



HEALTH STATUS OF WOMEN FROM A SMALL AND A BIG TOWN IN POLAND: THE SUBJECTIVE AND OBJECTIVE ASSESSMENT

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ABSTRACT

The way of defining the concept of health varies depending on the age, sex, social position of a person conditioned by place of residence, economic and family situation. The aim of the study was to assess subjective and objective health status of women over 65 living in a small and big town. In the subjective assessment of the nutritional status were the MNA questionnaire used, in the objective assessment was BMI used. Body composition analysis was carried out using the bioimpedance method. Lab tests were made using standard methods. The quantitative assessment of the diet was made using the 24-hour intake method, the results calculated in software Dieta 5. Significantly more often women from Nysa than from Wrocław assessed their health status in comparison with their peers as just as good or better ($p < 0.05$). The BMI value among Nysa women shows the overweight, and among women from Wrocław, obesity. The average content of adipose tissue among all examined women indicated significant fatness of the examined group (36 – 37%). The average energy supply in the food rations of women from Nysa and Wrocław differed statistically significantly and did not meet the accepted norms. In conclusion, we can say that older women from a small city assessed their health as better or as good compared to older women in a large city. The implementation of dietary norms and recommendations in the food rations of the subjects was insufficient. However, women from a small town provided statistically significantly more nutrients in their diets.

Keywords: women; nutrition; BMI; food intake; health

INTRODUCTION

The assessment of health states five main perspectives for the analysis of the term "health": 1) as a lack of disease, 2) as vitality, physical fitness, 3) as beneficial social relations, 4) as a functional disability, and 5) as psychosocial well-being. The way of defining the concept of health varies depending on the age, sex, social position of a person conditioned by place of residence, economic and family situation. Being healthy can also mean broadly understood "good life", as an adaptation of an elderly person to the current life situation, level of isolation, but also social integration (Hervik, 2016). The definition of health becomes particularly important in the case of people over 65, for whom the indicators determining them are significantly different. In a study of 505 people over the age of 65 led by Młynarska and colleagues (Młynarska et al., 2015), it was shown that people over the age of 65 assign the highest-rank claims to "live late in old age", "not get sick, at most rarely get influenza, indigestion", "have functional all parts of the body" and "feel good" and are characterized by an instrumental approach to health. Medical health indicators make it possible to correct self-assessment of one's health with reference ranges, e.g. biochemical parameters compatible with age or human sex. In the last decade, important data on the health condition of

older people in Poland has been presented in the multidisciplinary research project PolSenior (Mossakowska, Więcek and Błędowski, 2012) they are also systematically described in the Central Statistical Office (CSO) research and in the European Health Interview Survey (EHIS). In the PolPAN project from 2008 and 2013, additional health problems were assessed from three groups of ailments: physical, mental and social functioning. Social isolation is a major and prevalent health problem among community-dwelling older adults, leading to numerous detrimental health conditions. With a high prevalence, and an increasing number of older persons, social isolation will impact the health, well-being, and quality of life of numerous older adults now and in the foreseeable future. The POLPAN 50+ report was devoted especially to the health situation of older Polish women. When comparing the percentage of negative health self-assessment in Poland in 2009 and 2014, it should be noted that it decreased in the group of people aged 50 – 59 from 55% to 50%, in the group 60 – 69 from 72% to 65%, and in 70 – 79 group from 85% to 79%. In the group of people aged 80 and more, it increased from 86% to 88% (Piekarzewska et al., 2016). In the division of older people due to the level of education, it was found that poor or very bad self-esteem in the highest percentage was indicated by

people with lower education and this percentage in the group of 50 – 59 year olds was 18%, in the group of 60 – 69 years - 26%, in 70 – 79 years - 39%, and in the group of 80 years and more – 53%. People with secondary education three times more often claimed that their health is bad or very bad than people with higher education (13% vs. 31%). In the older age groups (80+), the percentage of people with health self-assessment as bad and very bad was definitely lower in the case of people with higher education (38%) than the average (47%) and vocational (53%). POLPAN research has shown that the process of aging in older age is different in men compared to women. The sense of health deteriorates in men after the age of 80, and between 60 and 80 years of age declared by respondents, the loss of health is small. At the same time, men feel an improvement in the subjective assessment of their own health and mood. Women, on the other hand, declare a decline in the assessment of their own state of health after the age of 60, and all medical indicators are deteriorating in the medical assessment (Mikucka, 2015).

