



Dissemination of Selected Risk Factors for Cardiovascular Diseases Among Patients Using Primary Health Care in the Lodz Voivodeship

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Abstract

Background: Cardiovascular diseases, classified as civilization diseases, constitute the most common cause of death among both women and men. Metabolic syndrome is a set of factors that predispose to the occurrence such diseases. Importantly, can be partly prevented by reducing modifiable risk factors.

Objective: The aim of the study was to uncover the distribution of selected risk factors for cardiovascular diseases among patients utilising primary health care in the Lodz Voivodeship.

Material and methods: An original online questionnaire consisting of 32 questions was distributed. The study involved 164 inhabitants of the Lodz Voivodeship who use primary health care facilities. Inclusion criteria: residents of the Lodz Voivodeship, aged between 30 and 60 years as well as informed consent to participate in the study.

Results: Hypertension affected 26.2% of participants. In the age range 30–40 years: 4.1% of participants, 41–50 years: 28.3%, and 51–60 years: 61.4% of participants. Diabetes affected 21.3% of participants. 64% of respondents had a BMI above normal. 28.7% of respondents did not engage in physical activity. Among the surveyed, smokers accounted for 37.8%. Among university diploma holders, smokers accounted for 28.2%, and those with non-university education – 54.1%.

Conclusions: The incidence of hypertension in the population of Lodz increases with age. The prevalence of dyslipidemia was independent of gender but dependent on education – higher among respondents with non-university education. Most of the inhabitants of the Lodz Voivodeship were physically active. Moreover, the most frequently chosen forms of physical activity were walking and Nordic walking, and less frequently – aerobics. The prevalence of smoking was similar among women and men. Smokers were more likely to be people with non-university education. The need of taking measures to raise awareness of cardiovascular risk factors, promote healthy lifestyles, and combat obesity has been identified.

Background

Cardiovascular diseases are the most common cause of death among both women and men. Based on the data collected by the Central Statistical Office (Pol. Główny Urząd Statystyczny), it has been observed that in Poland, in 2020–2021, cardiovascular diseases were the most common cause of death and accounted for more than 35% of all deaths [1]. Their frequency is constantly increasing, earning the name of civilization diseases. In medicine, we distinguish the concept of metabolic syndrome (also called syndrome X), which is not a separate disease entity but a set of factors that may contribute to the incidence of cardiovascular disease. In order to be able to recognize the occurrence of the metabolic syndrome, in accordance with the positions of various scientific organizations; i.e., IDF (the International Diabetes Federation), AHA (the American Heart Association), WHF (the World Heart Federation), IAS (the International Atherosclerosis Society), and others, three out of five criteria must be met: an increased waist circumference (women >80 cm, men >94 cm) associated with the development of visceral obesity, treated triglyceridemia or $TGL > 150$ mg/dL, HDL in women <50 mg/dL, in men <40 mg/dL, fasting glycaemia >100 mg/dL or known diabetes mellitus and diagnosed hypertension or blood pressure exceeding >130/85 mmHg [2, 3]. In addition to the diagnosis of a patient's metabolic syndrome, we also highlight a number of scales that help estimate the risk of death due to cardiovascular complications. For this purpose, the SCORE system is often used in Europe to assess the 10-year risk of death of cardiovascular diseases using the following factors: age, gender, systolic blood pressure, total cholesterol, and smoking. On this basis, tables estimating the risk in % are created. A score of $\geq 5\%$ is considered a high risk of death [4]. SCORE2 was also created for non-HDL cholesterol instead of total cholesterol and SCORE-OP for elderly patients [5]. In the United States, the Framingham model is more commonly used, taking into account: age, gender, triglycerides, non-HDL, smoking, diabetes, hypertension treatment, and systolic blood pressure values [6]. On this basis, it can be concluded that factors such as obesity, including visceral obesity, hypertension, diabetes, dyslipidemia, and smoking are key factors in the development of cardiovascular diseases.

These are modifiable factors; i.e., they may change during the course of treatment, diet, and lifestyle changes, so it is crucial to educate patients in this area. In Poland, for patients aged 35 to 65 years, CHUK runs a cardiovascular disease prophylaxis program, consisting of laboratory tests, which aims to increase the knowledge and awareness among patients about cardiovascular diseases and a healthy lifestyle but above all, to reduce the morbidity and mortality of Poles due to cardiovascular diseases by 20% [7].

