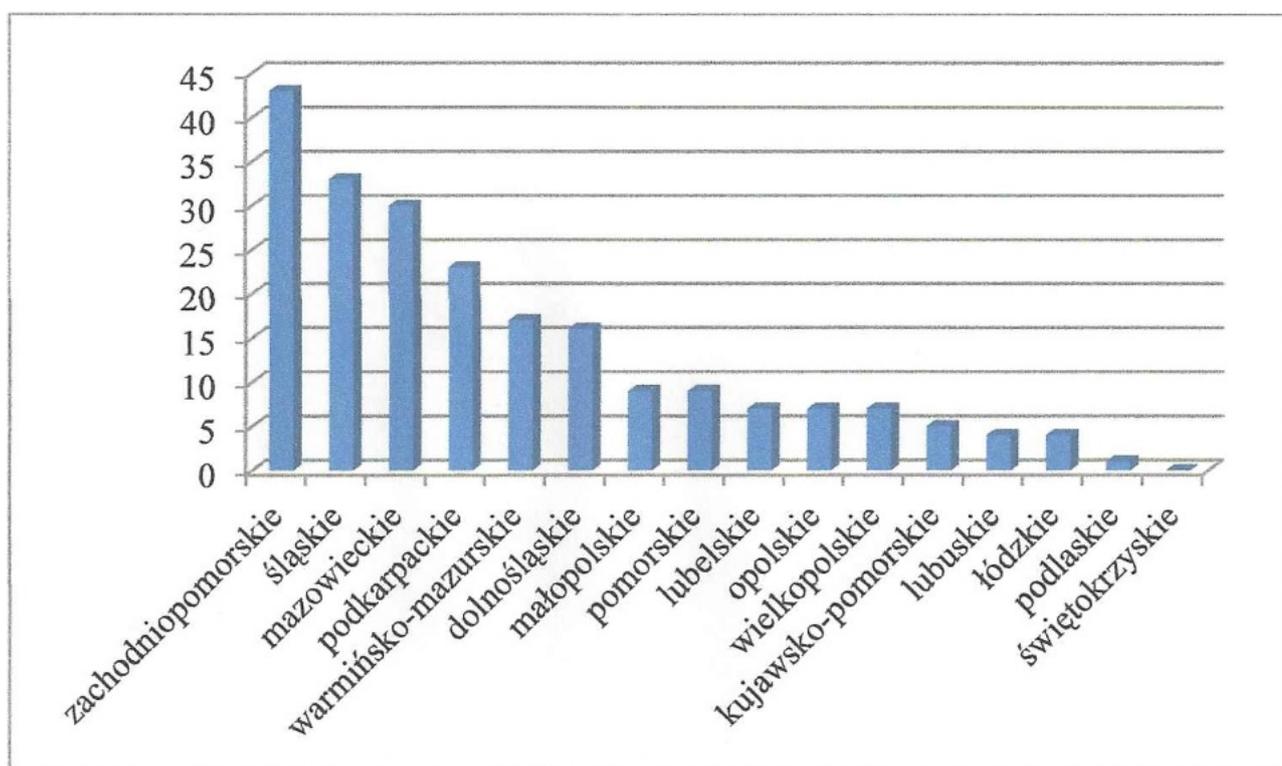


Figure 1: The number of programs implemented in voivodships in between 2009-2015.

Between 2009-2015, local government units at all levels implemented 215 health policy programs concerning overweight and obesity among children and youth. Programs included over 132 thousand children and youth at the school age. The vast majority of programs-more than 90% - concerned prevention of overweight and obesity. Several therapeutic and mixed programs, i.e., prevention and treatment, were implemented. Therapeutic and mixed programs were mainly implemented by counties. Within prevention programs among others consultations with a dietician, education of youth in terms of shaping pro-health eating habits and artistic, literary competitions and competitions of knowledge related to healthy eating and physical activity were conducted. Consultations were also carried out by physicians of various specialties, such as diabetology, neurology, orthopaedics and ophthalmology. Healthy food fairs, information events about anorexia, bulimia and obesity were organized. Educational materials, including posters and leaflets for children and parents were published. School nurses checked the blood pressure and weight of pupils. Children were taught what BMI stands for, how to calculate their BMI as well as read and interpret GDA marking on foods and how to prepare a balanced diet. Therapeutic and mixed programs were based mostly on advice of medical specialists.

