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Overweight and obesity among adults in Poland, 1983-2005

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ABSTRACT

Introduction: Overweight and obesity are causes for numerous non-communicable chronic diseases. In recent years their incidence have become a major epidemiological problem both in Poland and many other countries.
Purpose: Evaluation of the current situation of the overweight and obesity prevalence among adults in Poland and changes in this regard in the years 1983-2005.
Material and Methods: Review of the countrywide research and research in selected towns and regions on overweight and obesity occurrence conducted in Poland over the last 20 years.
Results: On the basis of national data for Poland, the incidence of overweight is estimated to be 39-40% among men and 28-29% among women, while the percentage of obese men and women is 16-21% and 19-22% respectively. The incidence of overweight and obesity differs with respect to gender, age, environment, the region of the country and social status. Excessive body weight is often observed in patients treated in hospitals. Abdominal obesity is very common and according to the ATP III guidelines, affects 16-28% of men and 35-40% of women, whereas under more strict IDF criteria it involves almost 40% of adult males and almost a half of adult females.
Conclusions: Results from numerous surveys conducted in the last few years indicate growth of the incidence of overweight and obesity, especially among men. The prevalence of overweight and obesity in Poland is comparable with most European countries.

Key words: epidemiological survey, overweight, obesity, occurrence, adults

INTRODUCTION

Obesity develops, when the energy value of a diet for a relatively long span of life exceeds the amount of energy used for basal metabolism, daily life activity and physical activity related to professional life, recreation or sport [1-3]. Obesity may lead to numerous health hazards, increasing the risk of e.g. cardiovascular diseases, type 2 diabetes, gallstones and cancer [4-6]. Therefore, a systematic evaluation of the nutritional status and incidence of overweight and obesity are of such importance. It allows for establishment of the risk of non-communicable chronic diseases related to improper nutritional status and an evaluation of prevention programmes [7,8].

Numerous surveys, which have evaluated overweight and obesity prevalence among adults, have been conducted in Poland so far [9]. Most of these surveys have covered persons from selected towns or regions of the country. The latest papers also published the results of representative surveys for the entire Polish population.

The aim of this paper was to evaluate the current situation of overweight and obesity occurrence among adults in Poland and changes in this regard in the years 1983-2005, based on a literature review.

REVIEW

Methods of the review

The study reviews research on overweight and obesity incidence among adults in Poland, carried out over the last 20 years. This includes both countrywide surveys and surveys of inhabitants of selected localities or regions of the country.

The analysis covers the following countrywide surveys:
— Surveys carried out within the NATPOL programme in

Table 1. **Overweight and obesity occurrence in Poland on the basis of countrywide research.**

Survey	Year of survey	Sample size	Age range	% overweight		% obesity	
				Males	Females	Males	Females
NATPOL II [10]	1997	1658	18-91	38	30	16	19
NATPOL PLUS [11]	2002	3051	18-94	39	29	19	19
Household Food Consumption and Anthropometric Survey [12]	2000	2825	18-96	41.0	28.7	15.7	19.9
WOBASZ [13]	2003-05	13408	20-74	40.4	27.9	21.2	22.4
Health status of Polish population in 1996 [14]	1996	47924	15 or older	37.6	26.5	10.3	12.4
Health status of Polish population in 2004 [15]	2004	35248	15 or older	39.5	26.6	12.6	12.5
Distribution of Body Mass Index in Poland in 2002 [16]	2002	1000	18 or older	30		14	
Nutrition mode and nutritional status of boys and men in Poland [17]&Nutrition mode and nutritional status of girls and women in Poland [18]	1991	4891	20-59	43.7	27.7	9.2	10.1
Nutritional status of patients hospitalized in Poland [19]	1999-2000	3256	16-100	35.7	32.1	15.9	24.9

