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## Assessment of the influence of socio-demographic and personality factors on health behaviours in healthy postmenopausal women

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## Abstract

Background: Lifestyle and health behaviours are determined by the level of knowledge, beliefs, existing dysfunctions, and interpersonal relationships, as well as personality factors. The aim of this study was to assess health behaviours undertaken by postmenopausal women, and to analyze how they are influenced by personality factors. Material/Method: The study included 196 postmenopausal women at the mean age of 56.80 +/- 4.08. The Health Behaviour Inventory and a personality questionnaire (NEO-FFI) were used. Results: In the study, women living in cities of over 100.000 residents scored higher than those living in smaller towns ( $p < 0.05$ ). The level of neuroticism negatively correlated with overall health behaviours, health practices, and a positive mental attitude ( $p < 0.05$ ). The level of conscientiousness negatively correlated with health behaviours, a positive mental attitude, and preventive behaviours ( $p < 0.05$ ). Positive correlations were observed between the level of extraversion and overall health behaviours, preventive behaviours, normal eating habits, health practices, and a positive mental attitude ( $p < 0.05$ ). Conclusions: 1. Raising the awareness through educational programmes implemented as part of care provided by primary care centres (especially in smaller towns and rural areas) could improve the level of healthful behaviours undertaken by postmenopausal women. 2. Health behaviours are also greatly dependent on personality traits, which are biologically determined and relatively stable.

## Keywords

health behaviours, personality, menopause

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A Study Design  
B Data Collection  
C Statistical Analysis  
D Data Interpretation  
E Manuscript Preparation  
F Literature Search  
G Funds Collection

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## abstract

**Background:** Lifestyle and health behaviours are determined by the level of knowledge, beliefs, existing dysfunctions, and interpersonal relationships, as well as personality factors. The aim of this study was to assess health behaviours undertaken by postmenopausal women, and to analyze how they are influenced by personality factors.

**Material/Methods:** The study included 196 postmenopausal women at the mean age of  $56.80 \pm 4.08$ . The Health Behaviour Inventory and a personality questionnaire (NEO-FFI) were used.

**Results:** In the study, women living in cities of over 100,000 residents scored higher than those living in smaller towns ( $p < 0.05$ ). The level of neuroticism negatively correlated with overall health behaviours, health practices, and a positive mental attitude ( $p < 0.05$ ). The level of conscientiousness negatively correlated with health behaviours, a positive mental attitude, and preventive behaviours ( $p < 0.05$ ). Positive correlations were observed between the level of extraversion and overall health behaviours, preventive behaviours, normal eating habits, health practices, and a positive mental attitude ( $p < 0.05$ ).

**Conclusions:** 1. Raising the awareness through educational programmes implemented as part of care provided by primary care centres (especially in smaller towns and rural areas) could improve the level of healthful behaviours undertaken by postmenopausal women.

2. Health behaviours are also greatly dependent on personality traits, which are biologically determined and relatively stable.

**Key words:** health behaviours, personality, menopause.

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## INTRODUCTION

Postmenopausal women experience somatic and psychological symptoms, whereas hormonal changes affect their looks and functioning. Perimenopausal symptoms, associated with oestrogen deficiency, can be divided into short-lived symptoms (menstrual disorders leading to a complete cessation of menstruation, vasomotor disorders, urogenital dysfunctions) and long-term symptoms. The latter include diseases related to a loss of the ovarian endocrine function, such as cardiovascular disease — caused by decreased estradiol secretion resulting from physiological or postoperative menopause, and metabolic changes — defined as the postmenopausal metabolic syndrome and raising the risk of coronary thrombosis, stroke, and vascular atherosclerosis-related diseases. Oestrogen deficiency leads to lipid metabolism disorders as well as to the emergence or exacerbation of type 2 diabetes. Also mental disorders are regarded as typical of the perimenopausal period. Another symptom is postmenopausal osteoporosis, as a decrease in bone-mass is inherent to the process of aging [1].