The target group is included primary school students, junior high schools, high schools, their parents and carers. Childrens, who

participated in health policy programs concerning overweight and obesity among children and youth were between 7 to 18 ages. Programs usually last from January to December. Individual tasks were carried out in the following months, excluding holidays. On the other hand, the distribution of educational materials lasted all year.

The diversity of programs implemented by various voivodeships was analyzed to establish which voivodeship implemented the largest number of programs and which-the smallest. Joint analyses for the years of 2009-2015 and for each year separately were performed indicating how the number of implemented programs changed in the studied period. For statistical inference the  $\chi^2$  test for one sample was used and it was stated that in the studied period statistically significant differences in the number of programs implemented in particular voivodeships occurred ( $p < 0.05$ ). Figure 1 presents the number of programs implemented by particular voivodeships between 2009-2015. Most programs were implemented by the West Pomeranian, Silesian and Masovian Voivodeships. The Lubusz, Łódź and Podlaskie Voivodeships implemented the smallest number of programs. The Świętokrzyskie Voivodeship did not implement any programs concerning prevention of overweight and obesity among children and youth between 2009-2015 (Figure 1).

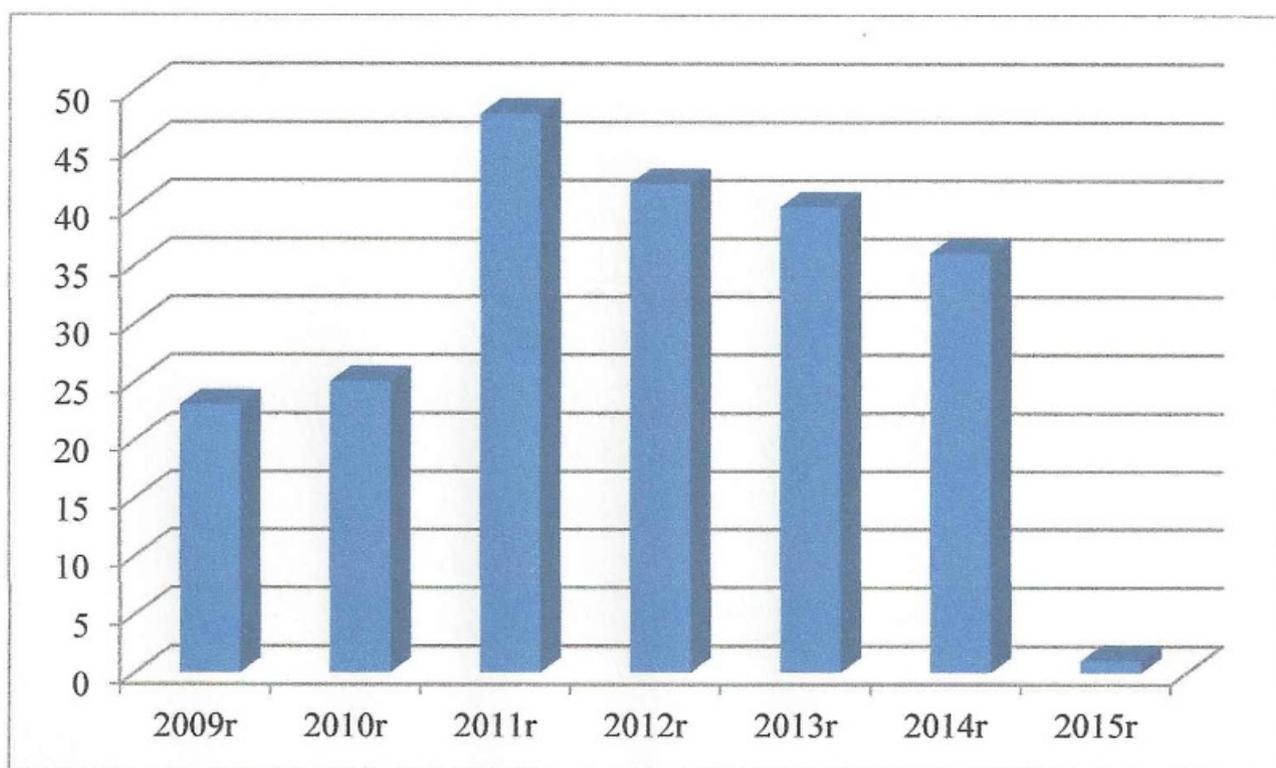


Figure 2: The number of programs implemented between 2009-2015 by all government units.