1997 and 2002 [10,11];
- Surveys carried out at the National Food and Nutrition Institute (NFNI) in 2000 within the "Household Food Consumption and Anthropometric Survey" project, which covered members of randomly selected households [12];
- The multi-centre nationwide health survey of the population (WOBASZ), carried out as part of the POLKARD programme between 2003 and 2005 [13];
- Health surveys of the population carried out by the Central Statistical Office in 1996 and 2004 [14,15];
- Surveys carried out at the Institute of Oncology in 2002 [16];
- Surveys which covered the population of employees across the country, carried out at the NFNI in 1991 [17,18];
- Surveys of the nutritional status of patients in hospitals, carried out within the project titled "Development of the scientific basis for hospital nutrition" between 1999 and 2000 [19].
- The analysis also covered the following surveys carried out in selected towns or regions in Poland:
- Surveys carried out within the Pol-MONICA and Pol-MONICA Bis projects among the citizens of right-bank Warsaw and the former Tarnobrzeg Voivodeship in 1983/84 and in 2001 [20-23];
- Surveys of economically active citizens of Wroclaw. Data were collected between 1983 and 1999 [24];
- Surveys of men from the Podlasie region, carried out between 1987 and 1989 and between 1996 and 1998 [25];
- Surveys carried out within the CINDI-WHO programme among the citizens of Lodz in 1991 and in 2001 [26];
- Population surveys carried out between 1998 and 2001 among the inhabitants of rural and urban areas in the Lubelszczyzna region [27];
- Surveys carried out between 2000 and 2002, which covered inhabitants of the Katowice agglomeration [28];
- Pilot studies carried out in 2003 prior to the launch of the Polish 400 Cities Project (PP400M) in 8 small towns in the Pomeranian, Lesser Poland and Greater Poland Voivodeships [29].

In the majority of the surveys analysed, the occurrence of overweight and obesity was evaluated on the basis of anthropometric measurements: height and weight [10-13,17-29]. In surveys carried out by the Central Statistical Office and the Institute of Oncology, the anthropometric data were obtained on the basis of survey participants' self-assessment [14-16].

The data on height and weight served to calculate BMI (Body Mass Index). In accordance with the criteria adopted by the WHO, overweight was diagnosed at BMI between 25.0 and 29.9, while obesity at BMI of 30.0 and more [30].

Apart from measuring height and weight, some of the surveys also included measurements of the waist circumference [10-13,29]. Abdominal obesity was diagnosed mostly when the waist circumference was more than 102 cm in men and 88 cm in women, in accordance with the Adult Treatment Panel III (ATP III) guidelines [31]. The authors of the surveys of the NFNI of 2000 analysed the frequency of abdominal obesity incidence in the surveyed population, taking into account the guidelines of the International Diabetes Federation (IDF) of 2005, according to which abdominal obesity is diagnosed when the waist circumference equals or exceeds 94 cm in men and 80 cm in women [32].

Overweight and obesity occurrence on the basis of countrywide research

The main sources of data regarding overweight and obesity occurrence among adults in Poland are the representative surveys for the whole Polish population (*Tab. 1*).

The most complete results are provided by the three surveys conducted during the last years: NATPOL research [10,11], "Household food consumption and anthropometric survey" [12] and WOBASZ research [13]. These surveys include all age groups of adults, with the exception of WOBASZ research, which does not include persons over the age of 74.

The NATPOL research investigated mainly the frequency and control of hypertension, however in 1997 and 2002 it included also some risk factors of hypertension, among others overweight and obesity occurrence [33]. In 1997, overweight was determined in 38% and 5 years later in 39% of males [10]. Among females, overweight was observed in 30% and 29% respectively. Obesity in 1997 was noted as 16% of men and 19% of women; while in 2002, in 19% of respondents, regardless of their gender.

The results of the NATPOL study show that over the period of 5 years (1997-2002), there were no significant changes in the incidence of overweight and obesity [11]. Attention should be drawn to the fact that the percentage of obese men in 2002 was 3 percentage points higher than 5 years earlier.

The occurrence of overweight and obesity increased with age. In 2002 the percentage of obese men and women at age 18-30 was 5%, with as much as 31% over 65 years of age. There was an increase in obesity incidence from 19% in the youngest group to 42% in individuals between 45-64 years of age, with a slight decrease in the oldest group.

Only 39% of those surveyed in 1997 and 37% of those surveyed in 2002 were aware of their overweight or obesity. The majority of them were women. In the 2002 studies, there was a 9-percentage-point difference between incidence of excessive body weight on the basis of self-evaluation and measurements in women, with a 26-percentage-point difference in men. Moreover, the authors showed better awareness in this respect in younger, better educated and well-off persons from large cities.

Abdominal obesity based on waist circumference (ATP III criteria) was determined in 19% of men and 34.9% of women in 2002.

