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ORIGINAL ARTICLE

Physical activity in perimenopausal women

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Abstract

Introduction. The menopausal age of women is characterized by a high probability of health problems related with oestrogen deficiency and reduced ovarian hormonal activity. The most significant element in the therapy of the menopausal problems is to take part in physical activity on at least a moderate level, which is sufficient to maintain health.

Objective. To investigate the effect of physical activity on the severity of the symptoms of menopause and body mass index BMI, which can decisively influence menopause.

Material and methods. A group of respondents consisting of 210 women aged between 45–65 who were not using hormone replacement therapy, and staying at a rehabilitation centre. The study was conducted in 2013–2014 in the provinces of Silesia, Podlasie and Malopolska. Research tools consisted of a self-designed survey questionnaire and the Menopause Rating Scale (MRS).

Results. Mean BMI indicated overweight of the women and their infrequency and low level participation in physical activity. The intensity of menopausal symptoms increased with BMI, and low physical activity of the respondents decreased with age. Increase in the intensity of physical activity decreased the severity of symptoms characteristic for menopausal age.

Conclusions. Physical activity can play an important role in reducing menopausal symptoms and preventing the most frequently occurring diseases of menopausal age.

Key words

menopause, physical activity, BMI

INTRODUCTION

The intensity and type of symptoms experienced by menopausal women vary from individual to individual, and depend mainly on the concentration of sex hormones (including hormone replacement therapy) and the psychophysical-social state of the women.

In the literature, early menopause symptoms associated with the progressive decline in ovarian hormonal activity and oestrogen deficiency include hot flushes, sweating, sleep disturbances, mental changes and menstrual disorders. In a later menopause period, there also appear atrophic changes of the urogenital system and related sexual dysfunctions, cardiovascular diseases, osteoporosis, musculo-articular afflictions. Approximately 85% of menopausal women experience at least one of the symptoms of menopause, most often reporting depressive disorders, vasomotor symptoms or sleep disorders [1, 2].

The most serious diseases of the menopausal period are cardiovascular diseases, which are the major leading cause of death in Poland through disturbances of lipid and carbohydrate metabolism, together with their numerous consequences. The group of diseases specific to the period of menopause also include type 2 diabetes and metabolic syndrome, cancer. Data from literature indicate that almost 1/3 of middle-aged European women are overweight or obese [3].

In menopausal women, android adiposity appears in which adipose tissue characteristically accumulates in the network and subcutaneous tissue of the abdomen. In contrast, gynoidal adiposity is characterized by the predominance of adipose tissue in the buttocks and thighs. In women with android-visceral obesity there is an increased risk of atherosclerosis. Intra-abdominal fat cells produce a variety of substances affecting the inflammatory reactions, insulin resistance, and risk of cardiovascular disease, leading to type 2 diabetes, coronary heart disease, myocardial infarction, atherosclerosis, hypertension, stroke, urinary incontinence, dementia, osteoarthritis, breast cancer, endometrial and colorectal cancer [4, 5].

A review of the literature also indicates the risk factors of acute myocardial infarction or stroke, e.g. metabolic syndrome, are also risk factors for sexual disorders in women [6].

The most important element in menopausal therapy is the modification to a health promoting life style, primarily increasing physical activity, healthy nutrition, reduction in body weight (BMI less than 25 kg/m2), abstention from nicotine and alcohol. Sometimes, pharmacological therapy is also used for insulin resistance, obesity, dyslipidemia and hypertension, and hormone therapy which has an impact on carbohydrate metabolism and the insulin resistance phenomenon.

In the literature, there is still lack of reports on the impact of physical activity on the severity of the symptoms of menopause and BMI, and is still a matter of fierce debate for researchers and an interesting and important topic of extensive research.

OBJECTIVE

The main objective of the study is to investigate the effect of physical activity on the severity of the symptoms of menopause and body mass index BMI. An additional aim is an attempt to answer detailed questions concerning the following questions:

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1) What is the prevalence of overweight and obesity in the studied group of women?
2) What is the level of physical activity in menopausal women?
3) Is there any relationship between the occurrence of some types of menopausal symptoms, BMI, or level of physical activity?
4) What is the role of physical activity in the prevention of symptoms and diseases characteristic for menopausal age?

The initial assumption is that the correct value of BMI in women during menopause contributes to a lower severity of menopausal symptoms, and physical activity is the best form of therapy for the relief of menopausal symptoms and reducing BMI.