Based on the  $\chi^2$  test for one sample, statistically significant differences in the number of programs implemented between 2009-2015 were observed- $\chi^2=6.34$ ,  $p < 0.05$ . Figure 2 presents the number of programs implemented in particular years. The numbers of

programs in particular years were similar, except for 2015, in which according to the available data only one program was implemented (Figure 2).

	2009	2010	2011	2012	2013	2014	2015	p value
Zachodniopomorskie	1	2	10	10	10	10	0	0.000816
Śląskie	6	4	9	7	5	2	0	0.067406
Mazowieckie	4	4	9	4	3	6	0	0.101032
Podkarpackie	0	1	1	8	8	5	0	0.000475
Warmińsko-mazurskie	2	2	3	4	3	3	0	0.67436
Dolnośląskie	4	4	1	3	2	2	0	0.436995
Małopolskie	1	1	6	0	0	1	0	0.001534
Pomorskie	1	3	1	0	3	1	0	0.288109
Lubelskie	1	1	1	2	1	1	0	0.919699
Opolskie	1	1	1	1	1	1	1	1
Wielkopolskie	1	1	2	1	1	1	0	0.919699
Kujawsko-pomorskie	1	1	2	0	1	0	0	0.566448
	0	0	1	1	1	1	0	0.80772
Łódzkie	0	0	1	1	1	1	0	0.80772
Podlaskie	0	0	0	0	0	1	0	0.409256
Świętokrzyskie	0	0	0	0	0	0	0	0

**Table 1:** The number of programs implemented by voivodeships between 2009-2015.

Table 1 presents the number of programs implemented by particular voivodeships between 2009-2015. From the data analyzed it can be concluded that statistically significant dynamics of changes in the number of programs implemented in subsequent years concern the following voivodeships: West Pomeranian, Podkarpackie and Lesser Poland ( $p < 0.05$ ). The number of programs implemented in the West Pomeranian Voivodeship increased significantly in 2011. While in 2015 no programs were implemented. In the Podkarpackie Voivodeship the number of programs increased significantly only in 2012. In 2015 no programs were implemented. In the Lesser Poland Voivodeship a significant difference-in comparison to other numbers-concerns only the year 2011 in which the largest number of programs were implemented-six programs concerning prevention of overweight and obesity among children and youth. In other voivodeships no statistically significant differences in the number of implemented programs were observed (Table 1).

Another analysis performed answers the question concerning the differences in the number of programs according to the local government unit and the matter of financing programs by particular local government units.

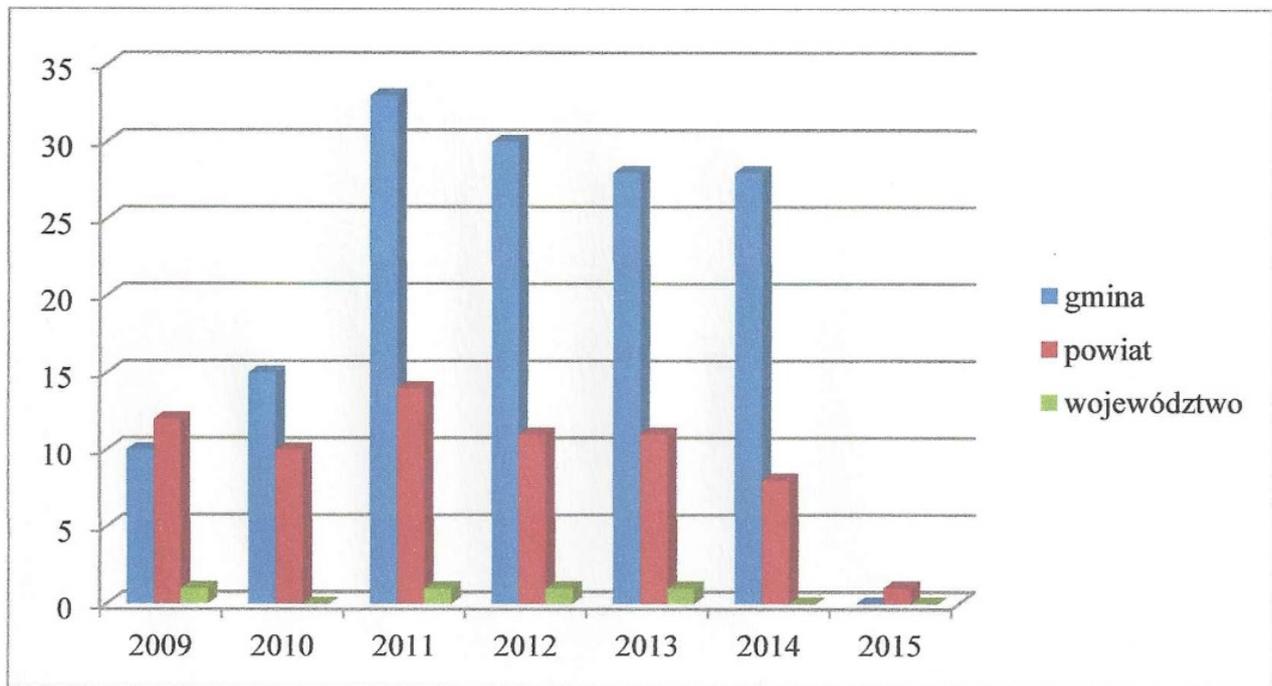
In the studied period most programs concerning prevention of overweight and obesity among children and youth were implemented by municipalities-144 programs, then by counties-67 programs and voivodeships-4 programs. Figure 3 presents the number of programs implemented by particular local government units between 2009-2015. In 2010, 2014 and 2015 voivodeships did not implement any programs concerning prevention of overweight and obesity among children. Most programs were implemented by local government units in

