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The assessment of health and nutritional status of seniors staying in in-patient healthcare institutions

Ocena stanu zdrowia i odżywienia seniorów przebywających w lecznictwie szpitalnym

ABSTRACT

Introduction. Changes progressing over time in seniors' bodies, as well as socio-economic and psychological factors contribute to the poor nutritional status of the elderly. Although both malnutrition and obesity may result in increased morbidity in this age group, they continue to constitute an underreported problem in Poland.

Objective. The aim of the thesis was to evaluate the health and nutritional status of seniors (65+) currently residing in hospitals.

Material and methods. The research was conducted from October to November 2015 among 150 patients of three Małopolska's hospitals. The studied group comprised 76 women (50.67%) and 74 men (49.33%) aged 65–96 (SD = 7.45). The utilised research method involved diagnostic surveys and interviews. To assess the nutritional status, a shortened Multi Nutritional Assessment (MNA) questionnaire and the author's original interview questionnaire were used.

Results. The most common chronic diseases in the studied group were cardiovascular diseases (n = 147; 98%), bone and joint diseases (n = 87; 58%), and sensory organ diseases (n = 85; 56.67%). Some of the respondents (n = 28; 18.67%) were bed- or chair-ridden, while 25 people (16.66%) could get out of bed, but not leave their domiciles. Nutritional disorders were diagnosed in a total of 46.67% of the respondents. People declaring themselves to be physically inactive were worse nourished than other respondents (p < 0.001). Moreover, a larger number of comorbidities and the occurrence of urogenital, bone and joint, neurological, or sensory organ diseases were related to worse nutritional statuses of the respondents (p < 0.05). Additionally, the more oral drugs the patients took, the worse their nutritional status was (p < 0.001).

Conclusions. Nutritional disorders were diagnosed in nearly half of the studied seniors. The worse nutritional status in the studied group was notably associated with physical inactivity, a larger number of comorbidities, and with oral medication intake, as well as with the occurrence of urogenital, bone and joint, neurological, and sensory organ diseases.

Key words: nutritional status; seniors; malnutrition; obesity; MNA

Problemy Pielęgniarstwa 2018; 26 (1): 51–57

STRESZCZENIE

Wstęp. Zmiany postępujące wraz z upływem czasu w organizmach seniorów oraz czynniki ekonomiczno-społeczne, psychologiczne przyczyniają się do złego stanu odżywienia osób w starszym wieku. Zarówno niedożywienie, jak i otyłość przyczyniają się do wzrostu chorobowości tej grupy wiekowej i stanowią wciąż niedoceniany problem w Polsce.

Cel pracy. Celem pracy była ocena stanu zdrowia i stopnia odżywienia seniorów (65+) przebywających w lecznictwie szpitalnym.

Materiał i metody. Badania przeprowadzono w okresie od października do listopada 2015 roku wśród 150 pacjentów trzech małopolskich szpitali. W badanej grupie było 76 kobiet (50,67%) oraz 74 mężczyzn (49,33%) w wieku 65–96 lat (SD = 7,45). W badaniach posłużono się metodą sondażu diagnostycznego i techniką wywiadu. Do oceny stanu odżywienia wykorzystano skrócony kwestionariusz *Mini Nutritional Assessment* (MNA) oraz autorski kwestionariusz wywiadu.

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Wyniki. Najczęstszymi schorzeniami przewlekłymi w badanej grupie były choroby układu sercowo-naczyniowego ($n = 147$; 98,00%), choroby układu kostno-stawowego ($n = 87$; 58,00%) oraz choroby narządów zmysłów ($n = 85$; 56,67%). Część respondentów ($n = 28$; 18,67%) było unieruchomionych w łóżku lub fotelu, z kolei 25 osób (16,66%) mogło wstawać z łóżka, ale bez opuszczania mieszkania. Zaburzenia stanu odżywienia rozpoznano łącznie u 46,67% badanych. Osoby, które zadeklarowały się jako nieaktywne fizycznie, były gorzej odżywione od pozostałych ankietowanych ($p < 0,001$). Większa liczba chorób współistniejących oraz występowanie chorób układu moczowo-płciowego, kostno-stawowego, schorzeń neurologicznych i narządów zmysłów wiązało się z gorszym stanem odżywienia badanych ($p < 0,05$). Im więcej leków doustnych zażywali pacjenci, tym cechowali się oni równocześnie gorszym stanem odżywienia ($p < 0,001$).

