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**cities
changing
diabetes**

Poland

School, Municipality, System – Partnership Against Obesity and Diabetes Epidemic



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W OCHRONIE ZDROWIA



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cities changing diabetes ----- **Poland**

Introduction

Dear Readers,

On November 26, 2019, Poland was the first country in Central and Eastern Europe to join the **Cities Changing Diabetes** global programme to combat diabetes. It is a unique initiative: its aim is to implement effective interventions to stop the galloping epidemic of type 2 diabetes. The initiative focuses on large cities all around the world, each of which develops and carries out its own action plan, adjusted to the national situation and conditions. The cities of Warsaw and Krakow have joined this unique network as representatives of Poland – a country with a growing rate of people at risk of obesity and type 2 diabetes, diseases incidental to high social inequality in the scope of prevention, education and treatment, and consequently requiring a significant levelling of opportunities in these areas.

Of particular concern in the analyses of the increase in the incidence of obesity and type 2 diabetes is the development dynamics among children and adolescents. Polish children are among those who gain weight fastest in Europe. It is worth recalling that in the 1970s, excess body weight was recorded in less than 10% of Polish pupils, while now every fifth school-age child (22%) is overweight or obese, thus being in the risk group of developing type 2 diabetes. The ongoing childhood obesity epidemic translates into a shorter lifespan for this population, numerous and serious health consequences, a reduction in educational and emotional potential, and for the state – multibillion and ever-growing expenditures on treatment and a gradual reduction in the productive capacity of the society.

Cities Changing Diabetes The Scientific Council in Poland decided to focus programme activities on the Polish school environment, i.e. on the population of children and teenagers as well as the teachers accompanying them in their development. In an endeavour to stop the epidemic of obesity and type 2 diabetes in Poland, the school is a natural environment for actively influencing the pro-health behaviours of children and adolescents, while teachers serve as natural motivators and influential examples of beneficial attitudes.

This publication constitutes a kind of a “baseline report” of the **CCD Programme** in Poland – a report dedicated to the health of Polish students and teachers in the context of obesity and type 2 diabetes. It presents the clinical and social aspects of diabetes, presents an overview of secondary research on the health and lifestyle of Polish students and teachers as well as synthetically depicts the history of health education in Polish schools. The key part of the report is the presentation of the results of questionnaire surveys carried out in the population of primary school teachers from local government schools in Krakow and Warsaw. The aim of the survey, which involved more than 4,200 teachers, was to obtain information on the level of knowledge about diabetes, to test teachers’ own experience as regards contacts with students suffering from type 1 diabetes, and to learn about teachers’ subjective self-assessment of their body weight and lifestyle. As part of the presentation of the survey results, the report contains a synthetic description of the age profiles of teachers participating in the project.

The report presents recommendations for interventions aimed at building effective prevention and comprehensive diagnosis and treatment of obesity (an epidemiological “precursor” of type 2 diabetes), as well as recommendations for interventions that are desirable in the area of caring for students with type 1 diabetes in educational institutions.

We believe that the data presented in the report, and in particular the proposals for systemic and school interventions developed in cooperation with prominent Polish experts, will significantly contribute to taking decisive, long-term and comprehensive actions dedicated to stopping the epidemic increase in the incidence of obesity and type 2 diabetes in Poland.

As I hand over the study to you, I would like to thank all the people and institutions participating in this important project: members of the CCD Scientific Council in Poland and the authorities of the Institute of Public Health of the Collegium Medicum of the Jagiellonian University for their scientific input. My special thanks go to the authorities of the Capital City of Warsaw and the City of Krakow for their support and involvement in conducting the survey among teachers – I would like to express my gratitude for the invaluable support of the initiative in the form of letters addressed to teachers and drafted by Renata Kaznowska, Deputy Mayor of Warsaw, and Jacek Majchrowski, Mayor of Krakow. I would further like to acknowledge the directors and employees of the Health and Education Departments of both cities, whose contribution to the organisation of the **CCD** Poland research is proof of awareness that a galloping increase in the incidence of obesity and type 2 diabetes among children is a major health and social problem, as well as readiness for constructive, partnership-based cooperation aimed at counteracting these unacceptable trends.

Yours faithfully,

Małgorzata Gałązka-Sobotka, PhD
Head of the CCD Project in Poland
Dean of the Centre for Postgraduate Studies
Director of the Institute of Health Care Management
at the Lazarski University



Dear Readers,

What do cities have to do with health? Why do schools and teachers have an important role to play in the health of urban communities, families and children?

This complete and first-of-its-kind report provides answers to these questions. It presents a broad and up-to-date overview of the knowledge and experiences of primary school teachers on diabetes and obesity – two noncommunicable diseases that have taken on the proportions of a pandemic. The analysis of the responses of over 4,000 teachers from Krakow and Warsaw allowed outstanding experts from the Lazarski University in Warsaw and the Jagiellonian University in Krakow, with the support of the Scientific Council of the **Cities Changing Diabetes** programme, to design systemic interventions aimed at improving the health of Polish society.

This would not have been possible without acknowledging the gravity of the problem and the huge, committed work put in by employees of the City Offices of Krakow and Warsaw, for which I am deeply grateful and for which I would like to commend them, also on the pages of this publication.

The report is aimed at decision makers in the health and education system, both at the national and local government level. I hope that at each level it will contribute to a better understanding of the challenges related to the presence of diabetes and obesity in the lives of Poles. Without understanding the importance and scale of the problems, these pandemics will not subside.

I wish us all perseverance and effectiveness in action, as well as courage in facing great contemporary challenges in the field of public health, both today and in the future. I am convinced that this report will help us overcome them.

Magdalena Paradzińska
CEO of Novo Nordisk Polska



The Cities Changing Diabetes Programme in Poland

Cities Changing Diabetes – a global initiative

The goal of the global **Cities Changing Diabetes** (CCD) programme is to halt the epidemic rise in the occurrence of diabetes – one of the most dynamically progressing civilizational diseases. The initiators of this international project, which has been expanded since 2014, are: the Steno Diabetes Center Copenhagen, University College London and Novo Nordisk. The programme has already reached over 130 million people in 41 cities around the world, among them Mexico City, Shanghai, Copenhagen, Rome, Houston, Johannesburg and Buenos Aires



Poland was the first CEE country to be admitted to the **Cities Changing Diabetes** project in 2019. It has been implemented in the cities of Warsaw and Krakow.

On November 26, 2019, Her Royal Highness, Crown Princess of the Kingdom of Denmark, and Magnus Heunicke, Minister of Health of the Kingdom of Denmark, took part in the ceremonial inauguration of the global CCD Programme in Poland. The host of the ceremony was Małgorzata Gałązka-Sobotka, PhD, Dean of the Centre for Postgraduate Studies at the Lazarski University.



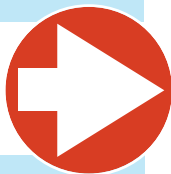
"The global Cities Changing Diabetes Programme is a unique network of large agglomerations that implement preventive anti-diabetes measures. International studies show that about two-thirds of people suffering from diabetes or at risk of this disease are residents of large cities or people working in them. Hence the idea and strategy of creating a programme dedicated to inhabitants of large cities. The aim is to effectively and efficiently halt the dramatic growth dynamics of the disease and popularize the best solutions in this area."

Anna Maria Volkmann, Academic Director of the Global Research Cities Changing Diabetes programme at University College London

The programme on a global scale establishes a platform for comprehensive support of social and health policies in the field of combating diabetes, which results in extensive cooperation between the project's organisers and representatives of local governments and experts. For this reason, the Programme Scientific Council was established in Poland, bringing together system experts, clinicians, patients and representatives of communities involved in the prevention and treatment of diabetes, both at the national and local levels in Warsaw and Krakow. As a result of the recommendation of the Scientific Council, activities in Poland have been focused on the school environment (including teachers as educators and promoters of a healthy lifestyle among Polish students). For this purpose, in 2021 a questionnaire survey was developed and carried out among teachers of educational institutions in both cities.

"Within the framework of the CCD Programme, comprehensive studies of the factors determining the growth dynamics of type 2 diabetes and the scale of its complications in the urban environment are carried out in partner countries. In all the involved cities, academic institutions, local government representatives and local stakeholders work together to establish research priorities and plan the implementation of the results. Each research carried out under the programme is of unique value in the context of developing optimal interventions to support local communities. In Poland, focusing attention on educational institutions is an essential step in achieving the objectives of the programme."

Magdalena Paradzińska, CEO of Novo Nordisk Pharma sp. z o.o. in Poland



"There is no doubt that the Cities Changing Diabetes programme is in line with the times in Poland. Its great advantage is the possibility of adapting activities to the specificity of our country, by which the Scientific Council sets great store. We have made a long-term decision to focus our activities on the community of school children and youth. Therefore, the first step in Poland was to examine the knowledge and pro-health attitudes of teachers as those who educate students. Thanks to the results of this survey, we were able to develop an intervention plan to be implemented in cooperation with the local governments of Warsaw and Krakow, as well as nationwide measures and interventions dedicated to school."

**Prof. Leszek Czupryniak, MD, PhD,
Head of the Department of
Diabetology and Internal Diseases,
Medical University of Warsaw**

The idea behind and strategy of the CCD Programme development

The specific characteristics of agglomerations directly affects the lifestyle of their inhabitants, and the fast pace of daily activities contributes to a more intensive development of civilizational diseases than in smaller clusters. Health education and prevention should therefore constitute important factors in organising the life of city residents. To meet this challenge, the World Health Organisation (WHO) has defined the concept of a "Healthy City" as a centre that is aware of the role of health as a social resource and a public good. It covers both physical living factors as well as psychological, environmental, housing and working conditions, in conjunction with economic, social and cultural aspects. Against this background, cities assume their rightful role as promoters of health

On average, a Polish student spends 41 hours at school every week, which is more than the standard working time of an adult. Children and teenagers' pro-health attitudes are shaped during educational activities, also through conversations with teachers and by observing their behaviours. Therefore, the teachers educate students in the field of health and shape their sensitivity and awareness.

Warsaw and Krakow – CCD strategy for schools

Educational activities in Warsaw and Krakow addressed to schools were initiated with a survey conducted among primary school teachers in both cities. The aim of the study was to verify teachers' knowledge on diabetes and its risk factors, as well as their personal experiences with students suffering from type 1 diabetes. The answers were provided by a total of over 4,000 teachers, thanks to which the results of the survey are of substantive value to the programme.

Overweight and Obesity as Main Factors in the Development of Diabetes

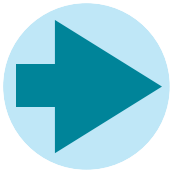
Overweight and obesity are phenomena of a global scale. Worldwide, almost 40% of adults are already overweight and 13% are obese.¹ According to OECD data from 2019², more than half of adult Poles (56.7%) are overweight or obese. It should be noted that diseases resulting from overweight and obesity shorten life by an average of 3 years and 10 months.³



Obesity is a chronic metabolic disease with a complex aetiology, resulting from disturbances in energy homeostasis and requiring individual and comprehensive treatment. According to the WHO,⁴ both overweight (as pre-obesity) and obesity are defined as abnormal or excessive accumulation of fat in the body, which poses a threat to human health. Overweight and obesity are major risk factors for many chronic diseases, such as hypertension, cardiovascular and liver disease, metabolic syndrome, sleep apnea, as well as type 2 diabetes and its prevalent complications. Obesity also affects patients' self-esteem and their social functioning at any age, and thus can lead to mental disorders and depression.



Obese people have a much higher risk of developing type 2 diabetes than those who are lean, with the risk of developing the disease increasing with growing body weight. With an increase in BMI above the norm by 1 kg/m² the risk of cardiovascular complications spikes by 2%, ischemic heart disease by 3%, and myocardial infarction by 5%.



"No other chronic disease involves such a significant number of complications and disorders. They are often treated as independent disease entities, but are in fact consequences of obesity.

Obesity causes a 90-fold increase in the risk of type 2 diabetes in women with a BMI above 35. More than half of all cases of hypertension in Poland are obesity-related."

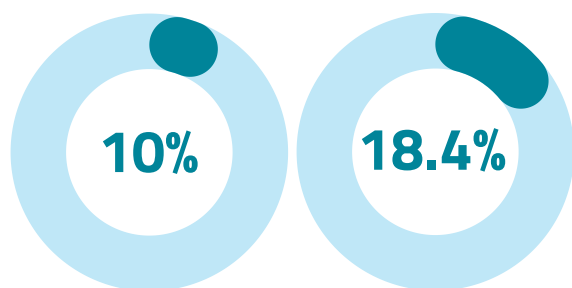
Professor Paweł Bogdański, MD, PhD

**Head of the Chair and Department of Obesity Treatment, Metabolic Disorders and Clinical Dietetics, Medical University of Poznań,
President of the Polish Obesity Treatment Society**

Overweight and obesity in children and adolescents

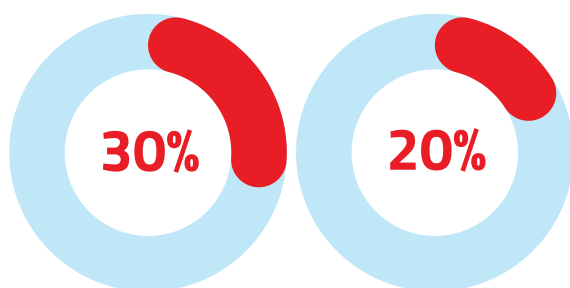
The epidemic of overweight and obesity affects in particular Polish children and adolescents: 10% of children aged 1-3 years are overweight or obese, and 18,4% are at risk of excess body weight. The problem also affects almost 30% of eight-year-olds and about 20% of children and teenagers aged between 10 and 16.⁶

Children aged 1-3



**Overweight
or obesity**

**Risk
of excessive
body weight**



**Children
aged
8**

**Children and
adolescents aged
10-16**

HBSC research shows that the problem is growing. In the period 2014-2018, the percentage of teenagers with excess body weight increased from 19.9% to 21.7%. The 2018 study of the health behaviour of adolescents aged 11-15 showed that excess body weight occurs in 29.7% of boys and 14.3% of girls.⁷

The diagnosis of overweight and obesity in children and adolescents is made on the basis of the value of the BMI index in relation to the gender and age-appropriate percentile grid. The range between the 90th and 97th percentile indicates overweight, while obesity is diagnosed when the 97th percentile is exceeded. Obesity can also be diagnosed based on the waist circumference percentile grid: it corresponds to the values above the 90th percentile for a given age and gender. It is believed that obese children most often become obese adults, and consequently have a considerably higher risk of developing type 2 diabetes.

Diabetes: from epidemic to pandemic

Every five seconds a new case of diabetes is diagnosed in the world. Every ten seconds someone dies of its complications.⁸



Every five seconds
a new case of diabetes
is diagnosed
in the world.



5 sec.



10 sec.

Every ten seconds
someone dies
of its complications.⁸

Diabetes ranks as one of the most common causes of disability and death in the world: it is responsible for more such cases than road accidents.⁹

In 2017, according to data from the International Diabetes Federation (IDF), there were 425 million diabetics in the world; the 2045 forecast is 629 million. Today we know that the number is going to be significantly higher.¹⁰



**Already 537 million people in
the world suffer from diabetes +46%**

Diabetes in the world

DIABETES 2021	537 million
DIABETES 2030	643 million
DIABETES 2045	783 million

Increase of 46%



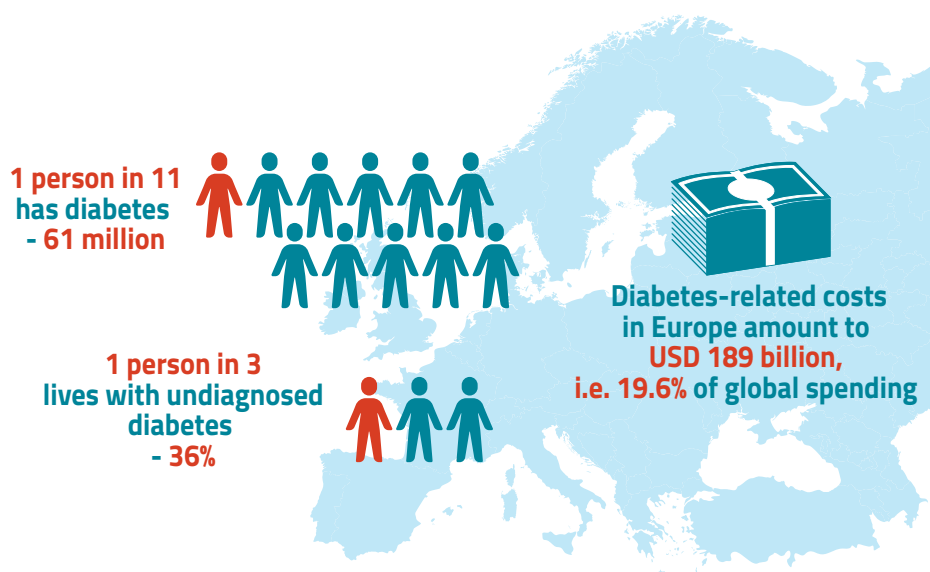
Diabetes in Europe

DIABETES 2021	61 million	9.2%
DIABETES 2030	67 million	9.8%
DIABETES 2045	69 million	10.4%

Increase of 13%



IDF predicts that by 2045 the incidence of diabetes in Europe will increase by a further 13%. In 2021, the costs related to diabetes in Europe exceeded USD 189 bn, which corresponds to 19.6% of the total global spending.



Classification of hyperglycaemic conditions according to the World Health Organisation¹¹

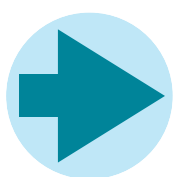
- Normal fasting blood glucose: 70-99 mg/dl (3.9-5.5 mmol/l);
- Impaired fasting glucose (IFG): 100-125 mg/dl (5.6-6.9 mmol/l);
- Impaired glucose tolerance (IGT) – blood glucose of 140-199 mg/dl (7.8-11 mmol/l) in 120th minute of the oral glucose tolerance test (OGTT);
- Pre-diabetes – IFG and/or IGT.

Diabetes – one of the following criteria:

symptoms of hyperglycaemia and random ≥ 200 mg/dl (> 11.1 mmol/l);
2-times fasting glucose ≥ 126 mg/dl (> 7.0 mmol/l);
glucose in 120 th minute of ≥ 200 mg/dl (> 11.1 mmol/l);
HbA1c level $\geq 6.5\%$ (> 48 mmol/mol).

"The Polish Diabetes Association has become a partner of the Cities Changing Diabetes programme in Poland with the aim of joining diabetes prevention initiatives that involve reliable education and social communication, in cooperation with local governments, experts and patient communities. Each such strategically implemented initiative is priceless on a social scale. We are also pleased with the formula of the global know-how of the programme as well as 'tailor-made' initiatives implemented by each agglomeration. We believe that Warsaw and Krakow will set a good example for other cities."

Anna Śliwińska,
President of the Polish Diabetes Association



Diabetes classification¹²

Type 1 diabetes – autoimmune destruction of pancreatic beta cells, usually leading to absolute insulin deficiency.

Type 2 diabetes – progressive loss of the ability of pancreatic beta cells to properly secrete insulin, accompanied by insulin resistance.

Other special types of diabetes:

- genetic defects in beta cell function;
- genetic defects in insulin action;
- diseases of the exocrine pancreas;
- endocrinopathies;
- infections;
- rare forms of diabetes caused by immune processes;
- other genetically determined syndromes associated with diabetes.

Gestational diabetes

Type 2 diabetes risk factors

- age over 45;
- overweight or obesity;
- low physical activity;
- hyperlipidaemia;
- diabetes in the family (parents or siblings);
- arterial hypertension;
- diseases of the cardiovascular system;
- in women – polycystic ovary syndrome, a history of gestational diabetes, giving birth to a child weighing over 4 kg.

Type 2 diabetes is among the causes of premature mortality, primarily from cardiovascular complications, complications leading to blindness, limb amputation and kidney failure. There are many factors at the root of type 2 diabetes, but most of them are related to civilisational developments and their consequences. Many can be prevented by modifying eating habits and undertaking regular physical activity.

