

# The knowledge of Tarnobrzeg residents on diabetes type II and the educational needs - preliminary

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## Summary

**Admission.** Type II diabetes is still a significant problem of civilization. Despite medical advances observed increase in the incidence of this disease entity, which adversely affects the health situation in Poland. The primary step in the fight against proliferation of type II diabetes is to increase the awareness of people about lifestyle, which may be included risk factors of the disease and thus increase in cases in the macro scale.

**Objective of the work** Assessment of the level of knowledge of the selected group of healthy adult residents of Tarnobrzeg about type II diabetes and risk factors for this disease.

**Materials and methods** The study was conducted in April 2018 under the district of Tarnobrzeg. In the study, 104 people took part. Among those surveyed, most were men. The method used in the study was a diagnostic survey and questionnaire technique author. Application of the basic statistical analysis using the Pearson chi-square.

**Conclusions** The level of knowledge respondents is insufficient to take action and protect behavior and reduce the risk of developing diabetes type 2. At the same time, however, the vast majority of both women and men believe that proper education can minimize the incidence of type II diabetes.

**Keywords:** Type 2 diabetes, knowledge, health awareness

## **Introduction**

Diabetes is the main problem of diabetes and one of the most serious medical twenty-first century. It contributes to premature mortality, but also is a common cause of disability. More and more patients die due to diabetes in the world - 4.8 million people, while in Poland, close to 30,000 [14]. Both hypertension and diabetes are the main risk factors for death from cardiovascular disease. Diabetes contributes to accelerate the development of atherosclerosis, and thus increases the risk of heart attack and stroke. It was noted that the risk of incident stroke is increased up to eight times in people with diabetes, and the risk of heart attack is higher in men by 50% in women by 150% compared to the total population [7]. A disturbing fact is premature mortality due to diabetes, which increasingly affects young people of working age. Also increased the number of patients who are unable to work due to complications of diabetes. According to the Polish Association of Diabetics, in Poland, performed most operations amputation, ie. 14,000 per year (almost every second person with diabetic foot) [14]. Diabetes is a metabolic disorder, characterized by chronic hyperglycemia, i.e. constantly sustained increase in blood glucose. This is caused by the malfunction of insulin, or the impaired secretion, and insulin resistance in the course of obesity. This is what obesity is found in 90% of cases of type II diabetes. Statistical data show that the risk of death in obese men suffering from diabetes is five times higher than in healthy men, and for women the risk is increased almost 7 times [7]. The compound of type II diabetes and obesity result from the fact that obese people occurs increases the production of free fatty acids on the abdominal body fat, resulting in a higher fat oxidation in liver and muscle, consequently leading to the release of glucose [7]. Studies conducted in the United States showed that nearly 70% of population, body mass index (BMI = body mass index) is greater than the thread 25 kg / m<sup>2</sup>, while in half of those stated obesity. In Poland also conducted similar studies (NATPOL PLUS), which showed that overweight people is 34% (including 29% women, 39% men), and 19% obese people. Only 47% were of normal weight [15]. that occurs in obese individuals with an increase production of free fatty acids on the abdominal body fat, resulting in a higher fat oxidation in liver and muscle, consequently leading to the release of glucose [7]. Studies conducted in the United States showed that nearly 70% of population, body mass index (BMI = body mass index) is greater than the thread 25 kg / m<sup>2</sup>, while in half of those stated obesity. In Poland also conducted

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Diabetes occurs without significant symptoms. In the initial phase, it develops gradually. It is genetic, environmental and behavioral. But the biggest role in its occurrence have behavioral and environmental factors, or lifestyle and health behavior. They determine the pace of development of the disease and affect the healing process. The development of diabetes is caused by increasing insulin resistance, which usually develops over a long time without giving any symptoms, because the cells are activated compensation. Symptoms that may indicate occurring diabetes are increased thirst, polyuria, weight loss, excessive sleepiness, inflammation of the urogenital system. Type II diabetes occurs in approximately 95% of all diabetics. Therefore, it is important to early diagnosis and health education of people taking into account their other health risks (eg. being overweight leads to obesity) and various psychosocial factors [7]. The percentage of people affected by this disease continues to grow because it is defined as a disease of civilization. In 2016. World Health Organization published a report "GLOBAL REPORT ON DIABETES" on the number of diabetic patients. Statistics show that since 1980 the world has seen a steady increase in the incidence of diabetes, mostly