The aim of the study was to assess subjective and objective health status of women over 65 living in a small town (Nysa, Opole province, 40 thousand inhabitants) and Wroclaw (643 thousand inhabitants).

Scientific hypothesis

Subjective and objective health status of women over 65 living in a small and big town are different. Women from a small city assessed their health as better or as good compared to older women in a large city. Women from a small city provided more nutrients in their diets than women from big city. More often women from small city than big one assessed their health status in comparison with their peers as just as good or better.

MATERIAL AND METHODOLOGY

The criteria for including women in the study ($n = 399$) was age above 65 years of age, psychophysical condition enabling the examination and place of residence (Nysa, Wroclaw). All women participating in the study were informed about the purpose and methodology of the study. Each of them expressed their written consent to carry them out. The study obtained the consent of the Bioethical Commission at the Medical University of Wroclaw (KB309/2008) and at the University of Applied Sciences in Nysa (KB 4/2016). In the subjective assessment of the health status of the surveyed women, the answers to self-assessment questions about their state of health included in the MNA (mini nutritional assessment) questionnaire were used. In the objective assessment of the nutritional status of the subjects, the measurement of mass, body height was used and on this basis the BMI body mass index was calculated, expressed as: body mass (kg)/height (m^2). Body composition analysis was carried out using the electrical bio-impedance method using an analyzer TANITA (Tanita Europe B.V., Amsterdam, Netherland). Lab tests were made using standard methods in the analytical laboratory of selected clinics, and generally accepted ranges of reference values for women of a given age were considered norms (Mahlknecht and Kaiser, 2010). The quantitative assessment of the diet was made using the 24-hour intake method, and the results calculated in the computer program Diet 5 were compared with the current standards developed

by the Institute of Food and Nutrition (IFN) in Warsaw for older women (Jarosz, 2017).

Statistical analysis

The normality of value distribution was checked by Shapiro-Wilk test. Due to the lack of normal distribution of quantitative data, the ANOVA-rank analysis of Kruskal-Wallis test was used. The χ^2 test was used to examine the significance of differences between variables characterizing women from Nysa vs. women from Wroclaw. Statistically significant were the results for which $p < 0.05$ and $p < 0.001$ was calculated. Statistical analysis of the obtained results was made using the Statistica 12.0 computer program by StatSoft, using calculations of mean, min and max values, standard deviation and percentage calculations.

RESULTS

The characteristics of the examined elderly women are listed in Table 1. The survey included 187 women from Nysa (47%) and 212 women from Wroclaw (53%). The structure of the answer to the question regarding health self-assessment in comparison with peers was determined by the place of residence of the surveyed women. Statistically significantly more often women from Nysa than from Wroclaw assessed their health status in comparison with their peers as equally good (respectively 48.7% vs 32.6%) or better (29.9% vs. 14.6%, $p < 0.05$). On the other hand, resident of Wroclaw more often than residents of Nysa claimed that they cannot assess their health condition (27.8% vs. 14.4% respectively) or that it is not as good as in their peers (25.0% vs 7.0%; $p < 0.05$). Most of the women participating in the study had secondary education, however, significantly more often they were Nysa residents than group from Wroclaw (62.0% vs 44.8%; $p < 0.05$). Every fifth respondent had higher education. Statistically significantly more often inhabitants of Wroclaw than Nysa declared primary education (25.4% vs 4.8%; $p < 0.05$). Gross income per capita among respondents was not statistically different in relation to their place of residence. The majority obtained income above 1000 PLN.

Women living in Wroclaw significantly more often than those living in Nysa lived alone (50.9% vs 36.9%; $p < 0.05$), while Nysa resident statistically significantly more often lived with a spouse (49.2% vs 38.7 %; $p < 0.05$). The level of physical activity declared by the examined women depended on the place of residence. Significantly more often women from Nysa than Wroclaw women reported that they were physically active (58.8% vs 41.0%; $p < 0.05$). In turn, significantly more often the answers "I'm rather active" were given by Wroclaw residents (44.8% vs 24.1%; $p < 0.05$).

Table 2 presents the measured anthropometric parameters in the examined group of older women. A statistically significant difference was found between women from Nysa vs Wroclaw in relation to body weight and BMI. Senior women from Nysa, who in most (about 80%) in self-assessment of their health state declared good or better health from their peers, had statistically significantly lower body mass than Wroclaw women (72.4 vs 78.3 kg; $p < 0.001$).

Table 1 Characteristics of studied group.

