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Prevalence of obesity among the inhabitants of South Bohemia

Częstość występowania otyłości wśród mieszkańców Kraju Południowoczeskiego

Abstract:

Lifestyle diseases constitute a group of diseases whose prevalence has constantly risen since the 1960s. They are closely associated with lifestyle. The modifiable risk factors that include, for example, eating behaviour, leisure-time activity, physical activity and exposure to stress contribute significantly to that trend. The fact that most of the factors are modifiable underlines the importance of primary and secondary prevention. Overweight, obesity and cardiovascular diseases are diseases that should be paid particular attention. The reason consists in the significant increase in their prevalence and the serious consequences connected with those illnesses. According to the data from the European Health Interview Survey (EHIS), 54% of the adult population of the Czech Republic are overweight. From that number, 17% of the population suffer from obesity [3]. Similar results are presented also by the conclusions of the Health Interview Survey published in January 2011. There is a significant shift in the trend to lower ages [5]. The severity of the consequences of an increasing prevalence of cardiovascular diseases is demonstrated by the fact that every year in the Czech Republic about 600 individuals out of 100 000 inhabitants die as a result of them. That constitutes more than 50% of all deaths [1]. This article draws attention to the results of an investigation carried out within the activities of the Prevention Centre in 2011-2012 that examined a total of 346 people over 18 years of age, 267 of them females and 79 males. The values of blood glusase and cholesterol from peripheral blood, blood pressure, height and weight were observed. Also the BMI value and total amount of body fat were measured using the Omron Body Fat Monitor. This device allows the measuring of the total amount of body fat based on bioelectrical impedance.

Streszczenie:

Choroby cywilizacyjne stanowią grupę chorób, których częstość występowania od lat 60. XX wieku stale wzrasta. Są ściśle powiązane ze stylem życia. Modyfikowalne czynniki ryzyka, które przykładowo obejmują nawyki żywieniowe, sposób spędzania czasu wolnego, aktywność fizyczną i narażenie na stres, w sposób istotny wpływają na ten trend. To, że większość tych czynników jest modyfikowalna, podkreśla znaczenie profilaktyki pierwotnej i wtórnej. Należy zwrócić szczególną uwagę na nadwagę, otyłość i choroby sercowo-naczyniowe. Wynika to z istotnego wzrostu częstości występowania oraz poważnych skutków tych schorzeń. Według danych pochodzących z europejskiego ankietowego badania zdrowia ludności (EHIS), 54% dorosłych mieszkańców Czech ma nadwagę. Co więcej, 17% osób należących do tej grupy cierpi na otyłość [3]. Podobne wyniki przedstawiają także wnioski z ankietowego badania zdrowia ludności opublikowane w styczniu 2011 roku. Trend ten uległ istotnemu przesunięciu w kierunku młodszych grup wiekowych [5]. Powagę skutków wzrastającej częstości występowania chorób sercowo-naczyniowych potwierdza fakt, że co roku w Czechach około 600 na 100 000 mieszkańców umiera w ich rezultacie. Liczba ta stanowi ponad 50% całkowitej liczby zgonów [1]. Niniejszy artykuł zwraca uwagę na wyniki badania przeprowadzonego w ramach działalności Ośrodka Profilaktyki w latach 2011-2012, które objęło ogółem 346 osób powyżej 18. roku życia, z których 267 było płci żeńskiej, a 79 – męskiej. Obserwowano wartości stężenia glukozy i cholesterolu we krwi obwodowej, ciśnienia krwi, wzrost i wagę. Mierzono także wartość współczynnika BMI oraz całkowitą ilość tkanki tłuszczowej w organizmie przy użyciu urządzenia do pomiaru tkanki tłuszczowej firmy Omron. Aparat ten pozwala na określenie całkowitej ilości tkanki tłuszczowej w organizmie w oparciu o metodę pomiaru impedancji bioelektrycznej.