type II. In 2014, the number of people affected by this disease was approximately 422 million, which represents almost a fourfold increase compared to 1980 [18]. Given the division of sex, men more than doubled the number of patients has increased, while that of women is suffering as much as 60% more. It is estimated, that in 2025 the number of people struggling with diabetes will amount to 700 million. Differentiation of the incidence of the disease in the country is high, hence solutions must be tailored to the region [4]. Another problem is the low awareness of the nature of the disease among people suffering. As many as 25% of Poles with diabetes do not know about this disease. This applies to both adults and children. Reasons for this are primarily lack of knowledge about risk factors, symptoms and treatment options, multi-stage diagnosis (measurement of glucose concentration in venous plasma, oral glucose tolerance test) and the lack of motivation of family doctors to perform tests among risk groups. Early diagnosis of type II diabetes not only leads to faster implementation of appropriate procedures in the control of hyperglycemia and preventing adverse effects, but also reduces the process of carcinogenesis. It has been shown that obese people with insulin resistance occurring hyperinsulinemia and increases the risk of cardiovascular disorders and cancer [14].

Persons who are at risk for diabetes and people over the age of 45, according to the Polish Diabetes Association should have a blood glucose test done once in 3 years. These factors include the following risk factors:

- obesity, overweight (BMI  $\geq 25$  kg / m<sup>2</sup>, or waist circumference of  $> 80$  cm for women  $> 90$  cm for men)
- diabetes occurring in family members in the first line,
- low physical activity,
- ethnicity or environment more vulnerable to disease (e.g. African American, Native American)
- persons with a known dyslipidemia (HDL cholesterol  $< 35$  mg / dl ( $< 0.9$  mmol / l) and / or triglycerides  $> 250$  mg / dl ( $> 2.85$  mmol / l))
- people with hypertension,
- people struggling with cardiovascular disease,
- women with a history of gestational diabetes,
- women with polycystic ovary syndrome,
- women who gave birth to a child weighing more than 4 kg [13].

Complications of diabetes relate primarily to damage cells in the body (mainly vascular endothelial cells and cells of the peripheral nerves) which leads to disruption of the blood supply to multiple organs. Long-term complications include micro and macroangiopathies. In the

microangiopathy microvascular capillaries are damaged mainly in the kidneys, the retina of the eye, or peripheral nerves. Distinguished diabetic retinopathy (damage to the retina and other parts of the eye), diabetic nephropathy (renal failure), and diabetic neuropathy (nerve damage), which is observed in all patients. A further consequence of diabetes is the chronic diabetic foot syndrome, or infection or damage to deep tissue rate due to damage to peripheral nerves or blood rate. This is usually the result of advanced diabetic polyneuropathy, which comes to micro-injuries, but the patient because of the numbness feels no pain, resulting in infections are emerging wounds. In turn, macroangiopathy involves damage to large arterial vessels- aorta, carotid arteries, brain, heart, lower limbs, which accelerates the formation of atherosclerotic lesions. Therefore, patients with diabetes often comes to the development of coronary heart disease, peripheral arterial and vascular disease of the brain [2].