Incidence also depends on place of residence.¹³ International^{14 15} studies demonstrate that inhabitants of cities are nearly two times more likely to suffer from diabetes than rural dwellers. In our country the situation is similar: over 65% of Poles affected by type 2 diabetes live in the city.



Place of residence	Number of diabetics	Share of place of residence among diabetics	Share of diabetics in place of residence
Countryside	880,000	35%	7.5%
City	1,600,000	65%	9%

Registered diabetes incidence in 2017 by place of residence; simplified data based on the Report of the National Institute of Public Health – PZH

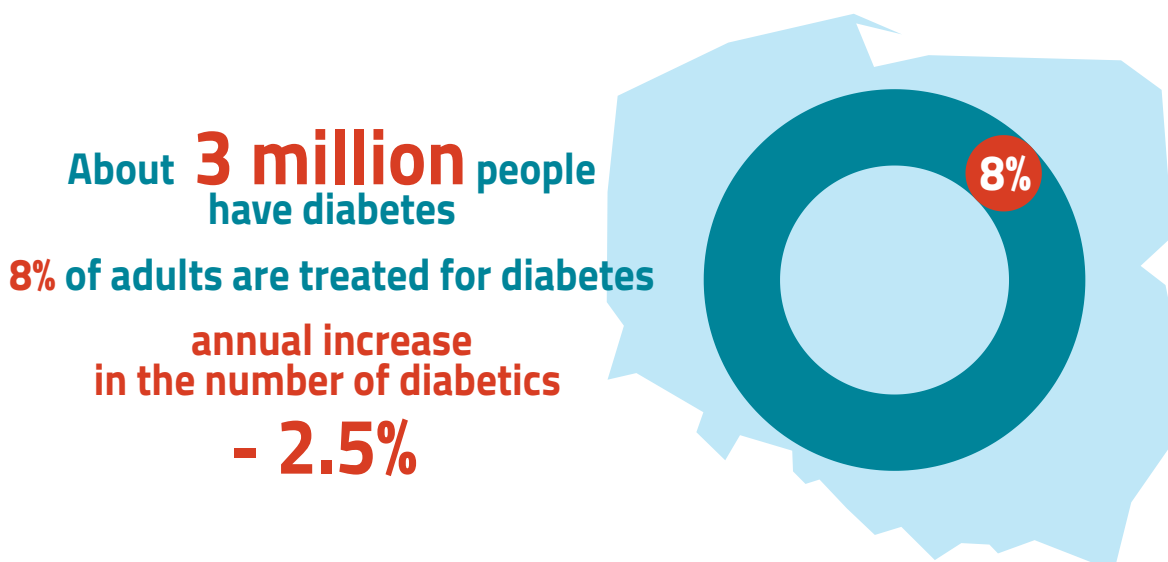
Diabetes growth dynamics in Poland

According to various estimates,¹⁶ over 2.5 million adults in Poland suffer from diabetes. That corresponds to ca. 8% of the adult population, i.e. every twelfth adult Pole. Above the age of 65, almost every fourth person (23%) is diabetic. The disease is more often diagnosed among women, who constitute 55% of the population. At the same time, it is expected that about 20% of patients remain undiagnosed. As they are not aware of it, they remain untreated. This means that as many as 3 million Poles may suffer from diabetes.

A comparison of 2013 and 2017 data shows that the registered prevalence in the period 2013–2017 increased each year by an average of 3.7%. Standardisation by age and sex in relation to the structure of the adult population in 2017 allowed for a calculated increase of 2.5%, representing the actual dynamics of the number of patients with diagnosed and treated diabetes, whereas an increase by 1.2% is related to the aging of the population.¹⁷

More and more people also have pre-diabetes, which is defined as an impaired fasting glucose level and/or impaired glucose tolerance.

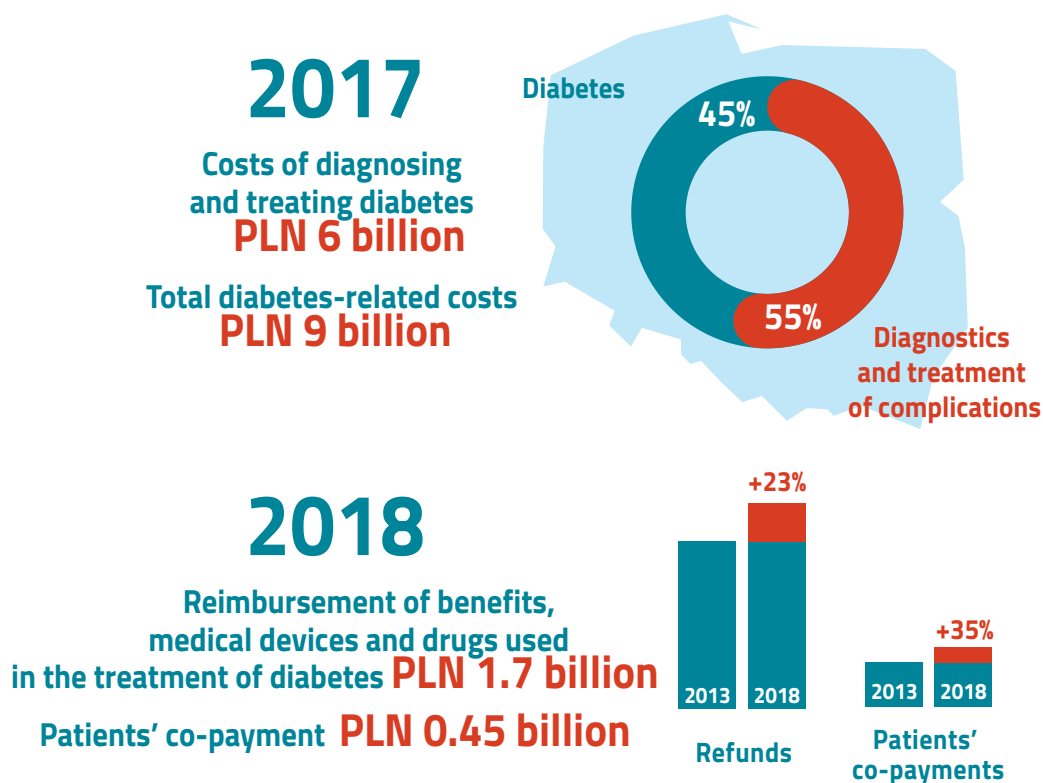
Experts predict that as many as about 3 million people may have pre-diabetes, which means they are at a high risk of developing diabetes in the coming years.¹⁸



Economic consequences of diabetes in Poland

According to the data of the National Health Fund (NFZ), in 2017 the costs of diagnosing and treating diabetes amounted to over PLN 6 billion, of which approximately PLN 2.8 billion (45%) was spent on diabetes alone, and over a half, i.e. around PLN 3.2 billion (55%), on diagnosis and treatment of its complications. The total cost of diabetes, including direct treatment, treatment of complications and the cost of diabetes-related provisions (e.g. pensions, benefits, disability payments) in 2017 was estimated at around PLN 9 billion.

In 2018, the reimbursement of benefits, medical devices and drugs used in the treatment of diabetes alone amounted to PLN 1.7 billion (50% – cost of drugs, 25% – cost of glucose testing strips, 21% – services provided). The total value was 23% higher than in 2013. It is worth noting that diabetes is an extremely costly disease also for patients. In 2018 patient co-payments amounted to PLN 0.45 billion and were 35% higher than in 2013.¹⁹



"In Poland, about 3 million people are struggling with diabetes, and the dynamics of the increase in obesity and diabetes incidence is unparalleled. This means we are dealing with a real epidemic. Unfortunately, diabetes more and more often affects children and adolescents, which is particularly severe as it determines the style of their entire lives. As the Scientific Council of the CCD Programme, we are aware of the urgent need to focus our efforts on the prevention of obesity and type 2 diabetes. We have made this commitment and will fulfil it in the coming years by implementing the planned macro and micro interventions."

Professor Maciej Małeck, MD, PhD, Head of the Department of Metabolic Diseases at the University Hospital in Krakow, Dean of the Medical Faculty of Collegium Medicum of the Jagiellonian University



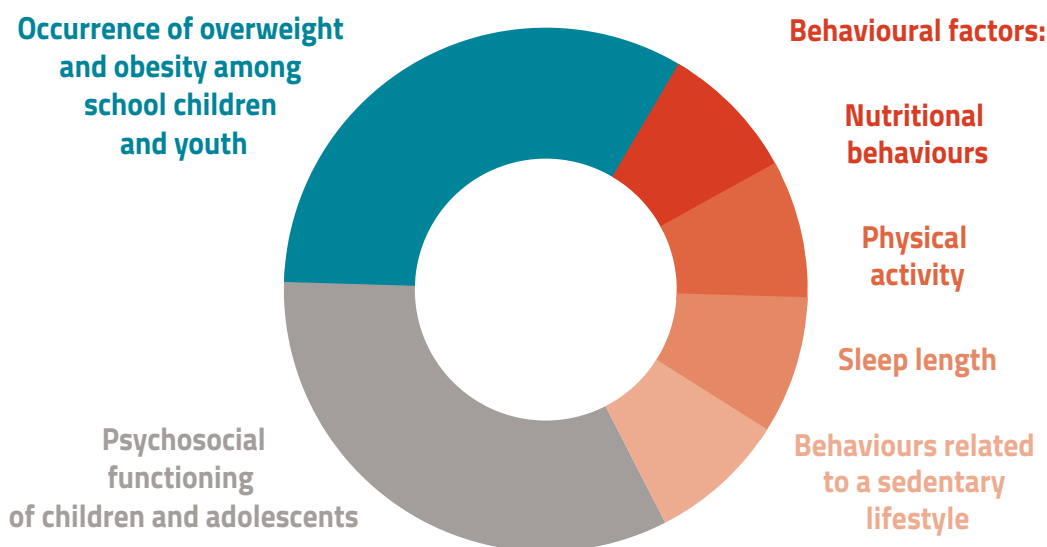
Health and Lifestyle of Polish Students in the Context of Obesity and Type 2 Diabetes Incidence – Review of Secondary Research

Health and lifestyle of Polish students

The phenomenon of health and lifestyle of Polish students has been the subject of interest among scientists and institutions responsible for the organisation of the health care system for the last dozen or so years.



The analyses published to date describe the health and lifestyle of students with the use of various parameters and research methodologies, as well as different age categories of children and adolescents, which is important in formulating conclusions. As a consequence, the authors of this study synthesised the described phenomenon in three key dimensions:



3.1 Occurrence of Overweight and Obesity



* Overweight and obesity in children in the COSI 2016 study²⁰

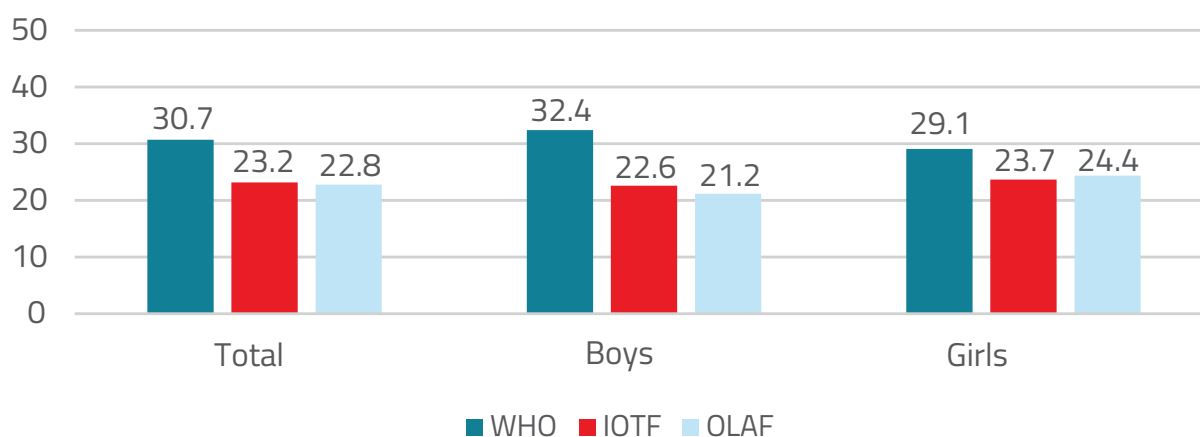
Selected results:

- According to WHO standards, almost one-third of Polish eight-year-olds exhibit excess body weight (32.4% of boys and 29.1% of girls are overweight or obese);
- One in five eight-year-olds have too large waist circumference (larger in girls than in boys).

Compared to the results of the population anthropometric studies of the Children's Memorial Health Institute (IPCZD) (OLAF 2010 project) for the same age group:

- In the COSI study the body weight of boys was greater by over 1 kg, and of girls by almost 2 kg;
- In the COSI study the mean value of the BMI index was higher in both sexes (17.1 kg/m² in boys and 17 kg/m² in girls vs. 16.7 kg/m² and 16.4 kg/m², respectively);
- In the COSI study the waist circumference was larger in boys by 2.5 cm, and by almost 3 cm in girls;
- In the COSI study the hip circumference was larger by 2 cm in boys and by 1.8 cm in girls.

* Childhood Obesity Surveillance Initiative (COSI) study – the first population study of eight-year-olds in Poland, conducted as part of the WHO's European child obesity monitoring project. It was carried out in 2016 as part of the NHP by the Institute of Mother and Child in 135 primary schools in 9 provinces among 3,408 children from 2nd and 3rd grade.

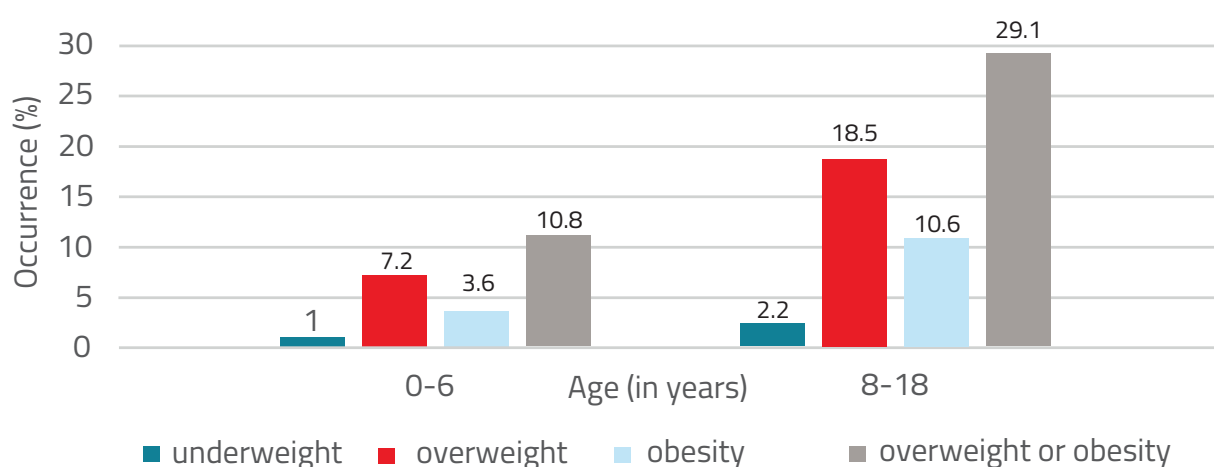


Data source: A. Fijałkowska, A. Oblacińska i M. Stalmach (ed.). *Nadwaga i otyłość u polskich ośmiolatków w świetle uwarunkowań biologicznych, behawioralnych i społecznych. Raport z międzynarodowych badań WHO Childhood Obesity Surveillance Initiative (COSI)*, Institute of Mother and Child, Warsaw, 2017, p. 24.



* How many children are obese according to the study of the Children's Memorial Health Institute?

Incidence of underweight, overweight and obesity; NPZ 2017-2020



Comparison of the occurrence of overweight and obesity in the years 2017-2020 with the years 2007-2009 among school children and adolescents

Sex	Body weight category	OLAF 2007-2009 % (95% confidence interval)	NHP for children and youth 2017-2020 % (95% confidence interval)
Boys	overweight and obesity	24.6 (23.66-25.52)	32.32 (30.36-34.43)
	obesity	8.8 (8.17-9.39)	13.50 (12.02-15.08)
Dziewczęta	overweight and obesity	17.4 (16.58-18.15)	25,84 (24,00—27,76)
	obesity	4.2 (3.84-4.68)	7.97 (6.86- 9.21)

* The study was conducted by the team of the Children's Memorial Health Institute. The population study was conducted under the supervision of Zbigniew Kułaga, MD, Head of the Department of Public Health at the Institute of Children's Health (IZD) in Warsaw and financed by the Ministry of Health.



"The growth dynamics of excessive body weight in the population of Polish students has never been so significant, and the actions implemented to slow it down – so evidently ineffective. For us, experts, the current state of dispersion and lack of synergy between education and prevention, lack of systemic diagnostic and treatment activities, lack of specialist centres, shortage of human resources and tools in the current health care system is unacceptable. Only radical new strategic actions, implemented centrally and locally, give us as a society a chance to slow down a health disaster of enormous mass scale."

Agnieszka Mastalerz-Migas, MD, PhD,
National Consultant in the field of family medicine



* "Health and Lifestyle of Polish Students" Report²¹

Excessive body weight and blood pressure in 2nd and 7th grade students:

- Excess body weight affects 31.8% of 2nd grade students and 29.0% of 7th grade students; it is more common in boys than in girls;
- The value above 90th percentile in the waist circumference, which is associated with an increased risk of disease, was recorded in 25.3% of 2nd grade students and 22.6% of 7th grade students;
- Every fifth 2nd and 7th grader has a hip circumference above the value that increases the risk of cardiovascular disorders;
- Elevated systolic blood pressure occurs in 24.3% of 2nd grade students and 12.1% of 7th grade students, whereas increased diastolic blood pressure in 18.2% of 2nd-graders and 11.4% of 7th-graders.



In 2018 as compared to 2016, the percentage of girls and boys with abnormally high values of systolic and diastolic blood pressure increased dramatically ($p < 0.001$). For systolic blood pressure, the percentage difference was 7.9% for boys and 7.0% for girls, and the percentages for diastolic blood pressure spiked by 8.5% and 9.6%, respectively.

The negative effects of hypertension and obesity exacerbate with age, and the risk associated with them gets ever higher in subsequent stages of a child's development.*

* "Health and Lifestyle of Polish Students", a report on results of the research carried out in 143 schools as part of the National Health Program (NPZ) project by the team of the Institute of Mother and Child (IMiD) in Warsaw in 2018-2019. The IMiD analysis was carried out on a group of 3067 2nd grade students and 1,262 7th grade students of primary school.



* “Students’ Health in 2018 Against the Background of the New HBSC Research Model” Report²²

Overweight and obesity among Polish teenagers in 2018:

- According to the WHO 2007 BMI categories, excess body weight occurred in 21.3%, including obesity in 4.7% of adolescents; it was significantly more frequent in boys (29.3% and 7.0%, respectively) than in girls (13.7 % and 2.6%);
- According to the criteria of the IOTF (International Obesity Task Force), excess body weight occurred in 16.5% of adolescents, including obesity in 2.3%; it was significantly more frequent in boys (22.6% and 3.1%) than in girls (10.8% and 1.6%);
- According to WHO 2007, the prevalence of overweight and obesity decreased with the age of the respondents: from 25.8% among 11-year-olds to 15.3% among 15-year-olds (there was a similar downward trend according to the IOTF criteria);
- The percentage of overweight and obese students according to the IOTF criteria increased in the period 2014–2018 by almost 2 percentage points (16.5% vs 14.8%); the increase was significantly higher in boys than in girls

Self-assessment of body weight among teenagers in 2018:

- 45.2% of students aged 11–15 assessed their body weight as normal (just right);
- In all age groups, significantly more adolescents (34.7–41.9%) assessed their body weight as too high (definitely too fat and slightly too fat);
- As many as 48% of 13-year-old and 51.7% of 15-year-old girls assessed themselves as too fat.

Behaviours aimed at losing weight

The most common reasons for adolescents adopting behaviours aimed at losing weight are dynamic changes in body structure and figure, the modern “ideal” of the human body, obesity epidemic, weight loss methods popularised by the mass media and supplements supporting it as well as the prevalent “fashion for slimming”.

