Health behaviors as determinants of the quality of life of the elderly

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Abstract

Background: Quality of life is a subject of research by representatives of various fields of science, including psychology, sociology, economics, and medicine. The results of some previous studies show that the quality of life of elderly people is related to their health behaviors. The aim of the study was to assess the relationships between the quality of life, considered in general and in detail, and health behaviors of healthy and ill elderly people from the Opolskie Voivodeship (Poland). *Methods:* 105 people (81 women and 24 men) participated in the study, including 61 patients and 44 healthy people, aged from 60 to 89 years. The average age of respondents was 71.2 ± 6.4 years. The main research method was the diagnostic questionnaire survey. The Health Behavior Inventory and R. Cummins's Comprehensive Quality of Life Scale were used. *Results:* The study results showed that the average value of the health behavior index in healthy respondents was significantly higher than in patients. The analysis of particular categories of health behaviors revealed that healthy persons declared normal eating habits more often than patients. The mean value of the general quality of life index was significantly higher in healthy respondents than in patients. Health status also significantly differentiated the quality of life in favor of healthy individuals in the domains of health and intimacy. In the analyzed group of respondents, health behaviors significantly determined the quality of life of patients only. The odds that the quality of life of patients are above average were greater in patients with average and higher health behavior indices than in patients with low health behavior indices. *Conclusion:* Measures of quality of life improvement should also be aimed at increasing the prevalence of health behaviors in the elderly.

Keywords: health behaviors, quality of life, the elderly, patients, the healthy

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INTRODUCTION

Quality of life is a research subject studied by representatives of various fields of science, including psychology, sociology, economics, medicine, and health sciences. Most of quality of life research has focused on the evaluation of the quality of life of people from segregated groups, based on such criteria as age, gender, occupation, place of residence or health status. The analysis of results of previous studies indicates, for example, a decline in the quality of life with age in some respondents [1,2], and higher levels of quality of life of healthy people compared with patients [3]. Lower quality of life indicators are also often associated with the prevalence of psychosomatic diseases, physical impairment, and poor social functioning in elderly people [4].

Following these observations, several authors of studies considered potential correlations between quality of life and health behaviors in elderly people. For example, it was proven that older people who undertake sufficient health-related physical activity have a higher quality of life compared to people with too low physical activity levels [5,6]. The World Health Organization recommends for older people to perform weekly: 150 minutes of moderate intensity physical exercise or 75 minutes of high intensity exercise. This is very important, because the involutionary processes in combination with troublesome ailments of elderly people are conducive to limited physical activity [7]. Among other disease prevention activities, smoking, health education and participation in prevention programs were proved to have a significant impact on quality of life [8]. Kwon et al. [9] and Xu et al. [10] showed that healthy eating habits played an important role in determining the quality of life of older people. The combination of rational nutrition with physical activity proved particularly effective in this context. An analogous, positive influence on the quality of life of elderly people was also noted in relation to dispositional optimism, sleep duration, and body mass [4,11,12].

Despite many earlier studies on potential links between quality of life and health behaviors of older people, there is still a lack of fully successful research in this area. Previous research has usually focused on the impact of particular health behaviors on quality of life, e.g. physical activity or diet. Rarely, however, was a comprehensive assessment of health behaviors performed or potential correlations between health behaviors and quality of life analyzed. Previous studies were also conducted among healthy or sick people; however, the directions and strength of relationships between quality of life and health behaviors in healthy and diseased persons have not been compared so far.

In the context of the above observations and identified research gaps, the aim of the present article is to assess the relationships between quality of life - in general and in detail - and health-related behaviors of healthy and sick elderly people from the Opolskie Voivodeship in Poland.

MATERIALS AND METHODS

The study was carried out in November and December 2018 in the Opolskie Voivodeship in Poland. The research project had been given a positive opinion by the Commission of Bioethics of the University of Physical Education in Wroclaw. The study sample consisted of 105 persons (81 women and 24 men), including 61 patients and 44 healthy persons, aged from 60 to 89 years. The age limits of the respondents were determined according to the classification adopted by the WHO, in which 60 years is the beginning of so-called early old age and 89 years is the end of so-called late old age. Characteristics of the respondents by health status, gender, level of education and marital status are presented in Table 1.

The selection of the sample for research was purposeful, in which the following inclusion criteria were adopted: address of residence – Opolskie Voivodeship, age – 60 and more years and exclusion criteria: chronic diseases, such as cancer, severe diseases of the circulatory, respiratory, digestive and excretory systems and dementia. The healthy respondents were participants in University of the Third Age classes in Opole. The patients-respondents were geriatric ward patients, hospitalized for 5-7 days. The basis for their hospital admission was the severity of pain in the course of degenerative diseases of the joints with a high risk of motor disability. The patients' coexisting medical conditions included arterial hypertension (NYHA Class II heart failure) and managed type 2

diabetes. Patients with cancer and severe disorders of the respiratory, digestive, and excretory systems as well as with dementia were excluded from the study.