2011-48 programs. No statistically significant changes in the number of programs implemented by municipalities, counties and voivodeships in particular years were observed ( $p > 0.05$ ) (Figure 3).

The vast majority of municipalities, counties and voivodeships did not implement health policy programs concerning prevention of overweight and obesity among children and youth in the analyzed period. Table 2 presents the number of programs implemented by particular types of local government units.

Also, the matter of financing health policy programs by particular local government units was analyzed. Two analyses were performed-for the period between 2009-2015 and for each year separately. Table 3 present total costs incurred by municipalities, counties and voivodeships in relation to implementing health policy programs associated with overweight and obesity among children and youth between 2009-2015.

Costs incurred by counties were significantly higher than costs incurred by other local government units. Despite implementation of the largest number of health policy programs municipalities incurred the lowest costs. The number of program participants and actions undertaken within program implementation directly affect the observed values. In numerous cases municipalities financed only a portion of the actions implemented within the programs. Such programs were also financed by counties, foundations or other public benefit organizations engaged in organization and implementation of prevention of overweight and obesity among children and youth.



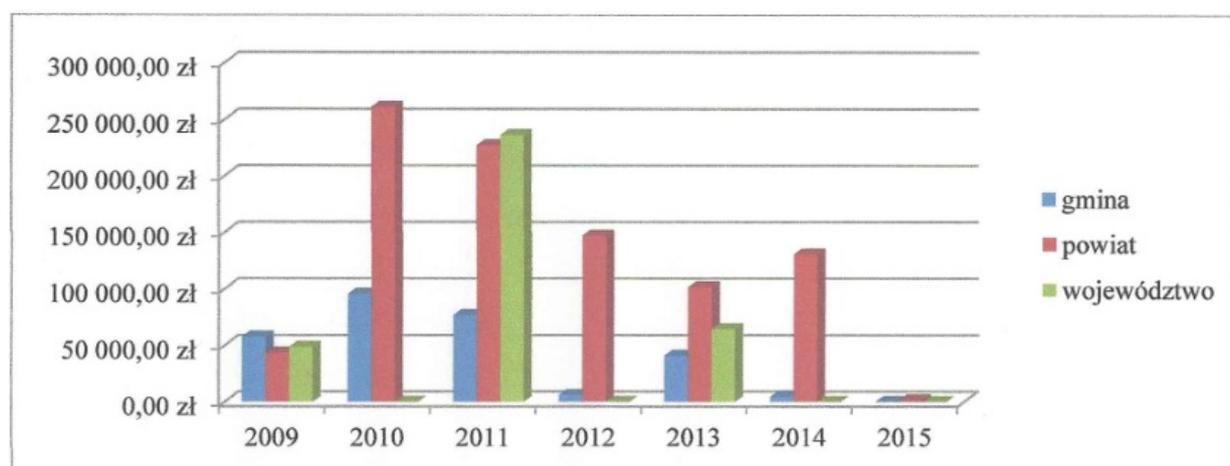
**Figure 3:** The number of programs implemented by local government units between 2009-2015 (gmina-municipality, powiat-country, województwo-voivodeship).