We observe increased body weight and changes in the shape of the body manifested by an increased waist size, which may result in a lack of motivation to take counteractions to reduce the accumulated adipose tissue. Excessive weight gain, abdominal obesity along with insulin resistance, dyslipidaemia, and arterial hypertension constitute a syndrome that is known as the poly-metabolic syndrome. This syndrome is an important clinical problem due to the risk of diabetes, cancer and cardiovascular diseases, which are the cause of 50% of deaths of perimenopausal women [2, 3, 4]. Health behaviours related to eating habits of menopausal women affect the BMI (Body Mass Index) and the WHR (waist/Hip Ratio). Bad eating habits of women over 40 years of age have been observed both in Poland, Spain and Brazil [4, 5, 6]. A real cause of obesity is a positive energy balance, insufficient physical activity, alcohol consumption, and the use of antidepressants. Nevertheless, many women think that obesity is mainly caused by MHT, and for that reason they give up the therapy [3].

Health behaviours are an element of lifestyle [7] and are defined as any type of behaviours in the field of health which, in the light of contemporary medical knowledge, trigger positive or negative health effects in people who implement them. There are two major categories of health behaviours: promoting health and harmful to health [8]. Lifestyle is associated with nutrition, physical activity and leisure, whereas it is the result of knowledge, beliefs, interpersonal relationships, existing dysfunctions and disorders, and personality-related conditions. Throughout life, and hence also during the period of menopause, these factors influence the overall functioning of man, including health-related behaviours [4].

Personality is determined by patterns of behaviour or differences between individuals concerning consolidated ways of responding to the changing internal and external environment that are characteristic of an individual. They consist of all the basic psychological characteristics, i.e. psychomotor drive, intellect, emotions, and the will [9, 10]. McCrae and Costa created the concept of the “Big Five” personality traits, which assumes that personality traits in adulthood are stable and unchanging. They identified five dimensions of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness [11].

The aim of this study was to assess health behaviours undertaken by postmenopausal women and to analyse how they are influenced by personality factors.

## MATERIAL AND METHODS

The study included 196 healthy postmenopausal women. Information about the study and invitation to take part in it had been sent to gynaecologists, primary care outpatient clinics, and outpatient clinics for women in the West-Pomeranian Province. The women qualified for the study were at least one year after menopause, and reported normal cervical smear, mammography and blood pressure results. Based on the medical history taken from each participant, we established that the women were free from endocrine, cancerous and mental diseases. Additionally, before entering the study the respondents completed the PRIME-MD questionnaire in order to exclude mental diseases in the study group. The mean age of the women was  $56.80 \pm 4.08$ . The youngest respondent was 42 years old; the oldest was 63 years. 47.7% ( $n = 94$ ) of the studied women had secondary education, 36.4% ( $n = 71$ ) had higher education, and 15.9% ( $n = 31$ ) had primary and vocational education.

The majority of the respondents (61.7%;  $n = 121$ ) were from cities of more than 100,000 residents; 20.6% ( $n = 40$ ) were from cities of 10,000–100,000 residents, and 12.2% ( $n = 24$ ) lived in cities of less than 10,000 residents and rural areas. 69.2% ( $n = 136$ ) were married, 53.3% ( $n = 105$ ) were professionally active, 31.3% ( $n = 61$ ) were retired (Table 1).

**Table 1.** Structure of the study sample with regard to sociodemographic data

Sociodemographic data	n	%
Education		
Primary	6	3.3
Vocational	25	12.6
Secondary	94	47.7
Third-level	71	36.4
Total	196	100.00
Place of residence		
Village	18	9.4
City < 10 000 dwellers	6	2.8
City 10 - 100 000 dwellers	40	20.6
City >100 000 dwellers	121	61.7
No data	11	5.5
Total	196	100.00
Marital status		
Single	11	5.6
Married	136	69.2
Widow	11	5.6
Divorced	38	19.6
Total	196	100.00
Professional activity		
Employed	105	53.3
Unemployed	21	10.7
Old-age pensioner	61	31.3
Pensioner	8	4.2
No data	1	0.5
Total	196	100.00

