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QUALITY OF LIFE AND NUTRITIONAL STATUS AMONG 65-YEAR-OLD OR OLDER PATIENTS WITH HEART FAILURE AND/OR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Jakość życia i stan odżywienia w grupie pacjentów w wieku powyżej 65 lat z niewydolnością serca i/lub przewlekłą obturacyjną chorobą płuc

Streszczenie

Wstęp

Występowanie chorób przewlekłych, jak niewydolność serca (NS), czy przewlekła obturacyjna choroba płuc (POChP), wpływa na stan odżywienia, jak i jakość życia seniorów.

Cel

Określenie zależności między stanem odżywienia a jakością życia w grupie pacjentów po 65 roku życia z NS i/lub POChP.

Materiał i metody

Badaną grupę stanowiło 120 pacjentów w wieku powyżej 65 lat, z NS i/lub POChP. W badaniach wykorzystano: kwestionariusz własnej konstrukcji, skalę MNA oraz kwestionariusz SF-36v2®Health Survey.

Wyniki

Zagrożonych niedożywieniem było 55,8% badanych, a 10,0% – niedożywianych. Średnia wartość indeksu jakości życia wynosiła 62,54±13,15pkt., wymiaru fizycznego – 72±13,67 pkt., a mentalnego – 44,58±18,87 pkt. Indeks jakości życia, jej wymiar fizyczny i mentalny zależały istotnie od stanu odżywienia (p < 0,001).

Wnioski

1) Stan odżywienia większości badanych był niezadowalający.

2) Jakość życia badanych nie była wysoka.

3) Indeks jakości życia, a także jej wymiar fizyczny i psychiczny były znacząco różne w zależności od stanu odżywienia badanych.

Słowa kluczowe: stan odżywienia, jakość życia, choroby przewlekłe, starsi

Abstract

Introduction

The occurrence of chronic diseases, like heart failure (HF) or chronic obstructive pulmonary disease (COPD),significantly influences both seniors' nutritional status and the quality of their life.

Aim of the study

Determination of the relationship between a nutritional status and a life quality among patients with HF and/or patients with COPD aged over 65.

Material and methods

The study group consisted of 120 hospitalized people aged over 65, suffering from NS and/or COPD. Tools used in the study: own construction questionnaire, MNA scale and SF-36v2®Health Survey.

Results

55.8% of patients were in danger of malnutrition, 10.0% were undernourished. An average value of the quality of life index was62.54±13.15pt, physical dimension – 72±13.67 pt and mental – 44.58±18.87 pt. Quality of life index and its physical and mental dimensions dependedon nutritional status assessed by MNA scale (p<0.001).

Conclusions

1) The nutritional status of the majority of respondents was unsatisfactory.

2) The quality of life in the study group was not high.

3) The general level of lifequality, as well as its physical and mental dimensions, were significantly different depending on the nutritional status of the subjects.

Key words: nutritional status, quality of life, chronic diseases, elderly

Introduction

A rising percentage of elderly people is a natural consequence of demographic changes that have been observed for several decades, especially in highly developed countries including Poland [www1]. Ageing society poses a challenge to public health and medicine, which requires complex measures to be taken not only to improve the elderly people's health condition but also the quality of their life [Bryła and Maniecka-Bryła, 2011]. Undeniably, the quality of life of elderly people is influenced by numerous factors. Physical well-being is considered to be one of the main determinants of the quality of life [Szewczyczak, Stachowska and Talarska, 2012]. On the other hand, physiological changes typical for the old age lead to a decline in functional capacity and conduce to numerous abnormalities (including disorders of nutritional status) and co-occurrence of chronic diseases (such as heart failure (HF) or chronic obstructive pulmonary disease (COPD), which, consequently, results in a decline in the life quality of elderly people [Kurowska and Simon, 2013; Ożga and Małgorzewicz, 2013; Mziray et al, 2014].

Therefore, in order to provide elderly people with proper and effective care tailored for their specific needs and problems, it is essential to include in the assessment of their condition not only clinical parameters but also the quality of their life, taking into account all its aspects and determinants.

The aim of the study was to determine the relationship between a nutritional status and a life quality among patients with HF and/or patients with COPD aged over 65.