Body weight reduction can be a health-wise or risky behaviour for the development and health of teenagers (unreasonable weight loss, associated emotional problems, fasting and “miraculous” diets, induction of vomiting or use of laxatives).

Polish teenagers and the tendency to lose weight:

- Every fifth teenager aged 11–15 has taken weight reduction measures; girls were much more likely to take weight loss measures than boys (25.4% vs. 16.2 %);
- The percentage of dieting girls increases systematically with age (19% for 11-year-olds, 22.6% for 13-year-olds);
- The percentage of boys losing weight decreases with age (19.3% in 11-year-olds, 13.4% in 15-year-olds).

* “Students’ Health in 2018 Against the Background of the New HBSC Research Model” Report – the Health Behaviour in School-Aged Children (HBSC) survey has been carried out since 1982, every 4 years, in 49 countries or regions of Europe. Poland has been a member of the HBSC network since 1989. Based on self-report data, the HBSC study defined approximately 60 indicators relating to adolescents’ health, lifestyle and environment. The latest HBSC study was conducted in Poland in the 2017/2018 school year among 5,225 students (11-, 13- and 15-year-olds).



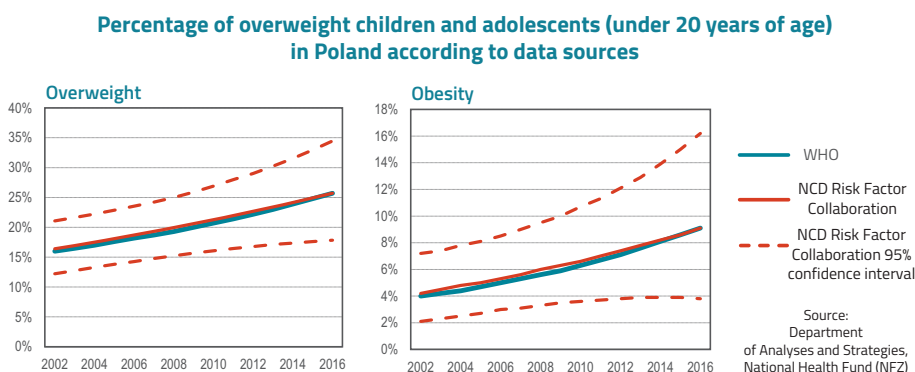
64.6% of teenagers were not overweight and there was no objective need for weight reduction. However, also in this group every fifth person had lost weight, and every fourth saw such a need.

In 2014-2018, the percentage of adolescents taking weight reduction measures slightly decreased (from 23.6% to 20.8%), and the percentage of adolescents who believed that they should do so increased (from 21.6% to 24.9%).



Overweight and obesity in children and adolescents in the NHF report²³

In the case of children and adolescents (people under 20 years of age), the NCD Risk Factor Collaboration indicates that in 2016 in Poland 31% of boys and 20% of girls were overweight, and 13% of boys and 5% of girls were obese. Compared to 2007, the increase in the number of overweight boys is particularly worrying – in 2007-2016 the percentage of overweight boys increased by 8% (by 5% for girls). As regards obesity, the proportion of obese boys increased by 5% and of obese girls by 2%.²⁴



Overweight and obesity in children and adolescents in the report of the Supreme Audit Office²⁵

In the opinion of the Supreme Audit Office (NIK), presented in the report published in 2021, despite the recognition of obesity as a civilisational disease and its treatment as one of the health priorities of the NHP 2016-2020, the activities of the Ministry of Health had not led to a decrease or even an inhibition of the growth rate of children and adolescents with excess body weight. The audit showed that these conditions occurred in 21.7% of children (of which 1/3 were obese and 2/3 were overweight).²⁶ The audit results showed, among others, a lack of systemic solutions in the field of monitoring preventive measures and the health condition of children and adolescents, lack of standardisation and comprehensive health care for children and adolescents in the field of overweight and obesity, ineffective implementation of the NHP's goal of combating overweight and obesity as well as a limited access to medical services and insufficient resources of medical staff.

3.2 Behavioural Factors

3.2.1. Nutritional behaviour of Polish students



“Health and Lifestyle of Polish Students” Report

It is recommended that school children eat 4-5 meals a day at intervals of 3-4 hours, preferably at fixed times of the day. It is particularly important for the proper development of children and teenagers to eat breakfast regularly – this is the first meal of the day, preceding a several-hour stay at school.²⁷

Do 2nd and 7th grade students eat breakfast?

- Every fifth 2nd grade student does not eat breakfast every day;
- Half of 7th grade students eat breakfast irregularly on school days, and every fifth does not eat anything before going to school.
- Compared to 2016, the percentage of girls who did not eat breakfast exhibited an alarming increase.²⁸

Eating breakfast on schooldays and weekends by sex and place of residence (% of surveyed 2nd grade students)

Breakfasts	Overall	Girls	Boys	City	Countryside
Never	2.8	3.3	2.3	2.5	3.7
Several days (1-3)	6.6	6.6	6.6	6.1	7.1
Most days (4-5)	9.4	9.1	9.7	9.8	8.6
Every day	81.2	81.0	81.4	81.6	80.5
		p=0.434		p=0.222	

Eating breakfast on schooldays and weekends by sex and place of residence (% of surveyed 7th grade students)

Breakfasts	Overall	Girls	Boys	City	Countryside
Never	20.8	24.6	16.9	20.0	23.1
1-2 days	10.9	13.0	8.6	11.4	9.6
3-4 days	12.1	11.4	12.7	9.8	8.6
Every day	56.2	51.0	61.7	56.8	54.6
		p<0.001		p=0.547	

Do students eat meals with their parents?

- Nearly one-third of 2nd and 7th grade students eat breakfast regularly with their parents. Among 2nd graders supper is the meal most frequently consumed in the company of parents; among 7th grades it is dinner;
- Gender significantly differentiates the regularity with which 7th grade students eat main meals with their families to the disadvantage of girls.²⁹

"The role of parents' personal example in shaping proper eating habits of children cannot be overestimated – it is most often up to the parents whether the children will take over eating habits that are beneficial or harmful for their development. It is believed that one of the most effective ways of instilling the right habits is eating together as a family. According to numerous studies, the more often children eat in the company of their parents, the less often they struggle with the problem of excessive body weight"

Professor Lucyna Ostrowska, MD, PhD
Head of the Department of Dietetics and Clinical Nutrition
at the Medical University of Białystok



COSI 2016 report – nutritional behaviour of eight-year-olds

Frequency of consumption of healthy and unhealthy products by eight-year-olds:

- Almost two-thirds of the surveyed children eat vegetables several times a week, and nearly one-fourth eat them every day. Fresh fruit is eaten more regularly than vegetables;
- Almost three-fourths of eight-year-olds eat salty snacks and fast food less than once a week;
- Half of eight-year-olds eat sweets (such as cakes or donuts) less than once a week, and nearly half eat sweet snacks on rare occasions;
- Analyses of the relationship between body weight and the frequency of consumption of unhealthy products showed statistically significant differences only for sweet snacks and sweets (such as cookies, biscuits, donuts).³⁰.

1/4

of eight-year-olds eat vegetables every day



HBSC 2018 model – nutritional behaviour of Polish teenagers

Despite numerous programmes aimed at improving students' nutritional habits, research results still show insufficient consumption of fruit and vegetables and excessive consumption of high-sugar foods.

What do teenagers eat and drink?

- Only one-third of teenagers eat fruit and vegetables in the recommended amount of at least 5 servings a day;
- Compared to HBSC 2014, there is an increase in the daily consumption of vegetables (by 4.9%) and fruit (by 4.4%);
- Two-thirds of teenagers eat sweets more than once a week (69.9%) and almost half of them drink sweetened drinks with the same frequency (44.9%);
- Girls eat sweets in excessive amounts more often than boys (72.6% vs 66.9%), whereas boys drink sweetened beverages more frequently than girls (52% vs 38.1%);
- The percentage of frequent consumers of sweets was the lowest among 11-year-olds (66.5%), while among 13- and 15-year-olds it was at a comparable level (71.6% and 71.3%).³¹

1 in 3 teenagers eat the recommended amount of fruit and vegetables



2 in 3 teenagers eat sweets more than once a week



Age group (total)	Never	Less than once a week	Once a week	2-4 days a week	5-6 days a week	Once every day	More than once every day
Fruit consumption							
11	1.2%	4.5%	6.5%	23.1%	18.1%	18.1%	28.5%
13	1.5%	5.5%	8.3%	30.2%	19.0%	16.4%	19.0%
15	1.9%	7.7%	10.6%	29.6%	17.2%	14.5%	18.5%
Overall	1.5%	5.9%	8.5%	27.7%	18.1%	16.3%	21.9%
Vegetable consumption							
11	4.5%	7.0%	11.0%	23.6%	16.8%	19.7%	17.5%
13	3.4%	6.5%	10.7%	27.1%	20.6%	16.5%	15.2%
15	3.3%	6.5%	9.7%	25.8%	20.6%	17.1%	16.9%
Overall	3.7%	6.7%	10.4%	25.5%	19.4%	17.7%	16.5%
Sweets consumption							
11	3.7%	13.6%	16.2%	27.3%	14.2%	13.0%	11.9%
13	3.9%	9.3%	15.2%	28.9%	16.4%	13.3%	12.9%
15	3.9%	10.8%	14.0%	30.0%	15.1%	13.0%	13.2%
Overall	3.8%	11.2%	15.1%	28.8%	15.3%	13.1%	12.7%
Drinking beverages with added sugar							
11	11.4%	27.6%	18.5%	16.6%	9.0%	7.0%	9.9%
13	11.6%	23.5%	17.7%	20.7%	11.0%	7.2%	8.2%
15	15.2%	25.6%	14.2%	20.3%	8.5%	6.9%	9.4%
Overall	12.7%	25.6%	16.8%	19.2%	9.5%	7.0%	9.2%

Data source: J. Mazur and A. Małkowska-Szkućnik (ed.), *Zdrowie uczniów w 2018 roku na tle nowego modelu badań HBSC*, Institute of Mother and Child, Warsaw 2018, p. 105-108.

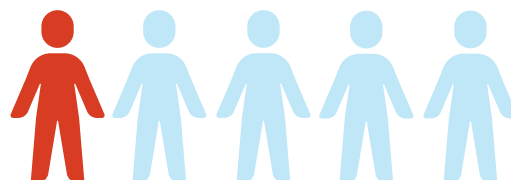
Eating breakfast among Polish teenagers

Eating breakfast every day by children and adolescents helps to reduce the risk of developing overweight and obesity, as is limiting consumption of snacks and high-energy products that are harmful to health; at the same time it enhances cognitive functions and school achievements.³²

Selected results:

- 61.3% of teenagers eat breakfast on school days, boys more often than girls;
- Every fifth teenager never eats breakfast (18.1%);
- Compared to HBSC 2014, the percentage of students eating breakfast every day on school days and on weekends has decreased (from 63.9% to 61.3% and from 87.3% to 86.1%, respectively).³³

**1 in 5
teenagers never
eats breakfast**



According to experts, the steady decrease in the percentage of Polish teenagers who regularly eat breakfast since 2002 is a very disturbing phenomenon.



“National Survey of Diet and Nutritional Status of the Polish Population” NIPH-PZH Report

Sugar and fast food in the diet of Polish youth aged 10-17:

- 38.1% of boys and 40.1% of girls use sugar to sweeten drinks or dishes, some even several times a day;
- Individual varieties of sweets are usually eaten once (27.9-34.9% in boys and 30.3-41.5% in girls) or 2-3 times a week (22.7-32.6% and 19.6-29.9%, respectively).
- French fries and fast food dishes are eaten most often 1-3 times a month, whereas crisps and other salty snacks are eaten more often – a few times a week in 42.1% of boys and 34.4% of girls;
- Most teens drink sweet sodas: 9.7% of boys and 6.3% of girls at least once a day, and 34% and 29.6% several times a week.³⁴



It has been estimated that, on average, people whose death can be linked to the consequences of consuming sugar-sweetened beverages live 15 years shorter than the average person their age. It is also assessed that in Poland nearly 1,400 deaths annually result from the excessive consumption of sugar-sweetened beverages.³⁵

3.2.2 Physical activity of Polish students

Physical activity stimulates the bodies of children and adolescents for proper growth and maturation, shapes fitness and physical efficiency as well as develops motor skills. It plays an important role in maintaining a healthy body weight and contributes to proper psychosocial development.

Based on scientific studies, it has been determined that the minimum recommended level of general physical activity for children and adolescents aged 7-15 years is at least 60 minutes of moderate physical activity a day.



“Health and Lifestyle of Polish Students” Report

Selected conclusions regarding physical activity among 2nd and 7th grade students:

- 18.6% of children during the week and 8.4% during the weekend are not active at all or are active less than 1 hour a day;
- Female 2nd-graders more often than male are physically active 1-2 hours a week, while boys more often participate in intensive trainings (over 2 hours a week);
- 61% of 2nd grade students and 45% of 7th grade students are driven to school, thus not taking advantage of the opportunity for everyday physical activity.³⁶



**Physical activity in free time on school days and weekends
by gender and place of residence (% of surveyed 2nd grade students)**

Time	Overall	Girls	Boys
School days			
Not at all	2.9	3.5	2.2
Less than 1 hour	15.7	16.9	14.6
About 1 hour	38.4	38.5	38.3
About 2 hours	30.0	29.4	30.6
About 3 hours	13.0	11.7	14.3
		p=0.033	
Weekends			
Not at all	2.1	2.7	1.6
Less than 1 hour	6.3	6.9	5.7
About 1 hour	20.2	22.1	18.4
About 2 hours	33.3	33.2	33.4
About 3 hours	38.1	35.2	41.0
		p=0.004	

Data source: A. Fijałkowska, A. Oblacińska i M. Korzycka (ed.). *Zdrowie i styl życia polskich uczniów. Raport z badań*. Institute of Mother and Child, Warsaw 2019, p. 55.



COSI 2016 Report

How active are Polish eight-year-olds?

Selected conclusions:

- Almost half of eight-year-olds (46.5%) reach school passively: they are driven by car or use public transport. In the countryside, this percentage is as high as 66%;
- Most parents declare that their child is physically active in free time for about an hour a day on school days and 2-3 hours a day on weekends;
- Compared to their peers with insufficient activity, eight-year-olds meeting the recommendations as regards daily physical activity more often do not exhibit excess body weight (statistical significance applies to weekends and boys);
- Compared to their peers who do not participate in organised physical activities, eight-year-olds who participate in this kind of activities significantly more often do not have excess body weight.³⁷



HBSC 2018 model – physical activity of Polish teenagers

Measurement of physical activity according to the HBSC protocol is conducted with the use of two tools: a measure of moderate physical activity (MVPA* – Moderate-to-Vigorous Physical Activity) and a measure of intense physical activity (VPA** – Vigorous Physical Activity).

* According to the WHO, the recommended frequency of moderate physical activity for children and adolescents is at least 60 minutes a day.

** According to the WHO, the recommended frequency of intense physical activity for children and adolescents involves high energy expenditure at least 4 times a week

Frequency of moderate physical activity (MVPA) by gender and age

Age group	0-1days	2-4 days	5-6 days	7 days
Moderate physical activity (MVPA)				
11 years	7.4%	39.4%	30.3%	22.9%
13 years	9.5%	44.1%	30.9%	15.5%
15 years	12.8%	49.4%	24.6%	13.3%
Overall	9.9%	44.4%	28.5%	17.2%

Frequency of intensive physical activity (VPA) by gender and age

Age group	Daily	4-6 times a week	2-3 times a week	Once a week	Less often or never
Intensive physical activity (VPA)					
11 years	16.3%	23.0%	31.5%	14.2%	14.9%
13 years	13.0%	19.0%	30.6%	18.3%	19.1%
15 years	10.1%	18.0%	33.2%	15.3%	23.4%
Overall	13.1%	20.0%	31.8%	15.9%	19.2%

Data source: J. Mazur and A. Małkowska-Szkućnik (ed.), *Zdrowie uczniów w 2018 roku na tle nowego modelu badań HBSC*, Institute of Mother and Child, Warsaw 2018, p. 89-90

According to the analyses of the HBSC 2018 study, only a small percentage of adolescents undertake physical activity, both moderate and intense, at the recommended level. The frequency of undertaken activity is closely related to the gender and age of teenagers.

Major results:

Moderate Physical Activity (MVPA):

- Only 17.2% of adolescents meet the MVPA recommendations, which indicates a decrease compared to HBSC 2014 (24.2%);
- The percentage of adolescents who are physically active 7 days a week decreases with age;
- The lowest percentage for boys meeting the recommendations is among 13-year-olds (16.1%).

Intensive physical activity (VPA):

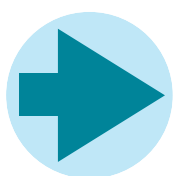
- Only one-third of teenagers (33.1%) undertake intense physical activity at the level recommended by the WHO, which translates into a significant decrease compared to HBSC 2014 (40.5%);
- The percentage of adolescents meeting the recommendations in this respect decreases with age: 39.3% of 11-year-olds and 28.1% of 15-year-olds meet the recommendations;
- Girls fare worse than boys: the difference in percentages reaches 10% to the disadvantage of girls and increases with age.³⁸



Spada odsetek młodzieży spełniającej zalecenia umiarkowanej oraz intensywnej aktywności fizycznej

"Lack of physical activity among students is one of the key risk factors for health problems in adulthood. We observe an increase in the importance of this factor with the age of students: from eight-year-olds, of which every fifth is actually not physically active at all, to teenagers, 80% of whom do not meet the recommendations for weekly moderate physical activity."

Professor Piotr Jankowski, MD, PhD, Professor at the First Clinic of Cardiology, Interventional Electrophysiology and Hypertension, Institute of Cardiology, Collegium Medicum of the Jagiellonian University



3.2.3 Sleep length among Polish children and adolescents



“Health and Lifestyle of Polish Students” Report

In the last 10 years, the percentage of school-age children struggling with sleep disorders has increased alarmingly. It is estimated that up to 30% of students have trouble sleeping, which may result in learning difficulties, a feeling of fatigue or poor concentration.³⁹

According to the recommendations of the American Academy of Sleep Medicine, children aged 6-12 should sleep 9-12 hours a day, and adolescents aged 13-18 – 8-10 hours a day.

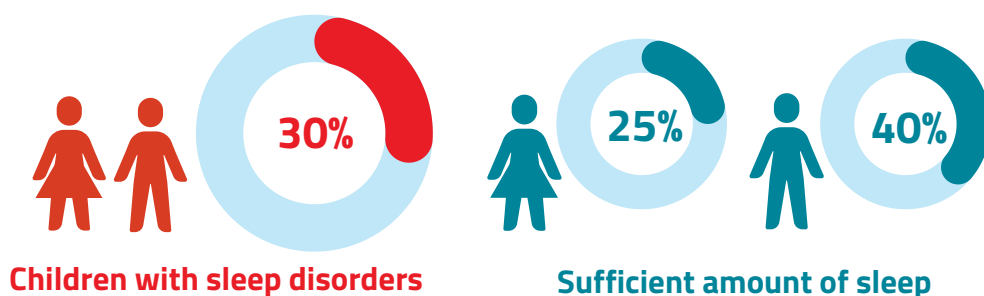
Sleep length according to sex

Time	Overall	Girls	Boys
Sleep length (% of surveyed 2 nd grade students)			
Less than 9 hours	7.8	8.5	7.1
9-11 hours	90.1	89.8	90.5
Over 11 hours	2.1	1.7	2.5
		p=0.125	
Sleep length (% of surveyed 7 th grade students aged 12)			
Less than 9 hours	68.9	74.7	59.6
9-11 hours	17.1	13.9	22.2
Over 11 hours	14.0	11.4	18.2
		p=0.040	

Data source: A. Fijałkowska, A. Oblacińska i M. Korzycka (ed.), *Zdrowie i styl życia polskich uczniów. Raport z badań*. Institute of Mother and Child, Warsaw 2019, p. 50

How do 2nd and 7th graders sleep?