Keywords: *lifestyle diseases, overweight, obesity, cardiovascular diseases*

Słowa kluczowe: *choroby cywilizacyjne, nadwaga, otyłość, choroby sercowo-naczyniowe*

Introduction

Overweight and obesity are diseases whose prevalence worldwide has been constantly rising. The incidence of obesity has more than doubled since the 1980s. According to World Health Organization statistics in 2008, more than 1.4 billion individuals over the age of 20 suffer from overweight worldwide. More than 200 million men and nearly 300 million women of that number suffered from obesity. The factors affecting the rising trend mainly include changes in behaviour, in the composition of diet and the imbalance between energy intake and energy expenditure [6]. The classification of Body Mass Index (BMI) is used most often for the basic evaluation of overweight and obesity. The index is defined as the weight in kilograms divided by the height in meters squared (kg/m^2). According to this classification, a normal value constitutes a BMI of 18.5 – 24.9. A value under 18.5 means underweight. Overweight is indicated by a BMI of 25-29.9. That value is also defined as pre-obesity. BMI values over 29.9 already indicate obesity. Obesity is further divided into first degree obesity, which is indicated by a BMI value of 30-34.9, second degree obesity with a BMI value of 35-39.9, and third degree obesity when the BMI value is equal to or exceeds the value of 40 [7]. However, an increasing BMI value is not only used for the determination of overweight or obesity. It also serves as an indicator of the increasing risk of related diseases such as: cardiovascular diseases, diabetes mellitus, degenerative diseases of joints or certain types of cancer [6].

Methods

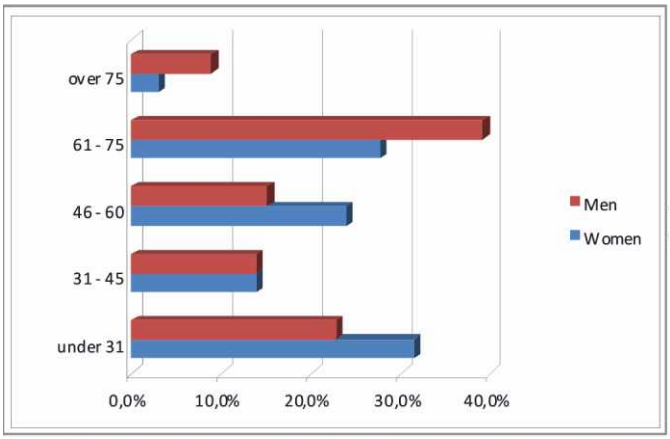
This article is based on the data collected within the activities of the Prevention Centre, which is a common facility of the University of South Bohemia in České Budějovice, the Faculty of Health and Social Studies and the Danone Company. The Centre started its work in 2006 and its activities are focused on the primary and secondary prevention of lifestyle diseases and consultation in the area of maintaining a healthy lifestyle. All services provided are anonymous. The clients are people over 18 years of age. The following data are based on the period 2011-2012 when a total of 346 persons were examined. Out of that number, 267 were females and 79 were males. The values of blood sugar and cholesterol from peripheral blood, blood pressure, height and weight were observed in those persons. The BMI value and total body fat were observed too. The following devices were used for measuring: Omron M3 blood pressure, Omron Body Fat Monitor (Omron BF306) for measuring the total body fat, the digital weight and height measuring device SEGA 730, the sugar device One Touch for glycemic measuring from peripheral blood and Accutrend chol for total cholesterol measurement. All measurements were made in accordance with hygienic-epidemiological principles and the sampling principle as stated by the producer. The recording of the biochemical and anthropometrical values were agreed to by the clients [4].

For this article we have chosen only the most interesting parameters from our results which are connected with the lifestyle diseases, mainly obesity. These parameters were the age of the clients, their height, weight, BMI value and total body fat. The data were subsequently processed using the SPSS program (Statistical Package for the Social Sciences), version 13.1. The chosen parameters were analyzed considering gender stratified samples. We used descriptive statistics for the analysis of categorical data, mainly absolute numbers, frequencies and differences between two groups (men, women) which have been expressed in percentages.

Results

A total of 346 persons were examined in the period of 2011-2012 within the activities of the Prevention Centre. Women prevailed significantly among the clients. A total of 267 (77.2%) women were examined. The number of men was 79 (22.8%). Both groups also differed in age structure (see Graph 1). Among the women, the age categories most frequently represented were those under 31 years of age (31.5%) and those between 61-75 years of age (27.7%). On the other hand, the least frequently represented age category was that of those over 75 (3%). Among the men, the age category of 61-75 years (39.2%) was most frequently represented. The least frequently represented category was that of over 75 years (8.9%).