Prevention includes modifiable factors, ie those which can be eliminated by implementing the principles of a healthy lifestyle. Therefore, the sooner will be introduced effective health promotion programs, the faster you manage to minimize the risk of developing diabetes. Nutritional recommendations for patients with type 2 diabetes are important in the prevention of diabetes, as the basis for weight reduction, maintenance of metabolic control and condition the course of the disease. The diet should be varied and diverse. Try to avoid foods with a high glycemic index, processed and containing saturated fats. Preferably, the meals are at fixed times, the body does not stores excess fat. In turn, physical activity affects not only the health improvement and normalization of body weight, but also conducive to lowering blood glucose level by increasing the sensitivity of insulin [9]. Physical exercise also reduces the risk of cardiovascular disease because it lowers the level of serum total cholesterol, the concentration of "bad" cholesterol, blood pressure and reduces the risk of thrombosis, which are factors in the development of atherosclerosis [19]. It has been shown that physical activity and a weight loss of 5-7% may reduce the risk of type II diabetes up to 58% over three years after the implementation of health behavior. The percentage of these people is greater with age, and for people aged 60 years and it amounts to as much as 71% [10]. Physical exercise must be adapted to the age of the person. Initial physical activity should be moderate pace and be dependent on the physical condition of the patient. The most important thing is consistency performing exercises, should be taken daily exercise, even if small, such as. walking, aerobics or Nordic walking.

Due to the fact that type II diabetes is associated with improper conduct lifestyle, so important it is the role of primary prevention (prevention of phase I). It is used for the development of public awareness and prevention of disease through health education. First of all, health

promotion aims to disseminate healthy lifestyle, including proper nutrition and increasing physical activity. This will contribute to the reduction of overweight and obesity, which are the main cause of diabetes type II. This disease can not be ignored, it deserves great attention by health systems, but most of all society. It is a chronic disease, hence it is important to prevent it from occurring, However, when there is already the most important and will be recognized as soon as possible the implementation of treatment. To change the situation, to reduce the number of cases should develop public awareness of the risk of diabetes type 2. Such activities must be disseminated on a global scale, starting from the smallest organizational units, or local communities. Since 2010 in Poland they are implemented prevention programs mainly by the Ministry of Health, part of the National Program for the Prevention of civilization diseases. This program is being implemented under the name. "Diabetes Prevention Program in Poland" [11]. The World Health Organization has released a program of primary prevention of diabetes, which contained guidelines for the maintenance of normal body weight, regular of sport, the use of a balanced diet.

### **Objective of the work**

The aim of the study was to determine the level of knowledge of a selected group of adults, residents of Tarnobrzeg about type II diabetes and risk factors for this disease.

### **Materials and methods**

The study was conducted at the upstate Tarnobrzeg. The study group consisted of 104 respondents were adults in different age groups. The exclusion criteria of the study was the fact diagnosed diabetes type 2. In the study used a survey method through the use of proprietary diagnostic questionnaire and basic statistical analysis using the Chi square Pearson. The questionnaire contained 20 closed questions, and the answers given were anonymous and voluntary. Among other things, respondents were asked about the occurrence of the problem of diabetes, risk factors, lifestyle and health behavior. In the study group they were most men- 59 people (56.73%), while women were 45- (43.27%).

### **Results**

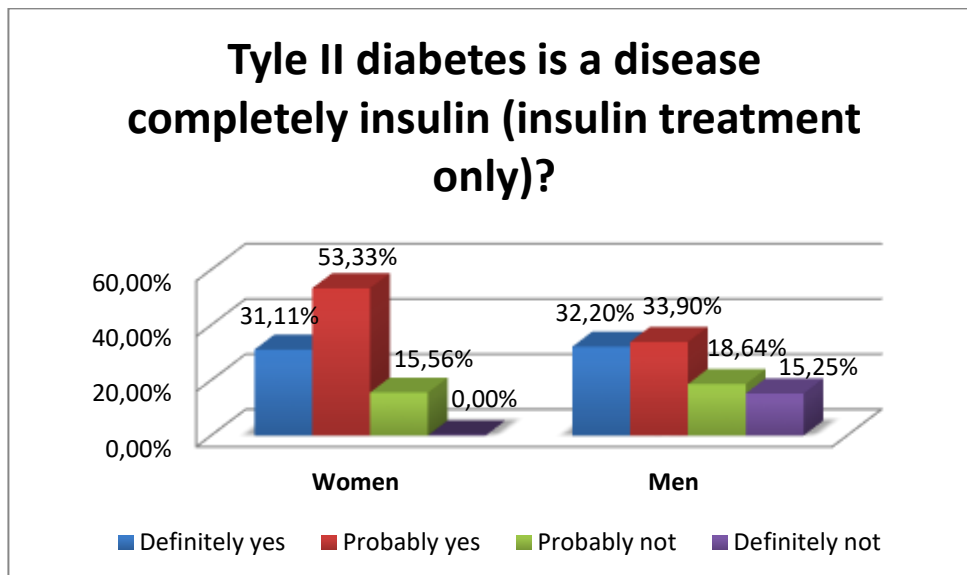
#### **Characteristics of the study group**