Variables	Women from Nysa		Women from Wroclaw		Chi ² Test <i>p</i> -value	
	n = 187	%	n = 212	%		
Self-health status in comparison with peers	not as good	13	7.0	53	25.0	0.00
	can not assess	27	14.4	59	27.8	0.00
	good as other	91	48.7	69	32.6	0.00
	better	56	29.9	31	14.6	0.00
	basic	9	4.8	54	25.4	0.00
Education	vocational	22	11.8	25	11.9	0.88
	secendary	116	62.0	95	44.8	0.00
	high	40	21.4	38	17.9	0.45
Income	≤ 1000 zł	79	42.2	101	47.6	0.32
	> 1000 zł	108	57.8	111	52.4	0.23
Type of family	along	69	36.9	108	50.9	0.00
	with a spouse	92	49.2	82	38.7	0.04
	with others/ with children	26	13.9	22	10.4	0.35
Activity physical declared	acitve	110	58.8	87	41.0	0.00
	rather active	45	24.1	95	44.8	0.00
	inactive	32	17.1	30	14.2	0.49

Table 2 Anthropometric parameters of the studied women.

Variables	Women from Nysa	Women from Wroclaw	<i>p</i> -value ⁴
Body mass (kg)	72.4 ±14.4 ¹ 68.7 ² ; 47.3 – 98.8 ³	78.3 ±20.5 75.0; 42.0 – 99.0	0.0002
Height (cm)	158.7 ±5.6 159.0; 144.0 – 173.0	158.7 ±6.4 159.0; 138.0 – 176.0	NS ⁵
BMI index (kg.m ⁻²)	28.7 ±5.1 27.9; 20.6 – 46.5	30.9 ±7,8 33.3; 17.4 – 45.1	0.0005
Body fat content (%)	36.4 ±5.7 36.6; 19.2 – 51.0	37.5 ±5.1 37.7; 19.2 – 51.2	0.0467

Note: ¹Data are expressed as mean ±SD (standard deviation); ²Mdn (median), ³min-max: minimal value-maximal value; ⁴statistical significant differences were verifiet by the Kruskal-Wallis test, *p* <0.05, *p* <0.001; ⁵NS not significant.

Table 3 Selected biochemical parameters of the studied women.

Variables	Women from Nysa	Women from Wroclaw	<i>p</i> -value ⁴
Hematocrit (%)	39.8 ±2.4 ¹ 40.1 ² ; 31.7 – 44.7 ³	40.3 ±3.0 40.4; 31.7 – 54.0	NS ⁵
Hemoglobin (g.dL ⁻¹)	13.4 ±0.8 13.5; 11.3 – 15.4	13.7 ±1.0 13.0; 10.1 – 18.3	NS
Total cholesterol (mg.dL ⁻¹)	202.6 ±47.4 203.0; 2.5 – 310.0	213.5 ±38.4 212.5; 100.0 – 320.0	NS

Note: ¹Data are expressed as mean ±SD (standard deviation); ²Mdn (median), ³min-max: minimal value-maximal value; ⁴statistical significant differences were verifiet by the Kruskal-Wallis test, *p* <0.05, *p* <0.001; ⁵NS: not significant.

Similar conclusions concerned the BMI index, which was statistically significantly lower in the group of older women from Nysa than from Wroclaw (28.7 vs. 30.9, *p* <0.001). The average BMI value among Nysa women was overweight, and among women from Wroclaw, obesity. The average content of adipose tissue among all examined women indicated significant fatness of the examined group (36 – 37%) and the risk of metabolic syndrome.

The biochemical parameters (hematocrit, hemoglobin and total cholesterol) determined in the blood of the studied women were not different in terms of the place of confusion. Increased total cholesterol was shown in the average sample

of women from Wroclaw, wich amounted to 213.5 mg.dL⁻¹ (Table 3). Table 4 presents data on the energy supply and selected nutrients in the food rations of the surveyed women.

The normative energy value of the diet of women over 65 with a body weight in the range of 55 - 65 kg (which corresponds to the average body height in the studi d group of 158 cm) is for low physical activity (PAL 1.4) from 6699 – 7327 kJ (1600 – 1750 kcal). Energy value of the food ration women with moderate physical activity (PAL 1.75) is 8583 – 9211 kJ (2050 – 2200 kcal) (Jarosz, 2017).

Table 4 Energy and selected nutrients in the food rations of the studied women.