All respondents were informed about the purpose and course of the research and agreed to participate in it voluntarily and anonymously. The research method used was the diagnostic questionnaire survey. The Health Behavior Inventory was used to evaluate respondents' health behaviors [13]. The inventory consists of 24 items describing various types of health behaviors which, depending on their frequency, were assigned a value of 1 to 5. On the basis of the collected information, an index of general health behavior intensity as well as indices for four inventory subscales: healthy eating habits, disease prevention behaviors, optimistic mental disposition, and health practices were calculated. Following the recommendations of the inventory author, the general health behavior index was converted to sten scores, with 1-4 sten scores interpreted as low, 5-6 sten scores as average, and 7-10 sten scores as high. The internal conformity of the Health Behavior Inventory, based on Cronbach's alpha, was 0.85 for the whole inventory, and between 0.60 and 0.65 for its four subscales. Respondents' quality of life was assessed with R. Cummins's Comprehensive Quality of Life Scale [14] measuring both subjective and objective quality of life in seven domains: material well-being, health, productivity, intimacy, safety, community, and emotional well-being. A general quality of life between -20 and +20 points was calculated. The Crombach-alpha reliability estimate for individual domain scales amounted to 0.7-0.8.

Table 1. Numbers of respondents by health status, gender and selected socio-demographic characteristics.

Variable	n	%
Health status		
healthy individuals	44	41.9
patients	61	58.1
Gender		
woman	81	77.1
man	24	22.9
Education		
elementary and basic vocational	30	28.6
secondary	44	41.9
higher	31	29.5
Marital status		
single	43	40.9
married	62	59.1

Table 2. Age and somatic characteristics of respondents in health status groups.

Variable	Group	x̄	SD	Me	Q	Z	p
Age	healthy	70.0	6.4	68.0	4.0	1.73	≥ 0.05
	patients	71.9	6.3	71.0	4.0		
Body height	healthy	163.4	7.3	162.0	5.0	-1.58	≥ 0.05
	patients	161.3	8.7	160.0	5.5		
Body mass	healthy	72.7	11.9	71.0	7.5	**2.72**	**< 0.001**
	patients	81.0	17.2	83.0	9.0		
BMI	healthy	27.2	4.4	26.1	2.5	**3.48**	**< 0.001**
	patients	31.0	5.9	30.8	4.5		

x̄ – arithmetic mean, SD – standard deviation, Me – median, Q – quartile deviation, Z – Mann-Whitney U test for n > 20, p – probability value (statistically significant at p ≤ 0.05 in bold)

Table 3. Health behaviors and quality of life of respondents in view of their health status.

Variable	Group	$\overline{x}$	Me	SD	Q	Z	p
Healthy eating habits	healthy	3.9	4.0	0.6	0.3	**-2.62**	**<0.001**
	patients	3.6	3.5	0.7	0.5		
Disease prevention behaviors	healthy	4.1	4.2	0.5	0.4	-1.04	≥0.05
	patients	3.9	4.0	0.7	0.6		
Dispositional optimism	healthy	4.1	4.0	0.6	0.3	-0.97	≥0.05
	patients	3.9	4.0	0.6	0.3		
Health practices	healthy	3.8	3.8	0.6	0.3	-1.87	≥0.05
	patients	3.6	3.5	0.7	0.4		
Health behavior index	healthy	96.0	97.5	10.7	4.8	**-2.43**	**<0.05**
	patients	90.9	91.0	13.0	9.0		
Material well-being	healthy	8.2	8.5	5.8	2.0	-1.45	≥0.05
	patients	7.1	8.0	5.5	2.5		
Health	healthy	9.1	10.0	8.3	4.8	**-2.00**	**<0.05**
	patients	5.4	8.0	10.2	4.5		
Productivity	healthy	9.8	9.0	5.9	2.5	-0.39	≥0.05
	patients	8.9	9.0	7.3	3.0		
Intimacy	healthy	13.4	15.0	6.3	5.0	**-1.97**	**<0.05**
	patients	10.9	12.0	7.7	3.5		
Safety	healthy	12.9	12.0	4.9	2.5	-1.82	≥0.05
	patients	9.8	12.0	7.8	4.5		
Community	healthy	6.5	6.0	7.1	4.8	-0.64	≥0.05
	patients	5.3	4.0	7.6	5.0		
Emotional well-being	healthy	11.4	12.0	7.9	3.8	-1.32	≥0.05
	patients	9.7	12.0	7.9	5.0		
Quality of life index	healthy	10.2	9.5	3.7	2.5	**-1.95**	**<0.05**
	patients	8.1	8.4	5.5	3.4		

$\overline{x}$ – arithmetic mean, SD – standard deviation, Me – median, Q – quartile deviation, Z – Mann-Whitney U test for n > 20, p – probability value (statistically significant at p ≤ 0.05 in bold)

Table 4. Quality of life and health behaviors in view of binary logistic regression.