The study group consisted of 104 persons: 59 women (56.73%) and 45 men (43.27%). The majority of respondents came from the city (58), while 46 respondents declared that comes from the village. Distribution of the respondents as regards the development rearranges as

follows: basic (15) training (19), intermediate (28) bachelor (20) masters (22). The greater part of respondents were students (31) of the surveyed perform physical work (22) and mental (28), and 23 respondents maintained with pension.

### Diagnosis and treatment of diabetes in the minds of respondents

We analyzed the respondents' knowledge on how to treat type II diabetes. It turns out that there is a relationship between gender respondents, and their view on the method for the treatment of diabetes (Chi-square = 9.28, df / p = 7.815; p = 0.05). Most women indicates that Type II diabetes mellitus (84.44%), a small part of the respondents replied that they do not cure her only through the administration of insulin (15.56%). While 1/3 of men (33.89%) considered that type II diabetes is insulin-dependent, and 66.1% of the respondents indicated that it is treated with insulin.



Source: own

**Chart 1.** Knowledge of insulin therapy in type 2 diabetes - and the gender of the respondents

The next question concerned the analyzed knowledge of the normal glucose concentration in the blood. In analyzing this question, respondents considered the place of residence and level of education. From the statistical data presented show that there is a link between the home and the knowledge of diabetes (Chi-square = 14.26, df/p = 7.815; p = 0.05). City dwellers significantly more often indicated the correct answer and biggest mistakes committed villagers. There is also a dependence between education and answers respondents (Chi-square = 29.99, df/p = 21.0261; p = 0.05). The data show that people with lower education (basic training) often marked a wrong answer. This may be related to place of residence, because more wrong answers marked the respondents coming from the countryside.

**Table 1.** Determination of the concentration of glucose in the blood due to residence

<i>The result of which blood glucose is correct?</i>				
	City		Village	
	N	[%]	N	[%]
70-99 mg / dl	20	34,48	13	28.26
100-125 mg / dl	31	53.45	20	43.48
above 126 mg / dl	0	0	10	21.74
I do not know	7	12.07	3	6.52

Source: own

**Table 2.** Determination of the concentration of glucose in the blood due to education

<i>The result of which blood glucose is correct?</i>					
	basic	professional	average	Bachelor	MA
	[%]	[%]	[%]	[%]	[%]
70-99 mg / dl	6.06	15,15	21.21	27,27	30.30
100-125 mg / dl	11.76	11.76	33.33	19.61	23.53
above 126 mg / dl	20	40	40	0	0
I do not know	50	40	0	10	0

Source: own

Later in the survey asked respondents about the knowledge of the term "hyperglycemia." It is noted the relationship between sex and tested their knowledge on the subject (Chi-square = 14.01, df/p = 7.815; p = 0.05). Women showed significantly more correct result than men. However, the majority of respondents - regardless of gender - erroneously indicated that hyperglycemia is a state of decreased glucose levels in blood- answered the respondents (55.56% women-men-33.90%). More than one third of the respondents (29.81%) indicated that it is the high blood glucose level, and the answer to this question did not know 16.36%, respectively.