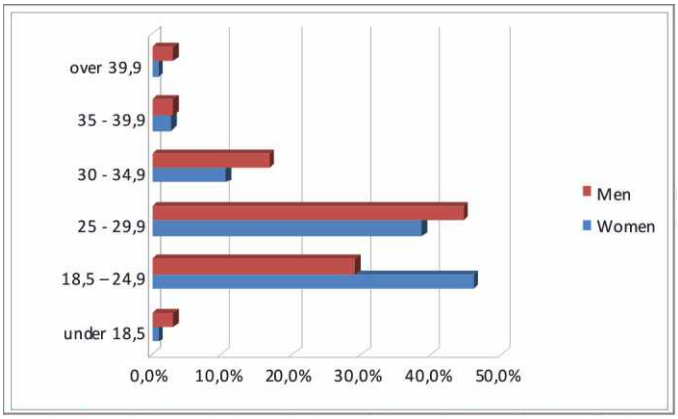
Fig. 1. Age



Age category	Women (N = 267)	Men (N = 79)
under 31 years	31.5%	22.8%
31-45 years	13.9%	13.9%
46-60 years	23.9%	15.2%
61-75 years	27.7%	39.2%
over 75 years	3%	8.9%

The data analysis related to BMI (see Graph 2) and body fat content brought very interesting results. The BMI value of 18.5 - 24.9 was most frequently represented in the sample of women. It was detected in 46% of clients. The second most frequently represented value was a BMI of 25 - 29.9; thus overweight, which was found in 38.8% of women. On the other hand, the prevailing value for men was a BMI of 25 - 29.9. Those values were found in 59.9% of men. Normal BMI values were found in 29.2% of men. That difference is caused to some extent by the age structure of the respondents because the physiological limits change with increasing age, the values also tend to increase [8]. Therefore, the body fat results of both genders were compared. The physiological value of body fat content of women is specified at 30%. That value was found in 21.3% of women. On the contrary, a value over 30% was recorded in 78.7% (N = 267) of women. The physiological value of body fat content of men is specified at 20%. Significantly higher values were found in 78.7% of men (N = 79).

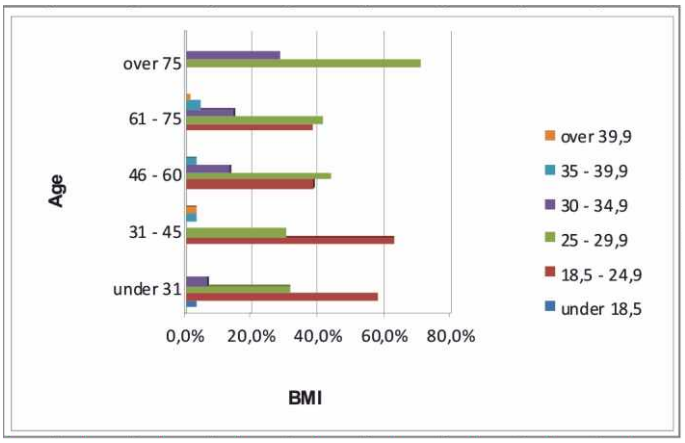
Fig. 2. Body Mass Index



BMI classification	Women (N = 224)	Men (N = 65)
Under 18.5	0.9%	3.1%
18.5-24.9	46%	29.2%
25-29.9	38.8%	44.6%
30-34.9	10.7%	16.9%
35-9.9	2.7%	3.1%
Over 39.9	0.9%	3.1%

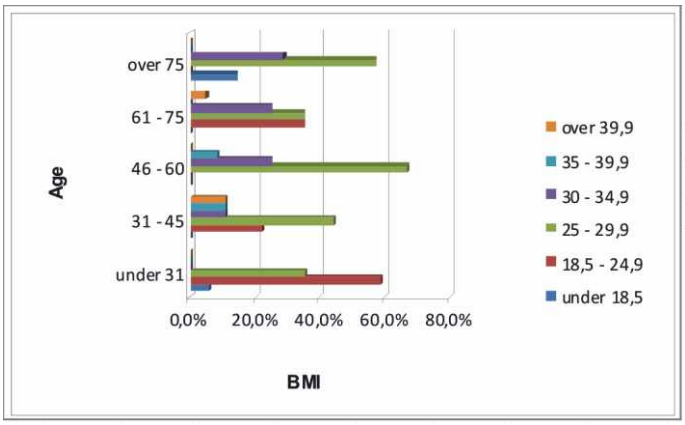
The analysis of the results of BMI values in relation to the age of clients indicates that for women (see Graph 3), the normal value, i.e. BMI of 18.5-24.9 did prevail in lower age categories. On the contrary with the rising age of clients, the BMI value increased too. Overweight (BMI of 25-29.9) predominated already over the presence of a normal BMI value in the age category of 46-60 years. That shift is evident for men too (see Graph 4), the prevailing presence of overweight (BMI 25-29.9) appeared in the age category of 31-45 years, where there is also a noticeably higher incidence of obesity.