Material and methods

The study was conducted between March and May 2018 in a group of 120 patients (57 women and 63 men) hospitalized on three internal diseases wards in Małopolska region. The main criteria for participating in the study were the age of 65 or more and a HF or COPD diagnosis. Additional criteria includeda somatic condition allowing for making a complete record of the study, at least moderate functional capacity in the area of basic daily living activities, no significant disorders in the cognitive sphere and signing up an informed consent for taking part in the study.

Qualifications for the study were based on the results ofAMTS (Abbreviated Mental Test Score–AMTS) with the minimum test score >6 [Romanik and Łazarewicz, 2017] and ADL (Activities of Daily Living – ADL)– with the minimum test score ≥ 3 [Borowicz, 2011].

The proper study consisted of an interview based on the authors' own questionnaire including questions aimed at obtaining patients' socioeconomic data and determining their current health status and its influence on their eating habits and the quality of their meals.

The level of the quality of respondents' life was determined by means of SF-36v2®Health Surveyafter the authors had been given a licence to apply this research tool. According to the questionnaire, the assessment of the quality of life is carried out in eight categories (physical functioning, limitations due to physical problems, bodily pain, general health, vitality, social functioning, limitations due to emotional problems and mental health). They allowed for a detailed examination of physical, mental and general aspects of the quality of respondents' life. All dimensions of the quality of life in SF-36 were rescaled into 0 to 100 range. The highest score corresponded to the lowest level of the quality of life, whereas the lowest score to the highest quality [Turska and Skowron, 2009; Kłak, Mińko and Siwczyńska, 2012].

The assessment of nutritional status was conducted by means of a full version of MNA questionnaire and the obtained results were interpreted in the following way: 24–30 – proper nutritional status; 17–23.5 – danger of malnutrition; <17 pt – malnutrition [Guigoz, 2006]. Anthropometric measurements, which were the complement of the MNA (Mini Nutritional Assesment – MNA) scale, were carried out according to current standards and they included: taking arm measurements in the middle of its length and calf measurements (accurate to ± 0.1 cm) by means of anthropometric tape (Seca 201), taking body weight measurements (accurate to ± 0.1 kg) by means of mechanical medical column scales (Seca 711) with a measuring rod (Seca 220) measuring patients' height (accurate to ± 0.1 cm). The arm and calf measurements were interpreted according to MNA scale. Body weight and height measurements were used to determine BMI (Body Mass Index – BMI), which, for the sake of the study, was interpreted following MNA scale recommendations (on this scale malnutrition risk corresponds to the BMI value below 23 kg/m^2) [Guigoz, 2006] and according to recommended interpretation of BMI for the elderly people where the value <25.0 kg/m^2 means underweight; 25.0–27.0 kg/m^2 – proper body weight and >27.0 kg/m^2 – excess body weight [Grzegorzewska et al, 2016].

The study also took into account the following information from medical records: type of hospitalization and its reason, the number of coexisting diseases, and the number of medicines taken on a regular basis.

A statistical analysis was conducted with the application of an integrated statistical and analytical software package provided by STATISTICA 10. Depending on the type of variables distribution calculations were conducted with the application of the following tests: U Mann-Whitney test, Kruskal-Wallis rank sum test, Spearman's rank correlation coefficient and Chi square test. The comparison of the values of quantitative variables in three and more groups was carried out by means of Kruskal-Wallis rank sum test. Correlations between two quantitative variables were analysed with the application of Spearman's rank correlation coefficient. Statistical analyses of nominal variables were examined by means of Chi square test. In all statistical calculations the level of statistical significance was assumed as α = 0.05.

The study was conducted in line with the recommendations of the Declaration of Helsinki. Participation in the study was voluntary and all participants were informed about its purpose and proceedings and gave their written consent to take part in it.

Results

Characteristics of the examined group: The study was conducted in a group of 120 patients (57 women and 63 men) diagnosed with HF and/or COPD and hospitalized in one of the hospitals in Małopolska region. The reason for hospital admission in 21.7% (n=26) of cases was exacerbation of HF, whereas 29.2% (n=35) of respondents were admitted to hospital because of COPD exacerbation. The remaining 49.2% (n=59) of respondents were hospitalized for other reasons. The average age of respondents was 78.0±7.6. Sociodemographic characteristic of the examined group is presented in Table 1.