Local government unit	Number of programs	Number of units implementing programs in particular years						
		2009	2010	2011	2012	2013	2014	2015
Municipality	0	2471	2468	2460	2464	2463	2463	2478
	1	5	6	8	3	7	7	0
	2	1	3	5	6	3	3	0
County	3	1	1	5	5	5	5	0
	0	372	371	368	370	370	373	379
	1	2	6	9	7	7	4	1
Voivodeship	2	5	2	1	2	2	2	0
	3	0	0	1	0	0	0	0
	0	15	16	15	15	15	16	16
	1	1	0	1	1	1	0	0
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0

**Table 2:** The number of local government units implementing programs between 2009-2015.

	Total costs between 2009-2015	Average costs
Municipality	280,847.00 PLN	40,121.00 PLN
County	911,362.00 PLN	130,194.57 PLN
Voivodeship	349,322.00 PLN	49,903.14 PLN

**Table 3:** Total and average costs of implementing programs incurred by local government units between 2009-2015.



**Figure 4:** Costs incurred by municipalities, counties and voivodeship between 2009-2015.

Figure 4 presents costs incurred by municipalities, counties and voivodeships in particular years. Most programs were implemented in 2011, also local government units implementing programs incurred the highest costs in 2011. In 2015 only one health policy program to fight overweight and obesity among children was implemented. The organizer of the program incurred a cost of 1,500 PLN (Figure 4).

## Discussion

The National Health Program for the years 2007-2015 assumed improvement of eating habits and quality of healthy food as well as a decrease in prevalence of obesity. The operational objective concerned the entire population; however, the vast majority of health policy programs were aimed at children and school-aged youth. In accordance with the National Health Program for the years 2007-2015, implementation of tasks related to prevention of overweight and obesity among people is a task which belongs among others to local government units. Implemented tasks among others include: Popularization of healthy eating habits at schools, popularization of knowledge about the composition and nutritional value of foods and about marks on foods to allow consumers to make conscious choices. The tasks require efficient interdepartmental cooperation coordinated with the recommendations of the WHO Global strategy concerning diet, physical activity and health. The need to undertake actions in the above-mentioned scope is confirmed by epidemiological data saying that approx. 20% of school-aged children are overweight and nearly 5% obese. According to WHO, data the annual growth rate of overweight and obesity in the world during childhood is increasing and currently it is ten times higher than in 1970. The benefits expected by the National Health Program are among others: reduced risk and

prevalence of chronic non-infectious diseases resulting from diet, increasing average life expectancy of men and women, decreasing mortality rates associated with diseases caused by faulty diet and reducing the risk and prevalence of diseases associated with poor health quality food [13,14]. Actions implemented by local government units are unsatisfactory which is indicated by insufficient implementation of the above listed assumptions. Results of studies on nutrition of selected groups of people, in particular taking cases of overweight and obesity into account, indicate an upward trend in prevalence of overweight and obesity among children and youth.

The above data indicate the obligatory nature of actions undertaken by local government units in terms of preventing overweight and obesity among children and youth. From the analysis performed, it can be concluded that most programs concerning prevention of overweight and obesity among children and youth were implemented by municipalities. On average, in the studied period between 2009-2015 statistically one program concerning prevention of overweight and obesity among children and youth was implemented per 17 municipalities. In counties the situation is more positive, as on average statistically one program was implemented per 6 counties.

The analysis of data from the "Central Statistical Office of Poland" indicates that the highest rate of children and youth with overweight and obesity has observed in the case of Masovian, Lesser Poland, Pomeranian and Greater Poland Voivodeships. While the lowest rate of children and youth with overweight and obesity has observed in the case of Podkarpackie and Podlaskie Voivodeships. The number of health policy programs implemented by local government units is presented differently from which it can be concluded that programs

concerning prevention of overweight and obesity among children and youth are not adjusted to particular areas. Most programs were implemented by the West Pomeranian and Silesian Voivodeship. The Masovian Voivodeship implemented thirty programs concerning prevention of overweight and obesity among children and youth between 2009-2015. The Pomeranian Voivodeship-only 9 and the Greater Poland Voivodeship-7 programs. While among voivodeships in which the percentage of children and youth with overweight and obesity is the lowest, most programs were implemented by the Podkarpackie Voivodeship-23 programs. The Podlaskie Voivodeship implemented only 1 program concerning prevention of overweight and obesity among children and youth.