Objective

To assess the risk of cardiovascular diseases among the inhabitants of the Lodz Voivodeship and to increase patients' awareness of modifiable risk factors for cardiovascular diseases. Assessment of the prevalence of the following risk factors among inhabitants of the Lodz Voivodeship aged 30 to 60 years: hypertension, diabetes, dyslipidemia, obesity, visceral obesity, and smoking.

Material and methods

An original, anonymous online questionnaire consisting of 32 questions. Research material was collected from December 2022 to March 2023. The study involved 164 inhabitants of the Lodz Voivodeship using primary healthcare facilities (table 1). Inclusion criteria: residents of the Lodz Voivodeship, aged between 30 and 60 years, informed consent to participate in the study.

Data from the questionnaires were entered into an MS Excel spreadsheet, and then the collected empirical material was analyzed. Both descriptive and statistical inference methods were used to develop the collected empirical material. The χ^2 independence test was used to compare the frequency of individual trait varieties in the study groups, as well as to investigate the relationship between qualitative traits. Those differences between frequencies and those correlations between traits, for which the calculated value of the χ^2 test turned out to be equal to or greater than the critical value read from the tables for the corresponding number of degrees of freedom with a probability of error of $p < 0.05$, were considered statistically significant.

Table 1. Characteristics of the study group

Characteristics of the study group	Number N	Percent %
Gender		
Women	90	54.9
Men	74	45.1
The age range of subjects in years		
30–40	74	45.1
41–50	46	28
51–60	44	26.8
Education		
Higher	103	62.8
Secondary	27	16.5
Vocational	23	14
Basic	11	6.7
Place of residence		
A large city with more than 100 thousand inhabitants	49	29.9
An average city from 20 to 100 thousand inhabitants	49	29.9
A small town under 20 thousand inhabitants	25	15.2
Village	41	25

Results

Hypertension affected 26.2% of respondents, of whom 28.9% were women and 23% were men. 18.4% of people declaring higher education suffered from hypertension, and among people with non-higher education, it was 39.3%. As many as 70% of women and 52.7% of men had home blood pressure checks.

Among the respondents aged 30–40 years, hypertension was experienced by 4.1% of them (3 people), in the range of 41–50 years: 28.3% (13 people), and in the range of 51–60 years: 61.4% of respondents (27 people). The observed differences turned out to be statistically significant – $p < 0.001$, $\chi^2 = 46.986$ (Figure 1).

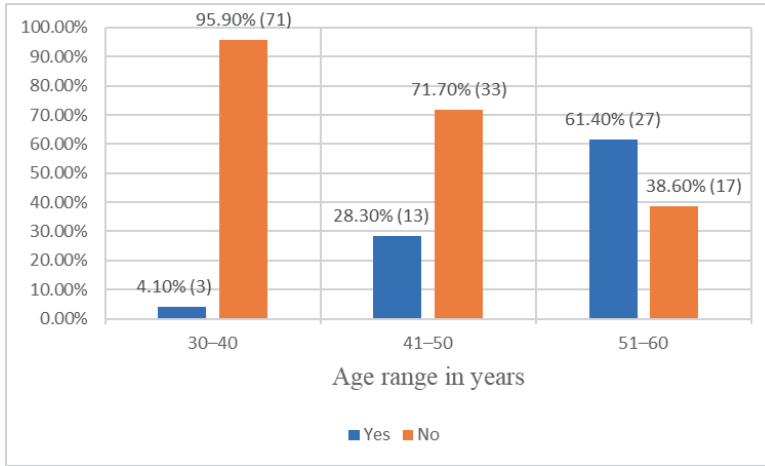


Figure 1. Presence of hypertension depending on age

Diabetes affected 21.3% of respondents, of whom 30% were women and 10.8% were men. Among all the patients with diabetes (36 people), patients with type II diabetes accounted for 77.8% (28 people), type I – 16.7% (6 people), and other types of diabetes (MODY, LADA) – 5.6% (2 people) – (Figure 2).