This survey-based study was performed using standardized research instruments. The Health Behaviour Inventory (IZZ – Inwentarz Zachowań Zdrowotnych) by Zygfryd Juczyński, containing 24 statements describing health-related behaviours, was used. It allows determining the general severity of behaviours that are favourable for health and the severity of four categories of health behaviours, i.e. proper eating habits, preventive behaviours, applied health practices, and a positive mental attitude. Taking into account the last year, the studied women determined the frequency of activities provided in the Health Behaviour Inventory according to a five-point scale (1 – almost never, 2 – rarely, 3 – from time to time, 4 – often, 5 – almost always). Raw results were transformed into standardized sten norms: sten 1-4 – low score, sten 5-6 – average score, sten 7-10 – high score [12]. A standardized questionnaire used to assess personality traits: NEO-FFI (Neo-Five Factory Inventory) was also applied. It allows obtaining information about five basic dimensions of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The results of every NEO-FFI scale are calculated by adding up the obtained points according to the key, and then converting the results to standardized sten scores. Depending on the number of stens, which prove that each characteristic is becoming stronger, the respondent gets a high score (7 up to 10), an average score (4 up to 6) or a low score (1 up to 3) for each of the 5 scales.

Statistical analysis was performed using the selected modules of Statistica 7.1 PL software bundles. The normality of distribution was assessed using the Shapiro-Wilk test. Statistical significance was set at a  $p < 0.05$  and  $\alpha = 95\%$ . The Student's t-test was applied to test the differences between two groups of women in terms of a given quantitative trait. Spearman's rank correlation coefficient was used to assess the correlation between two qualitative variables.

The research was approved by the Bioethics Committee of the Pomeranian Medical University in Szczecin No. KB- 0012/155/13 as of 18th November 2013.

## RESULTS

The conducted analysis of health behaviours in postmenopausal women showed that most of the respondents scored average in terms of the severity of health behaviours – 41.3%, 37.5% scored high, and low – 21.2%. The result of the overall severity of health behaviours by the IZZ questionnaire was 86.5 with a deviation of 12.6, and was interpreted as an average score, around the 6th sten. After making the analysis, a low degree of severity of health behaviours in the studied group for each category of health behaviours was observed. Shapiro-Wilk's test was used to confirm the normality of the distribution ( $p > 0.05$ ) (Table 2).

**Table 2.** Descriptive statistics – health behaviours of the studied women according to the Health Behaviour Inventory (IZZ)

Health Behaviour Inventory (IZZ)	$\bar{x}$ $\pm$ SD
Proper eating habits	3.6 $\pm$ 0.7
Preventive behaviours	3.6 $\pm$ 0.7
Health practices	3.5 $\pm$ 0.6
Positive mental attitude	3.7 $\pm$ 0.7
IZZ	86.5 $\pm$ 12.6

$\bar{x}$  – mean; SD – standard deviation; IZZ – Polish questionnaire Health Behaviour Inventory

An analysis of the respondents' personality traits by the NEO-FFI questionnaire was made, and less than 40% of women scored low and average values of neuroticism, 22.1% – scored high. The values of extraversion, agreeableness and conscientiousness were average in approximately half of the respondents, and at a high level in approximately 40% of the respondents. The values of openness to experience were average in 41.5% of the respondents, and high in 46.9%.

The analysis of the research material showed a statistically significant difference following proper eating habits with regard to the women's place of residence ( $p < 0.05$ ). There were no statistically significant differences in other IZZ categories ( $p > 0.05$ ). Women residing in cities with more than 100,000 residents scored higher than respondents living in towns up to 100,000 residents. Shapiro-Wilk's test was used to confirm the normality of the distribution ( $p > 0.05$ ) (Table 3). No statistically significant relationship between particular categories of health behaviour and age, marital status, professional activity, and these of MTH in the studied women was observed ( $p > 0.05$ ).