MATERIALS AND METHOD

The research was started after approval by the Bioethics Committee at the Medical University in Lublin under Resolution No. KE – 0254/269/2013 of 28 November 2013. The following health centers were formally invited to participate:
1) the private 'Zdrowie' Healthcare and Rehabilitation Centre in Częstochowa;
2) the private Health Resort in Gołdap;
3) independent public complex of Health Care Facilities of the 20th Health Resort and Rehabilitation Centre of the Military Hospital in Krynica Zdroj.

The study was started after receipt of formal written consent from the managers of these centres.

Women aged 45–65 years, not using hormone replacement therapy, staying at a systemic, physical rehabilitation camp, and who had expressed a desire to participate and had given a written consent, were eligible for inclusion in the study. The study excluded women with chronic illnesses, using HRT, after uro – gynecological surgery, outside the preferred age range, and who did not express agreement to participate, were excluded from the study.

During the first day of the rehabilitation camp, a survey questionnaires was distributed among women, placed into specially marked boxes on the premises of the resort, in order to preserve the anonymity of the women. Of the 300 questionnaires distributed, 212 were returned, 210 of which had been correctly completed and were used for further analysis, i.e. 70.67 % of the surveys returned. The study, finally completed in March 2014, was conducted in three provinces: Silesia, Podlasie and Malopolska, but the group of respondents were women who came from different parts of Poland.

The questions were designed essentially to match the cognitive abilities of the test group consisted of:
- a self-designed survey questionnaire concerning each respondent's particulars;
- evaluation of menopausal symptoms – Menopause Rating Scale (MRS).

The questions were closed and semi-open, which allowed the collection of subjective and spontaneous responses. The questionnaire also included nine socio-demographic questions and questions about state of health, age, place of residence, personal financial situation, education, work history and its nature, level of physical activity, body weight and growth, on the basis of which the BMI was calculated.

The levels of physical activity were evaluated on the basis of the Polish short version of the International Physical Activity Questionnaire (IPAQ), as derived from the www.IPAQ.ki.se. In accordance with the data contained in the questionnaire and the data from literature, there was a question about the intensity of the physical activity of the respondents, accordi8ng to three specific types of physical activity, with the exception of MET with further calculations. Only physical activity lasting longer than 10 minutes, without resting, during the last seven days was assessed [7, 8, 9]:
1) low physical activity – insufficient, the lowest level of physical activity, representing only walking: very slow walking, sitting. Regarding the energy requirements, low physical activity was characterized as activity in which 40–60% of basal metabolism (kcal) was used, between 500–700 calories burned per day.
2) moderate physical activity – adequate for achieving health benefits, referring to actions requiring average effort with slightly increased breathing and slightly accelerated heart action, such as carrying light weights, cycling at 15–18 km/h, recreational skiing, playing volleyball, average intensity fitness classes, marches – fast walking, on the assumption that:
   a) energy expenditure resulting from 150 minutes of moderate physical activity during the course of a week (average 5 days – 30 minutes, or 7 days – 20 minutes;
   b) in moderate physical activity a woman burns about 75% of the basal metabolic rate (kcal), about 900 calories a day.
3. High physical activity – high, indicating heavy effort, forcing highly-accelerated breathing and heart rate, such as lifting heavy loads, digging earth, aerobics, front crawl swimming, playing tennis, very fast cycling, endurance marches or long and intense marches, running at a speed of 8 km / h, assuming that:
   a) energy expenditure as the result of at least 150 minutes of high physical activity during the week;
   b) high physical activity expenditure from 100–140% of basal metabolic rate kcal, reaching a value from 1,200–1,700 kcal of energy expenditure.

The scale of assessment of menopausal symptoms (Menopause Rating Scale – MRS) was developed in the early 1990s by Professor Heinemann from the Berlin Centre for Epidemiology and Health Research [10]. The scale is available in 25 languages and the Polish version was used in the study with the permission from the author. Currently available scientific evidence indicate a high methodological quality of the MRS scale for measuring and comparing the menopausal symptoms on the quality of life of women aging in different regions of the world. The tool is designed to be easily understood by the respondents and is characterized by the clarity of the questions. It contains 11 menopausal symptoms [hot flushes and sweating, heart problems, trouble sleeping, depressive mood, irritability, anxiety, physical and mental exhaustion, sexual problems, bladder problems, vaginal dryness, discomfort associated with joints and muscles, the intensity of which should be noted on the basis of 5 categories: no symptoms, mild syptoms, moderate, substantial and severe syptoms. The respondent ensures the subjective perception of symptoms by ticking 1 of 5 boxes. The overall result of MRS is from 0 – no symptoms, to 44 points – the highest degree of severity of symptoms, and 11symptopms divided as follows:

A – psychological symptoms (depressed mood, irritability, anxiety, physical and mental exhaustion): from 0 to 16 points;
B – somatic-vegetative symptoms (sweats/flushes, heart problems, sleep problems, discomfort associated with muscles and joints: 0–16 points;
C – symptoms originating from the urogenital system (sexual problems, bladder problems, vaginal dryness): 0–12 points.