**Table 3.** Research knowledge hyperglycemia

<i>What is hyperglycemia?</i>				
	Women		Men	
	N	[%]	N	[%]
The reduced blood sugar levels	25	55.56	20	33,90
high blood sugar	15	33.33	16	27.12
normal blood glucose levels	0	0	14	23.73
I do not know	5	11.11	9	15.25

Source: own

Respondents were also asked about one of the main risk factors for type II diabetes, obesity. Respondents had to indicate whether overweight/obesity contribute to the development



of type II diabetes. Most of the respondents indicated the correct answer (60% women and 61.02% men; chi-square = 7.814, df/p = 5.9915; p = 0.05). (Table 4). In both groups, the majority of respondents chose the correct answer. However, when these results were compared with the subjective assessment of your eating style, it turned out that the vast majority apply high-fat diet (80% of women and 76.27% men). Only 20% of women and 23.73% of men used a low-fat diet (Table 5).

**Table 4.** Overweight/obesity and the risk of developing type II diabetes and the sex - respondents' opinions

<i>Do you think / you that overweight / obesity contribute to the development of type II diabetes?</i>				
	<b>Women</b>		<b>Men</b>	
	<b>N</b>	<b>[%]</b>	<b>N</b>	<b>[%]</b>
Yes	27	60.00	36	61.02
no	18	40.00	15	25,42
I do not know	0	00.00	8	13.56

**Table 5.** Self-assessment of their own style diet and sex of respondents

<i>How do you assess feeding your style?</i>				
	<b>Women</b>		<b>Men</b>	
	<b>N</b>	<b>[%]</b>	<b>N</b>	<b>[%]</b>
low fat	9	20.00	14	23.73
high fat	36	80,00	45	76.27

Source: own

The element of self-assessment used in the study was also to determine their exposure to the onset of diabetes type II. Ratings respondents were compared with their BMI (Chi-square = 14.26, df/p = 7.8147, p = 0.05). Only 35% of overweight and 40% obese subjects, aware of the fact that they are at risk (figure 2).



Source: own elaboration

**Figure 2.** The risk of developing type II diabetes, and body mass

Diabetes, a chronic disease brings many complications, both early and late. Therefore, respondents were also asked about the knowledge of the effects of the disease. It turns out that the majority of respondents correctly answered that the long-term complications of diabetes include: diabetic retinopathy, diabetic neuropathy and diabetic foot- answered yes (91.11% women and 96.61% men).

**Table 6.** Knowledge of late complications of diabetes mellitus type II

<i>What are the late complications of diabetes?</i>				
	Women		Men	
	N	[%]	N	[%]
diabetic retinopathy, diabetic neuropathy, diabetic foot	41	91.11	57	96.61
pneumonia, tuberculosis	3	6.66	2	3.39
headaches, nausea, impaired concentration	1	2.22	0	0.00

Source: own elaboration

As previously mentioned this primary prevention, which effectively reduces the incidence of type II diabetes is a key tool in the prevention of type 2 diabetes respondents were asked to indicate whether appropriate public education can minimize the incidence of diabetes. It has been shown that in the group of respondents sex was not important for an opinion on the

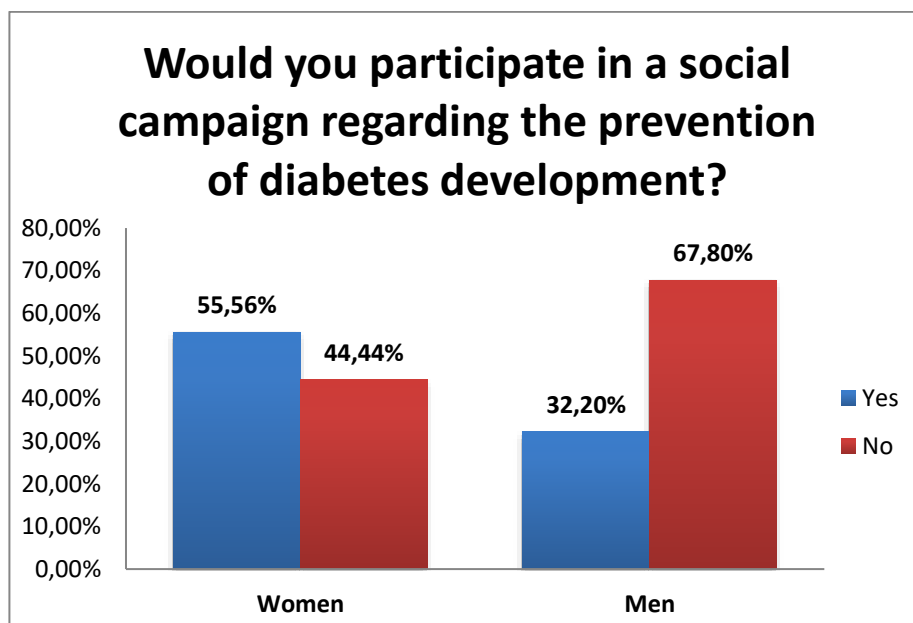
importance of education to minimize the incidence of diabetes (Chi-square = 0.28, df / p = 5.991; p = 0.05). In both treatment groups were similar answers. Both women and men in the clear majority (57.78% women 62.71% men) were of the opinion that the broadly defined health education can reduce the risk of developing type II diabetes (Table 3).