Wnioski. Zaburzenia stanu odżywienia rozpoznano u blisko połowy badanych seniorów. Gorszy stan odżywienia w badanej grupie był istotnie związany z brakiem aktywności fizycznej, większą liczbą chorób współistniejących oraz przyjmowanych leków doustnych, a także z występowaniem chorób układu moczowo-płciowego, kostno-stawowego, schorzeń neurologicznych i narządów zmysłów.

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Słowa kluczowe: stan odżywienia; seniorzy; niedożywienie; otyłość; MNA

Introduction

The progress in medicine with regard to disease treatment and prevention has brought about a considerable increase in the elderly population. Demographic transformation processes are a result of diminished mortality rate, increased life expectancy and the introduction of preventive programmes in the youngest age groups and the improvement in the elderly healthcare [1].

Proper nutrition is one of the factors determining proper development and functioning of human body. Its main task is to provide human body with appropriate amount and quality of nutrients. It is of vital significance for keeping daily living ability for many years [2].

It is common knowledge that in every age, particularly in old age, the intake of nutrients should be compliant with body metabolic demand. Increased chronic morbidity occurring in old age is often related to a necessity to apply numerous dietary limitations [3]. Long-term and irreversible process of physiological aging predisposes to the occurrence of dysfunctions and chronic diseases. Malnutrition [4] is a frequent problem concerning elderly people. The problem of the malnutrition of elderly people is among chronic disorders, which may lead to functional disability, at the same time worsening the quality of seniors life [3].

The process of demographic aging of the population of Poland poses new challenges for the health and social care system and education. Healthcare-oriented guidelines are focused on numerous aspects of aging, whose aim is disease prevention and health promotion among the elderly [5]. Activities connected with health promotion in the group of elderly people are oriented at raising health awareness, propagating the forms of activation and healthy lifestyle of the elderly, striving for functional and independent old age. Nutritional education of elderly people, their caregivers and family members performs a crucial role in health promotion [6].

Aim of the work

The aim of the work was the assessment of health and nutritional status of seniors (65+) staying in hospital treatment.

Material and methods

In the study, diagnostic poll method and interview technique were used. A revised version of MNA-Short Form, MNA-SF, and the authorial interview survey were applied. The MNA-SF scale consists of six items concerning food intake, loss of appetite, problems with chewing, swallowing and digestion, and with mobility. For the needs of the aforementioned questionnaire, anthropometric measurements were made, namely, the calf circumference, height and body mass (based on the last two, the BMI was calculated). The maximum score was 14 points. On the basis of the obtained result, the respondents were included in one of three groups: 0–7 points — malnourished, 8–11 points — at risk of malnutrition, 12–14 — normal nutritional status [7].

The authorial interview questionnaire comprised sociodemographic data, information about occurring diseases and everyday functioning. The respondents assessed their functionality in everyday activities using a scale which consisted of 8 activities, and the responses were scored depending on the difficulties during their performance: 1 point — stands for substantial difficulty, 2 points — slight difficulty, 3 points — no difficulty. The respondents could receive from 8 to 24 points. A bigger number of points means better coping with everyday activities.

Statistical calculations were made with the use of statistical package R 3.2.2. Since the distributions of groups were not normal, differences among groups were analysed by means of Mann-Whitney U test or Kruskal-Wallis test. When the analysis for more than two groups revealed significant differences, post-hoc

tests were performed to check exactly which groups differ from each other. Due to the lack of normality of distributions, Mann-Whitney U tests with Bonferroni correction were performed here. Comparisons of the values of qualitative variables in few groups were made by means of chi-square test. To assess correlation between two quantitative variables, Spearman's rank correlation coefficient was applied. The level of significance $p < 0.05$ was adopted in the calculations.

The study was carried out from October to November 2015 among 150 patients of three hospitals in Małopolska: Independent Public Health Care Institution — Dr Józef Dietl Hospital in Krynica Zdrój, General Surgery Ward, Trauma Surgery Ward and Internal Diseases Ward, Edward Szczeklik Specialist Hospital in Tarnów, Internal Diseases Ward, Health Care Centre in Tuchów, Internal Diseases Ward. The management of each facility were addressed to give consent to enter their premises and carry out the study.

The criterion of the inclusion in the study was the minimum age of 65 years and mental ability enabling to conduct interview questionnaire. The respondents were familiarised with the aim of the survey and informed about anonymity and voluntariness of participation. All the patients agreed to participate in the survey. The study was conducted according to ethical principles and good research practice compliant with the Helsinki Declaration.