Another representative survey - "Household food consumption and anthropometric survey" was carried out in 2000 in the National Food and Nutrition Institute (NFNI) [12]. Results of the survey show that the percentage of overweight males amounts to 41.0%, and overweight females to 28.7%. In the 19-29 age group, 27.6% of men were overweight, while in the 50-59 age group, this percentage amounted to as much as 47.1%. Overweight women in the youngest age group amounted to 11.3%, and 35.6% in the 50-59 age group. In both populations the percentage did not change significantly in the 60+ group.

Obesity was observed in 15.7% of males. A small percentage of men (0.3%) had extreme obesity. 19.9% of females were obese, while 1% showed extreme obesity. In older age groups, the incidence of obesity increased. In the 20-29 age group, 4.3% of men were obese, while in the 50-59 age group, this percentage amounted to as much as 25.3%. For women, the increase was even more evident: from 3.4% in the 19-29 age group to 37.2% in the 60+ age group.

The prevalence of overweight and obesity differs also with respect to the place of residence, especially in the male population. The overweight incidence in men living in urban areas was 43.2%, with obesity incidence amounting to 16.2%. These rates were lower in rural areas and amounted to 37.6% and 14.8% respectively. The overweight incidence in females was similar in both environments, 29.0% in the city and 28.1% in the country. However, obesity prevalence was higher in women living in rural (23.5%) than in urban area (18.0%). It should be underlined that the most visible difference in the distribution of overweight and obese men and women in urban and rural population was shown in the group of individuals over 50 years of age.

Abdominal obesity was estimated on the basis of waist circumference, according to ATP III and IDF criteria. According to ATP III criteria waist circumference indicating abdominal obesity was observed in 15.8% of men [9]. In the case of women abdominal obesity was observed in 35.6%. This percentage increased significantly in subsequent age groups. In the case, where the calculations were made in consideration of the IDF guidelines, the percentage of persons with abdominal obesity was much higher: 38.7% in men and 55.8% in women.

The WOBASZ project, realised in the years 2003-2005, covered the whole of Poland represented by 16 voivodeships [33]. The aim of the project was to assess the global cardiovascular risk of the Polish population and the level of particular risk factors, among others the overweight and obesity prevalence. Among men overweight was observed in 40.4% of respondents, obesity in 21.2% (in 0.6% - extreme obesity) [13]. Excessive body weight was present mostly in the Masovian Voivodeship (65.8%), while the least number of cases in the Lublin Voivodeship (55.2%). Overweight was stated in 27.9%, and obesity in 22.4% of women. Extreme obesity was observed in more women than men – 2.2% of respondents. Excessive body weight was present among women mostly in the Masovian Voivodeship (56.8%), while the least number of cases in the Lower Silesian Voivodeship (46.3%).

The incidence of abdominal obesity evaluated on the basis of waist circumference in accordance with ATP III guidelines, amounted to 28.3% for men and 40.4% for women.

Comparison of the results of representative surveys carried out in the National Food and Nutrition Institute [12] and under the NATPOL [10, 11] and WOBASZ [13] projects regarding overweight and obesity incidence among males may indicate a growing incidence in this population. In 1997, excessive body weight was observed in 54% of men (NATPOL) in 2000 – in 56.7% (NFNI), in 2002 – in 58% (NATPOL) and in 2003-2005 – in 61.6% (WOBASZ). On the other hand, the incidence of overweight and obesity in women showed no significant changes over the last few years.

Results of the WOBASZ [13] research indicate greater incidence of abdominal obesity than the results obtained by the National Food and Nutrition Institute [9] or NATPOL research [11]. It is difficult to clearly determine the reason behind the difference. It may result from various age ranges of individuals taking part in the study, accuracy and conditions of taking measurements, or other factors.

Overweight and obesity prevalence in the population of the entire country was estimated in a study conducted by the Central Statistical Office (CSO) in 1996 and 2004 [14, 15] and by the Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology in 2002 [16]. In contrast with the above-mentioned study, no anthropometric measurement was taken, with the BMI calculated on the basis of the data obtained from the respondents. The data were not verified in any control measurements, so it may be assumed that weight was underestimated, especially in women, whereas height overestimated.

The results of the study performed by the CSO in 1996 showed overweight in 37.6% and obesity in 10.3% of men [14]. Eight years later these results increased to 39.5% and 12.6% respectively [15]. In 1996, the overweight rate in women was 26.5%, whereas in 2004 it was 26.6%. The obesity rates were 12.4% and 12.5% respectively. It should be noted that these results indicate lower overweight and obesity prevalence than the surveys discussed above, probably due to underreporting. As mentioned previously, it most likely resulted from a tendency to underestimate the actual body weight or from using out-of-date measurements. This is confirmed by the results obtained by the authors of the NATPOL study showing that a significant number of respondents are unaware of their overweight or obesity [10,11].