**Table 7.** The impact of health education on the risk of developing diabetes type II

<i>Is appropriate public education can minimize the incidence of diabetes?</i>				
	Women		Men	
	N	[%]	N	[%]
Yes	26	57.78	37	62.74
no	10	22.22	12	20.34
I have no opinion	9	20.00	10	16.95

Source: own

Respondents were also tested willingness to participate actively in preventive actions. It turned out that even though more than half of early men (62.74%) declared that the right education can minimize the incidence of type II diabetes - that they were clearly less interested in participating in the prevention program. This interest has shown much more often women - 55.56% of this group. (Figure 3).



Source: own

**Figure 3.** Participation in social campaigns regarding the prevention of diabetes

## Discussion

Diabetes in recent years has become one of the serious problems in health. Therefore it requires a greater interest and interventions for prevention. The problem is big, while his rank as evidenced by the term diabetes epidemic. The presented results of the study confirmed that, like the other authors of the respondents knowledge about diabetes is not sufficient. Depending on the question about type II diabetes from insulin majority of women (84.44%) and men (66.1%) answered incorrectly, that it is a disease of insulin-dependent diabetes and requires insulin treatment alone (Figure 1). Similar results were obtained during the study of nursing students [6]. Of all respondents only 53% gave the correct answer and indicated that the disease is insulin-dependent diabetes. In contrast, 34% of respondents felt that the disease is insulin dependent [6]. On the other hand, patients clinic Bychawski Hospital, asked about the state of knowledge on the treatment of type II diabetes, responded that it is "average" (51-75%) - so answered 13 respondents (18.6%) and "high" (> 75 %) declared 57 patients (81.4%) [20]. While Abramczyk revealed lack of knowledge regarding the disease entity as many as 95% of the subjects [1]. Studies assessing the level of knowledge of patients diagnosed with type 2 diabetes also indicate that the impact of education is of great importance in self-care. The vast majority of respondents (91%) were of the opinion that greater awareness of the possible effects of diabetes causes an increase motivation for treatment. Moreover, respondents considered that education is the most advantageous form of individual interview (61% of respondents) a small portion of people eager to take part in practical classes (17%) [8]. The question of the correct value of glucose in the blood, a greater knowledge of the respondents showed the city (Table 1). Research carried out on a group of 150 students selected universities in Lublin, they gave far better results. Correct measurement of the blood glucose reported a total of 58% of respondents (72% of students from the Medical University, 44% of the University Marie Skłodowskiej- Curie and 58% of respondents of the LUT) [3]. In our study regarding the knowledge of hyperglycemia, the majority of respondents did not give the correct answer. It turns out that the existence of the disease varies knowledge in this area in a positive direction. Comparing the results of research on a group of patients diagnosed with type II diabetes, most properly respond to the corresponding question (66%) [8]. The main risk factor for type II diabetes is obesity, which is also due to insufficient knowledge of proper nutrition. Although respondents in the study group in our study concluded that overweight and obesity may contribute to the emergence and development of type II diabetes (60% of women and 61.02% men), most of them are eating high-fat diet (80% women and 76.27% men) (table 4.5). Additionally, more than half of those with abnormal body weight is considered that it is not