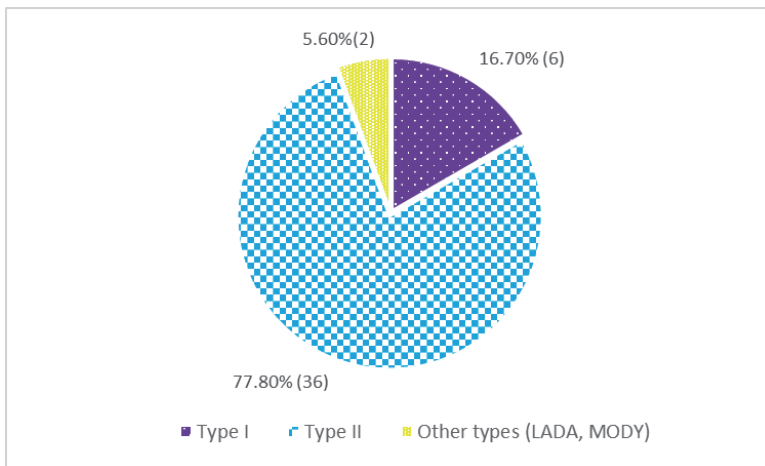


Figure 2. Types of diabetes in the study population

One in four (25%) inhabitants of the Lodz Voivodeship did not know whether they suffered from dyslipidemia. Among women, 17.8% had dyslipidemia, 57.8% had no dyslipidemia, and 24.4% had no knowledge of it. Among men, 21.6% had dyslipidemia, 52.7% had no dyslipidemia, and 25.7% had no knowledge of it. The observed differences turned out to be statistically insignificant – $p > 0.05$ (Figure 3).

As for the occurrence of dyslipidemia depending on education, among people declaring higher education, 14.6% had, 64.1% did not have and 21.4% did not know if they had it. Among those with non-tertiary education, 27.9% had a cholesterol disorder, 41% did not, and 31.3% did not know if they had. The observed differences turned out to be statistically significant – $p < 0.05$, $\chi^2 = 8.627$ (Figure 4).