The CSO data from the period of 1996-2004 shows a slight increase in overweight and obesity rates in males, with no change in the overweight and obesity rates in females [14, 15]. This is confirmed by comparing results of the NFNI [12], NATPOL [10,11] and WOBASZ [13] studies.

Also data from the Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology in 2002 could underestimate the overweight and obesity occurrence [16]. The information provided by the published paper shows the total incidence of overweight and obesity both in men and women, with the overweight rate amounting to 30% and obesity rate 14%.

The above countrywide surveys describe the epidemiological situation of overweight and obesity among adults in the recent few years, and potential changes in that regard at the end of 1990s. In order to evaluate the change in occurrence of overweight and obesity in the 1990s, results of the research conducted by the NFNI in 2000 [12] were compared with results obtained by the same institute in 1991 [17,18], which took into account persons aged 20-59.

This comparison shows that among men, the percentage whose BMI was too high (overweight and obesity) in 1991 was lower (52.9%) than the one observed in 2000 (54.8%) in the same age group. In the light of the data from 1991, the rate of obesity was much higher in 2000: in 1991 obesity was identified in 9.2% of males, while in 2000 in 14.9%. On the other hand, respondents in 2000 were much less frequently overweight – 39.9% than the men in 1991 – 43.7%.

As was the case for men, the women younger than 60, examined in 2000, also showed excessive body weight more frequently – 41.3%, than in 1991 – 37.8%. Overweight incidence in 2000 amounted to 26.6% and was slightly lower than in 1991 – 27.7%. Significant changes were observed in regard to the rate of obesity; in 2000 14.7% of women were obese, while in 1991 – 10.1%.

The above comparison allows us to determine with high probability that in the 1990s the overweight and obesity occurrence among adults in Poland increased. The growth of the obesity values is particularly alarming.

High frequency of overweight and obesity is confirmed by the study of the hospital population [19]. In the years 1999-2000, overweight occurred in 35.7% of men and 32.1% of women treated in hospitals and obesity respectively in 15.9% and 24.9%. It seems to suggest that overweight or obesity could have influence on the development of diseases, being the cause of hospitalization.

Overweight and obesity occurrence on the basis of research in selected towns and regions of Poland

In Poland, numerous surveys on nutritional status were carried out in selected towns or regions of the country (*Tab. 2*). Pol-MONICA and Pol-MONICA Bis surveys must be mentioned here most of all. These surveys were carried out in the years 1983-2001 among the residents of Warsaw and the former Tarnobrzeg Voivodeship [20-23]. In 2001, research covered persons aged 20-74 years. In Warsaw, overweight was diagnosed in 44.3% of men and 31.0% of women, and obesity in 28.1% of men and 29.1% of women [22]. Extreme obesity among men was rare (0.7%), while for women it was much more frequent (2.8%). In the former Tarnobrzeg Voivodeship, the percentage of overweight men amounted to 45.6%, and of overweight women – 33.0% [23]. Obesity was diagnosed in 19.7% of men and 28.5% of women. Mostly women suffered from extreme obesity (3.3%), among men such obesity was diagnosed in a few cases (0.6%).

In 1984, in the Warsaw population, overweight was noted in 48.9% of men aged 35-64 years, while obesity in 18.6% [20]. In 2001, percentage of overweight and obese men increased. Similar observations were made in the former Tarnobrzeg Voivodeship. In the years 1983-1984, overweight was found in 40.2% of urban and in 53.4% of rural males aged 35-64 years, while obesity in 12.3% and 15.9% respectively [21]. In 2001 the percentage of obese in the same age group increased.

Different tendencies were observed for women. In Warsaw in 1984 39.2% of women aged 35-64 years were overweight, while 28.0% were obese [20]. In 2001 the incidence of overweight decreased, while the incidence of obesity remained at a similar level. The prevalence of overweight also lowered in the former Tarnobrzeg Voivodeship in the period of 1983-2001. In the period of 1983-84 that irregularity was found in 40.4% of urban and 44.9% of rural females aged 35-64 years [21]. Obesity occurred in 30.6% of women in urban areas and in 25.9% in rural areas and these percentages were similar to those observed in 2001 in the same age group.