- The vast majority of 2nd-graders get enough sleep, that is more than 9 hours a day;
- Among 12-year-old pupils, the percentage of those who do not sleep long enough increases dramatically: only one-third of them sleep the number of hours recommended for their age group;
- Slightly over 25% of girls sleep as much as they should; in the case of boys the percentage exceeds 40%.⁴⁰



Sleep duration and the risk of overweight and obesity

Numerous studies demonstrate that insufficient hours of sleep disturb the energy balance of the body, which can lead to obesity.⁴¹ Cross-sectional studies show a significant association between short sleep and an increased risk of overweight and obesity in children and adolescents:

Results of the sleep study among Polish eight-year-olds:

- Eight-year-olds living in an urban area sleep on school days shorter than the recommended 9 hours significantly more often than their peers from the countryside;
- Students without excess body weight are those who more often sleep at least 9 hours on school days⁴².



3.2.4 Sedentary behaviour among Polish students



“Health and Lifestyle of Polish Students” Report

Scientific research shows that time spent in a passive manner (i.e. on sedentary activities, characterised by a lack of movement, mainly in front of a screen) is an independent risk factor for non-communicable diseases, including obesity, diabetes and cardiovascular disease.⁴³

In 2001, the American Academy of Pediatrics specified the recommended maximum screen time for children and adolescents to be 2 hours a day, and for children 4–9 years of age – 1.5 hours a day.

Behaviour related to a sedentary lifestyle among students in 2nd and 7th grade:

- On average, 2nd-graders spend 1 hour 23 minutes per day watching TV and using electronic devices on school days and 2 hours 25 minutes on weekends;
- Almost 70% of 2nd grade children meet the recommendation for screen time on school days, and just over 40% on holidays;
- Most 7th grade students use the computer 2–3 hours a day on school days and over 3 hours on weekends. Girls spend more than 3 hours in front of the computer, both during the week and on days off.⁴⁴



Screen time is related to body mass index (BMI)
– the more screen time, the higher the BMI.

Time spent on doing homework and reading on school days and weekends by gender and place of residence (% of surveyed 2 nd grade students)	Overall	Girls	Boys
School days			
Not at all	0.2	0.1	0.3
Less than 1 hour	16.7	15.5	17.8
About 1 hour	47.8	47.3	48.3
About 2 hours	30.6	31.7	29.4
About 3 hours	4.7	5.3	4.2
		0.219	
Weekends			
Not at all	5.8	5.7	5.9
Less than 1 hour	30.4	29.5	31.3
About 1 hour	38.5	38.5	38.4
About 2 hours	20.5	20.9	20.0
About 3 hours	4.9	5.3	4.4
		p=0.694	

Data source: A. Fijałkowska, A. Oblacińska i M. Korzycka (ed.). *Zdrowie i styl życia polskich uczniów. Raport z badań*. Institute of Mother and Child, Warsaw 2019, p. 64–65

Time spent on watching TV and using electronic media by children by gender and place of residence (% of surveyed 2 nd grade students)	Overall	Girls	Boys
School days			
Not at all	7.0	7.1	6.9
Less than 2 hours	66.9	64.0	69.3
2-3 hours	27.8	34.0	23.2
Over 3 hours	5.1	2.0	7.8
		p=0.111	
Weekends			
Not at all	1.2	1.2	1.3
Less than 2 hours	42.1	48.3	36.6
2-3 hours	37.2	29.5	44.2
Over 3 hours	21.0	22.6	19.5
		p=0.476	

Data source: A. Fijałkowska, A. Oblacińska i M. Korzycka (ed.). *Zdrowie i styl życia polskich uczniów. Raport z badań*. Institute of Mother and Child, Warsaw 2019, p. 64-65.



COSI 2016 Report



Research conducted in the US found that more time spent watching TV was associated with more frequent consumption of unhealthy products (French fries, sweet carbonated drinks, fast-foods). It was also shown that watching TV and videos as well as playing computer games was positively associated with the value of the BMI.⁴⁵

Screen time behaviours of Polish eight-year-olds:

- They spend 1 hour 36 minutes on school days and 2 hours 48 minutes on holidays on watching TV and using electronic media;
- Every other child meets the experts' recommendations regarding the length of screen time on school days and every sixth on days off;
- 3% of students spend more than 3 hours in front of the screen on school days, and as many as 25% on their days off.⁴⁶



HBSC 2018 Model – Sedentary behaviour of Polish teenagers before the COVID-19 pandemic

Long-term and frequent use of new digital media and interactive information and communication technology by young people can pose a risk to their mental health. A new phenomenon that threatens the mental health of adolescents are behavioural addictions, including addictions to computers, the Internet, gambling and shopping.

Watching movies or shows before the pandemic:

- Youth aged 11–15 spent an average of 2.5 hours a day watching movies or shows and using mobile devices, and more than 1.5 hours playing computer or console games;
- 60.8% of teenagers watched movies or shows for too long (2 hours or more) on school days, and 17.8% for very long (4 hours or more). On weekends, these rates grew (82.6% and 43.4%, respectively)⁴⁷.

Using computer/tablet/smartphone for other purposes (doing homework, e-mail correspondence, Facebook, Instagram, Snapchat, messaging):

- 56.1% of young people used those devices for very long periods on school days and 65.5% on weekends; 26% and 46.2% of teenagers used them too long, respectively;
- The percentage of users of the above-mentioned devices increases with age, and the average number of hours allocated also tends to go up;
- Girls use the above-mentioned devices more often than boys (64.4% vs. 47.6% on school days and 73.7% vs. 57.1% on weekends).⁴⁸



23.1% of students aged 11–15 communicate intensively with the use of electronic media (i.e. “almost all the time, the whole day long”), with girls (27%) more often than boys (18.9%).

Every fourth teenager with symptoms of media addiction has a low level of self-esteem in social relations (24.4%), and every second is dissatisfied with their own body (56.2%)⁴⁹.

Teenagers with symptoms of media addiction



One in four teenagers shows a low level of self-worth in social relations (24.4%)



Every second teenager is dissatisfied with their own body (56.2%)



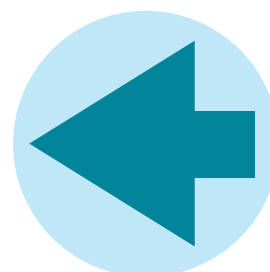
* “Teenagers 3.0” Report

How did the pandemic intensify the virtual activity of Polish youth?

The results of the “Teenagers 3.0”⁵⁰ report show that distant learning during the COVID-19 pandemic significantly extended the time spent by young people in front of the screen: in 2020 an average Polish teenager used a computer or smartphone for about 12 hours a day (mainly due to online lessons, which took over 7 hours a day). Compared to previous years, an upward trend is observed in the number of hours of virtual activity of young people as rest.

The unfavourable effects of a significant increase in the phenomenon during the lockdown will take their toll in the future. A significant increase in somatic complaints resulting from the longer screen time in relation to previous years is already visible. It is also disturbing that, according to parents and guardians, the Internet is often the only idea for organising a teenager’s time.

**12 hours a day
– screen time
among teenagers**



**4 h 50 min.
– average time
spent daily
on the Internet**



**4 h 50 min.
– average time spent
daily on the Internet
16.9% of teenagers use
the Internet extensively
at night, at the expense of sleep⁵¹**



* Report on the nationwide study of students “Teenagers 3.0” carried out every 2 years since 2014 to diagnose and interpret the behaviour of Polish teenagers on the Internet and the opinions of young people about the Internet. The survey was carried out in December 2020 using the Computer-Assisted Web Interview (CAWI) method in a group of 1,733 students of the 7th grade of primary school and the 2nd grade of secondary school, as well as 893 parents and guardians in 61 schools in all 16 provinces of Poland. The report is financed within the framework of the Ogólnopolska Sieć Edukacyjna (OSE, Polish National Education Network) programme

3.3 Psychosocial Functioning of Polish Students



“Health and Lifestyle of Polish Students” Report

During adolescence, teenagers begin to see themselves as social partners. It is then that teenagers frequently start to exhibit a low self-esteem, a subjective belief that they are misunderstood by people around them, a sense of loneliness, self-perception as an individual with low social competences, anxiety or depression⁵².

Psychosocial condition of 7th grade students before the COVID-19 pandemic:

- About one-third of students showed a high level of meaning in life, and nearly four-fifths were satisfied with their lives;
- A high level of meaning in life and satisfaction with life was exhibited significantly more often by boys than girls;
- The feeling of loneliness was experienced by every fourth 7th grade student.⁵³



According to data from the World Health Organisation (WHO), approximately 50% of all mental health disorders leading to drug abuse, aggression, violence, other antisocial behaviours and misconduct begin in adolescence⁵⁴.



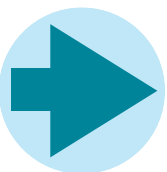
“Stress is one of the crucial factors in the pathogenesis of obesity, especially among young people. It may lead to increased food consumption as a form of emotional discharge. Research confirms that obese people often react more emotionally to stressful situations than people with a normal body weight. The term ‘comfort food’ has been coined as referring to products that ‘enhance’ our emotional state. These are mainly highly processed, caloric, sweet and fatty products, and thus the fastest route to overweight and obesity, and as such extremely dangerous for children and adolescents.”

Marta Pawłowska MBA
family health coach, eating disorder specialist

Excessive body weight can be one of the main sources of stress and lead to discrimination among teenagers. It generates lower self-worth and self-esteem, exposes adolescents to social comparisons and negatively affects the level of perceived stress.

"In children and adolescents, obesity plays a part in developing anxiety and depression disorders. According to the analyses of numerous researchers, including the Swedish Karolinska Institute, obese girls are more than 40% more likely to suffer from depression than their slim friends, and obese boys are 30% more susceptible. Given the increase in obesity and mental health problems among Polish children and adolescents, it is crucial to understand the relationship between childhood obesity, anxiety and depression, and to further investigate these mechanisms."

Professor Artur Mazur, Head of the Second Clinic of Paediatrics, Endocrinology and Paediatric Diabetology, Clinical Hospital No. 2 in Rzeszów



HBSC 2018 Model

Polish teenagers and stress at school:

- 14.4% of 11-15-year-old adolescents experience high levels of stress at school (a deterioration in relation to 10.2% in the HBSC 2014 study);
- 13% of 11-15-year-olds do not feel stressed at all (a deterioration in relation to 18.5% in the HBSC 2014 study)⁵⁵.

School stress level by gender and age

Age group	Feeling stressed at school			
	Not at all	A bit	Quite a lot	A lot
11 years	14.2%	57.9%	20.1%	7.8%
13 years	10.6%	46.0%	26.4%	17.0%
15 years	14.2%	40.2%	27.3%	18.3%
Overall	13.0%	47.9%	24.6%	14.4%

Data source: J. Mazur and A. Małkowska-Szkućnik (ed.), *Zdrowie uczniów w 2018 roku na tle nowego modelu badań HBSC*, Institute of Mother and Child, Warsaw 2018, p. 53.

The World Health Organisation estimates that between 10% and 20% of adolescents suffer from undiagnosed and untreated mental health problems.

Adolescents with mental health disorders are more prone to educational difficulties, strained peer relationships, risky behaviour and coexisting somatic diseases.⁵⁶





Psychosomatic complaints of adolescents:

- 41.4% of adolescents reported two or more recurring complaints (an increase of 3.1% compared to HBSC 2014);
- Girls report recurring complaints more often than boys;
- The reduction in the incidence of somatic symptoms is accompanied by a more frequent occurrence of psychological ailments.⁵⁷

In the years 2014-2018, the incidence of headache, abdominal pain, backache and dizziness decreased significantly in Polish adolescents, whereas irritability, nervousness and difficulty falling asleep were reported significantly more often. Only a recurring feeling of depression was reported at a similar frequency in both rounds of the HBSC study.⁵⁸

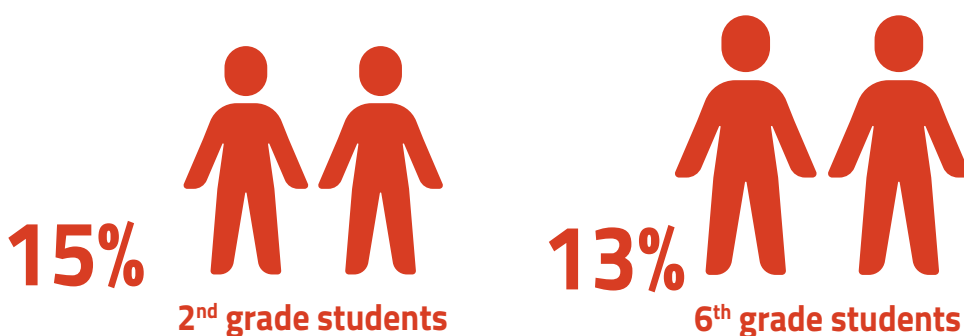
Aggression, destructive behaviour, problems in relations with peers and concentration disorders are the most frequently mentioned psychological problems among Polish primary school pupils noticed by teachers.⁵⁹



The quality of life of children and adolescents in the post-pandemic period – Report of the Ombudsman for Children 2021

Dissatisfaction with one's life

Condition threatening mental health



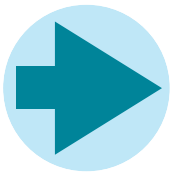
Selected study results⁶⁰:

- 17% of male and 14% of female 2nd grade students, and 11% of male and 15% of female 6th grade students feel dissatisfied with their lives to a degree that threatens their mental health;
- 17% of 2nd-graders were often or always sad, and 12% experienced a feeling of loneliness;
- 27% of 6th grade students often or always feel fed up with everything;
- 26% of 6th grade students more than often want to change something in their body, and 19% worry about their appearance.

Concern for physical health determines the mental health of students

Factors protecting children and adolescents from stress include proper eating habits, enough rest and sleep and regular physical activity. WHO also lists two extremely important factors determining the mental health of school children:

- Availability of psychological and pedagogical support for students at school and specialist help in institutions within the local environment;
- The level of competence of significant people from the child's environment.



"Social relations play an essential role in the development of a young person: they bring understanding and support, can be a source of well-being and protect against emotional stress. Limited social contacts and isolation during the pandemic have a clearly negative impact on the mental health of children and adolescents, increasing the risk of adaptational, emotional, depressive and anxiety disorders."

Professor Agnieszka Słopeń, MD, PhD,
Head of the Department of Child and Youth Psychiatry
of the Medical University in Poznań
National consultant in the field of psychotherapy of children and adolescents

9% of the population of children and adolescents display psychiatric disorders to a degree requiring professional care, which means the need to provide psychiatric and psychological assistance to over 630,000 people under the age of 18.⁶¹

Due to a dramatic deficit of service providers with mental health clinics for children, according to data from the guide on NHF treatment dates as of January 5, 2019, the shortest average waiting time for an appointment was in the Świętokrzyskie province (2 days) and the longest in the Podlaskie province (158 days)⁶².





School as a place of mental health protection for Polish students

According to experts, the school can support the mental health of students and reveal existing mental health problems among children and adolescents, but it can also cause them. Children's sense of physical and mental threat as well as educational and social failure may correlate with health and social problems, such as alcohol and drug use, premature sexual contacts and behavioural disorders (including criminal activities)⁶³.

"Research results reveal a broader context: a story about a school that ceased to be a place of development, growing up and learning together, and turned into an institution that exists solely for its own sake, a place of implementing an arbitrary core curriculum (...) Psychological comfort, built on trust, should form the basis of all activities carried out by the school. Especially during the pandemic, which highlighted all the weaknesses of the existing system."

Marta Puciłowska

Vice-President of the School with Class Foundation⁶⁴

Factors protecting the psychosocial functioning of obese students or those at risk of obesity include:

- Related to physical activity:
 - Participation in physical education lessons;
 - Intense physical activity, at least in line with WHO recommendations;
- Related to social factors:
 - Good communication in the family and school environment.



Health and Lifestyle of Polish Teachers in the Context of Obesity and Type 2 Diabetes Incidence – Review of Secondary Research

The issue of the health and lifestyle of teachers in Poland has not so far been an object of much interest among researchers or institutions responsible for the organisation of the education system in Poland. There are no representative studies and subject-related reports, and the available publications are sparse, which makes it difficult to formulate reliable conclusions. Thus, the following list should be treated as a space for reflection and a postulate for further analyses

Teachers: a unique social health group

Teachers constitute a unique group in social health analyses. The specificity of this profession can be approached:

- from the point of view of the health of the teacher as an individual – caring for one's own health is conducive to personal and professional functioning, may reduce the risk of occupational burnout and the effects of occupational burdens;
- from the point of view of health promotion and health education – teachers transfer knowledge, educate and model the health behaviour of their pupils;
- from a public health perspective – health and well-being of teachers can have a significant impact on physical and mental health of students.

Currently, largely due to the health and social consequences of the COVID-19 pandemic, more attention is paid to the need to conduct health analyses of selected professional groups, including teachers and other staff of educational institutions.

The awareness and pro-health attitudes of teachers not only shape the health behaviour of students, but also influence the model of school health education and its implementation. Thorough reflection on teachers' health and knowledge of this subject should therefore result in targeted interventions, both at the school level and on the national scale



* Self-assessment of health and health care among teachers

How did the surveyed teachers assess the state of their health?⁶⁵

- 76.8% of teachers assessed their health as good or very good;
- Women assessed their health as very good twice less often as men (14.8% and 29.3%, respectively);
- 77.5% of teachers declared that they rather care about their health or care for it very much.

What were their pro-health behaviours in practice?

- **Nutrition: 43.7% of teachers only occasionally limit the amount of eaten sweets.** Only 1 out of 8 health-promoting behaviours were undertaken by half of the teachers always or almost always: eating breakfast every day;
- **Body care: 42.6% of teachers always or almost always undergo preventive examinations as prescribed by a doctor.** 3 out of 8 pro-health behaviours were undertaken by more than half of the teachers always or almost always: dressing appropriately for the weather, brushing teeth twice a day, and following medical recommendations in case of illness;
- **Sleep, rest and mental health: Every second teacher sleeps 6-7 hours a day.** 2 out of 7 pro-health behaviours were undertaken by approximately half of the teachers always or almost always: 6-7 hours of sleep at night and spending time with friends at least once a month;
- **Physical activity: Only 20% of teachers engage in at least 30 minutes of moderate to vigorous physical activity each day.** All 3 pro-health behaviours were undertaken by groups ranging from 13.3% to 29.8% of teachers always or almost always: 30 minutes of moderate or intense physical activity a day, participation in organised activities at least once a week, intensified physical activity in everyday life;
- **Safety: 49.5% of teachers never or hardly ever wear a helmet while cycling/skiing.** 4 out of 5 pro-health behaviours were undertaken by a vast majority of teachers always or almost always: wearing seat belts and following traffic regulations, safe behaviour in the water and in contact with electrical devices/machines.⁶⁶

In the opinion of the research team of the quoted survey, it is correct to conclude that the lifestyle of the surveyed group of teachers significantly deviates from the pro-health model and indicates deficiencies in their own health education.⁶⁷ The conclusions, however, were not formulated for a representative group and are not suitable for generalisation without further confirmation.

* A survey conducted in 2011 by the Medical University of Warsaw (WUM) and the Warsaw University of Life Sciences (SGGW) in a group of 567 teachers of various types of schools, participating in professional development courses. The survey is not representative.



The surveyed teachers achieved the best results in the “Safety” subscale (93.7%) and fared worst in the “Physical activity” (47.6%) and “Nutrition” (59.1%) subscales.



Teachers’ lifestyle and its socio-demographic conditions

Selected conclusions:⁶⁸

- Male teachers show higher physical fitness and lower levels of stress and internal anxiety than female teachers, with slightly greater intensity of problems in the sphere of blood pressure and alcohol consumption;
- Teachers below 30 years of age have the fewest problems with excessive body weight, which tend to occur as they grow older; in the eldest age group (over 50) they call for radical changes;
- The youngest teachers exhibit the lowest physical fitness (also lower than that of the oldest group), and at the same time the lowest intensity of stress and internal anxiety.