The results obtained from the study were subjected to rigorous statistical analysis using classical statistical methods by Statistica software.

RESULTS

In the group of 210 surveyed women, the highest percentage were women aged between 45–50 (39.05%), women aged 51–55 (25.24 %), women aged 56–60 (20.48 %), and in the smallest group were women over 60 (15.24%).

More than half (53.33 %) of the examined women lived in a district town, 27.14% lived in a municipality, while 19.52% lived in a provincial capital.

Most women (59.05 %) reported an average economic situation, 26.19% described their situation as rather good, 7.14% identified their situation as rather bad, whereas a very good economic situation was reported by 4.76% of the respondents. In their subjective perception, 2.86 % of the women stated their economic situation as poor.

More than a half of the respondents declared having secondary education – 52.86 %), vocational education – 20.48 %, higher education – 15.71%, post-graduate education -7.62%, and basic education – 3.33%.

Most of examined women were professionally active – 66.19%, 15.71% were retired, 10.95% received a pension, while 7.14% wwere unemployed employment. 35.24 % of the women worked mentally, 32.86% declared performing physical labour, and 31.90 % were unemployed.

In nearly a half of the surveyed women (47.62%) the BMI index showed they were overweight, the correct BMI value was observed in 28.57%, first degree of obesity in 20.48 % and the average BMI index was observed in 26.98%, indicating the prevalence of overweight in the group of women studied.

The largest group of respondents were women who declared performing little physical activity in the past seven days (80.95 %), while only 15.24% claimed they performed moderate physical activity – enough to sustain health, and only 3.81% had undertaken high physical activity in the last week (Tab. 1). Due to the very small number of women in the study group with high physical activity, in further analysis comparison of respondents declaring low physical activity and both moderate and high physical activity was used.

On the basis of the results obtained, the average was calculated for the points scored on the MRI scale divided into subscales of symptoms; it was observed that psychological symptoms were characterized by the highest intensity in the studied group of women. Somatic-vegetative symptoms were characterized by medium severity at the level of 1.42 points on a four-point scale, and urogenital symptoms were characterized by the lowest intensity in the group of women in the study (Tab. 2).

As a result of data analysis from the MRS scale and the BMI value, a statistically significant correlation was observed. Positive correlations were also shown in the general result on the MRS scale and on the subscale of somatic-vegetative symptoms, which means that the higher the BMI, the greater the severity of symptoms (Tab. 3).

Table 1. The BMI index and intensity of physical activity in a group of examined women

BMI	The test group	
	N	%
Below standard (<18.5 BMI)	3	1.43
Standard (18.5-24,99 BMI)	60	28.57
Overweight (BMI) 25-29.99	100	47.62
First degree of obesity (BMI) 30-34,99	43	20.48
Second degree of obesity (More than 35 BMI)	4	1.90
Total	210	100.00
Physical activity	The test group	
	N	%
Low	170	80.95
Moderate	32	15.24
High	8	3.81
Total	210	100.00

Table 2. Average points scored on a MRI scale divided into subscales of symptoms

Severity of symptoms	Descriptive statistics	
	Average	Standard deviation
MRS	1.36	0.78
Psychological symptoms	1.52	0.94
Somatic-vegetative symptoms	1.42	0.84
Urogenital symptoms	1.07	0.87

Table 3. MRS subscales in correlation with BMI

Severity of symptoms	Correlations with BMI	
	r	p
MRS	**0.1381**	**0.046**
Psychological symptoms	0.1297	0.061
Somatic-vegetative symptoms	**0.1696**	**0.014**
Urogenital symptoms	0.0505	0.467

Psychological symptoms were characterized by a high intensity in the studied group of women, regardless of BMI, but in the group of overweight women the severity of these symptoms was the highest. In the group of women where the BMI index value showed obesity, the highest average values of severity of somatic-vegetative symptoms were reported, but much lower values of intensity of urogenital symptoms, compared to women with overweight (Fig. 1).

