







ORIGINAL PAPER

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Selected factors influencing the level of physical activity in the elderly

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ABSTRACT

Introduction. It is commonly known that physical activity has great influence on the quality of life and health in the people of all age groups. Physical activity has a beneficial influence on both functional and locomotive abilities, the dynamics of which deteriorates during the process of aging, and this in turn has an impact upon satisfaction of basic biological, social and psychological needs.

Aim. The main purpose of this study was an assessment of selected factors affecting the level of physical activity in the elderly.

Material and methods. The study group consisted of 100 participants (85 women and 15 men), aged from 65 to 69 years old. An International Physical Activity Questionnaire (IPAQ) - Polish long version was used.

Results. A high level of physical activity was reached by 44 participants, moderate level of physical activity was noted in 53 participants, and low in physical activity was found in 3 participants. Older the subjects reached lower MET value in case of job-related physical activity and higher MET value in case of physical activity in free time and total intense effort.

Conclusion. The level of job-related physical activity, the level of physical activity in free time and the total intense level of activity depended on the age of the subjects. There were no association between the level of total physical activity and sex, place of residence and BMI of participants.

Keywords. physical activity, older people, factors

Introduction

The World Health Organization (WHO) recognizes the age of 60 as the beginning of late adulthood (old age). Three basic stages are distinguished: from 60 up to 75 years of age - early period of old age; from 75 up to 90 years of age - late old age; over 90 years of age – longevity.¹ Successful aging consists of numerous factors among

which physical activity can be mentioned, which is the sphere of human activity giving the opportunity to express oneself in a very individualized form, taking into account ones potential, preferences, and allowing to shape own interests and activate creative processes.² Physical activity has many health benefits, especially for the elderly. The benefits of physical activity for both physical and

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Participation of co-authors: A – Author of the concept and objectives of paper; B – collection of data; C – implementation of research; D – elaborate, analysis and interpretation of data; E – statistical analysis; F – preparation of a manuscript; G – working out the literature; H – obtaining funds

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mental health among older adults has been shown in numerous studies.³ Maintaining activity in the elderly gives the ability to use existing reserves of energy, develops the opportunity to make new contacts and communicate with people. In addition, physical activity makes it possible to play important roles in the field of social life. According to Bień, the deficit of activity among older people evokes feelings of loneliness, social isolation, the progression of disability, and even premature mortality.⁴

Seniors constitute a huge part of our society which has to cope with many problems and concerns about their existence. According to research estimates, in the next twenty years there will be rapid growth in the number of the elderly due to the increase in the average life expectancy. The analysis of test results revealed that by 2035 seniors in Poland will represent a quarter of the entire population. According to calculations, the greatest number of seniors will live in cities.⁵

The level of physical activity in older people is not satisfactory in Poland in comparison to other EU countries. The residents of the Scandinavian countries, particularly Sweden, where the greatest number of centenarians live, are the most active.⁶ However, the phenomenon of longevity is more complex. Women are usually more physically inactive than men, regardless of their place of residence. This fact is confirmed by the present study, however, statistically they live longer.⁷

Aim

The aim of the study was to assess the level of physical activity of people over 65, as well as to analyze selected factors affecting the level of physical activity.

Material and methods

Participants

The research involved elderly people attending classes organized by the University of the Third Age in Przemysł. Out of the 225 seniors attending classes and lectures, 100 agreed to take part in the study. The youngest of the respondents were 65 years old and the oldest were 69 years old. Written consent for participation was obtained from participants prior to the study. All subjects were informed about the possibility of dropping out of the study at any stage.