* Health behaviour of physical education teachers

Selected conclusions:⁶⁹

- Trainee teachers have the ‘most proper’ relations with other people, organise their rest most efficiently and drive the car in the safest way.
- The average BMI of females was 21.7 kg/m², 26% of the respondents were underweight, none of them was obese;
- The mean BMI of males was 25.4 kg/m²;
- 54% of the respondents were overweight and obesity as per the BMI concerned (however, it is necessary to take into account the specific muscle tissue of this professional group in the male population) and none of them was underweight;
- 76% had an average indicator of health behaviours (eating habits, health practices, prevention, mental attitude), 16% low, and only 5% – high;
- Physical education teachers devoted an average of 7 hours a week to physical recreation. The largest percentage (19%) devoted 10 hours a week, and 14% of teachers practiced 5-6 hours a week. Women spent less time on physical activity than men;
- The less time the teachers devoted to physical activity and the fewer forms of physical recreation they participated in, the greater their body weight as expressed in BMI.

* A survey conducted by WSS Łódź and AWFIS Gdańsk in the 2008/2009 school year among 127 physical education teachers from Tri-City public schools. The subject of the analysis was the involvement of PE teachers in the field of their own health behaviour. The study used the Health Behaviour Inventory of Z. Jurczyński and The Body / Self Relationship Test by T.F. Cash.

As a result of the conducted research and based on the completed analysis of the literature, the authors of the study expressed a decidedly critical opinion as regards the pro-health behaviour of the surveyed physical education teachers. According to the researchers, PE teachers, firstly, did not act in a pro-health manner, as could be expected given their specialist knowledge, and secondly, both women and men represented mostly an average indicator of health-related behaviours, which indicates the need to undertake health promotion activities among this professional group⁷⁰.



* **Health-promoting behaviours among teachers and other school employees – analysis in the Health Promoting Schools network**

Selected conclusions:⁷¹

- 64% of teachers and 47.1% of other school employees always or almost always eat breakfast at home every morning;
- 38.7% of teachers and 27.9% of other staff always or almost always eat vegetables at least once a day;
- 13.2% of teachers and 9.8% of other employees always or almost always limit their sweets consumption;
- 18.4% of teachers and 20.7% of other employees always or almost always spend 30 minutes a day on moderate or vigorous physical activity;
- 23.6% of teachers and 31.1% of other employees always or almost always try to increase the amount of exercise and physical exertion in their daily lives (going on foot instead of taking the car, climbing up the stairs instead of using the elevator).

What is the pro-health behaviour of teachers and school employees in the Health Promoting Schools network? (selected results)

- Out of 32 analysed pro-health behaviours in teachers, only 11 (in other employees only 10) were undertaken with the desired frequency (always or almost always) by more than 50% of the respondents;
- The largest shortcoming in health-promoting practices was related to physical activity, nutrition and behaviour in the area of mental health, and the smallest to maintaining safety;
- The issues found were less significant among teachers than among other staff, in women than in men, and in older teachers than in younger ones⁷².

The research team indicated numerous problems with the health behaviour of teachers and other school employees of the Health Promoting Schools network. There were fewer irregularities among teachers, but the differences turned out to be less prominent than expected by the authors of the study (taking into account the higher level of teacher education)⁷³.

* Analysis of the frequency of health behaviours among teachers and other school staff. Carried out among 750 teachers and 259 other employees of the Health Promoting Schools network in 2013 by the Medical University of Warsaw and the Maria Grzegorzewska University (AP5) in Warsaw

Stress in the work of a teacher

The psychological well-being of teachers works in the interest of the whole society, as it is directly related to the quality of their work for the benefit of students. A teacher experiencing psychological problems may have a negative impact on students and build dysfunctional relationships with them.

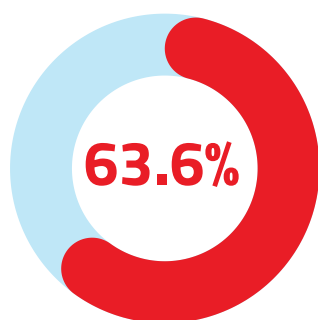


* How did teachers perceive stress at work prior to the pandemic?

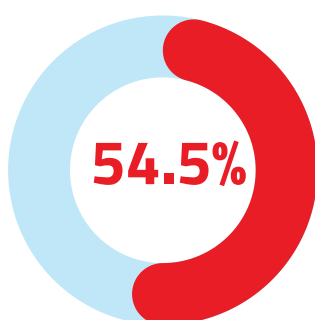
In a study⁷⁴ conducted among teachers of schools in Małopolska, as many as 72.7% of respondents very often or often pointed out the emotional exhaustion associated with a teacher's work, and 81.8% considered their work a source of stress.

Teachers declared a high level of satisfaction with their professional motivation, not losing energy and enthusiasm after meetings with parents (100% of respondents) and not being afraid of unexpected behaviours of students (90.9%). On the other hand, there is considerable reluctance to further professional development (63.6%) and a feeling of tiredness before going to work (54.5%).

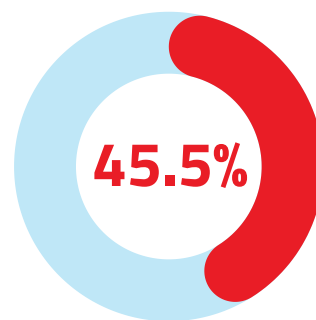
What generates stress among teachers?



Feeling of low prestige of the work performed



Low remuneration,
unequal treatment
in the assignment of tasks
and access to various benefits



Frequent changes in work
and regulations

100% teachers believe that the parents' demanding attitude towards teachers and the school constitutes a problem



* Information on the study: Carried out in the 2018/2019 school year, on a research sample of 110 teachers from schools in Małopolska (90.9% women and 9.1% men); "Subjective assessment of pedagogical work" and "Teacher burnout inventory" questionnaires in the version of S. Korczyński (2014) were used to assess the stressors.



Mental health of teachers in Poland (selected statistical data)⁷⁵

- 86% of teachers believe that their occupational workload is greater than in other professions;
- 20% of teachers identify in themselves full symptoms of professional burnout;
- 25% of teachers have a low sense of meaning of their work;
- Among primary school teachers
 - 34% experience sleep and/or eating disorders;
 - 30% experience prolonged sadness, nervousness and depressed mood;
 - 13% have anxiety disorders (including distrust, low self-esteem);
 - 9% experience a strong feeling of anger;
 - 8% experience chronic stress.



According to the EdWeek Research Centre, 80% of teachers think teaching is more stressful now than it was before the pandemic.

From May to October 2020, the proportion of teachers at risk of burnout in the US increased from 25% to 57%, and a quarter of teachers are contemplating leaving the profession (a rate three times higher than before the pandemic). Teachers are stressed by extended working hours, difficulties with engaging students in distance learning, change from distance learning back to in-school provision and health concerns.⁷⁶

Teachers and occupational diseases

A vast majority of diseases among professional teachers are chronic diseases of the speech organs caused by their excessive exploitation.

Risk factors predisposing teachers to vocal organ diseases:

- External factors: prolonged working time with the voice, working in noise, inappropriate acoustic and climatic conditions of the rooms and frequent respiratory infections among children and adolescents;
- Internal factors: general health condition, chronic laryngological diseases, faulty posture during voice emission, failure to observe the hygiene of the voice organ.

Other common occupational diseases among teachers are pneumoconiosis (caused by long-term contact with chalk dust), diseases of the osteoarticular system (especially among PE teachers and pre-school teachers), damage to the hearing organ, allergies and skin diseases, respiratory and visual diseases

5

History of Health Education in Polish Schools

Issues related to the protection of students' health in the school environment were contemplated as early as in the Renaissance. Andrzej Frycz Modrzewski recommended hardening children, practicing horse riding or ball games, emphasizing their educational, hygienic and health-promoting aspects.⁷⁷

Initially, health issues fell within the field of physical education, and then, thanks to the accomplishments of the National Education Commission (KEN) until the end of the 19th century they were part of a combined physical education and school hygiene.⁷⁸ Grzegorz Piramowicz, co-author and editor of the Acts of the National Education Commission, pointed to proper nutrition, a way of dressing, spending time outside, keeping the body clean and physical activity as ways of keeping students healthy and emphasised the crucial role of the teacher in health education. Jędrzej Śniadecki promoted similar theses. In his works, he underlined that the core of bringing up a child is his/her mental education and care for health, treated as an inseparable whole.⁷⁹ In 1869, there was a postulate to introduce hygiene teaching in schools and health sciences in teachers' seminars.⁸⁰

At the beginning of the 20th century, school hygiene began to develop as a separate field. In 1905, the Polish Schools Society (Towarzystwo Polskiej Macierzy Szkolnej) was established, which played a significant role in spreading knowledge about health in schools. Among members of the Board of the Society was Stanisław Kopczyński, one of the pioneers of hygiene education in Poland. He published over 200 scientific papers on school health and hygiene.⁸¹





The emergence of an independent Polish state after World War I also affected the shaping of new concepts in the field of education. The school was to be a healthy and health-promoting environment for the student. In 1918, the so-called Krakow Teachers' Congress took place. It distinguished between two sections of physical education: protective and active. The protective part related to the removal of harmful factors threatening health and was associated with school hygiene. Active physical education, on the other hand, included physical exercises, games and physical activities. It was emphasised that the entire team of teachers should cooperate in physical education and practical instilling of hygiene, not only as teachers of specific subjects.⁸² On March 11, 1932, a school reform was introduced, which strived to enhance access to education, also in smaller towns. In the curriculum area, the issues of hygiene education were introduced to an even larger extent, including the shaping of healthy attitudes by teachers.⁸³ In 1936, a decision was made to liquidate the Faculty of Physical Education and School Hygiene, and thus matters relating to school health lost their relevance. They were only referred to in the context of their suitability for state defence.

In the first post-war years, no changes were introduced to the organisation of education and teaching content, with efforts focused on rebuilding and expanding the network of schools. The pre-war core curricula still applied, and old textbooks were used.

The person that played a significant role in the post-war history of school hygiene was Marcin Kacprzak, a doctor and educator, co-organiser of the World Health Organisation. He contributed to the reactivation of the Polish Society of Hygiene, taught students how to raise the rank of public health and how to implement pro-health behaviours. He organised the only postgraduate studies in hygiene and epidemiology in the country. They were later transformed into the Sanitary and Hygienic Department of the Medical Faculty of the Medical University of Warsaw. Another person that merits mentioning is Hanna Wentlandtowa, the author of the

first Polish methodological textbook of health education, entitled "Sanitary Education: General Methodology", published in 1962, intended for tutors, teachers, educators, employees of after-school care centres, community centres and health care institutions.⁸⁴ She cooperated with Maciej Demel, who is considered the founder of the Polish school of health education. Demel worked on the assumption of a close relationship between physical and health education. He was the creator of the concept and theoretical foundations of health education in Poland and the forerunner of health pedagogy. He demanded that systemic actions be taken, so that the social health service and state education would become engaged in health prophylaxis, combating disease and alcoholism. He also called for health education in the countryside and in workplaces.⁸⁵

In the years 1992-95, the project "School Promoting Health" was initiated. This programme has been developed in Poland within the European Network of Schools Promoting Health (from January 1, 2008 – the Schools for Health in Europe Network Foundation – SHE). Poland became a member of this network as one of the seven initial countries. The programme commenced with a 3-year international pilot project (1992-1995), which constituted a starting point for bottom-up school initiatives.

Activities related to the development and dissemination of the idea of the Health Promoting School in Poland were implemented in cooperation with and support by the ministries of health and education. To ensure the further development of the programme and the continuation of Poland's membership in the Schools for Health in Europe Network, on November 23, 2009, a cooperation agreement was signed by the Minister of National Education, the Minister of Health and the Minister of Sport and Tourism on health promotion and prevention of problems among children and youth.



The agreement provides, i.a., for: synergic activities in the field of health promotion and prevention of problems among children and youth, which are executed by the parties to the agreement in schools and institutions and in the local environment, including actions aimed at implementing health-promoting programmes, i.a. Schools for Health in Europe. Currently, in all Polish provinces there are over 2,000 schools that are members of the Health Promoting School network.⁸⁶



In 1997, health education was for the first time included in the core curriculum. The topics concerned personal and environmental hygiene, safety and first aid, food and nutrition, physical activity, work, leisure, free time, family and community life education, psychosocial aspects of health as well as life free from addictions. The 1999 reform introduced an educational path called “pro-health education” to the core curriculum. In the 2008 introduction to the core curriculum it was stated that “health education is an important task of the school, whose role is to shape students’ habits of taking care of their own and other people’s health and of creating an environment promoting health.”⁸⁷ Health education was closely linked to physical education, and various health-related topics were included in most subjects.

The current core curriculum was introduced via the Regulation of the Minister of National Education of February 14, 2017 on the core curriculum for pre-school education and the core curriculum for general education for primary schools, including for students with moderate or severe intellectual disabilities, general education for the first-degree industry schools, general education for vocational training schools and general education for post-secondary schools (Polish Journal of Laws of February 14, 2017, item 356). The task of the school is to shape pro-health attitudes of students, as well as consolidate knowledge in the field of proper nutrition, the benefits of physical activity and the use of preventive measures. The set of curricula and the educational and school preventive programme form a coherent whole and must take into account all the requirements specified in the core curriculum.

Health-related topics are included in the core curricula of several subjects, in particular:

- **biology** – issues related to human anatomy and physiology and the protection of human health, skills enabling informed health-related decisions, shaping practices of a healthy lifestyle and instilling the habit of caring for one's own health and that of other people;
- **physical education** – physical development and physical fitness, physical activity, health education, counteracting civilization diseases, developing a sense of responsibility for health, enhancing self-esteem;
- **chemistry** – performing experiments: testing the reaction and pH of foods and cleaning agents, distinguishing between saturated and unsaturated fats;
- **safety education** – preparation for proper behaviour in situations posing a threat to health and life, education in the field of state security and rescue operations, health education and first aid.

The role of cooperation between the school, the nurse or school hygienist and parents was also emphasised. Furthermore, it was recognised that it is necessary to align classes with the educational and preventive programme of the school as well as educational programmes concerning health and prevention of risky behaviours or diseases. SANEPID (sanitary and epidemiological station) plays a special role in this area by offering schools projects related to healthy eating, physical activity, addiction prevention and cancer prevention.⁸⁹

The latest guidelines for health education are included in the National Oncology Strategy – a programme for 2020-2030 covering comprehensive changes in Polish oncology. It provides for the introduction of a separate class on health. Since September 2020, health education should be provided as part of weekly class meetings (3-5 lessons per year). As regards "health knowledge" as a school subject, it should be introduced from September 2022.^{89 90}



Description and Results of the CCD Study in Poland

From a public and personal health perspective, teachers constitute a very specific professional group. They are exposed to numerous burdens and are threatened with occupational burnout; therefore, proper care for their physical and mental health is conducive to their personal and professional functioning, as it minimises the risk of symptoms of disorders and occupational burnout.

Moreover, this group has a significant social impact, as it is responsible for health education as part of teaching individual subjects, shapes the model of school health promotion and its implementation, and thus directly moulds the attitudes and health behaviours of students.

Comprehensive and effective prevention of obesity and diet-related diseases, in particular type 2 diabetes, is one of the key public health challenges. The school is a natural environment for its implementation by actively shaping the health behaviour of children and adolescents, while teachers are natural influential examples of attitudes, authorities and motivators.

Research shows that in 70% of people where obesity occurs at the youngest age persists into adulthood. Moreover, school children and adolescents are a critical group for an effective social campaign against the development and effects of obesity and type 2 diabetes. According to experts, the most sensitive group as regards development of obesity and its effective inhibition are children aged 7-13: among those who lost weight at the age of 7-13, the risk of type 2 diabetes did not increase in adulthood; in contrast, among persons who were overweight or obese and lost weight at the age of 13-18 the risk of type 2 diabetes was 3 times higher, and the consequences of complications more frequent and much more severe.⁹¹

Survey objectives

The objectives of the survey among primary school teachers as part of the Polish edition of the **Cities Changing Diabetes** programme:

- Obtaining information on the level of teachers' knowledge about diabetes;
- Learning about teachers' opinions on the occurrence of overweight and obesity among students, as well as on educational and preventive health-promoting activities carried out in schools;
- Obtaining data on teachers' lifestyle (subjective self-assessment of body weight, diet and physical activity);
- Acquiring information about teachers' experiences in contact with type 1 diabetes among students.

Survey description

The survey was conducted with the use of an online questionnaire provided to school principals by the Krakow City Hall and the Warsaw City Hall. The questionnaire was available to all teachers of primary schools in Kraków and Warsaw

Survey among teachers of Krakow	Survey among teachers of Warsaw
from April 14 to May 12, 2021	from May 7 to June 18, 2021
3,061 respondents	1,190 respondents

Survey limitations

Limitations in the interpretation of the results obtained in the survey that need to be taken into account are typical of scientific research, in particular conducted in the form of an online survey. Firstly, **representativeness** (some groups are more/less willing to fill in an online questionnaire), secondly, **attendance**, and thirdly, the fact that the **participants completed the questionnaire unassisted** (without the interviewer's participation), which could result in underestimating knowledge (answering quickly, without reflection) or overestimating knowledge (checking correct answers in the available sources).

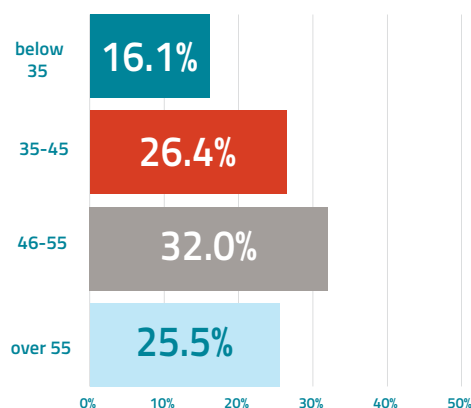
However, the age and gender distribution of the teachers who participated in the study did not differ significantly from the distribution of these characteristics in the populations of teachers in Krakow and Warsaw. Additionally, conducting an online survey made it possible to obtain 4251 responses from teachers in a short time (in a similar period, i.e. April-June, for both cities).



Description and Results of the CCD Study in Poland

Characteristics of the respondents

Age



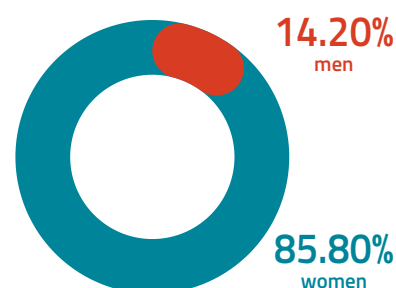
Experience related to the disease

I am sick	3.0%
Disease in the immediate family	33.1%
No experience	63.9%

Work experience

less than 5 years	11.1%
5-10 years	10.2%
11-15 years	12.8%
16-20 years	11.2%
over 20 years	54.7%

Sex



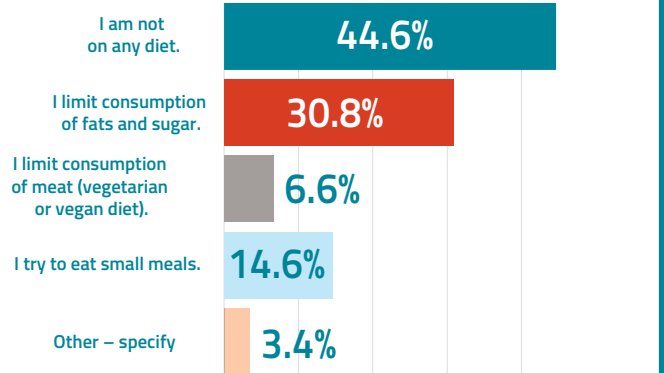


Health-promoting behaviours of teachers

Please choose one answer that best describes you:

I am a slim person.	29.4%
I have no problems with excess weight.	27.7%
I am slightly overweight (up to 10 kg).	31.3%
I am obese.	11.5%

What is your diet:



Most frequently declared other types of diets are:

- a balanced diet;
- a diet with a low glycaemic index;
- a caloric limit diet;
- an elimination diet (gluten, lactose, meat);
- a disease-related diet.