Fig. 3. BMI in relation to age – women



Age category	Number of women in age category	Body Mass Index (BMI)					
		Under 18.5	18.5-24.9	25 – 29.9	30 – 34.9	35 – 39.9	Over 39.9
under 31 years	60	3.3%	58.3%	31.7%	6.7%	0%	0%
31-45 years	30	0%	63.3%	30%	0%	3.3%	3.3%
46-60 years	59	0%	39%	44.1%	13.5%	3.4%	0%
61-75 years	68	0%	38.2%	41.2 %	14.7%	4.4%	1.5%
over 75 years	7	0%	0%	71.4%	28.6%	0%	0%

Fig. 4. BMI in relation to age - men

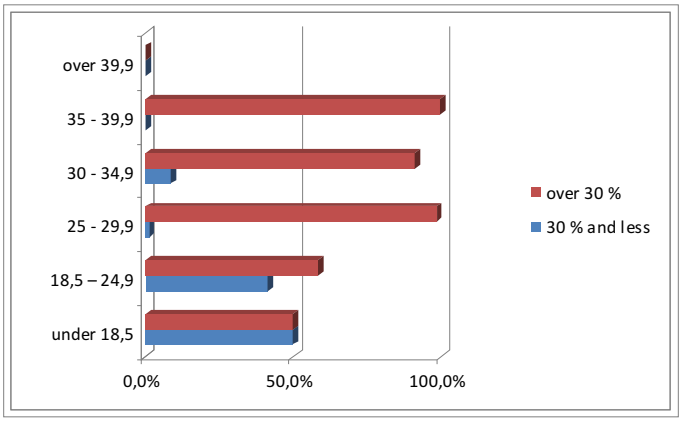


Age category	Number of men in age category	Body Mass Index (BMI)					
		Under 18.5	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	Over 39.9
under 31	17	5.9%	58.8%	35.3%	0%	0%	0%
31-45	9	0%	22.3%	44.4%	11.1%	11.1%	11.1%
46-60	12	0%	0%	66.7%	25.0%	8.3%	0%
61-75	20	0%	35%	35%	25.0%	0%	5%
over 75	7	14.3%	0%	57.1%	28.6%	0%	0%

Body fat content relates very closely with overweight. The values for both genders were therefore compared with the BMI values. The values of women could be compared in

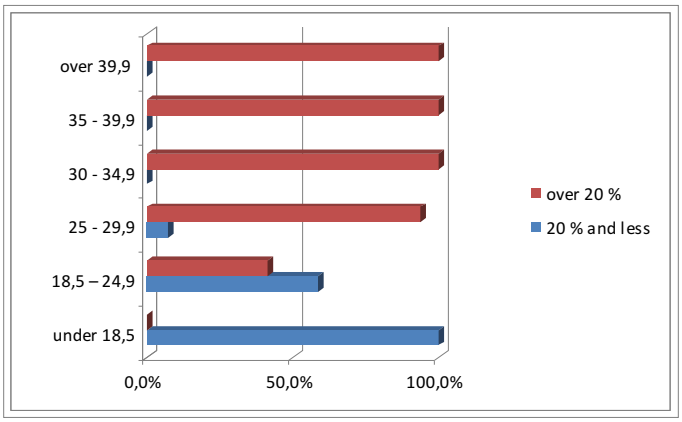
a sample of 203 women (see Graph 5). The findings show that normal BMI was found in 92 women and 58.7% of those women had body fat content over 30%. Significantly higher levels of body fat content were detected in women with a BMI of 25-29.9, 98.8% of whom had a body fat content over 30%. That trend was also very similar for men (N = 61). However in case of a normal BMI of 18.5-24.9, an absolute majority of the 17 men had physiological values of body fat content, i.e., 20% or less (see Graph 6).