The highest percentage of the examined people lived with their families (65.0%; n=78). The respondents who lived alone made up 30.8% (n=37) of the examined group, and the other (4.2%; n=5) people lived with some other person unrelated to them.

Table 1. Sociodemographic characteristic of the examined group
Tabela 1. Charakterystyka socjodemograficzna badanej grupy

	Total	Women	Men			
	n = 120	%	n = 57	%	n = 63	%
Place of residence						
Country	38	31.7	21	36.8	17	27.0
City < 100 000 inhabitants	9	7.5	4	7.0	5	7.9
City ≥ 100 000 inhabitants	73	60.8	32	56.2	41	65.1
Education						
Primary	33	27.5	11	19.3	22	34.9
Vocational	33	27.5	9	15.8	24	38.1
Secondary	35	29.2	29	50.9	6	9.5
Postsecondary	0	0.0	0	0.0	0	0.0
Higher	19	15.8	8	14.0	11	17.5
Marital status						
Single	7	5.8	4	7.0	3	4.8
Married	45	37.5	23	40.4	22	34.9
Widowed	62	51.7	28	49.1	34	54.0
Divorced	6	5.0	2	3.5	4	6.3
Financial status						
Verygood	5	4.2	2	3.5	3	4.8
Good	42	35.0	21	36.8	21	33.3
Satisfactory	47	39.2	19	33.4	28	44.4
Bad	19	15.8	11	19.3	8	12.7
Verybad	7	5.8	4	7.0	3	4.8

Legend: n – number of respondents; % – percentage of respondents
Source materials: Study based on the authors' own research.

The average number of coexisting diseases was 4.73±2.10, and the average number of medicines taken on a regular basis was 8.83±3.86; Table 2.

Table 2. Total number of coexisting diseases and the medicines taken on a regular basis
in the examined group – descriptive statistics
Tabela 2. Liczba chorób współistniejących i przyjmowanych leków na stałe
w badanej grupy ogółem – statystyki opisowe

M ± SD	Me	Min	Max	Q_1	Q_3
Number of coexisting diseases;n=120					
4.73 ± 2.10	5	0	10	3	6
Number of medicines taken on a regular basis;n=120					
8.83 ± 3.86	9	0	20	7	11

Legend: n – number of respondents; M – arithmetic mean, SD – standard deviation, Me – median,
Min – minimum, Max – maximum, Q1 – lower quartile, Q3 – upper quartile
Source materials: Study based on the authors' own research.

When asked about current health complaints the respondents usually pointed out the feeling of suffocation – 58.3% (n=70), pain – 38.3% (n=46), cough – 35.0% (n=42) and a decline in physical capacity – 10.0% (n=12). These ailments had a negative impact on the appetite and eating habits of 60.0% (n=72) of respondents, however, the other 40.0% (n=48) of respondents did not notice such a correlation.

Assessment of nutritional status: As many as 85.0% (n=102) of the respondents considered their nutritional status to be correct, whereas 6.7% (n=8) of the examined group believed that they were malnourished and another 4.2% (n=5) believed that they were at risk of malnourishment. One person considered their nutritional status to be excessive. The remaining 3.3% (n=4) of the elderly patients could not assess their nutritional status. A general anthropometric characteristic of the examined group is presented in Table 3.

Table 3. General anthropometric characteristic of the examined group – descriptive statistics
Tabela 3. Charakterystyka antropometryczna badanej grupy ogółem – statystyki opisowe

M ± SD	Me	Min	Max	Q_1	Q_3
Height (cm); n=120					
163.82 ± 8.89	164.00	143.00	189.50	158.50	170.00
Weight(cm); n=120					
73.07 ± 15.21	72.20	40.10	122.10	62.00	83.25
BMI (kg/m^2); n=120					
27.23 ± 2.73	26.77	19.56	34.15	21.48	29.36
Armmeasurements (cm); n=120					
28.27 ± 4.38	28.40	17.20	43.30	25.00	31.00
Calfmeasurements (cm); n=120					
35.38 ± 4.21	35.00	24.30	46.10	32.00	38.50

Legend: n – number of respondents; M – arithmetic mean, SD – standard deviation, Me – median,
Min – minimum, Max – maximum, Q1 – lower quartile, Q3 – upper quartile
Source materials: Study based on the authors' own research.