Statistically significant differences were observed for the comparison of undertaken physical activity and severity of symptoms characteristic for menopausal age. With the increase in the intensity of physical activity, the severity of symptoms decreased, which is characteristic for menopausal age (Tab. 4, Fig. 2).

However, statistically significant differences were observed between respondents in the age group with low physical activity, and the group of moderate or high physical activity (Z=2, 386; p=0.017). Engaging in physical activity

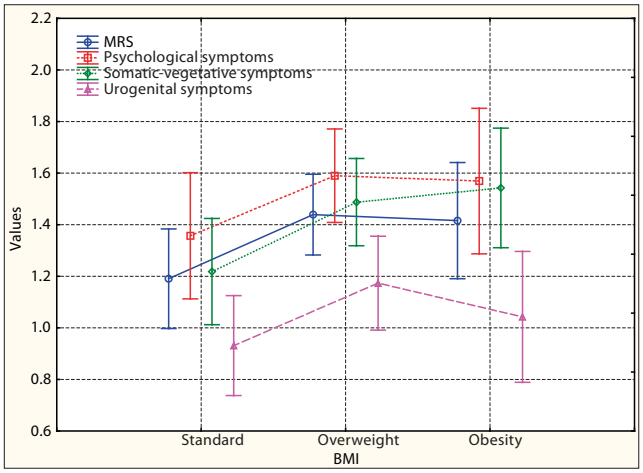

Figure 1. A comparison of three groups of MRS because of the BMI

Table 4. Comparison of the intensity of physical activity and the severity of symptoms.

Severity of symptoms	Low activity		Moderate or high activity		The significance of differences	
	M	SD	M	SD	Z	p
MRS	1.38	0.79	1.27	0.76	0.844	0.399
Psychological symptoms	1.54	0.95	1.41	0.91	0.784	0.433
Somatic -vegetative symptoms	1.44	0.83	1.35	0.87	0.642	0.521
Urogenital system	1.10	0.88	0.96	0.79	0.733	0.463

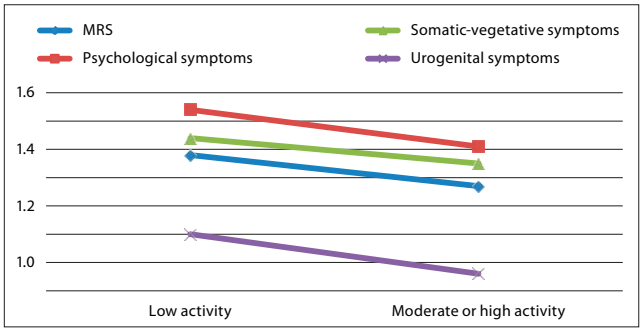

Figure 2. Comparison of the intensity of physical activity and the severity of symptoms

in menopausal women decreases with age, and in the group of women aged over 60, only 18.24% declared undertaking low physical activity (Tab. 5).

Table 5. Comparing physical activity in women's age groups

Physical activity 45-50 years		Age of respondents			
		51–55 years	56–60 years	More than 60 years	
Low physical activity	N	62	41	36	31
	%	36.47%	24.12%	21.18%	18.24%
Moderate or high physical activity	N	20	12	7	1
	%	50.00%	30.00%	17.50%	2.50%
Total	N	82	53	43	32
Physical activity		Average age rank		Z	p
Low physical activity		110.14		2.386	0.017
Moderate or high physical activity		86.79			

The average BMI in the group of examined women who declared little physical activity was 27.93 kg/m² – indicating overweight, and in the group of women performing physical activity of high or moderate intensity – 22.93 kg/m² (standard). Differences between groups of low and moderate/high physical activity are statistically significant (Z=7, 936; p< 0.001) (Tab. 6).

Table 6. Comparison of physical activity and BMI index

Physical activity BMI in normal range		BMI index		
		Overweight	Obesity	
Low physical activity	N	30	93	47
	%	17.65%	54.71%	27.65% .
Moderate or high physical activity	N	33	7	0
	%	82.50%	17.50%	0.00%
Total	N	63	100	47
Physical activity		Average BMI	Z	p
Low physical activity		27.93	7.936	<0,001
Moderate or high physical activity		22.93		

DISCUSSION

Results of research conducted in Poland in 2013 by electrical bioimpedance showed [11] that obesity concerned 23.53 % of perimenopausal women, and overweight – 36.76%. Moreover, in Poland, the percentage rate of obese women increases twice after menopause, and visceral adipose tissue mass may increase by 50.00% [12]. In the light of the results obtained, a higher BMI was observed in the group of women aged 45–65, which may be related to a different research methodology. In another study, 150 women in perimenopause, which was published in 2013, only one in five women (20.70%) had adequate body weight [13].

