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ORIGINAL PAPER

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ASSESSMENT OF PSYCHOPHYSICAL CAPACITIES FOR PROFESSIONAL WORK IN LATE MIDDLE AGE AND AT THE BEGINNING OF OLD AGE

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Abstract

Background: In Poland average life expectancy extends, while the number of the elderly who are active in the labor market decreases. **Material and Methods:** The study population consisted of 429 people aged 50–70 years old living in the community of south-eastern Poland. The respondents were divided into 2 study groups: group I – late middle age (50–60 years old) and group II – early old age (61–70 years old). With the use of questionnaires they were given, we obtained their socio-demographic data, assessed their cognitive and emotional state, as their physical activity levels. We used the Tinetti test to assess their gait and balance. **Results:** We did not find statistically significant difference in cognitive functioning between the studied groups ($p = 0.109$). Moreover, there was no significant relationship between belonging to an age group and suffering from depression ($p = 0.06$) as well as no major differences were observed in the general level of physical activity in relation to age ($p = 0.112$). Our study found that most of our subjects, regardless of gender, declared their willingness to continue professional work after reaching retirement age. **Conclusions:** The results of own research did not show significant differences in psychophysical state between people in late middle age and at the beginning of old age. Most of the researched participants declared their willingness to continue professional work. Due to changing demographic conditions, it is becoming an important issue to maintain the highest possible level of professional activity of older people in the labor market in Poland. Med Pr 2018;69(4):375–381

Key words: elderly, middle age, health status, physical activity, work capacity, chronic disease

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INTRODUCTION

The European Union age pyramid is going to change in the coming decades. The reasons are the decreasing fertility rate, the increase in life expectancy, and migration. As a result, the old-age dependency ratio (the ratio between the number of persons aged 65 and over, generally economically inactive, and those typically in the labor force, or the productive part) is going to increase from 27.8% to 50.1% in 2060 [1]. This means that for each person aged 65 and older there are going to be 4 persons at working age. The decrease in labor force may result in crash of pension systems and shortage of workers. One of the ways to maintain an appropriate quality of health care and level of pensions is extending the age of economic activity [2].

In 2015, employment rate of people aged 55–64 was 53–55% in the European Union (EU). It took highest values in Iceland – 84.8% and in Sweden – 74,5%, while in Poland it was 44.3%. More than a half of older employees resign from work before reaching retirement age. The reasons are limitations to their psychophysical work capabilities as well as decrease in motivation to take or continue work [3].

Work capability is the ability to perform work related tasks with good quality at a limited time. According to Martinez et al., work capability is a determinant of functional independence, and a condition to sufficient physical activity and healthy lifestyle [4]. Seitsamo et al. stated that engagement in professional activities had a positive effect on wellbeing and quality of life of the elderly. They found that functional capability impairment might be compensated by increased activity in professional or social work [5].

Because of the observed demographic trends, the aim is to extend economic activity and postpone retirement

as well as to promote activities that ensure full independence of the elderly [6]. Dunlosky et al. point out that persons aged 60 and older still have a high potential to engage in intellectual, physical and social activities [7].

The elderly have higher incidence of chronic illnesses. According to Marcinkiewicz et al., illnesses such as hypertension and diabetes impact the time of economic activity [8]. A person's health state is defined through the capability to achieve the goals. The ability to perform everyday activities defines good physical and mental health of the elderly [9]. The English Longitudinal Study of Aging (ELSA) states that subjective wellbeing is related to longer life. These results were not dependent on age, gender, demographic factors or physical and mental health [10]. According to Finogenow, the moment of resigning from professional work is a critical moment in a person's life. It results in deterioration of subjective wellbeing, and changes a person's social and economic status [11]. The state of economic inactivity leads to deterioration of health and of quality of life. Terminating professional activity may result in losing social contacts or inability to use the now free time, previously spent at work [12].

Demographic changes in Poland and worldwide impact human economic activity to a large extent. The report "Priorities for occupational safety and health research in Europe: 2013–2020" states that an aging society is a challenge for health care of the working generations [13]. Life expectancy extends and the proportion of elderly workers in the workforce increase. Therefore, we designed this study to assess the psychophysical capabilities for work in late middle age and early old age of people inhabiting the south-east regions of Poland.