The average BMI value in the examined group reached 27.23±2.73 kg/m^2. Judging by this index, 15.8% (n=19) of the respondents had a proper body weight. The average score on MNA scale was 21.83±3.25 in this group. These results led to the conclusion that among the respondents 55.8% (n=67) and 10.0% (n=10) respectively were at risk of malnourishment or malnourished; Figures 1 and 2.
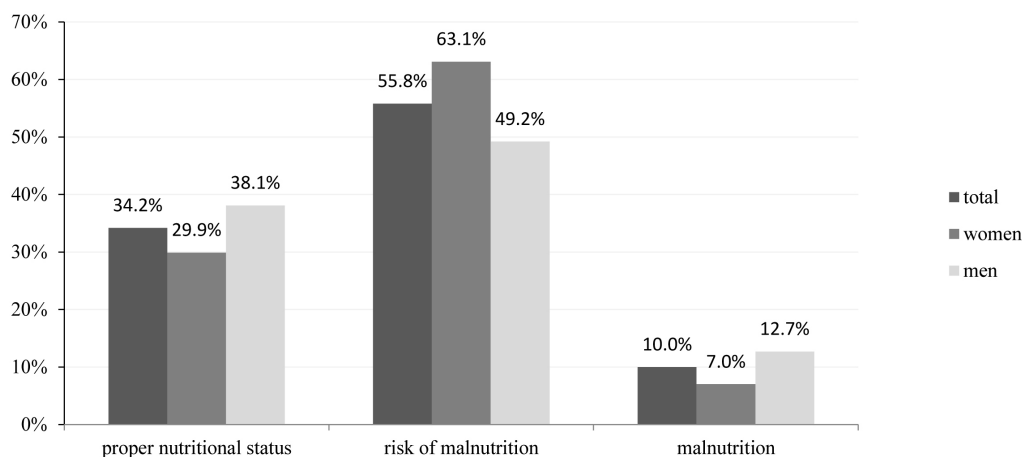

Figure 1. Assessment of respondents' nutritional status based on full version of MNA questionnaire
Rycina 1. Ocena stanu odżywienia badanych w oparciu o pełną wersję kwestionariusza MNA
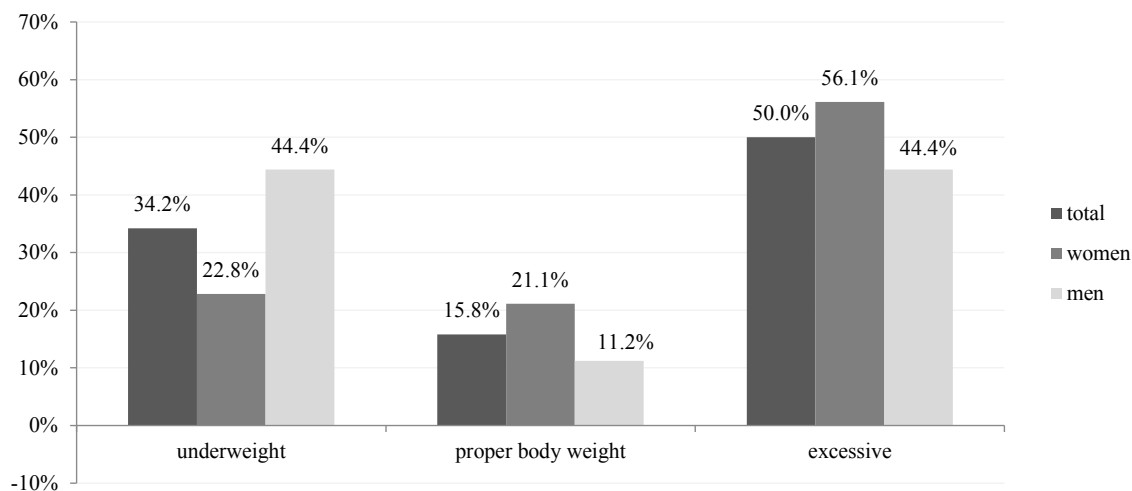
Figure 2. Assessment of respondents' nutritional status based on BMI
Rycina 2. Ocena stanu odżywienia badanych w oparciu wartość wskaźnika BMI

Assessment of the quality of life: The study based on the SF-36v2®Health Survey was aimed at assessing the index of the quality of respondents' life perceived as general quality of life and as its physical and mental dimensions. The comparison of detailed results is presented in Table 4.