Table 2. **Overweight and obesity occurrence in selected towns or regions in Poland.**

Survey	Town or region	Year of survey	Sample size	Age range	% overweight		% obesity	
					Males	Females	Males	Females
POL-MONICA [20]	Warsaw	1984	2646	35-64	48.9	39.2	18.6	28.0
POL-MONICA [21]	former Tarnobrzeg Voivodeship	1983-84		35-64	40.2 (urban) 53.4 (rural)	40.4 (urban) 44.9 (rural)	12.3 (urban) 15.9 (rural)	30.6 (urban) 25.9 (rural)
POL-MONICA BIS [22]	Warsaw	2001	1370	20-74	44.3	31.0	28.1	29.1
POL-MONICA BIS [23]	former Tarnobrzeg Voivodeship	2001	1186	20-74	45.6	33.0	19.7	28.5
Overweight and obesity in urban population of Poland in 1983-1999 yrs [24]	Wroclaw	1983-99	34762	21-60	23-33 (21-30 y) 43-46 (31-40 y) 46-52 (41-50 y) 48-57 (51-60 y)	9-18 (21-30 y) 20-30 (31-40 y) 34-38 (41-50 y) 39-46 (51-60 y)	2-6 (21-30 y) 6-12 (31-40 y) 13-19 (41-50 y) 14-22 (51-60 y)	2-9 (21-30 y) 5-17 (31-40 y) 12-30 (41-50 y) 21-43 (51-60 y)
Overweight and obesity and their determinants among men from Podlasie region in the years 1987-1998 [25]	Podlasie region	1987-89 1996-98	556		48.2 50.7		14.6 22.5	
CINDI-WHO [26]	Lodz	1991 2001	1879 1842	18-64 18-64	37.7 41.0	32.6 26.9	13.5 16.4	21.2 16.9
'New detected' obesity in population of Lubelszczyzna – results of survey on self-estimation of weight [27]	Region of Lubelszczyzna	1998-2001	3782	35 or older	41.6 (urban) 37.4 (rural)	32.5 (urban) 33.4 (rural)	26.1 (urban) 20.5 (rural)	33.5 (urban) 38.9 (rural)
Adipose tissue and the body mass index in adults [28]	Katowice, Sosnowiec	2000-02	3359	30-72	45.5	35.5	20.8	25.8
PP400M – pilot study [29]	Pomeranian, Lesser Poland & Greater Poland Voivodeships	2003	5171	18-92	46.4	38.9	27.3	28.0

No significant changes were noted in the incidence of overweight and obesity in the years 1983-1999 among Wroclaw residents aged 21-60 years [24]. Still, the overweight and obesity occurrence varied significantly between social groups. The highest percentage of persons with excessive body weight was in the physical workers group (from 38% to 70% among men and from 27% to 83% among women, depending on age group), the lowest was in the group of intellectuals (25-71% among men and 11-60% among women).

The increase in incidence of excessive body weight among men was observed in Podlasie between 1987 and 1998 [25]. In the period of 1987-1989, 48.2% of respondents were overweight, while 14.6% were obese. In the years 1996-1998, these values were 50.7% and 22.5% respectively.

The direction of changes observed by the authors of the research carried out under the CINDI-WHO programme, among 18-64 years old residents of Lodz in 1991-2001, [26] was similar to those found in Pol-MONICA and Pol-MONICA Bis surveys [20-23]. Among men, the percentage of overweight respondents in the period analyzed increased from 37.7% to 41.0%, while the percentage of obese respondents grew from 13.5% to 16.4%, with an upward tendency observed in all age groups. Among women, though, the incidence of excessive body weight decreased from 32.6% to 26.9% for overweight, and from 21.2% to 16.9% for obesity. These positive changes were noted mainly in the group aged 35-54.

The surveys carried out between 1998 and 2001 in the region of Lubelszczyzna provide information on the incidence of overweight and obesity both in the urban and rural population [27]. The respondents included individuals over 35 years of age.

Overweight incidence was 41.6% in men from urban areas and 37.4% of men in rural areas. The obesity rates were also higher in the urban population (26.1%) than in the rural population (20.5%). The overweight incidence amounted to 32.5 among women living in the city and 33.4 among the women living in the country. The most visible difference was noted between the obesity rate in women living in the city

(33.5%) and those living in the country (38.9%). The high incidence rates of excessive body weight may result from the age range of respondents.