MATERIAL AND METHODS

Study subjects and location

A cross-sectional study was conducted by the use of the random route method among inhabitants living in the community of south-eastern Poland aged 50–70 years old. A total of 429 people were interviewed in their place of residence by specially trained researchers. Due to the incompleteness of some collected data, 78 questionnaires were rejected in this article and 351 complete questionnaires were included in the further analysis. The study population was divided into 2 groups: group I – late middle age (50–60 years old) and group II – early old age (61–70 years old).

In accordance with the Declaration of Helsinki, the subjects were provided with information about the aim and the course of the study, and expressed their informed consent to participate. The approval to conduct the study was obtained from the Bioethical Commission of the University of Rzeszów.

Tools

We used questionnaires to collect subjects' basic socio-demographic data, such as age, gender, place of residence, education and occurrence of chronic diseases diagnosed in the subjects by the doctor. The participants were also asked about their willingness to continue professional work.

Cognitive and emotional state

We assessed subjects' cognitive impairment with the Mini-Mental State Examination (MMSE). The MMSE consists of 30 questions that quantitatively measure aspects of cognitive functioning. The Mini-Mental State Examination is a clinical scale that has high internal consistency and high diagnostic accuracy [14]. The assessment of the cognitive functioning was made according to Fedyk-Łukasik methodology [15].

The Geriatric Depression Scale (GDS) is used for assessing the intensity of depression symptoms in the elderly. It consists of 15 questions on mood, motivation, and somatic symptoms of depression. The scale has high accuracy and reliability [16].

Physical activity

We assessed the level of physical activity with the short version of the International Physical Activity Questionnaire (IPAQ). The questionnaire comprises 7 questions on the frequency and time of physical activity related to leisure, work and everyday life. The ratio of physical activity intensity was assessed with the metabolic equivalent (MET). One MET is the consumption of oxygen in quiet sitting, which is 3.5 ml of O_2/kg/min. It is assumed that light intensity activities have MET values of 3.3, moderate activities have MET values of 4, and vigorous intensity activities have MET values of 8. The following values describe levels of physical activity:

- insufficient activity (< 600 MET–min/week),
- sufficient activity (600–1500 MET–min/week),
- increased activity (> 1500 MET–min/week, with less than 3 days/week of intensive activity),
- high activity (> 1500 MET–min/week, with at least 3 days/week of intensive activity, or more than 3000 MET–min/week) [17].

Gait and balance

We used the Tinetti test to assess gait and balance. The test consists of 2 parts. The part 1 assesses static and dynamic balance. The part 2 assesses mobility. The maximum number of points in the 2 parts is 28 pts [18].

Statistical analysis

For the considered variables we provided a quantity and structure indicator. To compare group I and group II parameters, we used Pearson's Chi^2 test. We used Statistica 12.0 statistical package to conduct the statistical analysis. Statistical significance was set at $p < 0.05$.

RESULTS

The study encompassed 351 subjects aged 50–70 years old. The majority of subjects were women – 57.55%. More than a half of subjects lived in rural areas – 54.99%. In both groups, the majority graduated from high school. The largest percentage rate of respondents spend their free time in front of the TV. The most common chronic illnesses that the subjects suffered from were spinal joint degenerative disorders and hypertension, out of which, hypertension was more common in people in the older age group. There were no statistically significant differences in terms of sex, place of residence, body mass index and comorbidities between the groups studied. The Table 1 presents the characteristics of the studied population.

Regarding group I, 74.78% of people had a good cognitive status, while in group II – 66.50%. There was no statistically significant difference in cognitive functioning between the 2 groups (p = 0.109). In group II, 19% of subjects had moderate depression.

Table 1. Characteristics of the studied population of people aged 50–70 years old and living in the community of south-eastern Poland