Table 4. General quality of life in the examined group assessed according to SF-36v2®Health Survey– descriptive statistics
Tabela 4. Jakość życia w badanej grupie ogółem oceniona w oparciu o kwestionariusz SF-36v2®Health Survey– statystyki opisowe

M ± SD	Me	Min	Max	Q_1	Q_3
Quality of life index – general quality of life; n=120					
62.54 ± 13.15	63.87	30.97	86.45	54.19	72.58
Physical dimension of quality of life;n=120					
72.01 ± 13.67	75.79	32.63	94.74	62.63	82.11
Mental dimension of quality of life;n=120					
44.58 ± 18.87	45.45	9.09	87.27	29.09	56.36

Legend: n – number of respondents; M – arithmetic mean, SD – standard deviation, Me – median, Min – minimum, Max – maximum, Q1 – lower quartile, Q3 – upper quartile
Source materials: Study based on the authors' own research.

An analysis of the data showed that as far as the quality of life index is concerned, the highest percentage of respondents scored between 61 and 80 (50.8%; n=61). In the physical dimension, the highest percentage of respondents (45.8%; n=55) scored between 61 and 80, whereas in the mental dimension most people (45.8%; n=55) scored below 40; Figure 3.

No significant difference was found in the assessment of quality of life and respondents' gender (p=0.116), marital status (p=0.428), level of education (p=0.860), place of residence (p=0.517) or financial status (p=0.465). Significant differences were observed only as far as respondents' age was concerned. General assessment of the quality of life was decreasing with the examined patients' age (r=0.19; p=0.034).

Neither the assessment of the general quality of life nor its physical or mental dimensions differed much depending on the type of diagnosed disease: HF and/or COPD (p: 0.408; 0.304; 0.957 respectively).

A statistical analysis showed that the level of quality of respondents' life was decreasing with a rising number of coexisting diseases. Such a correlation was observed between the index of life quality and its

physical and mental dimensions (r=0.28 and p=0.002; r=0.27 and p=0.00; r=0.21 and p=0.019 respectively). Also the number of medicines taken on a daily basis was significantly correlated with all examined variables of the quality of life (r=0.32 and p<0.001; r=0.27 and p=0.003; r=0.23 and p=0,010 respectively).
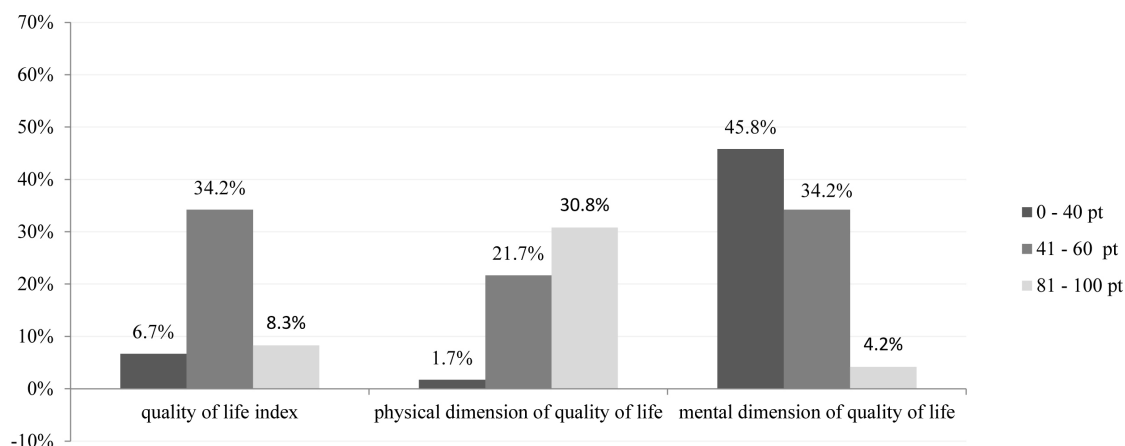

Figure 3. Respondents' quality of life (SF-36) – obtained score ranges
Rycina 3. Jakość życia (SF-36) badanych – zakresy uzyskanych wyników punktowych

A significantly higher level of the quality of life was observed in respondents whose appetite and/or eating habits were not negatively influenced by their health complaints (p<0.001).