Variables	Women from Nysa	Women from Wroclaw	Norms IFN 2017	p-value ⁴
Energy (kJ)	6382.8 ± 2542.6 ¹ 5994.7 ² ; 10256.6 – 3774.0 ³	5536.6 ± 1977.4 5127.2; 1315.1 – 14318.9	7955	0.0009
Energy from protein (%)	16.5 ± 5.0 15.9; 7.5 – 27.9	14.8 ± 4.1 14.3; 6.0 – 21.2	15	0.0010
Energy from fat (%)	27.6 ± 11.6 27.5; 7.6 – 3.3	33.4 ± 8.6 33.1; 13.4 – 38.6	25	0.0000
Energy from carbohydrates (%)	55.5 ± 12.1 56.1; 41.8 – 67.7	51.4 ± 9.4 52.3; 44.6 – 67.9	60	0.0002
Saturated FA (g)	20.1 ± 17.4 16.3; 1.6 – 32.8	20.6 ± 10.5 18.5; 3.0 – 39.3	12 – 14	NS ⁵
Monounsaturated FA (g)	18.5 ± 14.1 15.2; 15.8 – 22.7	18.9 ± 10.7 16.4; 12.6 – 21.97	22 – 25	NS
Polyunsaturated FA (g)	6.8 ± 5.4 5.7; 1.3 – 8.9	7.8 ± 6.0 6.1; 1.2 – 9.0	16 – 17	NS
Calcium (mg)	543.5 ± 313.6 488.8; 128.0 – 1091.8	391.8 ± 259.8 322.5; 64.0 – 1003.7	1000	0.0000
Iron (mg)	11.4 ± 5.5 10.0; 3.0 – 14.0	7.4 ± 3.1 7.4; 2.6 – 12.6	6	0.0000
Vitamin D (µg)	2.1 ± 2.5 1.5; 0.7 – 7.1	2.0 ± 3.4 1.2; 0.5 – 5.8	15	NS
Folate (µg)	255.8 ± 25.4 227.9; 17.5 – 39.3	126.2 ± 27.3 118.8; 30.8 – 368.7	450	0.0000

Note: ¹Data are expressed as mean ±SD (standard deviation); ²Mdn (median), ³min-max: minimal value-maximal value; ⁴statistical significant differences were verified by the Kruskal-Wallis test, $p < 0.05$, $p < 0.001$; ⁵NS: not significant.

The average energy supply in the food rations of women from Nysa and Wroclaw differed statistically significantly (6382.8 vs 5536.6 kJ, $p < 0.001$) and did not meet the above standards. Higher energy supply in the Nysa seniors' food rations determined a better, close to the values recommended by the Institute of Food and Nutrition in Warsaw, the % energy from proteins (10 – 15%), fats (25 – 30%) and carbohydrates (55 – 65%).

The content of saturated TCs in the average food ration of all examined women was too high and amounted to an average of 20 g. The norms of Poland 2017 for the studied women for this nutrient are 12 – 14.4 g. The supply of calcium and folates in the food rations of Nysa and Wroclaw residents was deficient and differed in a statistically significant way. It should be emphasized, however, that women from Nysa followed accepted norms in a larger share (over 50% of the norm). In the food rations of the studied women, particularly low content of vitamin D was demonstrated, which in the average value was about 13 – 14% of the norm (15 µg) for this age group. In the face of such a low targeted implementation, it seems that dietary supplementation with this vitamin is used in the whole group of women surveyed.

DISCUSSION

The nutritional status of the subjects depends on many factors. In the face of the continuous extension of human life, psychological factors (feeling stress, coping with everyday life conditions, social relations) conditioning

well-being and, subsequently, affecting the biological assessment of health condition are becoming more and more important. The majority of elderly women surveyed in this work living in a small town (about 80%) declared in the opinion of MNA that they assessed their health as compared to their peers as being good or better (Table 1). This was confirmed in anthropometric studies, where statistically significant differences between body weight and BMI were demonstrated. The body mass of seniors from Nysa was smaller and amounted to 72.4 kg on average and 78.3 kg from Wroclaw. BMI among Nysa women was overweight and women from Wroclaw were obese, 28.7 kg.m⁻², respectively 30.9 kg.m⁻² (Table 2). In the study of **Wasiluk et al. (2015)** from Biała Podlaska it was found that the average body mass of the examined women over 60 (n = 180) was 73.0 kg, and BMI 28.3 kg.m⁻². A high percentage of overweight and obesity in older people is also confirmed by international studies. Observations conducted in the USA showed that 78.4% of men over 60 and 68.6% women from the same age group are overweight or obese (**Flegal et al., 2010**). **Sánchez-García et al. (2007)**, observing 60-year-old and older Mexicans, noted that BMI ≥ 25 kg.m⁻² concerned 65.4% of women. Similar results have been demonstrated on the European continent. **Lahti-Koski et al. (2000)** assessing Finnish residents noticed that 73.0% of women in this country aged 55-64 were overweight. On the other hand, in southern Italy, 86.0% of women aged 60 - 69 years were diagnosed with obesity or obesity (**Barbagallo et al., 2001**). Representative Spanish