Variable	Respondents [n (%)]			p
	group I (50–60 year old) (N = 145 (41.31%))	group II (61–70 year old) (N = 206 (58.69%))	total (50–70 years old) (N = 351 (100%))	
Gender				
women	87 (60.00)	115 (55.83)	202 (57.55)	
men	58 (40.00)	91 (44.17)	149 (42.45)	0.436[a]
Type of residence				
urban	57 (39.31)	101 (49.03)	158 (45.01)	0.072[a]
rural	88 (60.69)	105 (50.97)	193 (54.99)	
Education				
primary	22 (15.17)	38 (18.45)	60 (17.09)	
basic vocational	38 (26.21)	72 (34.95)	110 (31.34)	
secondary	52 (35.86)	76 (36.89)	128 (36.47)	0.007[a]
higher	33 (22.76)	20 (9.71)	53 (15.10)	
Body mass index				
underweight	4 (2.76)	1 (0.49)	5 (1.42)	
normal	54 (37.24)	65 (31.55)	119 (33.90)	
overweight	52 (35.86)	92 (44.66)	144 (41.03)	0.300[b]
obesity	35 (24.14)	48 (23.30)	83 (23.65)	
Free time activities				
walking	80 (55.17)	110 (53.40)	190 (54.13)	0.372[c]
working	107 (73.79)	150 (72.82)	257 (73.22)	0.420[c]
sport	40 (27.59)	42 (20.39)	82 (23.36)	0.059[c]
tourism	40 (27.59)	39 (18.93)	79 (22.51)	0.028[c]
reading books/newspapers	73 (49.62)	122 (59.22)	195 (55.56)	0.038[c]
watching TV	107 (73.79)	156 (75.73)	263 (74.93)	0.340[c]

Table 1. Characteristics of the studied population of people aged 50–70 years old and living in the community of south-eastern Poland – cont.

Variable	Respondents [n (%)]			p
	group I (50–60 year old) (N = 145 (41.31%))	group II (61–70 year old) (N = 206 (58.69%))	total (50–70 years old) (N = 351 (100%))	
Illnesses				
diabetes	34 (23.54)	55 (26.70)	89 (25.36)	0.118[c]
hypertension	54 (37.24)	102 (49.51)	156 (44.44)	0.011[c]
cardiovascular disorders	24 (16.55)	24 (11.65)	48 (13.68)	0.094[c]
ostheoporosis	20 (13.79)	32 (15.53)	52 (14.81)	0.326[c]
degenerative peripheral joint disorder	52 (35.86)	80 (38.83)	132 (37.61)	0.286[c]
degenerative spinal joint disorder	72 (49.56)	116 (56.31)	188 (53.56)	0.106[c]
rheumatism	35 (24.14)	55 (26.70)	90 (25.64)	0.249[c]

[a] Chi² test.
[b] Chi² test without underweight category.
[c] Test of significance of differences between 2 structure indices.

We did not find statistically significant relationship between belonging to one of the age groups and developing depression (p = 0.060). We did not find statistically significant relationship in the general level of physical activity depending on age (p = 0.112). In group I, 17.24% of subjects and 12.62% of subjects from group II had increased or high physical activity. We found a statistically significant increase of risk of falling in the older group (p = 0.003). In group II, 13% of subjects had fivefold increase of risk of falling, and 26% had moderate risk of falling. The Table 2 presents the relationships between age and cognitive impairment, developing depression, general physical activity level and risk of falling.

Table 2. Relationships between age and cognitive state, developing depression, general physical activity level and risk of falling in the studied groups

Variables	Respondents (N = 351 (100%)) [n (%)]		p
	group I (50–60 year old) (N = 145 (41.31%))	group II (61–70 year old) (N = 206 (58.69%))	
Mini-Mental State Examination			
normal cognitive state	108 (74.78)	137 (66.50)	0.109[a]
impaired cognitive state, without dementia	37 (25.52)	69 (33.50)	
Geriatric Depression Scale			
no depression	126 (86.90)	163 (79.13)	0.060[a]
moderate depression	19 (13.10)	43 (20.87)	
International Physical Activity Questionnaire			
insufficient activity	44 (30.34)	84 (40.78)	0.112[a]
sufficient activity	76 (52.42)	96 (46.60)	
increased and high activity	25 (17.24)	26 (12.62)	
Tinetti test			
fivefold increase of risk of falling	13 (8.97)	31 (15.05)	< 0.001[a]
moderate risk of falling	19 (13.10)	57 (27.67)	
no risk of falling	113 (77.93)	118 (57.28)	

[a] Chi² test.

We surveyed the willingness of the subjects to continue working after reaching retirement age. In group I, 35.63% of women expressed their willingness to do so, compared with 60.87% from group II. Men showed a comparable increase in willingness to continue work – from 29.31% of subjects from group I to 62.64% of subjects from group II. The Table 3 presents answers to the question on willingness to continue professional work after reaching retirement age.