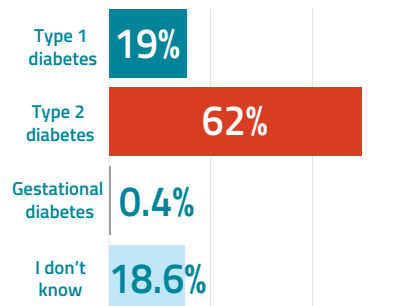
Your lifestyle in term of physical activity is characterised by:

frequent physical activity (at least 3 times a week)	36.3%
little physical activity (once a week at most)	39.0%
occasional physical activity (3 times a month at most)	17.1%
no physical activity	7.7%

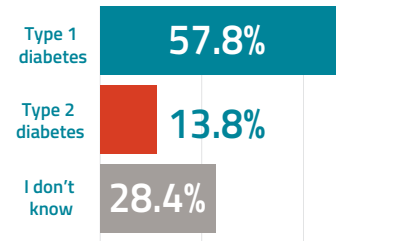


Knowledge on diabetes

■ What is the most common form of diabetes among adults?



■ What is the most common form of diabetes among children?



■ How many people in Poland suffer from diabetes?

approx. 100,000	5.3%
approx. 500,000	21.0%
approx. 3 million	65.2%
approx. 6 million	8.6%

■ Who is most at risk of developing type 2 diabetes?

a person who abuses alcohol	1.4%
an overweight or obese person	91.8%
a smoker	0.3%
I don't know.	6.5%

Over 90% of correct answers to the questions:

- What is the blood glucose meter called?
- What is the name of the hormone that regulates blood sugar?
- How is insulin dosed?



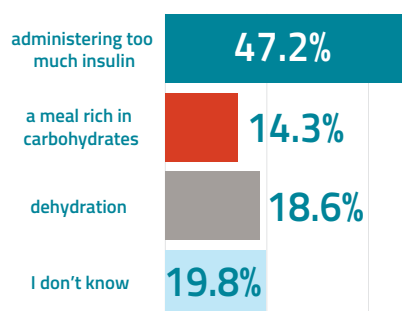
What is hypoglycaemia?

too low blood glucose levels	81.2%
high blood glucose levels	15.2%
normal blood glucose levels	0.3%
I don't know.	3.3%

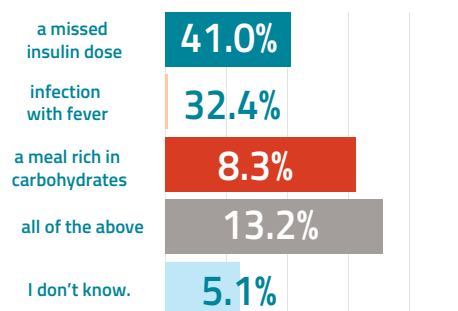
What is hyperglycaemia?

too low blood glucose levels	88.4%
high blood glucose levels	7.7%
normal blood glucose levels	0.1%
I don't know.	3.9%

What could be causing a hypoglycaemia?



What are the causes of hyperglycaemia?



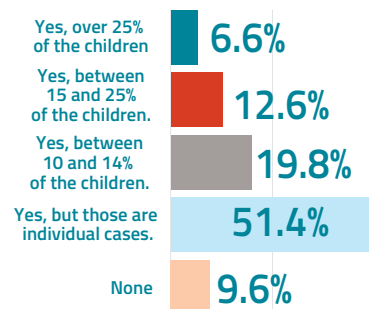
70%-80% of correct answers to the questions:

- Which foods should a diabetic patient avoid?
- What are the symptoms of low blood glucose?
- What three other diseases can be caused by diabetes?
- What are the symptoms of high blood sugar?

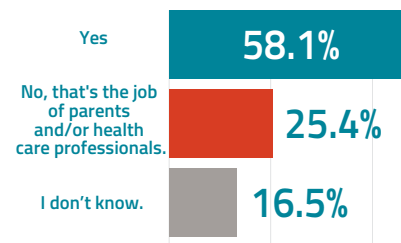


Role of teachers in the prevention of type 2 diabetes

■ Have there been any overweight or obese children among your students?



■ Knowing about the existence of an obesity prevention and treatment clinic, would you advise that your student gets a consultation there?



■ Are any activities undertaken in your school to promote healthy eating and lifestyle?

Yes, regularly	71.3%
Yes, but in my opinion they are insufficient	13.2%
Occasionally	12.6%
None	2.9%

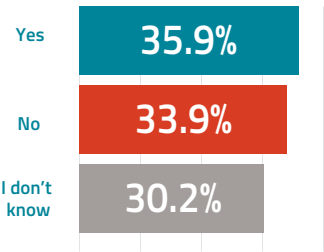
■ Has the school taken any measures to reduce the risk of overweight and obesity among children in connection with the lifestyle change resulting from COVID-19 pandemic?

Yes, this issue has been discussed and it has been recommended to encourage children to be active.	38.8%
Yes, but those are rather initiatives of individual teachers.	31.1%
No, the situation forced us to deal with other issues.	30.1%

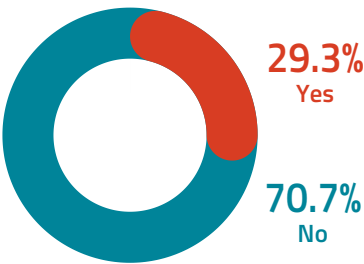


Experience in caring for students with type 1 diabetes

Have there been any children with type 1 diabetes among your students?



Have you been involved in caring for a student with type 1 diabetes?



Having a student/students with type 1 diabetes in the class, have you taken any measures to increase your knowledge about the disease and how to deal with the student with diabetes?

Yes	71.0%
No	29.0%

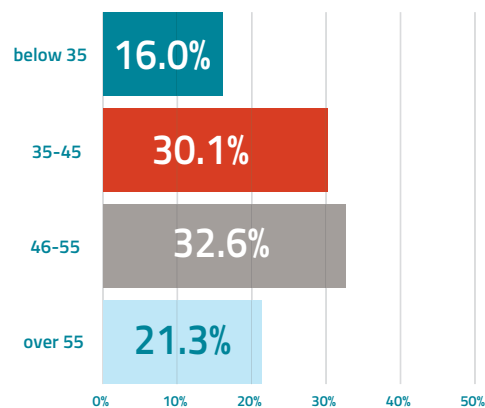
How did you expand your knowledge?

- Through participation in a training organised by the school management – 33.2%;
- Through participation in a training organised by the local government – 4.6%;
- I read leaflets – 25.9%;
- I talked to my doctor – 10.3%;
- I read materials on the Internet – 70.0%;
- Other, specify – 11.8%



Characteristics of the respondents

Age



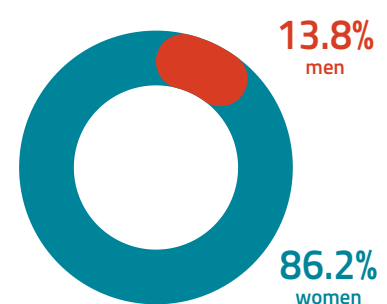
Experience related to the disease

I am sick.	4.7%
Disease in the immediate family	36.3%
No experience	59%

Work experience

less than 5 years	9.9%
5-10 years	10.3%
11-15 years	14.5%
16-20 years	14.2%
over 20 years	51.1%

Sex



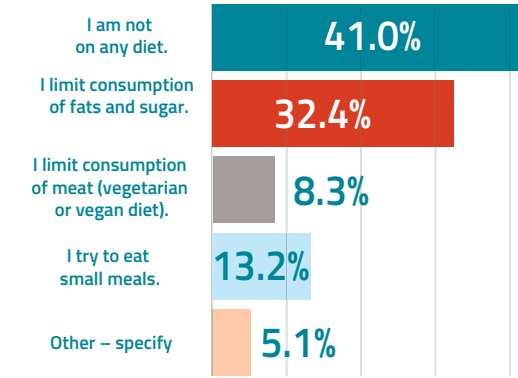


Health-promoting behaviours of teachers

Please choose one answer that best describes you:

I am a slim person.	27.7%
I have no problems with excess weight.	24.9%
I am slightly overweight (up to 10 kg).	33.9%
I am obese.	13.5%

What is your diet:



Most frequently declared other types of diet are:

- a balanced diet;
- a diet with a low glycaemic index;
- a caloric limit diet;
- an elimination diet (gluten, lactose, meat);
- a disease-related diet

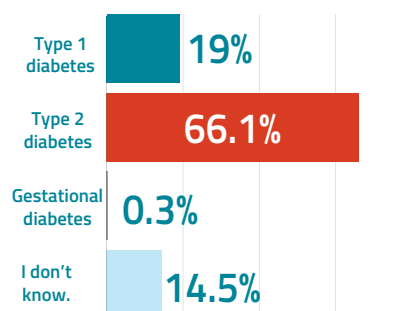
Your lifestyle in terms of physical activity is characterised by:

frequent physical activity (at least 3 times a week)	38.2%
little physical activity (once a week at most)	37.1%
occasional physical activity (3 times a month at most)	15.3%
no of physical activity	9.3%

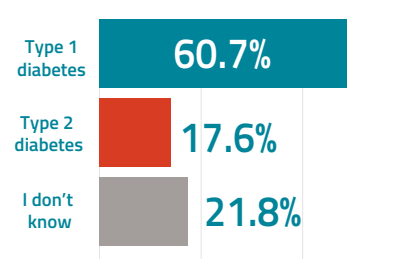


Knowledge on diabetes

■ What is the most common form of diabetes among adults?



■ What is the most common form of diabetes among children?



■ How many people in Poland suffer from diabetes?

approx. 100,000	5.3%
approx. 500,000	23.7%
approx. 3 million	61.7%
approx. 6 million	9.3%

■ Who is most at risk of developing type 2 diabetes?

a person who abuses alcohol	0.9%
an overweight or obese person	92.0%
a smoker	0.8%
I don't know.	6.3%

Over 90% of correct answers to the questions:

- What is the blood glucose meter called?
- What is the name of the hormone that regulates blood sugar?
- How is insulin dosed?



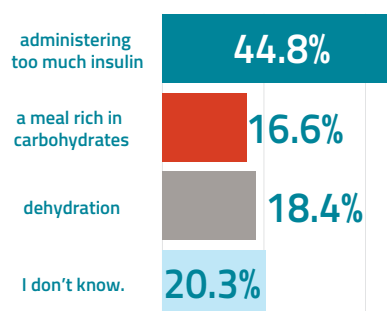
What is hypoglycaemia?

too low blood glucose levels	80.7%
high blood glucose levels	15.7%
normal blood glucose levels	0.3%
I don't know.	3.3%

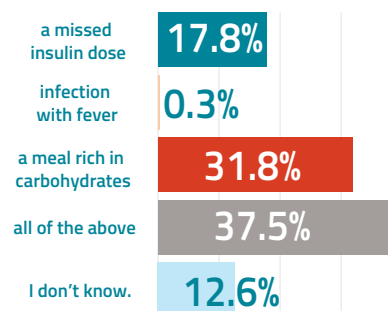
What is hyperglycaemia?

too low blood glucose levels	88.2%
high blood glucose levels	8.0%
normal blood glucose levels	0.1%
I don't know.	3.8%

What could be causing a hypoglycaemia?



What are the causes of hyperglycaemia?



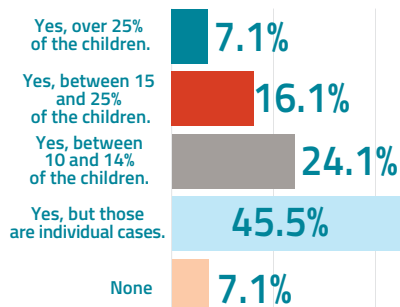
70%-80% of correct answers to the questions:

- Which foods should a diabetic patient avoid?
- What are the symptoms of low blood glucose?
- What three other diseases can be caused by diabetes?
- What are the symptoms of high blood sugar?

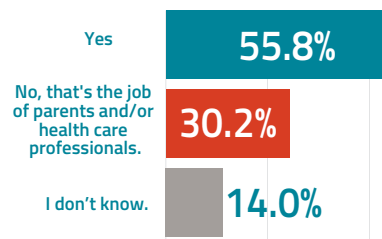


Role of teachers in the prevention of type 2 diabetes

Have there been any overweight or obese children among your students?



Knowing about the existence of an obesity prevention and treatment clinic, would you advise that your student gets a consultation there?



Czy w Państwa szkole podejmowane są działania mające na celu promocję zdrowego odżywiania i stylu życia?

Yes, regularly.	64.1%
Yes, but in my opinion they are insufficient.	18.4%
Occasionally	13.5%
None	3.9%

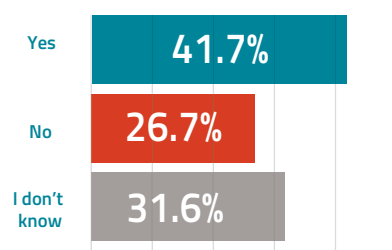
Has school taken any measures to reduce the risk of overweight and obesity among children in connection with the lifestyle change resulting from COVID-19 pandemic?

Yes, this issue has been discussed and it has been recommended to encourage children to be active.	36.8%
Yes, but those are rather initiatives of individual teachers.	29.7%
No, the situation forced us to deal with other issues.	33.5%

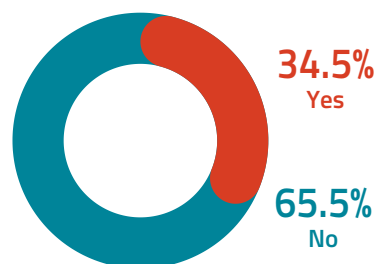


Experience in caring for students with type 1 diabetes

Have there been any children with type 1 diabetes among your students?



Have you been involved in caring for a student with type 1 diabetes?



Having a student/students with type 1 diabetes in the class, have you taken any measures to increase your knowledge about the disease and how to deal with the student with diabetes?

Yes	72%
No	28%

How did you expand your knowledge?

- Through participation in a training organised by the school management – 32.4%;
- Through participation in a training organised by the local government – 6.1%;
- I read leaflets – 29.1%;
- I talked to my doctor – 11.9%;
- I read materials on the Internet – 72%;
- Other; specify – 13.4%.



Group

below 35

■ **General information:**

- Women 83.4%, men 16.6%;
- Lowest percentage of diabetics (1.8%), 40.8% – diabetes in the family.

■ **Lifestyle:**

- People who are slim and have no problems with excess weight 72.4%;
- 58.1% of the respondents do not follow any diet;
- The lowest rate of regular physical activity (rarely and often – 72.4% in total).

■ **Knowledge on diabetes:**

- The lowest number of correct questionnaire answers – the group with the least satisfactory knowledge.

■ **Role in the prevention of type 2 diabetes**

- More often than older teachers do not notice overweight and obesity among students (individual persons – 52.7%);
- The lowest rate of recommendations for consultations in an obesity treatment clinic (48.7%);
- The group least satisfied with health education activities at school and obesity prevention related to COVID-19.

■ **Role in caring for students with type 1 diabetes:**

- This group least frequently declared experience as regards contacts with students with type 1 diabetes (24.7%);
- Least experience in caring for a student-patient (33.6%);
- Own education via the Internet (77.1%); trainings organised by school management (43.8%), leaflets (26.7%) and consultation with a doctor (11.4%).



between 35 and 45

■ General information:

- Women 85%, men 15%;
- The percentage of diabetics – 2.4%, diabetes in the family – 33.2%.

■ Lifestyle:

- Indication of overweight and obesity – 38.6%, more frequent declarations of sugar and fat reduction in the diet (28.9%);
- The highest rate of regular physical activity (rarely and often – 77%).

■ Knowledge on diabetes:

- More correct answers than in the group below 35 years of age.

■ Role in the prevention of type 2 diabetes

- The phenomenon of overweight and obesity among students is most often perceived as affecting individuals (48.8%);
- More willing than younger teachers to recommend obesity treatment clinics (57.7%);
- 69.8% believe that health education activities in school are carried out on a regular basis;
- 35.9% believe that obesity prevention related to COVID-19 pandemic was discussed and recommended at school, and 32.6% are of the opinion that the activities were at the discretion and decision of the teacher.

■ Role in caring for students with type 1 diabetes:

- 35.8% have had contact with a student suffering from type 1 diabetes;
- 52.9% have been involved in the care;
- Own education using the Internet (68%), trainings organised by school management (51%), leaflets (33.2%) and consultations with a doctor (12%).



between 46 and 55

■ General information:

- Women 87.2%, men 12.8%;
- The proportion of patients with diabetes – 1.7%, diabetes in the family – 34.3%

■ Lifestyle:

- Declarations of overweight and obesity – 45.3%, reduction of sugar and fat in the diet – 34.3%, an increase in the percentage of declarations as regards limiting meal sizes – 16.4%;
- The percentage of respondents declaring regular physical activity – 75.1%

■ Knowledge on diabetes:

- Higher percentage of correct answers than in respondents under 35 years of age and aged between 35 and 45 – the group with the most satisfactory knowledge

■ Role in the prevention of type 2 diabetes

- Respondents from this group perceive the phenomenon of overweight and obesity among students as affecting individuals (50.4%);
- Most declarations as regards recommendations to refer a student to an obesity clinic (61.2%);
- The group most satisfied both with health education activities at school (conducted regularly – 76.8%) and obesity prevention in connection with the COVID-19 pandemic.

■ Role in caring for students with type 1 diabetes:

- 39.9% has had contact with a student with type 1 diabetes (highest percentage);
- 56.8% have been involved in care;
- Own education through the Internet (69%), trainings organised by school management (56.9%), leaflets (33.7%) and consultations with a doctor (9.1%).



Group over 55

■ General information:

- Women 86.5%, men 13.7%;
- The highest percentage of diabetics – 6.1%, the rarest declaration of disease occurrence in the family – 26.6%.

■ Lifestyle:

- Declarations of overweight and obesity – 53.7%, reduction of sugar and fat in the diet – 37%, an increase in the percentage of declarations as regards limiting meal sizes – 19.1%;
- The rate of regular physical activity – 75.4%.

■ Knowledge on diabetes:

- The number of correct answers higher than in the groups below 35 years of age and between 35 and 45, at a level similar to the 46-55 group.

■ Role in the prevention of type 2 diabetes

- Respondents from this group more often than others perceive the phenomenon of overweight and obesity among students as affecting individuals (54.5%);
- A consultation in an obesity clinic would be advised by 60.6%;
- As many as 71.6% considered health education activities in schools to be regularly conducted, while the prevention of obesity in connection with the COVID-19 pandemic was described as discussed and recommended by 45% (the highest percentage among all groups).

■ Role in caring for students with type 1 diabetes:

- 38% have had contact with a student with type 1 diabetes;
- 58.9% have been involved in care;
- Own education through the Internet (67%), trainings organised by school management (50%), leaflets (37.8% – the highest percentage) and consultations with a doctor (10.7%).



Conclusions

■ Knowledge on diabetes increases with age

- The highest rate of correct answers was recorded in the 46-55 age group;
- The area of knowledge that requires expanding the most is causes, symptoms and treatment of hyperglycaemia and hypoglycaemia.

■ Health attitudes are changing

- The problem of overweight and obesity increases with age – the highest dynamics in the 35-45 age group;
- Regular physical activity and the use of diets increase with age – the highest in the groups of 46-55 years and over 55 years of age

■ Involvement in pro-health activities is positively correlated with the length of work experience

- The youngest group is the least involved and, at the same time, the most critical of the pro-health activities undertaken by the school;
- The group of teachers in the 46-55 age group is the most involved in prevention and the most satisfied with the pro-health activities implemented by the school.

■ Involvement in caring for students with type 1 diabetes grows with work experience

- Teachers aged 46-55 had the most frequent contact with children suffering from type 1 diabetes, and teachers aged 55 and over were the most frequently involved in the care.
- In the process of supplementary training, younger teachers are more likely to use modern methods of acquiring knowledge and most often of all respondents consult a doctor in order to obtain the necessary information. In older groups, there is a noticeable attachment to the classic methods of acquiring knowledge about type 1 diabetes and caring for a student suffering from this disease.