Outcome measurements

We used the International Physical Activity Questionnaire (IPAQ) - Polish long version. The questionnaire consists of 5 parts containing a total of 27 questions. Each of these parts refers to the following areas of activity: (1) job-related, (2) transportation, (3) housework, (4) recreation, sport, and leisure-time, (5) time spent sitting. The questionnaire contains detailed questions about the activity undertaken during the last week. Individual types of effort were defined in Metabolic Equiv-

alent of Task (MET) units min / week. Based on the obtained calculations, the level of physical activity was determined. Three types of physical activity levels are specified: (1) low - physical effort not taken at all or the total activity value is not higher than 600 MET-min / wk; (2) moderate - total physical activity is in the range above 600 MET-min / wk and does not exceed more than 3000 MET-min / wk; (3) high - determines physical effort above 3000 MET-min / wk.⁸

Data analysis

Results of the study were developed using descriptive statistics: number (n), %, \bar{x} (mean) and standard deviation (SD). To analyze the results obtained in this study, non-parametric tests were used.

The Spearman's rank correlation coefficient was used to determine the relationship between two numerical features and is an indicator that takes values from the range of -1 to 1. The correlation coefficients 0.9 or -0.9 indicate the same (very high power of correlation), although the conclusions drawn on their basis will be opposite - in the first case with the increase in the value of one feature, the value of the other also grows, and in the second case they decrease. In this study, the following adjectival scale was assumed: Correlation force: $|R| < 0.3$ - no correlation; $0.3 \leq |R| < 0.5$ - weak correlation; $0.5 \leq |R| < 0.7$ - average correlation; $0.7 \leq |R| < 0.9$ - strong correlation; $0.9 \leq |R| < 1$ - very strong correlation; $|R| = 1$ - perfect correlation. The Pearson chi-square test was used to analyze variables having the character of qualitative data. The significance level was adopted at $p < 0.05$. Calculations were performed with Statistica 10.0.

Results

The study was attended by 100 participants aged over 65 (85 women and 15 men). The average age of the respondents was 61.3 ± 3.8 years. The youngest of the respondents was 65 years old and the oldest was 69 years old. The body weight of respondents ranged from 52 kg to 102 kg. The BMI of the respondents ranged from 19.7 kg/m² to 32.9 kg/m². Table 1 presents the general characteristics of the groups.

The average job-related activity in the studied group was 206.8 ± 498.8 MET min / wk. This value, however, seems to be biased looking at the distribution of results obtained by individuals. According to the obtained data, the majority of respondents in this category obtained 0 MET (inactive professionally - retired or on pension). The average value for transportation was about 939.3 ± 675.8 MET min / wk. The smallest recorded activity in this sphere was 132 MET and the largest 2772 MET. The value recorded in the case of physical activity related to housework, general housekeeping and family care was on average 1063.8 ± 511.4 MET min / wk. The smallest

recorded activity in this area was 132 MET, and the largest 2370 MET. The value recorded in the case of physical activity in free time was on average 629.1 ± 418.9 MET min / wk. The smallest recorded activity in this sphere was 66 MET and the largest 1706 MET (Table 2).

Table 1. General characteristics of the studied groups

Variable	Full sample
Sex ^a	
Woman	85
Man	15
Education ^a	
Secondary	46
Higher	54
Place of residence ^a	
City	76
Village	24
Age [year] ^b	61.3 ± 3.8
Body mass [kg] ^b	72.8 ± 11.0
Body mass index [kg/m ²] ^b	26.0 ± 3.6
Body mass index ^a	
Normal	38
Overweight	43
Obesity	19

Data are expressed as: ^a n (%); ^b \bar{x} (SD).

On the basis of the results obtained in the IPAQ questionnaire, data was recalculated according to the appropriate scale and transformed into qualitative data, so that it was possible to determine the total physical activity of individuals. High level of physical activity was reached by 44 subjects, moderate level of physical activity was noted in 53 subjects, and low in physical activity was found in 3 subjects (Table 2).