Table 3. Willingness to continue professional work in retirement age in the studied group

Answer	Respondents (N = 351 (100%)) [n (%)]			
	group I (50–60 year old) (N = 145 (41.31%))		group II (61–70 year old) (N = 206 (58.69%))	
	women	men	women	men
Yes	31 (35.63)	17 (29.31)	70 (60.87)	57 (62.64)
No	56 (64.37)	41 (70.69)	45 (39.13)	34 (37.36)

DISCUSSION

Our results show that there are no statistically significant differences between subjects in late middle age and in early old age as regards cognitive functioning, emotional functioning and in general level of physical activity. The older group had an increased risk of falling when compared to the younger group. In spite of certain limitations to mobility and body balance, most of the elderly men and women expressed their willingness to continue professional work after reaching their retirement age.

In Poland there are 13.6% of citizens who are 65 years and older. By 2050 this percentage will have risen to 34.5% and it is going to be one of the highest in the European Union [19]. From the psychophysical perspective, the process of aging means a progressive deterioration of functioning of systems and organs. To monitor the psychophysical state of older adults, a unified system of measuring it is necessary. Introducing efficient tools for functional assessment, such as: body mass index, cognitive tests, mobility assessment, physical activity assessment, and chronic illnesses monitoring should become an integral part of countrywide policy of data collection that serves health monitoring [20].

Our study revealed that the differences between subjects aged 50–60 and 61–70 were minute. The biggest age related differences were those related to increased risk of falling in the older study group. Similar results were obtained by Verghese et al. The authors revealed that age and co-morbidity are factors associated with an increased risk of falling [21].

As a result of the study we found that spinal joint degenerative disorders and hypertension are the most common chronic diseases in both age groups. The obtained outcome is consistent with the data of the Central Statistical Office, which indicates that the most common diseases in the population of older people in Poland are degenerative changes of the spine, arterial hypertension and degenerative changes in peripheral joints [22]. In our study we evaluated the prevalence of depression in late adulthood and early old age. Symptoms of moderate depression were more frequent in the older age group (20.87% vs. 13.10%, $p = 0.06$). Similar findings were obtained by Yaka et al., who showed that depression symptoms occurred in 18.5% of people over 60 years of age [23]. We also found that insufficient physical activity levels appear slightly more often in the early stages of old age (30.34% vs. 40.78%, $p = 0.112$). Sun et al. indicated a minor decrease occurring with age in physical activity among the elderly in a systematic review, although there was variation across the studies [24].

The cognitive functioning and emotional state as well as the level of physical activity were similar in both studied groups. A review by the International Organisation for Economic Cooperation and Development (OECD) found that over the course of a few recent years the level of disability of the elderly decreased in 5 out of 12 studied countries. Disabilities experienced in the older age often stem from accumulated results of unhealthy lifestyle or other risk factors faced earlier in life [25]. Eliminating risk factors such as smoking or obesity in younger age may result in better functioning in old age. It is also important to adapt to the needs of older people the environmental factors of their lives (understood as the physical, and social world as well as attitudes system) which, when appropriately modified, allow them to maintain their efficiency and independence in the everyday functioning of both family, social and professional life [26].

Our study found that most subjects, regardless of their gender, declare willingness to continue their professional work after reaching retirement age. According to Kwiatkiewicz, employees who have reached retirement age, are able to claim their pension benefits and still continue work [27]. A cross-sectional study by Warr did not find significant differences in professional work tasks as conducted by younger and older work-

ers [28]. Eichhorst et al. concluded that older employees demonstrate similar work efficiency as their younger colleagues [29]. Mountford pointed out that older employees are more devoted, reliable and engaged [30]. They tend to change work less often and have fewer accidents at work. These authors noted that older employees were as innovative as younger ones. Despite this, older employees are offered fewer training and development opportunities [30]. To ensure equal opportunities at work, it is necessary to introduce policies that increase employer awareness on elderly employees' work capabilities.

CONCLUSIONS

Polish society is aging, yet it is also becoming more active and better educated. According to our study, there were no significant differences in psychophysical state between people in late middle age and at the beginning of old age. Most of the researched participants declared their willingness to continue professional work. Due to changing demographic conditions, it is becoming an important issue to maintain the highest possible level of professional activity of older people in the labor market in Poland. It is necessary to widen research assessing the psychophysical condition of the elderly and broadly understood environmental factors in the context of maintaining the ability to continue professional work by these people in Poland.

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