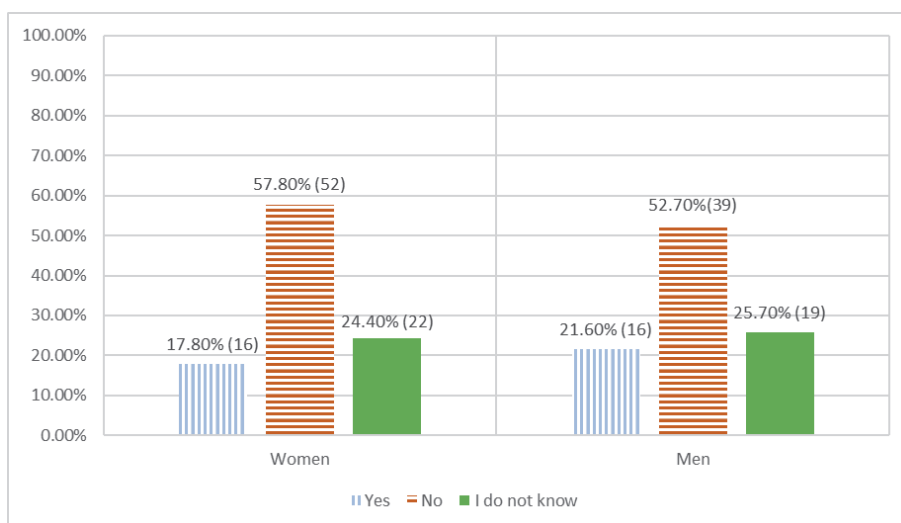


Figure 3. Prevalence of dyslipidemia by gender

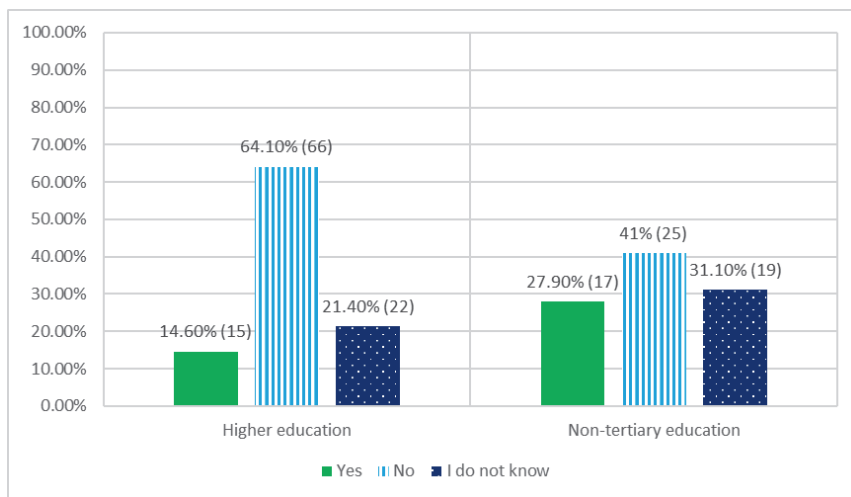


Figure 4. The prevalence of dyslipidemia by education

A modifiable cardiovascular risk factor for metabolic syndrome is waist circumference (measured with a sewing tape midway between the navel and rib arch): in women >80 cm and men >94 cm. Among the women surveyed, 48.8% had circumference constituting a risk factor (>80 cm), among men, 38.2% declared circumference constituting a risk factor (>94 cm). The observed differences turned out to be statistically insignificant – $p > 0.05$ (Figure 5).

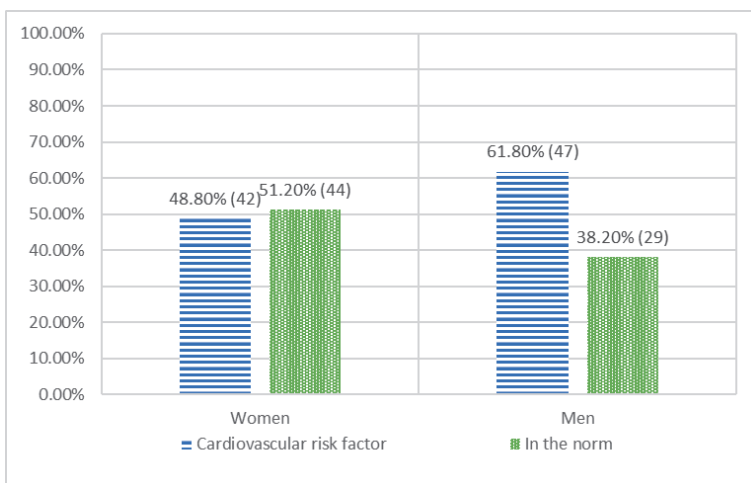


Figure 5. Waist circumference depending on gender

64% of respondents had BMI above normal. The distribution of BMI in the population of women and men and subjects with tertiary and non-tertiary education is shown in the tables (Tables 2 and 3). The observed differences turned out to be statistically insignificant – $p>0.05$.

Table 2. The distribution of BMI in the study population by sex

BMI	Women		Men		Total		p>0.05
	N	%	N	%	N	%	
<18.5 kg/m ²	6	6.7	1	1.4	7	4.3	
18.5–24.9 kg/m ²	34	37.8	18	24.3	52	31.7	
25–29.9 kg/m ²	33	36.7	33	44.6	66	40.2	
30–34.9 kg/m ²	10	11.1	16	21.6	26	15.9	
>35 kg/m ²	7	7.8	6	8.1	13	7.9	

Table 3. The distribution of BMI of the study population by education

BMI	University education		Non-university education (primary, secondary, vocational)		Total		p>0.05
	N	%	N	%	N	%	
<18.5 kg/m ²	5	4.9	2	3.3	7	4.3	
18.5–24.9 kg/m ²	38	36.9	14	23	52	31.7	
25–29.9 kg/m ²	39	37.9	27	44.3	66	40.2	
30–34.9 kg/m ²	12	11.7	14	23	26	15.9	
>35 kg/m ²	9	8.7	4	6.6	13	7.9	

As many as 71.3% of respondents engaged in physical activity. 52.4% reported exercising 1–3 times a week, 12.2%: 4–5 times a week, and 6.7% daily. The most frequently chosen forms of physical activity are walking and Nordic walking (women 47.8%, men 29.7%, higher education 33%, non-higher education 50.8%). The least frequently chosen sports discipline is aerobics (women 12.2%, men 0%, higher education 7.8%, other than higher education 4.9%).

The observed differences for the breakdown by sex turned out to be statistically significant – $p<0.001$, $\chi^2=22.03$ (Table 4).

The observed differences for the breakdown by education turned out to be statistically significant – $p < 0.05$, $\chi^2 = 14.839$ (Table 5).