exposed to developing diabetes type II (Figure 2). As in the previous issue - the results of other authors confirm that this knowledge comes with experience of the disease. Asked patients clinic diabetes and obesity increases the risk of type II diabetes. As many as 60 people (95.7%) indicated that there is a link between body weight and the development of diabetes, only 3 patients (4.3%) answered that obesity does not matter in the formation of diabetes. The results showed that the respondents know that the wrong weight increases the incidence of type II diabetes [20]. Regarding late complications of diabetes, the majority of respondents in the present study has granted the correct answer recognizing that belongs to them, diabetic retinopathy, diabetic neuropathy and diabetic foot (91.11% women and 96.61% men). Properly question about late complications of diabetes also responded to patients diagnosed with type 2 diabetes treated Diabetes in the Municipal Center of the Independent Municipal Health Care in Bialystok (72.3% of respondents). Only a small part of the respondents (6.9%) it placed these complications, influenza, tuberculosis, lung disease and other conditions [8] Studies have Sopot conducted by the Social Research Laboratory of the Department of Metabolic Diseases, Medical College led by prof. dr. n. med. Jack Sieradzki and Polish Diabetes Association has highlighted the problem of lack of health education. The question relating to the occurrence of diabetic complications, 72% of respondents indicated that they are always or frequently. However, only one in five thought so ill. Despite this, respondents were able to indicate what are the complications of type II diabetes [17]. Sobierajski in turn conducted a survey of Poles knowledge about diabetes. As many as 35% of all respondents could not name a single effect of the disease, although it is a disease involving many organs [12].

## **Conclusions**

1. The level of knowledge in the group relating to diabetes is not sufficient - respondents did not know the concepts of hyperglycemia and hypoglycemia, have no knowledge of the correct value of the concentration of glucose in the blood.
2. Increase public health awareness about the incidence of risk factors for this disease, because the people most likely to develop -with overweight and obesity are not aware of it. Although most are aware that overweight and obesity is a risk factor for type II diabetes, only about 1/3 of the respondents lead a rational diet, or a low-fat diet. It is important to promote health behaviors have the youngest, because then eating habits are formed, which later affect the quality of life. This is crucial, because initially diabetes has no symptoms, they often learn about the disease, when you need to take drug treatment, rather than prevention. The need to also increase the efficiency of diagnosis, through the implementation of relevant procedures and

standards, greater access to technology and the dissemination of social action in the fight against diabetes, which will be mobilized to control blood sugar levels, as well as to encourage lifestyle changes. Awareness of both the elderly and the younger of the factors that influence the development of this disease and how you can reduce the risk of developing it. Today it is a huge problem not only among the elderly but also in younger group. The scale of this phenomenon makes it deserves attention. of the factors that influence the development of this disease and how you can reduce the risk of developing it. Today it is a huge problem not only among the elderly but also in younger group. The scale of this phenomenon makes it deserves attention. of the factors that influence the development of this disease and how you can reduce the risk of developing it. Today it is a huge problem not only among the elderly but also in younger group. The scale of this phenomenon makes it deserves attention.

3. The vast majority of women and men believe that proper education can minimize the incidence of type II diabetes - but do not do anything in this regard to his knowledge of the subject expand.

4. The studies show clear deficits in both the awareness of Type II diabetes and the level of respondents' knowledge about the nature of diabetes. This is due to the lack of adequate health education, primarily at the local level, in environments such as school, work, home. From the data presented above it shows that people are interested in running social campaigns and gladly would take part in them. This is a challenge for the authors of health programs, local authorities in the district of Tarnobrzeg to expand public awareness about the disease through widespread health education, which will definitely have a positive impact on health behavior and will impact on minimizing the incidence of type II diabetes.

5. A considerable role in education, especially in local communities, plays a primary care nurse family. It is a member of the therapeutic team, which through frequent contact with people has the ability to conduct educational activities. It serves as a family nurse educator and informer. Its activities may influence the health behavior of society, shaping positive attitudes, and thus minimize the risk of developing type II diabetes and reduce complications of the disease.

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