Caring for Students with Type 1 Diabetes

The last twenty years have seen a dramatic – by over 300%– increase in the number of children diagnosed with type 1 diabetes, as well as the progressive growth of the disease among the youngest children (0-4 and 5-9 age groups). Poland is at the forefront of the countries where the number of children with type 1 diabetes is growing at the fastest pace: currently there are around 20,000 of them.⁹⁴

Type 1 diabetes is an incurable and chronic autoimmune disease, which requires constant monitoring and management by the patient or, in the case of a child, a parent/caregiver. It is imperative to constantly monitor blood glucose levels and to respond appropriately to any divergences. Poorly controlled and ineffectively treated diabetes can cause serious complications, including renal failure, blindness and limb amputation.

The only effective method of treating diabetes is insulin therapy combined with constant self-monitoring. From the moment of diagnosis, insulin therapy and self-monitoring must be carried out continuously, also during the child's stay in an educational institution. Measuring blood glucose, weighing meals, calculating carbohydrate content and insulin doses – these are tasks that a child with diabetes must perform many times in the course of a day, often with the help of parents/guardians.

Organisation of care for a student with type 1 diabetes

Pursuant to the current regulations of the educational law⁹⁵, chronically ill children can attend generally accessible pre-schools and schools, and teachers are obliged to diligently carry out tasks related to the position entrusted to them and the basic functions of the school, i.e. didactic, educational and care-related, guided by the welfare of students, care for their health, while respecting their personal dignity.

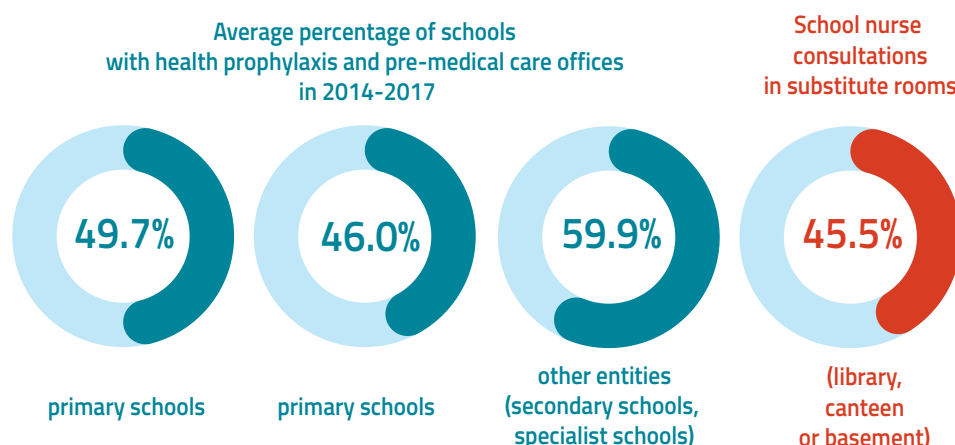
The organisation of preventive care in educational institutions is regulated by the Pupil Health Care Act of April 12, 2019.⁹⁶ It clarifies the division of medical care, specifying the need to coordinate the activities of persons and entities providing medical care over students, and extends the authority of a nurse in an educational setting (as the only person providing medical services on the premises of an educational institution).

Pursuant to Article 20 of the above-mentioned Act, care for a chronically ill student at school is carried out by a nurse in the educational setting or a school hygienist, in cooperation with a primary care physician, parents and school employees.

The condition of children with type 1 diabetes, who require constant support in self-control related to the disease, is particularly difficult in schools and pre-schools, where proper medical care of a nurse or school hygienist is not provided.

According to 2018 data of the Supreme Audit Office (NIK)⁹⁷, the health care system for Polish students is essentially non-existent. In 66.3% of the inspected entities, a school nurse / hygienist was not available in working time proportional to the number of students covered by the care.

Between 2014 and 2017, the average percentage of schools with health prophylaxis and pre-medical care offices was at following levels: 49.7% of primary schools, 46% of middle schools and 59.9% of other facilities (secondary schools, special schools). In 45.5% of the inspected entities, school nurse examinations were conducted in substitute rooms (library, canteen or basement).⁹⁸



Health care in school settings is decidedly unsatisfactory. For example, in 2020 in Krakow⁹⁹, in 185 educational institutions there were 178 health prevention and pre-medical care centres. In the vast majority of institutions, the nurse's office operated 1 or 2 days a week, in 45 – 3 days a week, in 28 – 4 days a week and only in 43 educational facilities – 5 days a week. Similar statistics are recorded in other Polish cities.



Consequently, students with type 1 diabetes are most often left without proper care, which is a prerequisite for the child's safe stay at school.

At the same time, Article 21 of the Pupil Health Care Act stipulates that the administration of medications or performing other activities during a student's stay at school by school employees may take place only with their written consent. This implies that if no such consent is granted, in the absence of a school nurse there is no person in the facility who could help a student with a chronic disease.

A study of the quality of care for children with type 1 diabetes, as assessed by parents¹⁰⁰, showed that 13% of respondents were refused admission to the facility and in the case of approximately 10% of parents it was suggested they transfer the child to another facility (once they informed the school about the child's chronic illness). 51% of the surveyed parents indicated that the educational institution did not have a person responsible for administering a life-saving glucagon injection to a diabetic student. In 54% of establishments there was no person trained in diabetes, and over 68% of facilities had no school nurse available for the adequate number of hours.

The problem of caring for students with diabetes has been noticed by international and Polish scientific societies. The International Society for Pediatric and Adolescent Diabetes (ISPAD) draws attention to the psychosocial functioning of children with diabetes, who should be provided with conditions for learning and development similar to their healthy peers and underlines that diabetes should not be a reason for a limited access to education.¹⁰¹

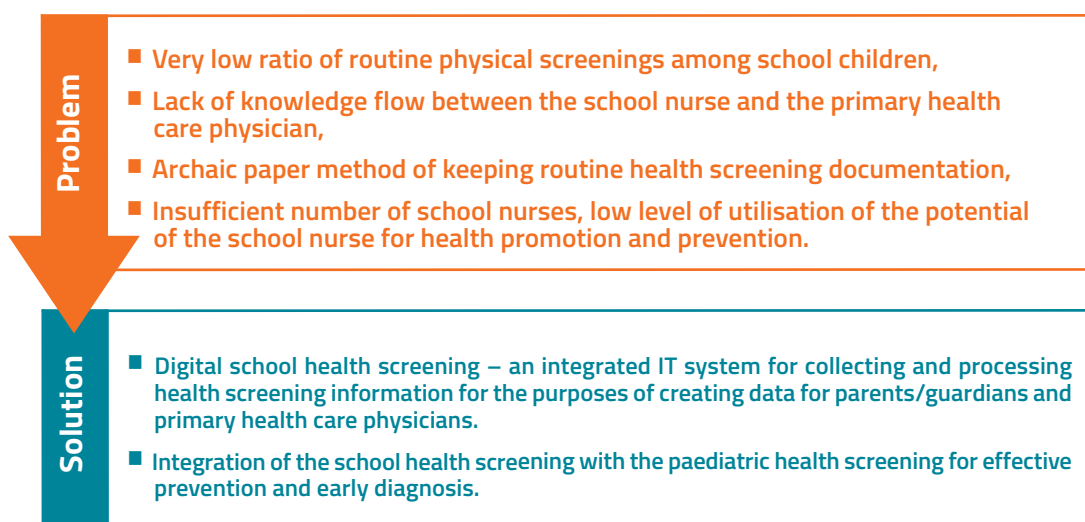
The Polish Diabetes Association (PTD)¹⁰² emphasises in its recommendations the need to train the staff of educational institutions in the field of diabetes-related self-care, which would allow students with the condition to stay safe in a pre-school or school, taking into account their special needs due to the disease.

Being aware of the dire need for change, the community of diabetologists postulates tirelessly the introduction of systemic procedures and solutions that will ensure a safe stay for children with type 1 diabetes in educational institutions, guaranteeing care adequate to the requirements associated with the disease.

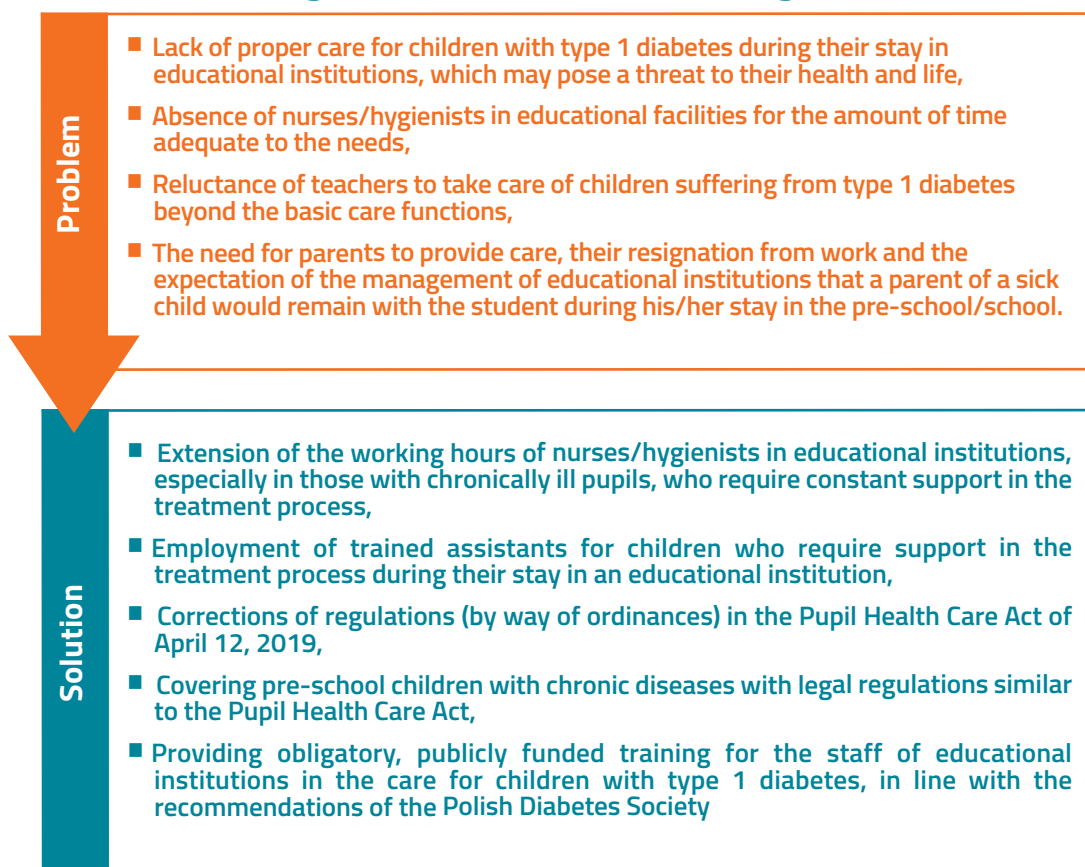
Recommended Interventions

8.1. Systemic Interventions

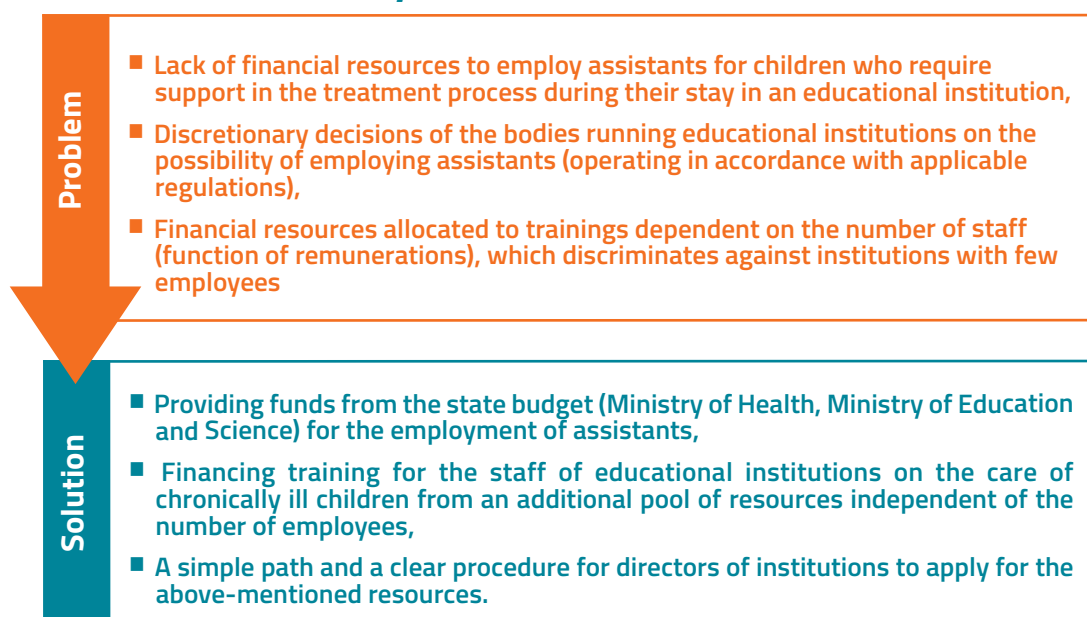
8.1.1. School medicine and telemedicine integrated with primary health care (reconstruction of the routine physical screening system)



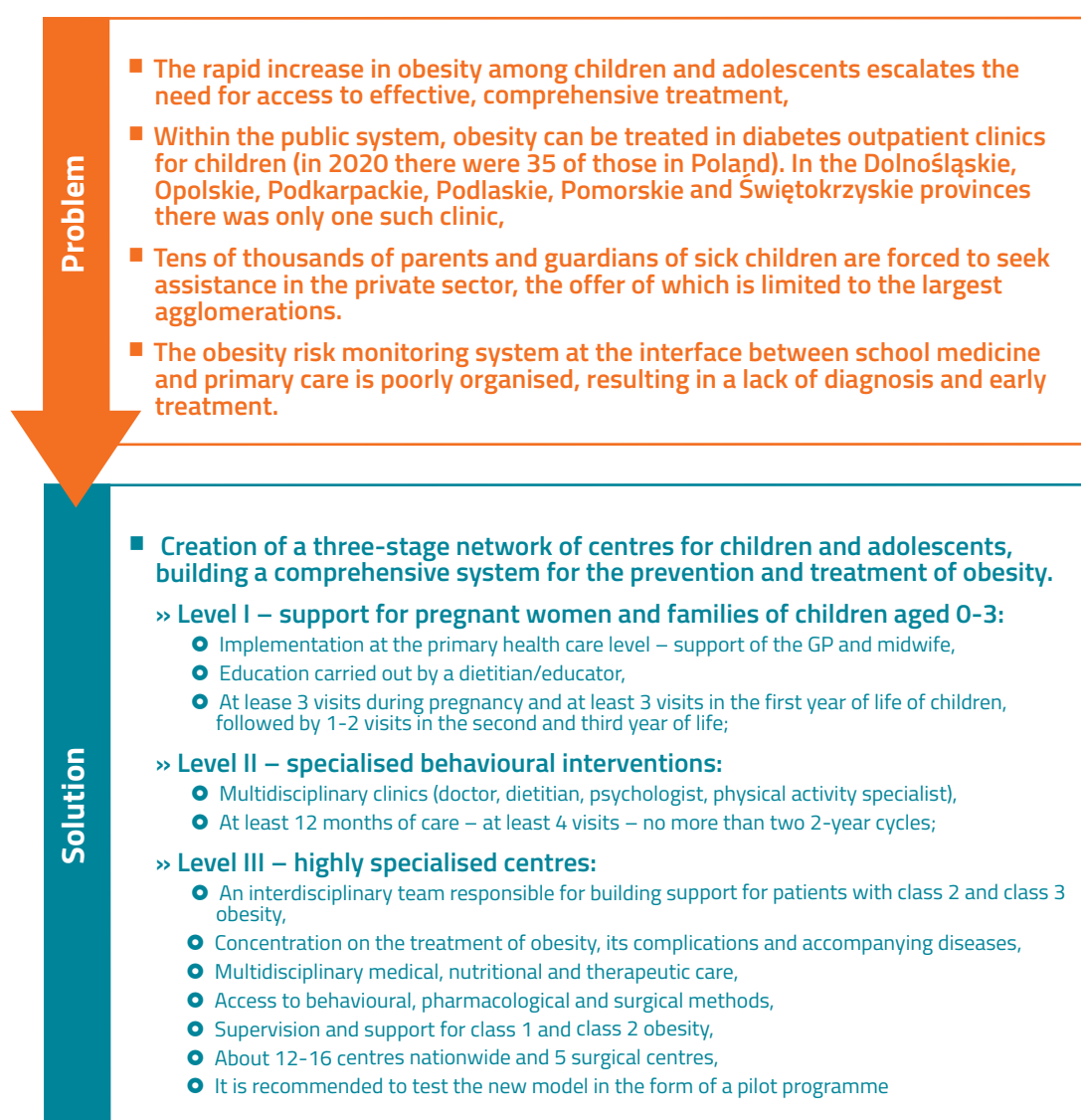
8.1.2. Reconstruction of the school care system for children suffering from chronic diseases, e.g. type 1 diabetes



8.1.3. School subsidies for care of chronically ill children



8.1.4. Obesity prevention and treatment clinics for children



8.1.5. Conservative obesity treatment outpatient clinics for adults (KOS-BMI 30 Plus)

Problem

- The high incidence of obesity among adult Poles creates the risk of serious complications such as: diabetes, diseases of the osteoarticular system, cardiovascular diseases, kidney diseases, cancer, etc.,
- Obesity is practically not diagnosed in the Polish public system, which results in the lack of a suitable treatment plan. Health care is focused on the treatment of complications, not the underlying disease, which results in huge losses in health value (understood as the relation of the treatment result and the patient's experience to the treatment costs),
- Obesity treatment has become the domain of the private sector, which gives lower income patients much less chance to recover and avoid the development of further health problems,
- Primary health care doctors do not undertake actions in the field of diagnosing and treating obesity, which results from low competences in this area,
- Obesity treatment requires the involvement of an interdisciplinary team cooperating towards achieving a common goal, i.e. the therapeutic effect.

Solution

- Creating a model of integrated care for obese patients, which includes:
 - » a primary health care team, referring patients to specialists,
 - » a specialist team,
- Dedicated clinics for people suffering from obesity:
 - » with the BMI value of 30 kg/m² and
 - » with at least one of the following obesity complications (carbohydrate metabolism disorders: pre-diabetes and/or type 2 diabetes, arterial hypertension, dyslipidemia, obstructive sleep apnea requiring CPAP, polycystic ovary syndrome, necessity to reduce body weight before endoprosthetics),
- The aim of the integrated model is to improve the quality and effectiveness of treatment in beneficiaries aged 18 years and older with the ICD-10: E66.0 diagnosis,
- Primary health care should include:
 - » Diagnosis of obesity utilising basic anthropometric parameters,
 - » Diagnosis of obesity complications (including laboratory diagnostics),
 - » Referral of a patient with obesity to the care of a specialist team,
 - » Cooperation with a specialist team (including follow-up laboratory tests),
 - » Medical and dietary care after completing a one-year specialist programme,
- Conservative obesity treatment clinics for adults (KOS-BMI 30 Plus) should be responsible for the implementation of:
 - » Module I – Initial diagnostics and formulating an individual treatment plan,
 - » Module II – Specialist treatment and monitoring,
 - » Module III – Therapeutic rehabilitation,
- Indicators for assessing the effects of treatment in the clinic should be weight reduction by 10% and at least one of the five endpoints:
 - » Improved carbohydrate metabolism,
 - » Reduced arterial hypertension,
 - » Normalised lipid metabolism,
 - » Sleep apnea remission or its reduced severity,
 - » Reduced severity of androgenisation symptoms or restoring normal menstrual cycles,
 - » Fulfilling eligibility criteria for endoprosthetics,
- It is recommended to test the new model in the form of a pilot programme.

8.2. School interventions

School as an incubator of pro-health initiatives

Problem

- Systemic and local government projects do not always accurately identify public health problems, and consequently do not adapt solutions to the specificity of the school environment,
- Low level of identification of school staff with projects created by external experts/environment/organisations,
- Low sense of agency and no sense of ownership as regards the results of the actions “dictated” by the creators and external implementers.
- Untapped potential of teachers and parents in creating a “healthy school” culture.