It should be noted that the differences between the overweight and obesity rates in the urban and rural areas of the Lubelszczyzna region [27] were similar to the differences observed by the authors of the countrywide study performed in 2000 by the National Food and Nutrition Institute [12]. Both studies showed higher incidence of overweight and obesity in men living in the city, with similar incidence of overweight in women from both populations and higher incidence of obesity in women living in the country.

Research on the overweight and obesity prevalence was also carried out in the Katowice agglomeration in the years 2000-2002 [28]. Among men, the incidence of overweight amounted to 45.5%, and for obesity – 20.8%. Among women overweight was diagnosed in 35.5% of respondents, while obesity in 25.8%.

The source of information on the incidence of overweight and obesity among the residents of small cities are the results of pilot studies performed according to the Polish 400 Cities Project (PP400M) [29]. The surveys were performed in 8 small towns in the Pomeranian, Lesser Poland, and Greater Poland Voivodeships in 2003. The respondents included men and women aged 18 to 92, with the majority of subjects above 40 years of age. Two thirds of the respondents had excessive body weight. The incidence of overweight was significantly higher in men (46.4%) than in women (38.9%), with similar obesity rates in both populations (27.3% and 28.0% respectively).

The measurement of the waist circumference (according to the ATP III criteria) showed abdominal obesity in 43.1% of respondents, with a significantly higher rate in females (48.3%) than in males (32.4%).

Higher incidence rates of overweight and obesity in residents of small cities in comparison with other data could result from the age range of the respondents. The mean age in this population was 55.6, and it was significantly higher than in the representative sample from the 2002 NATPOL study (avg. age of 45) [11].

A comparison of the results of research covering persons from selected towns or regions confirms the occurrence of regional differences in the incidence of excessive body weight in Poland, observed by the authors of the WOBASZ survey [16]. Research carried out in Warsaw and Podlasie show higher occurrence of overweight and obesity in these regions – the especially high percentage of obese men in Warsaw draws particular attention [22,25]. The surveys of Lodz residents show that excessive body weight in this city is rarer than in other towns or regions in Poland, which were examined [26].

Results of the research carried out in selected towns and regions of the country are not unambiguous regarding tendencies in overweight and obesity prevalence in Poland. In Warsaw, Lodz, and former Tarnobrzeg Voivodeship an increase in the incidence of overweight and obesity was observed for men and a decrease for women [20-23, 26]. The overweight and obesity occurrence shows an upward tendency also among men living in Podlasie [25]. In Wroclaw, on the other hand, no significant changes were observed for either gender in that regard [24].

Table 3. **Overweight and obesity occurrence in selected countries [34].**

Country	% overweight		% obesity	
	Males	Females	Males	Females
Argentina	35.7	27.9	37.4	37.8
Australia	43.7	33.6	28.4	29.1
Belarus	47.5	37.7	16.2	32.2
China	29.0	21.1	4.1	3.6
Cyprus	40.3	35.9	11.4	24.7
Denmark	40.5	30.8	12.0	8.3
Estonia	42.1	25.4	8.6	8.4
Finland	44.0	33.0	20.9	19.4
France	36.6	27.1	9.0	7.6
Germany	42.2	33.0	22.9	22.1
Greece	45.4	34.9	30.3	26.4
Italy	38.3	24.6	14.4	13.7
Japan	24.7	17.0	2.3	1.1
Malta	43.3	29.6	28.1	36.5
Mexico	38.3	26.9	30.1	41.0
New Zealand	39.8	28.3	28.9	39.9
Poland	37.8	26.3	12.9	18.0
Romania	32.2	28.6	5.5	12.0
Russian Federation	36.9	28.1	9.6	23.6
Slovakia	40.0	35.3	12.0	25.3
Slovenia	42.1	35.9	13.9	27.6
South Africa	31.7	30.4	7.6	36.8
Ukraine	33.8	29.1	7.4	19.4
United Kingdom	42.0	35.6	23.7	26.3
United States	31.4	24.3	44.2	48.3

Comparison of the incidence rates of overweight and obesity in Poland to those in selected countries in Europe and around the world

In recent years the World Health Organization has collected data on the incidence of chronic non-communicable diseases and their risk factors. The database also includes information on the incidence of overweight and obesity in particular countries taking into account adults above 15 years of age (*Tab. 3*) [34].