**Table 3.** Assessment of the categories of health behaviours with regard to place of residence

Categories	Place of residence – up to 100 000 residents			Place of residence – more than 100 000 residents			t	p
	n	$\bar{x}$	$\pm SD$	n	$\bar{x}$	$\pm SD$		
Overall IZZ	68	83.38	$\pm 13.05$	128	87.18	$\pm 14.17$	-1.84	$> 0.05$
Positive mental attitude	68	3.61	$\pm 0.67$	128	3.78	$\pm 0.64$	-1.74	$> 0.05$
Preventive behaviours	68	3.50	$\pm 0.79$	128	3.67	$\pm 0.69$	-1.54	$> 0.05$
Proper eating habits	68	3.38	$\pm 0.74$	128	3.65	$\pm 0.71$	-2.53	<b><math>&lt; 0.05</math></b>
Health practices	68	3.40	$\pm 0.58$	128	3.53	$\pm 0.65$	-1.43	$> 0.05$

t - Student's t-test; p - level of significance set for statistics t, IZZ - Polish questionnaire Health Behaviour Inventory

The correlation between health behaviours and personality traits was made on the basis of the NEO-FFI questionnaire. The analysis of the research material showed a weak, negative correlation between health behaviours in the overall assessment and health practices, and a moderate, negative correlation between a positive mental attitude and the severity of neuroticism ( $p < 0.05$ ). A weak, negative correlation between the shaping of health behaviours, a positive mental attitude, preventive behaviours, and the severity of conscientiousness was observed as well ( $p < 0.05$ ). A weak, positive correlation was found between health behaviours in the overall assessment, preventive behaviours, proper eating habits, and health practices, and a moderate, positive correlation between a positive mental attitude and the severity of extraversion ( $p < 0.05$ ). The relationship between health behaviours and openness to experience ( $p > 0.05$ ) and agreeableness ( $p > 0.05$ ) was not found (Table 4).

**Table 4.** The correlations between health behaviours and the severity of personality traits according to the NEO FFI

Categories	Openness to experience		Neuroticism		Agreeableness		Extroversion		Conscientiousness	
	R	p	R	p	R	p	R	p	R	p
Overall IZZ	0.11	$> 0.05$	-0.21	$< 0.05$	0.00	$> 0.05$	0.29	$< 0.05$	-0.21	$< 0.05$
Positive mental attitude	0.05	$> 0.05$	-0.34	$< 0.05$	0.02	$> 0.05$	0.39	$< 0.05$	-0.21	$< 0.05$
Preventive behaviours	0.10	$> 0.05$	-0.07	$> 0.05$	0.01	$> 0.05$	0.21	$< 0.05$	-0.26	$< 0.05$
Proper eating habits	0.06	$> 0.05$	-0.11	$> 0.05$	-0.00	$> 0.05$	0.20	$< 0.05$	-0.13	$> 0.05$
Health practices	0.04	$> 0.05$	-0.15	$< 0.05$	-0.01	$> 0.05$	0.15	$< 0.05$	-0.03	$> 0.05$

R - Spearman's rank correlation coefficient; p - the level of significance calculated for R, IZZ - Polish questionnaire Health Behaviour Inventory



## DISCUSSION

In the author's own research, the overall severity of health behaviours was defined as moderate, whereas low severity was found in all categories of health behaviours. In a study of Weber-Rajek et al., health behaviours of perimenopausal women were at an average level. The highest scores within particular health behaviour categories were obtained for preventive health behaviours, and the lowest ones for proper eating habits and health practices [13]. A study conducted by Młynarska et al. on a group of respondents over 65 years of age (of whom 62% were women) demonstrated a low level of health behaviours in more than 43% of cases, and an average level in 36% [13]. Other research studies have shown differences in the severity of health behaviours in such categories as proper eating habits, behaviours, and preventive health practices. Women showed a significantly higher level of severity of health behaviours than men [14]. Research by other authors shows that respondents in lasting relationships showed significantly higher levels of positive mental attitudes [15]. The research conducted by Kaleta and Mróz has shown that social support which has its source in the family has a significant impact on the level of health-related activities, especially in the area of a positive mental attitude [16]. These results are confirmed by the research conducted by Pałucka et al. who showed that family and friends form the most important social bonds, helping to maintain mental health [17]. The existence of a social support network, and especially having a family, affects the increased frequency of following proper eating habits, preventive behaviours, and health practices. The lack of support from family correlates with decreased physical activity, increased frequency of nicotine addiction, and improper eating habits [18, 19]. Many years of research conducted by Count showed a correlation between weaker social bonds and a reduced frequency and quality of the undertaken health-related activities [20].