Statistically significant dynamics of changes in the number of programs implemented in subsequent years concerns only three out of sixteen Voivodeships: West Pomeranian, Podkarpackie and Lesser Poland Voivodeships. While, the Świętokrzyskie Voivodeship between 2009-2015 did not implement any program concerning prevention of overweight and obesity among children and youth. Insufficient interest of local government units in prevention of overweight and obesity is confirmed by data presented by the Agency for Assessment of Medical Technologies and Tariffs (AOTMiT). Since 31 August 2009 Ministries and local government units are obliged to consult projects of health policy programs with the Agency for Assessment of Medical Technologies and Tariffs (AOTMiT) (the Act of 25 June 2009 on amending the act on health care services financed from public funds and the act on prices (Journal of laws no. 118, item 989). Between 2010-2013 AOTMiT evaluated only 44 programs [15,16].

Local government units engage a small percentage of funds in implementation of programs to prevent overweight and obesity among children. From the budget intended for health policy programs in the studied period, the largest amount to programs to prevent overweight and obesity was assigned by municipalities (1.9% of the budget), followed by voivodeships (1.5% of the budget). Among counties the percentage share of expenses for programs to prevent overweight and obesity in the studied period did not exceed 0.4% [17-19]. The analysis of the structure of expenses of particular local government units may indicate the fact that first of all funds are intended for implementation of obligatory tasks specified in the provisions of law.

Preventing overweight and obesity among children and youth at the population level is a very difficult and complex task requiring a systemic approach and engagement of numerous sectors of public life, including scientific community, health care, health promotion and government administration [20]. Within programs to prevent overweight and obesity among children, mainly consultations with a dietician, education of youth in terms of shaping pro-health eating habits and artistic, literary competitions and competitions of knowledge related to healthy diet and physical activity were conducted. Among others there were no recommendations how to properly read information included on food labels or encouraging children to spend less time using computers and TVs. It is associated with proper amounts of physical activity and reduced frequency of watching ads for sweets, salty snack and fast foods by children.

Between 2009-2013 in nine European countries the TEMPEST (Temptations to Eat Moderated by Personal and Environmental Self-regulatory Tools) program was conducted concerning the role of individual and environmental self-regulatory tools to deal with nutritional temptations. The countries covered by the program were Belgium, Denmark, Finland, Germany, Netherlands, Poland, Portugal, Romania and the United Kingdom. Fifteen thousand young people

aged 10-17 participated in the program. Reasons for excessive weight in children and youth should be sought mostly in high availability of unhealthy foods and lack of parental supervision [21].

The National program for prevention of overweight and obesity and chronic non-infectious diseases through improved nutrition and physical activity is the first program to fight overweight and obesity implemented simultaneously in all EU countries. Preventing overweight, obesity and chronic diseases has become the priority at the European Union level. The EU Council, following the Global Strategy concerning Nutrition, Physical Activity and Health developed by the WHO prepared a document entitled Green Paper "Promoting healthy diets and physical activity: A European dimension for the prevention of overweight, obesity and chronic diseases" (December 2005). In this document it was stated that the basic cause of non-infectious chronic diseases and premature deaths in Europe is improper nutrition and lack of physical activity. Increased prevalence of obesity in Europe has become one of the main problems of public health.

## Conclusion

- Programs implemented by local government units is have not any casual relationship on obesity prevalence. An excessively low level of engagement of local government units in counteracting overweight and obesity among children resulted in a lack of improvement in the fight against overweight and obesity among children in Poland.
- An excessively low level of engagement of local government units in effective implementation of the policy to fight overweight and obesity among children. It is associated with an insufficient degree of funding which negatively affects implementation of tasks in the field of preventing diseases and promoting health by local government units.
- The actual health needs of local communities were not taken into account to a proper extent. Health education is still insufficient. Too little attention is devoted to children's consumption of vegetables and fruits and drinking water instead of sweetened carbonated drinks. Traditional Polish cuisine promotes dishes rich in saturated fats. There is too little consumption of fish and other foods that contain omega 3 and 6 fatty acids.
- Some voivodeships and local government units did not implement any programs to fight overweight and obesity among children and youth in the studied period between 2009-2015. Overweight and obesity among children is not a serious enough health problem for Polish health policy [22,23].
- The actual health needs of local communities were not taken into account to a proper extent-according to the forecasts of the Institute of Mother and Child in Poland each year the number of overweight children will increase by 400 thousand, including approx. 80 thousand of obese children. Therefore, the problem demonstrates an upward trend.
- Local government units must continue actions aimed at preventing overweight and obesity among children and youth. The number of programs should systematically increase and they should engage an increasing number of people.
- Health policy programs to prevent overweight and obesity among children should have attractive forms of presenting information for the youngest participants so that children can become familiar with principles of healthy eating they can communicate in their closest surroundings as quickly as possible.

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