Table 2. Level of physical activity

Physical activity	Value
Job-related physical activity ^a	206.8 ± 498.8
Transportation related physical activity ^a	939.3 ± 675.8
Housework, house maintenance and caring for family related physical activity ^a	1063.8 ± 511.4
Recreation, sport, and leisure- time related physical activity ^a	629.1 ± 418.9
Walking in total ^a	1246.9 ± 776.9
Moderate physical activity in total ^a	1484.9 ± 694.4
Intensive physical activity in total ^a	90.8 ± 182.0
Physical activity in total ^a	2822.6 ± 1092.0
Time spent sitting in total ^a	1844.7 ± 588.6
Average time spent sitting ^a	263.5 ± 84.1
Level of physical activity^b	
High	44
Moderate	53
Low	3

Data are expressed as: ^a MET – minutes/week: \bar{x} (SD); ^b n (%)

Statistical analysis by Spearman's rank correlation test confirmed that job-related physical activity, free time physical activity and total intense effort was related to the age of the subjects ($p < 0.05$). The absolute values of the correlation were $|R| = 0.2$ which indicates a very weak correlation power. Correlation orientation in the case of job-related physical activity was negative, which means that the older the subjects were, the lower was the MET value. In the case of physical activity in free time and in the case of total intense effort, the orientation of the correlation was positive, which means that the older the respondents were, the higher the value of MET they obtained (Table 3).

Table 3. Age and BMI vs. the level of physical activity

Level of physical activity	Spearman's R	p
Age		
Job-related physical activity	-0.2	0.027*
Transportation related physical activity	0.1	0.320
Housework, house maintenance and caring for family related physical activity	0.0	0.783
Recreation, sport, and leisure- time related physical activity	0.2	0.028*
Walking in total	0.1	0.256
Moderate physical activity in total	-0.1	0.312
Intensive physical activity in total	0.2	0.018*
Physical activity in total	0.1	0.489
Time spent sitting in total	0.0	0.941
Average time spent sitting	0.0	0.942
BMI		
Job-related physical activity	-0.0	0.961
Transportation related physical activity	0.1	0.143
Housework, house maintenance and caring for family related physical activity	0.1	0.437
Recreation, sport, and leisure- time related physical activity	0.2	0.059
Walking in total	0.2	0.033*
Moderate physical activity in total	0.1	0.555
Intensive physical activity in total	0.1	0.487
Physical activity in total	0.2	0.107
Time spent sitting in total	0.2	0.086
Average time spent sitting	0.2	0.087

Based on the results presented in Table 3, it was found that there is a relationship between the level of physical activity associated with total walking and the BMI value of the subjects ($p < 0.05$). The absolute value of the correlation was $|R| = 0.2$ which testifies to its very weak strength (Table 3).

The level of total physical activity in the subjects was not influenced by their sex. The education of the respon-

dents was not a factor determining the statistically significant level of physical activity. More often, however, a high level of activity was recorded among the respondents with higher education. People with secondary education more often than the others presented moderate and low activity.

The general level of physical activity did not depend on the place of residence of the respondents. The level of high and moderate activity was more frequently demonstrated by rural residents. The low level was more frequently observed among urban residents.

The general level of physical activity of the subjects was not dependent on the BMI value. It can be observed, however, that the highest level was obtained by obese people, while the moderate level was obtained by overweight people. The low activity level was only found in people with normal body weight (Table 4).

Table 4. Sex, place of residence and BMI vs. the level of physical activity

Variable	Level of physical activity			p
	High n (%)	Moderate n (%)	Low n (%)	
Sex				
Woman	36 (42.3)	46 (54.1)	3 (3.5)	0.602
Man	8 (53.3)	7 (46.6)	0 (0)	
Education				
Secondary	18 (39.1)	26 (56.5)	2 (4.3)	0.556
Higher	26 (48.1)	27 (50.0)	1 (1.8)	
Place of residence				
City	33 (43.4)	40 (52.6)	3 (3.9)	0.612
Village	11 (45.8)	13 (54.2)	0 (0)	
BMI				
Healthy	16 (42.1)	19 (50.0)	3 (7.9)	0.224
Overweight	18 (41.8)	25 (58.1)	0 (0)	
Obesity	10 (52.6)	9 (47.3)	0 (0)	