The countries with the greatest overweight and obesity incidence in Europe are Malta, Greece, the UK and Belarus. In Malta the excessive body weight was observed in 71.4% of men and 66.1% of women, with 75.7% and 61.3% in Greece respectively, 65.7 % and 61.9% in the UK, and 63.7% and 69.9% in Belarus. A high percentage of overweight and obese men was also noted in Germany (65.1%), Finland (64.9%), with a high percentage of overweight and obese women in

Slovenia (63.5%), as well as Slovakia and Cyprus (60.6%).

Among all the European countries included in the comparison, the lowest overweight and obesity rates were noted among males in Romania (37.7%), Ukraine (41.2%), France (45.6%) and Russia (46.5%). The countries with the lowest overweight and obesity rates for females included Estonia (33.8%), France (34.7%), Italy (38.3%) and Denmark (39.1%).

Among the countries outside of Europe, there is a significant number of obese and overweight people in the USA, with an excessive body weight in 75.6 % of men and 72.6% of women. Other countries with high overweight and obesity rates are Argentina, Mexico, Australia and New Zealand. Attention should also be drawn to South Africa, where the incidence of overweight and obesity in men was much lower than in women. The countries with low overweight and obesity rates are Japan and China.

According to the data of the World Health Organization, the incidence of obesity and overweight in Poland among individuals above 15 years of age was 50.7% in men and 44.3% in women. These rates are lower than the results in the representative sample of the country-wide survey presented before, however, those survey did not include respondents below 18 years of age, in whom overweight and obesity rates are lower [10-13]. In comparison with other countries, the incidence of overweight and obesity in Poland should be considered moderate.

Authors of the review on obesity prevalence published in 2008 showed Poland as one of the countries with the highest obesity prevalence in Europe (i.e. greater than 25%) [35]. That review included 2 sources of data from Poland: Pol-MONICA study from 1992-1993 conducted in the former Tarnobrzeg Voivodeship among persons aged 35-64 and HAPIEE study carried out in 2002-2005 among the citizens of Cracow aged 45-64. The older ages of these studied groups influenced the higher obesity prevalence among them than in populations from many other countries, for which surveys included younger persons. It seems the review overestimated the obesity occurrence in Poland. Countrywide surveys cited in this paper showed lower obesity rates than the Pol-MONICA and HAPIEE studies considered in the review.

For the reason mentioned above, the WHO database probably gives a better comparison between European countries in this regard. According to this data, Poland is not one of the countries with the highest incidence of these abnormalities, however, obesity and overweight prevalence in many other countries is lower.

CONCLUSIONS

Results of the research on nutritional status in recent years show that overweight and obesity are a serious epidemiological problem in Poland.

According to the data obtained in representative surveys in the entire country, excessive body weight is observed in approximately 60% of adult men and in approximately 50% of adult women. The incidence of overweight among men is estimated to be 39-40% and 28-29% among women, while the percentage of obese men and women is 16-21% and 19-22% respectively. High prevalence of overweight and obesity in Poland is confirmed by the research covering the hospital population and the residents of various towns and regions of the country.

The percentage of overweight and obese adults grows significantly with age. In the case of elderly people, the incidence of excessive body weight, particularly obesity, is much higher in women that in men. Moreover, some women, particularly those over 40, suffer from extreme obesity, which is rare in men.

The incidence of overweight and obesity varies with respect to the place of residence: the environment and the region of the country. Among males overweight and obesity are more common in urban areas while among females – in rural areas. The highest incidence rates of overweight and obesity, both in men and women, are in the Masovian Voivodeship.

Another factor that has an effect on the incidence of overweight and obesity is social status. Overweight or obesity are more often observed in people with a secondary and vocational education than in those with a higher education.

Among adult Poles, especially women, abdominal obesity is quite frequent. It is diagnosed in 16-28% of men and 35-40% of women (in accordance with the ATP III guidelines), and when more rigid criteria are applied (IDF guidelines) it may refer to as much as 39% of men and 56% of women.

Over the 1990s, the percentage of overweight and obese persons increased significantly. In the last few years, however, this negative tendency seems to be reversing in the female population. Among men, the prevalence of excessive body weight is still increasing, but the rate of this increase is much slower.

The problem of overweight and obesity is serious in many countries. Europe shows particularly high incidence of these abnormalities, especially in Greece, Malta, the UK, Germany and Belarus. As for the countries outside Europe, it is mainly the USA, Canada, Australia and New Zealand.

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