Group	Health behavior index	General quality of life index				OR	p	CL	
		≤Me		>Me				-95%	95%
		n	%	n	%				
Healthy	low	2	66.7	1	33.3	1.00	≥0.05	–	
	average	2	40.0	3	60.0	0.33		0.02	6.65
	high	18	50.0	18	50.0	0.50		0.04	6.02
Patients	low	5	38.5	8	61.5	1.00	<0.001	–	
	average	12	46.2	14	53.9	1.37		1.05	5.33
	high	37	56.1	29	43.9	2.04		1.60	6.90

The reference category for the dependent variable is: low health behavior index. Abbreviations: OR – odds ratio of binary logistic regression, p – probability value, CI – confidence interval for OR.

For the purpose of the analysis, the respondents were divided into two groups. The first group consisted of respondents whose general quality of life index was lower than or equal to the median; and the second group comprised respondents whose quality of life was higher than the average. The size of the sample and the lack of statistically significant differences between the assessments of health behavior and quality of life in men and women meant that all the results of the study were discussed

without gender division. The level of statistical significance was set *ex ante* at α < 0.05. All statistical calculations were made with the use of IBM SPSS Statistics 20 software package.

RESULTS

The average age and body height of respondents from the Opolskie Voivodeship were similar, regardless of their health status. Healthy respondents were characterized by significantly lower (p < 0.001) mean body mass and BMI values (Table 2).

The analysis of the results showed that the mean value of health behavior index in healthy respondents was 96.0 ± 10.7 pts. and was significantly higher (Z = -2.43, p < 0.05) than in patients with 90.0 ± 13.0 pts. The analysis of particular subscales of health behaviors showed that healthy people significantly more often declared following healthy dietary habits than patients (Z = -2.62, p < 0.001). Despite the fact that healthy respondents also declared their participation in disease prevention activities and health practices more often and had a higher level of dispositional optimism than healthy people, the differences were statistically non-significant (p ≥ 0.05).

The mean general quality of life index (10.2 ± 3.7 pts. in healthy respondents, and 8.1 ± 5.5 pts. in patients) was significantly higher in the former (Z = -1.95, p < 0.05). The health status also significantly differentiated between healthy respondents and patients in the quality of life domains of health (Z = -2.00, p < 0.05) and intimacy (Z = -1.97, p < 0.05). In healthy respondents, non-significantly higher (p ≥ 0.05) mean values of quality of life indices in the domains of material well-being, productivity, safety, community and emotional well-being (Table 3) were also observed.

Table 4 presents the results of binary logistic regression analysis showing the relationships between quality of life and health behaviors of the elderly. The goodness of fit model value of χ2 = 7.66 and test probability of p < 0.05 indicate that the model differs significantly from the one containing only an intercept. In the analyzed group of Opolskie Voivodeship residents aged 60 to 89 years, health behaviors significantly determined the quality of life of the patients only (< 0.001). The odds of above average patients' quality of life was 37% (OR = 1.37) in respondents with an average health behavior index, and over 2 times higher (OR = 2.04) in respondents with a high health behavior index, than in those with a low health behavior index. These observations were not made in the group of healthy persons (Table 4).

DISCUSSION

The study results show that the elderly people in good health were more likely to display health behaviors than the respondents in bad health. The significant role of lifestyle in determining the health of the elderly has been confirmed empirically by a number of authors [15,16]. According to Lalonde's concept of health fields, lifestyle is the most important determinant of human health, as the strength of its impact is estimated at about 55% [17]. The health behavior domain which clearly differentiated between both groups of respondents was proper eating habits. In the discussed studies, this concerned, among others eating vegetables, fruits and coarse-grained bread, and limiting the consumption of animal fat, sugar, salt and preservatives. Similar results in relation to the key role of healthy nutrition were noted by Fung et al. [18], Paschou et al. [19] and Mamalaki et al. [20].