Discussion

The results of our research confirm that the study group willingly decided to spend time actively. This is demonstrated by the analysis of the declared activity. Out of 100 subjects, as many as 53% were characterized by moderate levels of physical activity. A high level was noted in 44% of the respondents, while a low level was found by 3% of the respondents. In studies carried out in Warsaw, among the respondents of a similar age, it was found that over 67% of the respondents declared high and moderate levels of physical activity, while 32.4% found themselves among those least involved in active leisure activities 32.4%.⁹ Similar results are presented among the students of the University of the Third Age in Wałcz, who present a high and moderate level of activity amounting to 58.3%.¹⁰ The reverse results were obtained by analyzing the entire Polish population. It turns out that despite the National Health Program campaigns to

raise awareness of the benefits of running various forms of activity in the elderly, only 10% of seniors are willing to follow the recommendations.¹¹

The results of our research showed that older subjects achieved lower MET index. The results of studies conducted by Szymczak and Skrzek also indicated a negative correlation between the level of physical activity and the age of the subjects. The authors also showed a slight difference in the level of physical activity between women and men.¹²

Based on the analysis of the results of own research, it was shown that physical activity related to job-related physical activity was at a low level. The explanation of these results may be the fact that the majority of the respondents were professionally inactive. In turn, in the studies of Szymczak and Skrzek, the surveyed men were a group of economically active people, which is why they obtained higher results than in our research.¹² In a study conducted in a group of nurses, Bergier et al. noted high MET indicators in the group of health care staff.¹³ Topolska et al. noted low values of job-related physical activity among elderly women in Zamość area, as well as in the work related to household duties.¹⁴

The results of our research have shown that in the field of leisure activity, as well as analyzing the total intense physical effort, older subjects obtained higher values of the MET index. It can be assumed that the students of the University of the Third Age are aware of the benefits of active spending free time for their health. Age is not an obstacle for them to take recreational forms of activity. According to research carried out by Dębicka and Chudecka, the University of the Third Age students are characterized by a high level of physical activity in comparison with other peers.¹⁵ Older nurses in the range above 51 yrs., in comparison with younger colleagues, also spent their free time actively by participating in recreational physical activity. This group was most likely to take such activities as cycling or running. To a lesser extent they were interested in swimming or dancing.¹³ According to Topolska et al., similarly a lot of free time had women aged 55-65 from Zamość area. They also had high rates of transportation related physical activity.¹⁴ Research by Tuero et al. confirms the relationship between active spending free time and physical fitness.¹⁶ Many researchers have also proven that there is a relationship between spending free time actively and the occurrence of obesity.¹⁷⁻²⁰

In the present study, no correlation was found between sex of the subjects and the total level of physical activity. In turn, the results of research conducted by Tablot et al. indicated that women had a lower level of physical activity than men.²¹ In the studies of Szymczak and Skrzek, the studied elderly women were also characterized by a lower level of physical activity in relation to men.¹²

In our study, no relationship between the total level of physical activity and the BMI index was found. However, obese or overweight people were more likely to have high or moderate levels of physical activity. The result may also be due to the fact that these people may have tried to reduce excessive body mass by intensifying the level of physical activity. However, in studies carried out in the area of University of the Third Age in Wałcz, 81.3% of obese people have a low level of physical activity.¹⁰ Similarly, according to Szymczak and Skrzek, overweight respondents were characterized by a lower level of physical activity.¹² As it is commonly known, the proper level of physical activity affects the maintenance of normal body mass. The finding of this dependence has contributed to the formulation of many recommendations for people who are overweight or obese. It is believed that it is necessary to perform at least 60-90 min of physical activity daily at moderate level to maintain a healthy body weight.²²

In our research, the level of education was not a determinant of physical activity at the statistically significant level. However, people with higher education were more likely to have high levels of physical activity. Similarly, Knapik et al. in their research have proved that an important factor influencing the level of activity in older people is education, which subsequently influences the self-assessment of health.²³

According to analyzes carried out by Piątkowska, age is the most important factor conditioning the attitude of Poles towards physical activity.²⁴ Literature review confirms the relationship in which the level of activity decreases with age both among men and women.²⁵ Similar data obtained the researchers from other countries.^{26,27}

Conclusion

The level of job-related physical activity, the level of physical activity in free time and the total intense level of activity depended on the age of the subjects. There was a relationship between the level of physical activity associated with total walking and the BMI.

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