The average age of the respondents was 74.73 and ranged from 65 to 96. In the surveyed group there were 76 females (50.67%) and 74 males (49.33%). The biggest group consisted of married people — 44.67%, and the smallest group of divorced ones (4.67%). There was a high percentage of widows and widowers (38.00%), whereas 12.67% of the respondents were single. The highest percentage were people living in the country (58.67%), a little less — city dwellers (41.33%). Respondents with primary education made up 44.00%, and with higher education — 8.00%. 27.33% of the respondents had vocational education and 20.67% had secondary education. People living with their wife/husband constituted 43.33%, people living with their children — 43.33%, and living with somebody else 4.00%. There were quite a lot of people living alone (18.00%), 6.67% lived with a partner, and 5.33% lived in a health care and curative institution or in a nursing home.

Results

Cardiovascular system diseases concerned the biggest number of the respondents (98.00%). Osteoarticular system diseases (58.00%) and sensory organs related diseases (56.67%) were frequent in this group. Diseases of neurological system occurred most

rarely and concerned 24.67% of the respondents. The average number of the diseases coexisting in the respondents was 7.65, and it ranged from 1 to 17. The average amount of drugs taken on permanent basis was 6.75 and it ranged from 2 to 16.

Among the respondents, 40.00% defined themselves as physically active people, 27.33% gave a negative answer, 32.67% were not always willing to undertake physical activity. Physical activities most willingly undertaken by the respondents were walks (58.00%) and work in allotment garden (44.67%), a little fewer — 26.67% chose cycling, 16.00% — exercises at home, 6.67% — organised gymnastics, whereas 24.00% defined another type of physical activity. The average number of points obtained by the respondents on the scale of everyday activities was 15.9 and ranged from 8 to 24. More than half of the respondents (64.67%) declared full mobility. Some respondents (18.67%) were bed or chair-ridden, 16.66% reported reduced mobility, and could get out of bed without leaving home.

More than half of the respondents (65.33%) claimed, that over the last three months there was no decline in food intake, which would be related to the loss of appetite, digestion, swallowing or chewing disorders. In some respondents there was a moderate decline in meals (31.34%), caused by aforementioned reasons. Severe decline within that scope was declared by 3.33%. In 66.67% of the respondents no loss of body weight occurred over the last three months. Some respondents declared unknown loss of weight (17.33%). The loss of body mass between 1 and 3 kg was observed by 11.33%, and above 3 kg — by 4.67%. The average value of BMI index of the respondents was 26.04 and ranged from 16.44 to 38.06 kg/m². In majority of the respondents (69.33%), the BMI index was 23 and more. The index within the range 21–23 was observed in 17.33%, BMI below 19 in 7.33%, and between 19 and 21 in the remaining 4.00%.

On the basis of the MNA-SF scale, proper nutritional status was observed in 53.33% of the respondents. The risk of malnutrition occurred in 28.67%, whereas malnutrition in 18.00%. Based on the data analysis it was found out that the MNA result significantly depended on the gender of the respondents ($p < 0.05$). In males, more often than in females, both proper nutritional status and malnutrition occurred ($p = 0.004$). The risk of malnutrition was diagnosed in them more seldom (Tab. 1).

Nutritional status was statistically significant depending on the number of coexisting diseases ($p < 0.05$). The bigger the number of coexisting diseases, the worse nutritional status of the respondents. At the same time, nutritional status did not significantly depend on the presence of cardiovascular system,

Table 1. Relation between nutritional status and gender

Tabela 1. Zależność pomiędzy stanem odżywienia a płcią

MNA	Women		Men		p *
	n	%	n	%	
Proper nutritional status	33	43.42%	47	63.51%	p = 0.004
At risk of malnutrition	31	40.79%	12	16.22%	
Malnutrition	12	15.79%	15	20.27%	