Table 4. Preferred physical activity depending on gender

Preferred physical activity	Women		Men		Total	
	N	%	N	%	N	%
Walking, Nordic walking	43	47.8	22	29.7	65	39.6
Running	14	15.6	15	20.3	29	17.7
Swimming	14	15.6	19	25.7	33	20.1
Cycling	18	20	19	25.7	37	22.6
Gym	16	17.8	16	21.6	32	19.5
Aerobic	11	12.2	0	0	11	6.7
Joga/pilates	11	12.2	1	1.4	12	7.3
Other	14	15.6	24	32.4	38	23.2

$p < 0.001$
 $\chi^2 = 22.03$

Table 5. Preferred physical activity depending on education

Preferred physical activity	University education		Non-university education (primary, secondary, vocational)		Total	
	N	%	N	%	N	%
Walking, Nordic walking	34	33	31	50.8	65	39.6
Running	21	20.4	8	13.1	29	17.7
Swimming	26	25.2	7	11.5	33	20.1
Cycling	21	20.4	16	26.2	37	22.6
Gym	26	25.2	6	9.8	32	19.5
Aerobic	8	7.8	3	4.9	11	6.7
Joga/pilates	9	8.7	3	4.9	12	7.3
Other	28	46	10	16.4	38	23.2

$p < 0.05$
 $\chi^2 = 14.839$

Among the surveyed, smokers accounted for 37.8%. Among women, 36.7% smoked, and among men 39.2% smoked. The observed differences turned out to be statistically insignificant – $p > 0.05$ (Figure 6).

Among the respondents with higher education, smokers accounted for 28.2%, and among the respondents with education other than higher education 54.1%. The observed differences turned out to be statistically significant – $p < 0.001$, $\chi^2 = 10.966$ (Figure 7).