studies conducted among people over 60 also confirmed a very high percentage of overweight and obesity in women (82.1%) (Gutiérrez-Fisac et al., 2004). Observations conducted in the Czech Republic indicate that 41.0% of women aged 55 - 64 suffer from overweight, whereas obesity is 30.0% (Elmadfa et al., 2009). The changes in the BMI index are influenced by the increasing body mass and the progressive reduction in its height. According to research by Zamboni et al. (2005), the regression of the somatic feature is 8 cm in women and 5 cm in men between the ages of 20 and 85, and every centimeter of body reduction translates into an increase in the value BMI by 0.3 kg.m⁻². In addition, changes in the body composition of the body are observed with age. They are mainly manifested in the re-production of lean body mass and the growth of adipose tissue. Kyle et al. (2002) found that the fat content between 20 and 85 years doubles. In addition, the BMI value alone in young people and seniors will reflect the body composition of the various components in terms of the contribution of individual components. Therefore, overweight and obesity should be determined on the basis of fat content for older people. This parameter in older Nysa women was 36.4% and was statistically significantly lower than the fat content of women from Wrocław (37.5%), although both values indicated significant fatness of the examined seniors. The content of adipose tissue and fat free in the body is a particularly important parameter for predicting sarcopenia in older people. Sarcopenia is a syndrome characterized by loss of muscle mass, strength and performance (Ozga and Malgorzewicz, 2013). This problem concerns 5 - 13% of 60 - 70 year old's and 11 - 50% of people >80 years of both obese and normal weight (Cruz-Jentoft et al., 2010). In this study, an average of 202.6 mg.dL⁻¹ of total cholesterol was determined in the serum of older women from Nysa and 213.5 mg.dL⁻¹ in women from Wrocław. These values did not differ in these groups in a statistically significant manner (Table 3). In the general classification, the level of this parameter should not exceed 200 mg.dL⁻¹. In observational studies in the elderly (> 65 years), a weaker relationship between total cholesterol and cardiovascular risk and deaths was demonstrated in comparison to younger people. Among the reasons for this low dependency are earlier deaths due to diseases of the cardiovascular system in people with higher cholesterol levels, more frequent occurrences of other chronic diseases, malnutrition and weight loss. In addition, nonlipid risk factors and their effect on instability of the atherosclerotic plaque, its rupture and/or thrombosis may play a greater role in increasing the risk of episode (Catapano et al., 2016; Cybulska and Kłosiewicz-Latoszek, 2016; Bays et al., 2016). The energy value and content of individual nutrients in the food rations of the studied women from Nysa and Wrocław differed statistically significantly (Table 4). Deficient energy value of food rations was demonstrated, which was conditioned by too low share of energy coming from carbohydrates. However, the percentage of implementation of energy standards among Nysa women was higher (80% vs 69%), there was an excessive intake of saturated fatty acids in the diets of the whole group of seniors tested and too low polyunsaturated fatty acids. The contents in the food rations of calcium and folates were deficient and statistically differentiated the examined groups of older women. However, the Nysa seniors realized

a statistically higher percentage of the standard (Ca 54% vs. 39% of the norm, folate 56% vs. 28% of the norm). An important nutritional problem is the deficiency of vitamin D intake in the seniors' diets found in many works. Older women from Nysa and Wrocław consumed about 13% of the norm on vitamin D. In the current literature, it is emphasized that a constant deficiency of this vitamin may have a negative effect on the immunomodulatory and neuroprotective functions in the body. If the concentration in the blood of this vitamin is too low, the incidence of cognitive impairment, Alzheimer's and Parkinson's disease is increased. There are many publications that link vitamin D deficiencies with an increased likelihood of mood disorders, including depression (Jorde et al., 2008; Zdrojewicz et al., 2015).

CONCLUSION

Older women from a small city assessed their health as better or as good compared to older women in a large city. In both groups, however, excessive body mass and BMI were found, indicative of overweight and obesity. The implementation of nutritional standards and recommendations in the food rations of the subjects was insufficient. However, women from a small town provided statistically significantly more nutrients in their diets.

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