Solution

- Cyclical creative workshops for teachers, students and parents, involving the school community in designing and implementing initiatives building a health culture.
- Supporting school initiatives, in particular the development of competences in the following areas:
 - » Acquiring funds for the execution of own projects,
 - » Project evaluation,
 - » Building local involvement around the initiated projects



8.3. Inspirational Solutions



8.3.1. Krakow inspires

Obesity, Type 2 Diabetes, Hypertension and Atherosclerosis Prevention Programme

The programme, implemented since 2000 as part of the **“Healthy Krakow” Municipal Health Care Programme**, provides for a preventive examination of city residents aged 25 and over who have not been diagnosed with diabetes, atherosclerosis or cardiovascular complications. The programme is executed in three stages:

- Anthropometric measurements, questionnaire study (assessment of exposure to the development of diabetes), oral glucose load test and a questionnaire on arterial hypertension, tobacco addiction and the prevalence of diabetes and atherosclerosis in the family; in the case of diabetes diagnosis, further treatment provided by the National Health Fund (NFZ);
- Individual meetings with an educator for persons diagnosed with impaired glucose tolerance and/or abnormal lipid profile;
- Verification of the progress of activities undertaken in consultation with the educator.

The programme is implemented by public and non-public health care entities from the City of Krakow, which provide mainly primary health care services.



“Krakow Roots for the Family” Campaign

An educational pro-family campaign aimed at disseminating preventive measures by promoting family values and a healthy and sporty lifestyle.

The campaign includes:

- **Swimming for families** – action aimed at families with children aged 5-16, living in the Municipality of Krakow (families can take advantage of free swimming lessons under the supervision of an instructor; it is planned to extend the action to include swimming classes for infants and children up to 4 years of age);
- **Krakow Family Festival** – an annual open-air event combining free preventive examinations and medical consultations with family attractions (games and fun, contests with prizes, horse rides, culinary workshops);
- **Healthy Eating = Smart Thinking** – a campaign that teaches children and adolescents healthy eating habits, an active lifestyle and promotes sports attitudes and healthy food products (culinary and nutritional workshops and educational competitions in primary schools, meetings between parents and specialists in the field of nutrition and physical activity);
- **Family-Friendly Places** – a project that helps the residents of Krakow identify places adapted to the needs of families with children of all ages, where they can actively participate in the city’s social and cultural life;
- **Children’s Talents Patronage** – a campaign to help gifted children from primary schools in Krakow who cannot fully develop their talents and passions due to a difficult financial or family situation.



“Krakow in Shape” Campaign

An educational and promotional campaign encouraging healthy exercises and physical activity, implemented thanks to the cooperation of various departments of the Krakow City Hall and inaugurated during the national isolation caused by the COVID-19 pandemic. Under the motto **“Come out to the field! Discover all the opportunities for active time in the city!”** - educational materials and instructional videos were distributed to help residents exercise at home; in the following months the materials promoted outdoor activities. Weekend fitness marathons and rock climbing classes, as well as group dancing or racewalking lessons under the masterful supervision of Robert Korzeniowski were held in Krakow parks.

The campaign now permanently features in the calendar of educational and promotional events in Krakow.



School Kitchen for Children and Teenagers with Special Nutritional Needs

In one of the Day Care Centres, the Krakow City Hall plans to organise a kitchen dedicated to students with special nutritional needs. The demand of students with food allergies, celiac disease, diabetes, phenylketonuria or cystic fibrosis will be reported to the project organisers by school principals after receiving formal documentation confirming the necessity of a special diet.

The innovative formula of this project implemented by the Krakow City Hall is a “tailor-made” solution to the problems of many families that struggle with the logistics and costs of preparing meals for children with special health and nutritional requirements.

The planned project will be financed entirely from the city budget. Research is currently underway to diagnose the needs of Krakow students who require specialised nutrition



8.3.2. Warsaw inspires

“Active Senior” Health Promotion Programme

The programme is aimed at people over 60 years of age residing in Warsaw. It focuses on maintaining and improving the general fitness and quality of life among seniors. As part of the programme, seniors participate in a series of group meetings held twice a week: introductory meetings in the form of lectures e.g. on the principles of proper nutrition (nutritional diets and their impact on the risk of obesity or malnutrition, methods of changing unhealthy eating habits), predisposition to the development of diseases (hypertension, ischemic heart disease, stroke), risks resulting from low physical activity and other pro-health practices beneficial for seniors. Subsequent meetings of the cycle are devoted to exercises enhancing overall fitness with the use of small equipment with proven parameters, e.g. mattresses, gym mats, balls, exercise chairs, gymnastic sticks, rubber bands, etc.

The programme also takes place in the form of Nordic walking and swimming sessions.

In 2020, 1,787 people benefited from the programme; in 2021, 2,642 seniors participated in the initiative.

“Antenatal Classes” Educational Programme

A programme aimed at health education and promotion among future parents. The task of institutions providing antenatal classes is to promote health education among parents in the field of pregnancy, childbirth, puerperium and care for a new-born, as well as psychophysical preparation for childbirth. Class topics are also important in the context of obesity and the fight against diabetes, as they include symptoms of pregnancy complications, such as arterial hypertension, glucose level assessment, oedema, etc. As part of the activities, participants can learn about gestational diabetes, how to recognise it, the appropriate diet in the case of gestational diabetes, the impact of diabetes on the foetus and infant as well as complications of gestational diabetes.

In 2020, 7,526 women took advantage of the programme; in 2021, there were 9215 participants.



Program promocji zdrowia „Zdrowy Uczeń”

The programme is addressed to children and adolescents attending public schools for which the City of Warsaw is the leading body, i.e. primary and secondary schools where health services contracted by the National Health Fund are provided for in the teaching and upbringing environment, as well as in caring and educational institutions. The main goal of the programme is to provide conditions for students to acquire knowledge on pro-health behaviour and for their own health.

The programme is implemented mainly by school nurses, who cooperate with doctors, nutritionists, physiotherapists and specialists in physical activity in the area of specialised topics.

The thematic block on diabetes included in the programme covers knowledge about metabolic diseases, among other things, the characteristics of type 1 and type 2 diabetes, disturbing symptoms that may indicate diabetes, risk factors for diabetes in children and adolescents, the impact of physical activity and a proper diet on the regulation of glucose levels in blood.

In 2020, 196,561 children and adolescents took advantage of the programme; in 2021 there were 196,753 participants.

“Warsaw Health Days” Health Promotion Programme

A general health education programme, based on the organisation of educational meetings for Warsaw residents, carried out in various districts of the capital city. Lectures are conducted by experts in the field of health protection and promotion. During the pandemic period, no group meetings with residents took place.

In 2018, the following initiatives were executed within the framework of the programme:

- “Dietary management in type 2 Diabetes” (Rembertów),
- “Happiness on a plate?” (Bemowo),
- “How to nourish your brain so that it becomes your friend?” (Bemowo),
- “How to be a conscious consumer?” (Bemowo),
- “What products contain sugar? Consequences of excessive sugar consuming and its healthy substitutes” (Bemowo),
- “Impact of diet on health” (Ursynów),
- “Diabetic prevention – foot care” (Wola).

In 2019, the following initiatives were executed within the framework of the programme:

- “Principles of healthy eating” (Mokotów),
- “Principles of healthy eating for seniors” (Mokotów),
- “Diabetes: prevention and treatment” (Ochota),
- “Obesity in the elderly” (Rembertów),
- “Obesity: a civilization disease of the 21st century” (Targówek),
- “What an elderly person should eat?” (Ursynów),
- “Diabetes: an epidemic of the 21st century” (Wola),
- “A sweet life without sugar. Healthy eating, including healthy sugar substitutes, the importance of drinking water, diet adapted to age” (Wola),
- “Lecture on dietetics and healthy eating” (Żoliborz).



Initiatives of Municipal Health Care Entities

Municipal health care entities for which the Capital City of Warsaw is the creating body:

- The "Prevention 40+" NHF programme aimed at early diagnosis of diabetes and other diseases, implemented by SZPZLO Warszawa Praga-Północ in 2022,
- The "Stop Diabetes!" EU project aimed at seniors, residents of Warsaw aged 60+. As part of the programme, seniors can perform tests such as: random glycemia measurement, BMI calculation, WHR, blood pressure measurement, as well as take advantage of health education in the field of risk factors for diabetes and comorbidities; a programme implemented by SZPZLO Warszawa Praga-Północ in 2020-2022,
- The "Principles of nutrition of infants and young children – prevention of overweight in the youngest" training series addressed to parents and guardians, implemented by the Warsaw Children's Hospital SPZOZ in 2019,
- Action promoting pro-health behaviour – including free tests (lipid profile) carried out by SZPZLO Warszawa-Rembertów in 2019-2020,
- Action promoting pro-health behaviour – including free glucose and cholesterol testing, carried out by SPZOZ Warszawa-Białołęka in 2020,
- Free tests campaign as celebration of the Women's Day – including measurements of glucose level, body weight and blood pressure, carried out by SZPZLO Warszawa-Mokotów in 2020,
- "Conscious living with diabetes" workshops carried out by SZPZLO Warszawa-Targówek in 2019-2020,
- "Effective slimming. Negative calorie diet" workshops implemented by SZPZLO Warszawa-Targówek in 2019-2020.

Overweight and Obesity Prevention and Treatment Programme – to be implemented from 2023

The Warsaw City Hall is preparing to implement a new health policy programme called "Health policy programme for the prevention and treatment of overweight and obesity in children and adolescents under the age of 15 inhabiting the capital city of Warsaw".

The aim of the planned initiative is to improve the health behaviour of overweight and obese children and adolescents aimed at a reduction in body weight among programme participants in relation to the initial indicators

The programme is planned to feature cycles of consultations with paediatric or metabolic diseases specialists, dietary advice, psychological support, consultations with physical activity specialists and workshops for parents / legal guardians on introducing and maintaining beneficial changes in the lifestyle of charges.

The programme will be initiated in 2023; preparatory work is currently underway.

8.3.3 Initiatives Promoting Physical Activity, e.g. Move For Fun

Move For Fun – an initiative aiming to bring more movement and fun to schools and pre-schools. For children, these are engaging movement games, and for teachers, an interesting way to achieve learning goals. Move For Fun proves that movement games can successfully enable teachers to work in all four development areas of the core curriculum, not only in the physical sphere traditionally associated with movement.



Teachers receive a ready work tool for implementing the programme in an educational institution, i.e. a set of movement games in the form of **Movement Cards**. Movement cards combine tradition with innovation. Simple games, some well-known to children, such as “tag” or “dodgeball”, were enriched with two elements: suggestions of different stories and a random selection enabling frequent modifications of the game. The card game gives many possibilities: it introduces a story and educational elements, and additionally allows children to co-create the game. The sense of influence and agency makes the participants more willing to engage in the game.

Teachers also have the **Move For Fun Guide** at their disposal, which makes the adventure with the programme pleasant and easy to implement. All you have to do for the children to exercise (move), play (fun) and learn at the same time is follow the instructions. Classes do not require prior preparation.

Move For Fun at the international level is carried out in partnership with the International Sport and Culture Association (ISCA) and the Danish Sports Association (DGI). In Poland, the initiative is coordinated by the V4Sport Foundation.



Expert Opinions on the “School, Municipality, System – Partnership Against Obesity and Diabetes Epidemic” Report

In recent years, diabetes has gained a high priority on the list of the most important global health problems. This is due not only to the rate of increase in the incidence of the disease, but also to its growing health, financial and social costs.

In the health care system, medical care for a diabetic is predominantly the responsibility of primary health care and encompasses such activities as health promotion, identification of risk factors, prevention of carbohydrate disorders, and education in the field of pre-diabetes and type 2 diabetes.

But what should school care for a child suffering from diabetes look like? What does the teacher’s knowledge of diabetes need to be? Systemic solutions do not prepare teachers sufficiently to work with a pupil with diabetes, either at the stage of obtaining pedagogical education, or as part of later self-education.

Looking for areas of the most effective interventions in the prevention of civilizational diseases, in particular obesity and type 2 diabetes, the Scientific Council of the CCD Programme in Poland recognised the school environment as a key area in which such activities should be concentrated. Children and adolescents are educated with the participation of all teachers and as such play an important role in shaping the pro-health attitudes of the young generation. Schools, supported by local government and Primary Health Care (POZ) units, may plan and implement their own and joint initiatives.

Apart from presenting the risk factors for developing diabetes, the “School, Municipality, System – Partnership Against Obesity and Diabetes Epidemic” report provides a unique overview of the research on the health and lifestyle of Polish students and teachers, as well as the characteristics and results of surveys conducted in the teachers’ communities of Krakow and Warsaw.

Designing interventions in the area of preventing, but also minimising the effects of diseases such as diabetes or obesity, requires an interdisciplinary approach that involves various milieus.

I hope we have provided you with important reading material that will inspire policymakers, local government officials, teachers, medical and public health professionals, and all interested in combating obesity and diabetes.

Professor Iwona Kowalska-Bobko, PhD, Jagiellonian University

Head of the Department of Health Policy and Management, Director of the Institute of Public Health, Faculty of Health Sciences, Collegium Medium of the Jagiellonian University. Expert of the European Observatory on Health Systems and Policies (EuroWHO), Chairwoman of the Małopolska Branch of the Polish Society of Public Health, Chairwoman of the Sectoral Council for Competences in Health Care and Social Welfare



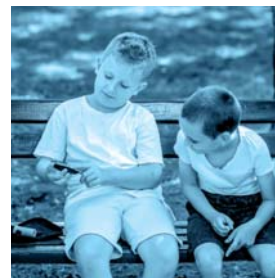
The “School, Municipality, System – Stop the Obesity and Diabetes Epidemic” report prepared as part of the Polish section of the Cities Changing Diabetes international project is a very important step in building public awareness as regards the risks associated with the rapidly increasing incidence of obesity and diabetes in our country. It is the first study of a broad school environment, analysing the knowledge and attitudes of teachers towards the problem of overweight and diabetes and the students suffering from these conditions. Multiple conclusions drawn from the obtained data have allowed us to formulate suggested actions, whose implementation may give hope to stop the epidemic of metabolic diseases, additionally aggravated by the negative impact of the coronavirus pandemic on body weight.

The importance of the project that resulted in the preparation of this report cannot be overestimated – if only for one reason. Traditionally, diabetes or obesity is dealt with by doctors and nurses, who suggest to patients specific therapeutic measures, including surgical treatment of obesity. These purely medical measures will not, however, stop the spike in the number of obese or diabetic people. The reason for this phenomenon lies outside the field of clinical medicine. What makes our body weight increase is bad eating habits, excessive consumption of calories and alcohol, low physical activity and a misunderstanding of the health risks associated with obesity. This process begins in childhood, at home and at school. Therefore, to counteract the greatest health threat posed by modern civilization, it is necessary to take action at home and at school. Increasing teachers’ awareness will undoubtedly bring about a behavioural change among educators and school employees, inspire them to create pro-health actions, increase the opportunities for students to participate in activities aimed at improving their health, including reduction of overweight. It is not doctors or hospitals that prevent obesity or diabetes – this can only be achieved by wise social, urban and educational policy. The CCD report is to help formulate it at the commune, city and poviatt level.

This report aims to become one of the first studies showing the actual state of knowledge and activities in the field of metabolic disorders in Polish schools. The findings are quite disturbing: there are a lot of pupils with diabetes and overweight, knowledge about these diseases among teachers is insufficient, and there are numerous barriers preventing the rapid implementation of pro-health measures. We are very pleased with the attitude of the educational authorities of Warsaw and Krakow, who were actively involved in the preparation of this report; it gives hope that the proposals for specific actions and solutions presented in the final part will have a chance of at least partial implementation. In fact, the fate of this report will be a measure to what extent it is possible to introduce changes benefiting health of residents and how the declarations of city officials and teachers will translate into a real change in schools and the shape of the city itself, so that the prevention of obesity and diabetes does not – as has often been the case so far – consist in repeating slogans on various political and election rallies, but becomes a fundamental goal of the authorities of both Polish capitals – and over time the country as a whole – for the benefit of health of children and adolescents and their teachers.

Professor Leszek Czupryniak MD, PhD

Head of the Diabetes and Internal Medicine Clinic of the Medical University of Warsaw



Obesity and the ensuing type 2 diabetes are among the most serious public health challenges in developed countries. As evidenced by the numbers describing the epidemiological status of both diseases in our society, Poland is no exception in this respect. We have over 3 million people suffering from diabetes, even more affected by pre-diabetes, and less than half of the population within normal body weight range. All this is reflected in the health of the whole society, making Poles less productive than they could be or leaving the labour market prematurely, mainly due to cardiovascular diseases. This situation creates an enormous burden for the health care system and generates significant and ever growing costs for the budget every year.

The aforementioned health problems of excessive body weight already affect the youngest citizens, including primary school children. An additional important phenomenon among this group is the growing number of students with type 1 diabetes, who deserve proper care in the school environment.

Are we able to meet these challenges? Can we follow the footsteps of selected other European countries – especially Scandinavian ones – and reduce the risk of civilizational diseases resulting from a sedentary lifestyle, unhealthy eating, stress and other phenomena caused by modern civilization in Polish society? We must not only believe that we are able to overcome these challenges, but also take specific actions. A good example is the Cities Changing Diabetes initiative, which unites doctors, scientists, local government officials, educators, teachers and the pharmaceutical industry. The "School, Municipality, System – Partnership Against Obesity and Diabetes Epidemic" report is one of the outcomes of this initiative. The aim of the report is to describe the current situation in terms of risk factors identified among students in our schools, to assess teachers' preparedness for the ever-growing task of promoting a healthy lifestyle among their students, and also an attempt to indicate actions necessary to be taken in the near future. The initiative focuses on large cities (in Poland the two participating agglomerations are Warsaw and Krakow), because it is children and young people in metropolises that are most at risk of suffering from these phenomena.

I would like to express my hope that the report will find attentive readers not only among those who organise and finance the functioning of our health care system and schools, but also among all those who "care" about the health of present and future generations of Poles.

Only by working together can we face the health challenges of today

Professor Maciej Małecki, MD, PhD

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In today's world, the Cities Changing Diabetes project is a valuable undertaking, because it introduces knowledge and good international practices, contributing to the reduction of the risk of metabolic complications related to obesity and type 2 diabetes. Unfortunately, that risk is spreading among ever younger age groups, and as a country we are becoming an infamous leader as regards weight gain among children, adolescents and young adults.

Obesity is not only an aesthetic problem, but above all a complex medical issue. From this point of view obesity is also a cardiological disease with a huge impact on the cardiovascular system, as the risk of complications in obese patients is significantly higher in all areas than among patients with normal body weight. Lipid metabolism disorders, occurrence of arterial hypertension, lack of physical activity – these are risk factors that in obese patients generate an increased probability of atherosclerosis at an early stage, followed by its progression, and eventually clinical syndromes associated with atherosclerosis, i.e. heart attack or stroke.

Therefore, the earlier preventive measures against obesity and type 2 diabetes are introduced, the more real and effective the probability of stopping the avalanche of their effects and complications. If we also realise that during the pandemic the average resident of the European Union gained an average about 6 kg (statistics confirm that this is also true for Poland), then we can see the enormity of the clinical problem we are dealing with.

Therefore, it is crucial, firstly, to be aware of the current state of affairs, and, secondly, to implement best practices, also in the field of public health. Health promotion and effective prevention of obesity and type 2 diabetes are undoubtedly one of the greatest public health challenges of the 21st century. These are issues that we all need to recognise and take seriously, at every social and administrative level.

That makes activities combining the knowledge and efforts of various environments – doctors, health promoters, non-governmental organisations – invaluable. One of such initiatives is the CCD report entitled "School, Municipality, System – Partnership Against Obesity and Diabetes Epidemic" in Poland. It demonstrates unequivocally the obesity phenomenon in Polish schools, provides commentaries by representatives of various circles who "care" about public health and suggests interventions that should be coherently and consistently undertaken and disseminated at the school, local government and central administration level.

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Notes

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