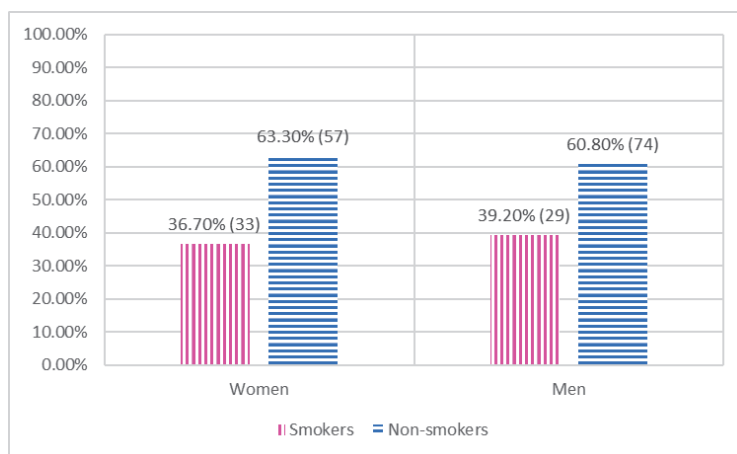


Figure 6. Smoking among the respondents according to gender

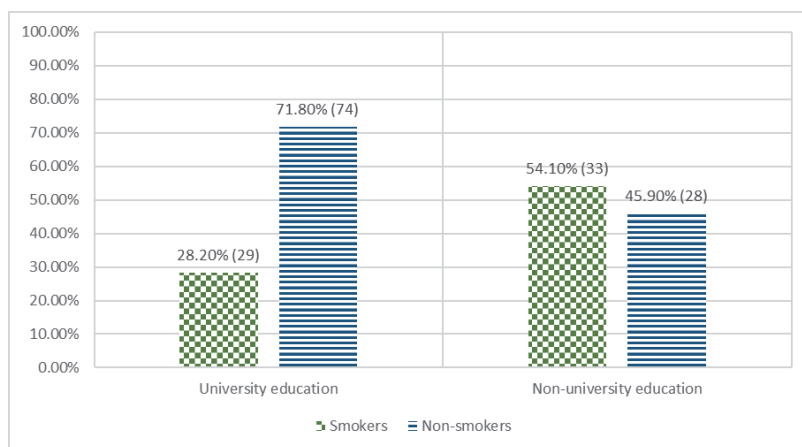


Figure 7. Smoking among the respondents depending on their education

Discussion

Modifiable cardiovascular risk factors include smoking, hypertension, diabetes, and dyslipidemia (hypercholesterolemia, atherogenic dyslipidemia, triglyceridemia). In order to prevent illness and consequent death, it is necessary to treat the aforementioned diseases and to carry out activities promoting a healthy lifestyle. The patient should have the knowledge and awareness to minimize their risk factors. According to the annual congress of the European Association of Preventive Cardiology (EAPC), cardiovascular risk should be a cross-cutting issue – cardiology, primary health care, epidemiology, social sciences and closely linked to lifestyle [8]. Prophylactic follow-up should be promoted as many patients are unaware of dyslipidemia or diabetes, as they often remain asymptomatic. In the population of Lodz patients, a high percentage of people who do not know about the occurrence of dyslipidemia was observed, both among women and men, as well as among patients with higher and non-higher education. A 2020 study in Sarajevo found that knowledge of the metabolic syndrome and clinical and laboratory findings did not differ significantly between educated and uneducated patients. There was also no difference between gender and age [9]. Among the inhabitants of the Lodz Voivodeship, there was a considerable percentage of patients with visceral obesity (based on a high waist circumference), especially among women. In the American study from 2022, even though widespread, knowledge of cardiovascular disease and perception of risk factors among women remained low [10]. In the population of Lodz, there is a high percentage of patients diagnosed with hypertension, especially among the group of people aged 51–60. According to another study conducted in Poland in 2018, the incidence of hypertension is high and has increased by about 12% within 10 years. Although the number of patients treated and blood pressure control have almost doubled over the past decade, this is still below expectations [11]. A groundbreaking study conducted by the Prospective Studies Collaboration in 2002 collected cohort data from almost one million adults aged 40–89 to assess the association between blood pressure and the risk of cardiovascular death. Researchers found that, on average, for every 20 mm Hg higher than normal SBP or 10 mm Hg higher than normal DBP of 115/75 mm

Hg, there was a doubling of the risk of ischemic heart disease or death due to stroke [12, 13]. Smoking is common among both women and men and is more common among residents with non-university education. According to WHO estimates, more than one billion people smoke tobacco worldwide [14]. A study conducted in March 2022 showed a high prevalence of tobacco and e-cigarette use among adults in Poland. Age, having children, and educational attainment were significantly related to current daily smoking [15]. When it comes to diabetes, type 2 is the most common type among the inhabitants of Lodz, as well as worldwide. Cardiovascular diseases (CVD) are the main cause of morbidity and mortality among patients with diabetes, whose risk of death from cardiovascular causes is two to four times higher than in people without diabetes [16]. According to a Greek study, it adversely affects the condition of the cardiovascular system of patients, as it causes both macro- and microvascular complications [17]. According to a study on the cardiovascular risk of 188 patients with type 2 diabetes, risk-reducing measures should be particularly targeted at the elderly, those with a long duration of diabetes, poor education, and poor metabolic control [18]. Physical exertion, declared by a significant percentage of inhabitants of the Lodz Voivodeship, is a protective factor against cardiovascular disease. In line with new recommendations, the WHO suggests that adults (18–64 years) should exercise 150–300 minutes per week at moderate intensity or 75–150 minutes at high intensity [19]. Regular physical activity reduces the risk of hypertension, cardiovascular disease, cancer, type 2 diabetes, and premature death. People over 65 should also be active. In the elderly, physical activity helps prevent falls and related injuries, as well as bone weakness and reduced fitness [20]. According to the study, the socioeconomic status of the country also affects the level of cardiovascular risk. Physical activity increased with the country's income, and low-income countries had the lowest incidence of healthy diets [21].

Conclusions

1. The incidence of hypertension in the population of Lodz increased with age.
2. The prevalence of dyslipidemia and visceral obesity, as measured by waist circumference, was independent of gender. Dyslipidemia

occurred more often among inhabitants of the Lodz Voivodeship declaring education other than higher (i.e. secondary, vocational, and primary) than among inhabitants with university education.

3. Most of the inhabitants of the Lodz Voivodeship were physically active. The most frequently chosen forms of physical activity were walking and Nordic walking, and less frequently aerobics.
4. The prevalence of smoking was similar among women and men. Smokers were more likely to be people with non-higher education. Healthcare patients should be educated about the harmful effects of smoking.
5. Measures should be introduced to increase the awareness of the inhabitants of the Lodz Voivodeship about the risk factors of cardiovascular diseases, promote a healthy lifestyle and counteract obesity.

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