Quality of life and nutritional status: Respondents' nutritional status assessed by means of a full version of MNA scale had a significant impact on all examined variables of the quality of life (general quality of life, quality, physical and mental dimensions); Table 5.

Table 5. The correlation of results of Kruskal-Wallis rank sum test assessing the malnutrition index (MNA) and the quality of life assessed by means of SF-36v2®Health Survey (SF-36)
Tabela 5. Wyniki testu sumy rang Kruskala-Wallisa oceny wskaźnika niedożywienia (MNA) w zależności od jakości życia ocenianej w oparciu kwestionariusz SF-36v2®Health Survey (SF-36)

Quality of life(SF-36)	Assessment of malnutrition index (MNA)			
	n	rank sum	average rank	Kruskal-Wallis test
Quality of life index – general quality of life				
Proper nutritional status	41	1685.50	41.11	T= 21.61; p< 0.001
Risk of malnutrition	67	4561.50	68.08	
Malnutrition	12	1013.00	84.42	
Quality of life – physical dimension				
Proper nutritional status	41	1815.50	44.28	T=14.32; p< 0.001
Risk of malnutrition	67	4520.50	67.47	
Malnutrition	12	924.00	77.00	
Quality of life– mental dimension				
Proper nutritional status	41	1782.50	43.48	T=17.27; p< 0.001
Risk of malnutrition	67	4476.00	66.81	
Malnutrition	12	1001.50	83.46	

Legend: n – number of respondents; T – results of Kruskal-Wallis rank sum test; p – critical value;
MNA – *Mini Nutritional Assessment, SF-36 –SF-36v2®Health Survey*
Source materials: Study based on the authors' own research.

No significant correlation was observed between the interpretation of BMI and any dimension of the quality of life of the examined patients, Table 6.

Table 6. The correlation of results of Kruskal-Wallis rank sum test assessing Body Mass Index (BMI) and the quality of life assessed by means of SF-36v2®Health Survey (SF-36)
Tabela 6. Wyniki sumy rang Kruskala-Wallisa oceny wskaźnika masy ciała (BMI) w zależności od jakości życia ocenianej w oparciu o kwestionariusz SF-36v2®Health Survey (SF-36)

Quality of life (SF-36)	BMI assessment (BMI)			
	n	rank sum	average rank	Kruskal-Wallis test
Quality of life index – general quality of life				
Underweight	41	2604.00	63.51	T=0.51; p=0.776
Proper body weight	19	1093.00	57.53	
Overweight	60	3563.00	59.38	
Quality of life – physical dimension				
Underweight	41	2429.00	59.24	T=0.08; p=0.959
Proper body weight	19	1169.00	61.53	
Overweight	60	3662.00	61.03	
Quality of life– mental dimension				
Underweight	41	2679.50	65.35	T=1.23; p=0.542
Proper body weight	19	1087.00	57.21	
Overweight	60	3493.50	58.22	

Legend: n – number of respondents; T – results of Kruskal-Wallis rank sum test; p – critical value; BMI – *Body Mass Index, SF-36 – SF-36v2®Health Survey*
Source materials: Study based on the authors' own research.

Discussion

Nutritional status is a significant factor responsible for health. However, due to natural changes in the organism which accompany the ageing process as well as numerous coexisting diseases the population of elderly people is particularly susceptible to developing malnutrition. Malnutrition in the old age leads to a decline in functional capacity and development of numerous diseases; it worsens medical prognosis, prolongs hospitalization and accounts for a higher mortality rate in this age group [Bryła and Maniecka-Bryła, 2011].Numerous studies show a significant correlation between the nutritional status and the quality of life in the population of elderly people [Kurowska and Simon, 2013; Rasheed and Woods, 2013; Kanikowska et al, 2015].

The study was conducted in a group of 120 patients (57 women and 63 men) diagnosed with HF and/or COPD and hospitalized in one of the hospitals of Małopolska region.