The PONS study also shows a high percentage of overweight and obesity in women aged 45–64, based on measurements of BMI and WHR. Data indicate that the occurrence of overweight in 42.00% of the examined women, and obesity in approximately 35.00% of the women, which amounts to 77.00% of the examined women with too much weight, and the occurrence of overweight and obesity, increased with age [14].

The literature shows that the reduction of BMI reduces the vasomotor in the menopausal period [15], which was confirmed in the presented study.

Based on the analyzed results of the study it can be concluded that in the group of women whose BMI indicated obesity, recorded the highest average value of somatic-vegetative symptoms, but much lower values of the severity of symptoms of urogenital system, compared with women with overweight. Different results were obtained by Llaneza et al., indicating that among obese postmenopausal women with abdominal obesity and high BMI, the percentage of women reporting sexual dysfunction is higher [16], which probably is related to the age of the surveyed women (above 65 years of age).

The subject of the sexuality of women in recent decades has become a significant topic for thorough consideration [17], also in relation to the sexuality of menopausal women,becauses

sexual functioning contributes to increasing the sense of satisfaction with life and feeling less severity of menopausal symptoms [18, 19]. Understanding the impact of physical activity on sexual function in menopausal women requires further study and discussion.

As a result of the survey, it was observed that the psychological symptoms were characterized by high intensity in the group of examined women, regardless of the value of the BMI index, but the average value of BMI index in the group of respondents indicated overweight, which is partly confirmed in the literature. Women in whom there occurred a depressive episode in the premenopausal period, much more often had a tendency to abdominal obesity and increased BMI [20]. Reduction in body weight and fat content is a key element in the therapy in menopausal women by reducing the risk of occurrence of the metabolic syndrome, endometrial cancer, stress urinary incontinence, bone and joints ailments – especially related to joint degeneration, somatic – vegetative symptoms, psychological, as well as sexual dysfunction [21, 22]. In reducing body weight in order to prevent these diseases the most important factor is undertaking physical activity.

In the light of the presented study, women engaging in low physical activity during the last seven days were the largest group (80.95 %). Only 15.24% of the women claimed moderate physical activity, and only 3.81% had undertaken high physical activity in the last week. These results appear to be consistent with the data obtained in other studies carried out in Poland in recent years concerning physical activity. According to a study conducted in 2008 in Poland, about half of adult Poles are physically inactive in their leisure time. 53% of respondents had not performed any intense physical activity within the last week, 40.00% claimed that they had not undertaken moderate physical activity in the last week [23].

PONS test results published in 2011 show that 33.30 % of Poles aged 45–64 years had not performed any kind of physical activity lasting more than 10 minutes in the past week. Only 2.40 % of respondents had undertaken all kinds of physical activity in the last week, and 11.10% had undertaken moderate physical activity. Walking in free time for at least 10 minutes in the last week was declared by 59.90% of respondents aged 55–64, which meant engaging in low physical activity [24]. The overall level of physical activity decreased with age, which was confirmed by the current study.

A study published in 2014 which including women aged 45–60 living in Turkey, showed that performing physical activity by women had a significant impact on eliminating menopausal symptoms, as assessed by the MRS scale. The study showed a significant decrease in menopausal symptoms, together with an increase in physical activity [20]. Similar results were obtained in a test of 370 Brazilian women aged 40–65 [25], also confirmed in this study.

CONCLUSION

1. As a result of the study, it was noted that moderate and high physical activity of menopausal women has a significant positive impact on eliminating menopausal symptoms, which has been confirmed in scientific reports in recent years.
2. Maintaining ideal body weight in a group of menopausal women is conditioned by an appropriate BMI and taking part in moderate and high physical activity.
3. The guarantor of supporting health is maintenance of physical activity at a moderate or high level, depending on the capabilities of the given individual. Low physical activity is insufficient to maintain health.
4. Only a small percentage of women actively undertook physical activity in the recommended forms and with the right intensity. Therefore, an effort should be made to encourage women to be more physically active in order to prevent diseases characteristic for menopause.

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