Fig. 5. BMI in relation to body fat content – women



BMI classification	Number of women in age category	30% and less	Over 30%
Under 18.5	2	50.0%	50%
18.5-24.9	92	41.3%	58.7%
25-29.9	81	1.2%	98.8%
30-34.9	23	8.7%	91.3%
35-39.9	5	0%	100%
Over 39.9	0	0%	0%

Fig. 6. BMI in relation to body fat content – men



BMI classification	Number of men in age category	20% and less	Over 20%
Under 18.5	1	100%	0%
18.5-24.9	17	58.8%	41.2%
25-29.9	28	7.1%	93.9%
30-34.9	11	0%	100%
35-39.9	2	0%	100%
Over 39.9	2	0%	100%

Limitation of the results

The limitation of the results which are presented in this article is that it presents the data on community based sample of inhabitants living in South Bohemia. This sample of clients was composed only of people who were examined on the basis of their own decision. They were mainly people who have an interest in health or in maintaining a healthy lifestyle. Therefore, these results have an informative character in relation to the prevalence of obesity and they can not suggest that they are representative for the entire population of this region. But we can state that the prevalence of overweight and obesity is comparable to the entire population of the Czech Republic.

Discussion

Overweight and obesity belong to civilization and metabolic diseases with high incidence. A survey of VZP ČR shows that in the Czech Republic a total of 55% of the population suffer from overweight or obesity [2, 5]. Nearly 34% of that number suffer from overweight and 21% from obesity. There is a significant shift in the trend of those diagnoses to lower age groups [2, 5]. Therefore the Czech Republic is high in the rankings of countries with the highest prevalence in the number of people suffering from obesity. The results of our investigation (see Graph 2) also correspond with these data. Overweight or obesity were found in 53.1% of women (N = 224) and 67.7% of men (N = 65). In the sample of women, 38.8% suffered from overweight and 14.3% from obesity. In the sample of men, 44.6% suffered from overweight and 23.1% from obesity.

The comparison of the age of clients and BMI values provided interesting results. Both for women and for men, increasing BMI was evident in relation to the increasing age of clients. The increasing prevalence of overweight is already significant in the age group of 46-60 years for women (see Graph 3), as it was detected in 44.1% of clients. At the same time, an increasing prevalence of obesity was detected in 13.5% of that age category. A similar trend was recorded in older age categories as well. In the case of men (see Graph 4), an increasing number of overweight individuals was already recorded in the age category of 31-45 years. It was detected in 44.4% of

men. The incidence of obesity was significantly increased there as well and that trend was also evident in the following age categories.

The determination of body fat content is also essential for the prevention and evaluation of overweight and obesity. Physiological values are specified at 30% for women and at 20% for men. A significantly higher prevalence of nonconforming values were registered in both groups. Then those values were compared with BMI values. An interesting finding showed that although 92 women had a BMI value of 18.5-24.9, 58.7% of them had a body fat content value higher than 30% (see Graph 5). The number of women for whom a value higher than the physiological value was measured increased with the increasing value of the Body Mass Index. To the contrary, physiological values (i.e., 20% and less) prevailed in the sample of men (see Graph 6) with a BMI value of 18.5-24.9. The increase of body fat content was also related to an increasing BMI.

We can expect that secularization of development, changes in lifestyle, in nutrition habits or in way of spending leisure time will surely belong to the factors that contribute to the increasing number of people suffering from lifestyle diseases in future. Overweight, obesity and commomly related cardiovascular diseases belong to a group of diseases whose prevalence is alarming. The prevalence of these diseases significantly affects the quality of life of the individual, as well as increases financial demands on the health and social care systems. The consequences of these diseases are not limited only to the physical aspect of the individual. They even extend to social and spiritual areas. In view of the fact that modifiable factors contribute significantly to their occurrence, it is necessary to put greater emphasis on effective prevention and on the involvement of the individual in the care provided. So both professionals and the general public must face the challenge of improving care in this area.

Conclusion

Overweight and obesity are very important diseases connected with lifestyle. Following up their prevalence and specifics in this particular region of the Czech Republic may help in planning specific interventions at different levels of prevention. For the future it is very important to plan these interventions according to the requirements and the character of the community.

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Kalendarium Zdrowia

WRZESIEŃ

9 września	**Światowy Dzień FAS**
12 września	**Światowy Dzień Pierwszej Pomocy**
15 września	**Europejski Dzień Prostaty**
21 września	**Światowy Dzień Choroby Alzheimera**
25 września	**Dzień Solidarności z Osobami Chorymi na Schizofrenię**
26 września	**Międzynarodowy Dzień Głuchych**
27 września	**Światowy Dzień Serca**