The conducted analysis was aimed at determining the correlation between the quality of life and nutritional status in the examined group of elderly patients. The assessment of nutritional status was carried out with the application of a full version of MNA scale and Body Mass Index interpretation recommended for the population of elderly people [Grzegorzewska et al, 2016]. SF-36v2®Health Survey questionnaire was used to assess the quality of life [Turska and Skowron, 2009; Kłak, Mińko and Siwczyńska, 2012].

The average score on MNA scale in the examined group reached 21.83±3.25. These values are similar to the findings obtained by Błaszczyk-Bębenek et al. [2016]. In the group of 133 people aged between 70 and 96 the average score on MNA scale was 23.77±3.26 [Błaszczyk-Bębenek, Kostrzand Schlegel-Zawadzka, 2016].

The authors discovered that according to MNA scale, as many as 55.8% of respondents are in danger of developing malnutrition and one respondent in ten is already malnourished. Similar results were obtained in the studies carried out by Ulatowska and Bączyk [2016]. Their study showed that in a group of 48 people aged between 70 and 90, 52.1% of respondents were at risk of malnutrition and 33.3% were malnourished. Similarly, in the international study conducted by Guigoz [2006] and based on the results of MNA scale, malnutrition and the risk of malnutrition were confirmed in, respectively, 23% and 46% of hospitalized patients [Guigoz, 2006].

Proper or excessive weight, however, is not always equivalent to proper quality of nutritional status in the group of elderly patients. It is not surprising that in the authors' study only every third respondent was underweight (BMI <25.0 kg/m^2), whereas overweight (BMI >27.0 kg/m^2) or proper body weight was observed in 50% and 15.8% of elderly patients respectively [Mziray et al, 2016; Kawalec-Kajstura et al, 2019].

The study assessed the quality of respondents' life with the application of SF-36v2®Health Survey. Afterwards, an analysis of the quality of life index was carried out taking into account both general quality of life and its physical and mental dimensions. The level of life quality in all analysed dimensions was not high, which may be explained by the fact that the respondents suffered from at least onechronic disease (HF and/or COPD). Average scores reached respectively: 62.54±13.15 – quality of life index, 72.01±13.67 – physical dimension and 44.58±18.87 – mental dimension of the life quality. Similar findings were obtained in the study carried out by other authors. Rasheed and Woods [2013], who, assessed the quality of life in the group of 149 hospitalized patients aged from 65 to 99 with the application of SF-36 questionnaire, also observed low level of life quality (lower than established population norms) in all its domains [Rasheed and Woods, 2014]. Similarly, in the study by Koligat et al. [2012], a group of patients suffering from chronic diseases (diabetes, osteoporosis) was characterized by a lower level of life quality in all its dimensions than the control group [Koligat et al, 2012].

Numerous authors emphasize the correlation between the quality of life and nutritional status of elderly people [Rasheed and Woods, 2013].The authors' own study also proved that nutritional status assessed with the application of a full version of MNA scale had a significant influence on all assessed variables of life quality of the examined elderly patients (general quality of life, physical and mental dimensions) (p<0.001). On the other hand, no significant correlation was observed between BMI interpretation and any dimension of life quality of the examined people. These correlations are confirmed by the findings of, for example, Artacho et al. [2014]. The aforementioned study was conducted in a group of 168 chronic elderly patients whose nutritional status assessed with the application of MNA scale had a significant impact on all analysed domains of life quality, which were assessed by means of WHOQOL-BREF. Just like in the authors' own study, no significant correlation was observed between BMI and the quality of life [Artacho et al, 2014]. Similar conclusion could be drawn after an analysis of the findings of the aforementioned study by Rasheed and Woods [2013].

Conclusions

1. The nutritional status of the majority of respondents was unsatisfactory, no matter whether it was assessed on the basis of MNA scale or BMI value.
2. The quality of life in the study group was not high. The average score of the quality of life index reached 62.54±13.15: for physical and mental dimensions 72.01±13.67 and 44.58±18.87 respectively.
3. The general level of life quality, as well as its physical and mental dimensions, were significantly different depending on the nutritional status of the subjects assessed on MNA scale (p<0,001).

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