Another observation from the analysis of the study results, is the higher quality of life in healthy people as compared to patients. Analogous quality of life differences between studied groups were observed in the domains of health and intimacy. Vagetti et al. [21] and Gothe et al. [22] also noted significant correlations between quality of life and health status.

Among the respondents from the Opolskie Voivodeship, health behaviors significantly affected the quality of life only in patients. The odds of a high level of quality of life of hospitalized patients increased with manifestations of their health behaviors. Efklides et al. [23] in their study of elderly ill and healthy Greeks also noticed a different influence of health behaviors on the quality of life among the representatives of both groups. Health behaviors also determined the quality of life of Chinese with hypertension in Cao et al. [24].

Researchers have observed the significant impact of particular health behaviors of older people on their quality of life. Petek et al. [25] in their study of people with a high risk of hypertension noticed that their quality of life was determined by physical activity and good nutritional habits. Qin et al. [26] in their research on US elderly diabetic patients noted significant links between quality of life, physical activity, and non-use of stimulants. However, they did not observe similar correlations in the case of fruit and vegetable consumption. Fanning et al. [12], when investigating older people with obesity, showed that their quality of life was most strongly affected by physical activity during a few weeks of health training. However, the condition for the statistical significance of described correlations was respondents' loss of excessive body weight. Physical activity and rational nutrition are the health behaviors that have the strongest impact on the quality of life among the elderly with osteoarthritis as examined by Arranz et al. [27]. Uchmanowicz and Gebbens [28] also revealed the significant impact of the mental functioning on the quality of life in elderly patients with heart failure. The results of the present study revealing significant links between the quality of life and health behaviors only in patients are not reflected in other works. In a few previous studies analogous relationships were also observed in healthy subjects. It should be stressed, however, that these studies examined potential links between the quality of life and particular health behaviors of respondents, rather than a comprehensive set of health behaviors.

Significant relationships between quality of life and selected health behaviors in healthy South Koreans aged 65 and over were found by Hong et al. [29]; in Australians aged 75 and over by Amarasena et al., [30]; in Chinese aged 65 to 74 by Shao et al. [31]; and in Poles by Cybulski et al. [32] Elderly people from Poland were also studied by Puciato et al. [9] who noted that the odds of high assessment of their quality of life were greater along with increasing levels of physical activity. Moreover, it was shown that the highest average general quality of life and quality of life in the physical, psychological, social and environmental domains were found in respondents whose intensity of physical activity was the highest. On the other hand, Wong et al. [33] revealed that non-smoking was a health behavior with the strongest impact on the quality of life of elderly people in Hong Kong. Kostka and Jachimowicz [4], Maher and Cummins [34], Renaud and Bédard [35] found significant relationships between the quality of life of elderly people and dispositional optimism. Kwon et al. [9], Vind et al. [36], and Roe et al. [37] proved the significant impact of proper eating habits on the quality of life of elderly people. They demonstrated the significant role of health education programs in effective counteracting falls and, consequently, in determining the quality of life of elderly people. However, Uchmanowicz et al. [38] identified significant relationships between the quality of life and sleep disturbances in elderly people.

The present study has its strengths and weaknesses. Its important strength is a comprehensive analysis of health behaviors and quality of life, and evaluation of potential correlations between these aggregated categories. These relationships have not been considered simultaneously in groups of healthy and diseased persons. Only a small part of previous studies have focused on Central European countries, which - due to their dynamic social and economic developments and transformations of their economic and health care systems - seems to be a particularly interesting area of research. The weakness of the present study is the limitation of its spatial scope to one region of Poland only. Any subsequent studies should extend their spatial range, and thus increase the number of respondents. A larger number of respondents will allow determining the role of age in assessing the quality of life in individual domains. An interesting research problem seems to be also separate investigations of relations between quality of life and health behaviors in groups separated by disease types, or socio-economic variables such as gender, education, marital status, or material status. The importance of these determinants of quality of life was documented in Bottone et al. [39]. Given the importance of proper nutrition and physical activity for the lifestyle and health status of older people, subsequent studies should also analyze their role in assessing quality of life in more detail.

CONCLUSIONS

The results of the study confirm positive relationships between the quality of life and health behaviors in elderly patients. Since improving the quality of life is one of the main strategic objectives of numerous countries and regions, it is necessary to recommend to policy makers the implementation

of measures aimed at promoting health behaviors among the elderly. Health behaviors such as physical activity, rational nutrition, substance avoidance - especially tobacco products - and positive mental attitudes should be considered particularly promising determinants of quality of life. Public authorities at central and regional levels, health care providers, insurance companies, relatives and carers of older people, the media, and patients themselves need to work together to increase the effectiveness of promoting such health behaviors.

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