The author's research has not confirmed that the marital status significantly shaped the respondents' health behaviours. It is believed that the reason for discrepancies among the results compared to other authors may be the assessment of the relationship only between the marital status and following health-related behaviours, passing over the widely understood network of social relationships that go beyond the institution of marriage. However, it has been shown that women residing in cities with more than 100,000 residents scored higher in the category of proper eating habits than respondents living in towns up to 100,000 residents.

Another study of 505 subjects over aged 65 demonstrated that women with third-level education (former intellectual employees) had higher overall levels of health behaviours [21].

In the author's study it was observed that there was a negative correlation between the severity of expression of neuroticism and the overall coefficient of following health-related behaviours, a positive mental attitude and using health practices. A high degree of extroversion had a significant, positive impact on all areas of the health-related functioning of the respondents.

The study of van Straten et al. provided evidence for a significant relationship between personality traits and health-related quality of life (HRQoL). HRQoL is determined not only by a disease, current health status, and demographic data, but also personality traits, which are relatively stable throughout life [22]. Similar results were reported by Jurczak et al., who noticed that personality traits that were on the highest levels among late-reproductive age women



were openness to experience and agreeableness. The areas that were best assessed by the women were physical functioning, emotional functioning, and physical fitness [23]. The research conducted among patients suffering from type I diabetes has shown that health behaviours depend on personality traits. It has been observed that in the group of women, the overall coefficient of health-related behaviours increased in inverse proportion to openness to experience. Women with a high degree of openness to experience undertook fewer preventive actions, compared to the remaining respondents, and this difference was significant. Conscientiousness turned out to be a trait a lower expression of which decreases the overall severity of health behaviours, especially the tendency to undertake preventive actions. A higher level of openness to experience correlated with a decreased, positive mental attitude [24].

The research by Booth-Kewley and Vickers confirmed that conscientiousness largely affects the level of adhering to health behaviours. People with a high degree of expression of this trait were scrupulous to follow medical recommendations and apply prophylactic instructions [25]. The author's own studies have shown that a higher degree of conscientiousness decreased the overall coefficient of health behaviours, reduced the positive mental attitude, and resulted in a lowered level of following preventive behaviours. In the study of 400 postmenopausal women carried out by Ghorbani et al., high levels of conscientiousness correlated with more severe hot flushes and night sweats [26]. Neuroticism is a trait which is considered the strongest predictor of an anti-health lifestyle. It has been found that people with a high severity of this trait are more pessimistic and less satisfied with their lives, feeling a higher level of disease-related fear [11]. A similar study of Kishida et al. showed that women with higher neuroticism were less satisfied with everyday life [27].

Our results suggest that health behaviours undertaken by the participants of the study are partially influenced by personality factors, which are relatively stable. We found, however, that these behaviours can also be determined by the place of residence.

## LIMITATIONS

We analysed the influence of sociodemographic and personality factors on health behaviours exhibited by postmenopausal women. Our study involved 196 women. Undoubtedly, a larger study sample would increase the scientific value of this research. Nevertheless, the analysis of sociodemographic and personality factors throws a new light on factors that determine health behaviours of postmenopausal women. The limitations of our study do not allow us to generalize the findings to the whole population. Nonetheless, we believe that the study provides a fresh perspective on these issues.

## CONCLUSIONS

1. Raising the awareness through educational programmes implemented as part of care provided by primary care centres (especially in smaller towns and rural areas) could improve the level of healthful behaviours undertaken by postmenopausal women.
2. Health behaviours are also greatly dependent on personality traits, which are biologically determined and relatively stable.

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