*Chi-square test

Table 2. Relation between nutrition and diseases

Tabela 2. Zależność pomiędzy stanem odżywienia a chorobami

Types of diseases	MNA	Present		None		p*
		n	%	n	%	
Urogenital system diseases	Proper nutritional status	30	35.71%	50	75.76%	p < 0.001
	At risk of malnutrition	30	35.71%	13	19.70%	
	Malnutrition	24	28.57%	3	4.55%	
Osteoarticular system diseases	Proper nutritional status	39	44.83%	41	65.08%	p = 0.048
	At risk of malnutrition	29	33.33%	14	22.22%	
	Malnutrition	19	21.84%	8	12.70%	
Sensory organs related diseases	Proper nutritional status	29	34.12%	51	78.46%	p < 0.001
	At risk of malnutrition	33	38.82%	10	15.38%	
	Malnutrition	23	27.06%	4	6.15%	
Neurological diseases	Proper nutritional status	5	13.51%	75	66.37%	p < 0.001
	At risk of malnutrition	15	40.54%	28	24.78%	
	Malnutrition	17	45.95%	10	8.85%	

*Chi-square test

Table 3. Relation between nutritional status and physical activity

Tabela 3. Zależność pomiędzy stanem odżywienia a aktywnością fizyczną

MNA	Physical activity						p *
	Yes		No		Not always		
	n	%	n	%	n	%	
Proper nutritional status	51	85.00%	5	12.50%	23	46.94%	p < 0.001
At risk of malnutrition	7	11.67%	16	40.00%	20	40.82%	
Malnutrition	2	3.33%	19	47.50%	6	12.24%	

*Chi-square test

respiratory system, digestive system diseases and metabolic disorder ($p > 0.05$). However, there was a statistically significant relation between nutritional status of the respondents and the occurrence of urogenital system diseases ($p < 0.001$), osteoarticular system diseases ($p = 0.048$), sensory organs related diseases ($p < 0.001$) and neurological diseases ($p < 0.001$). People with this types of diseases were nourished worse (Tab. 2).

Nutritional status was also substantially significant dependent on the amount of oral drugs ($p < 0.05$). The more drugs were taken, the worse nutritional status was ($p < 0.001$). It also depended statistically on physical activity ($p < 0.001$). People, who declared to be physically non-active, were nourished worse than other respondents (Tab. 3).

Nutritional status was statistically dependent on everyday activities ($p < 0.05$). The more everyday

activities, the better nutritional status. At the same time, everyday activities were statistically dependent on the number of coexisting diseases. The more coexisting diseases, the fewer everyday activities. It was proved, that people suffering from metabolic disorders, urogenital system diseases, osteoarticular system diseases, sensory organs related diseases and neurological diseases had significantly lower results in the everyday activities scale ($p < 0.05$). People with and without respiratory system diseases, cardiovascular system diseases and digestive system diseases did not differ in the result obtained in the everyday activities scale ($p > 0.05$).

Discussion

Nutrition disorders are a common and serious problem of elderly people. Disorders include both malnutrition and emaciation, as well as overweight and obesity [8]. Malnutrition, which is one of great geriatric syndromes, is a very common problem of people in old age.

In accordance with the literature of the subject, nutrition disorders are positively correlated with incidence rate and mortality rate. As for many years the relation between malnutrition and premature mortality of the elderly was emphasised, Söderström et al. [9] from university hospital in Uppsala carried out a prospective cohort study, the aim of which was to confirm or exclude the first relation. The research tool was the MNA questionnaire, the surveyed group was made up of patients above 65 years of age, admitted to hospital between March 2008 and May 2009. Proper nutritional status concerned 35.5% of seniors, the risk of malnutrition — 55.1%, and in 9.4% malnutrition was recognised. The 50-month observation period was survived by 75.2% of properly nourished, 60% of people with diagnosed risk of malnutrition and only 33.7% of undernourished patients ($p < 0.001$). According to the researchers, the examined nutritional status assessed based on the full version of MNA is an independent factor of premature death of people above 65 years.

Also, when conducting this research, the MNA questionnaire was used (in the shortened version). The tool is a screening test, recommended for common use to assess the risk of malnutrition in patients aged 65 years and above, due to its high sensitivity and specificity [10].

The research conducted by Mini Nutritional Assessment International Group showed that malnutrition in the highest percentage concerned patients of rehabilitation wards (51%), hospitalised patients (39%), and then residents of nursing homes (14%). In the domestic environment, there was the least number of malnourished people in old age (6%), however,

it is worth mentioning that among the remaining ones, only 63% were properly nourished, and in more than 30% of surveyed patients the risk of malnutrition was observed [8]. Slightly different data were presented by Pirlich and Lochs [11], according to whom the frequency of the occurrence of malnutrition status among the elderly staying in hospitals was 30–65%, in nursing homes — 25–60%, and among people staying in the domestic environment the percentage is at the level of 2–32%. Medical statistics show that in 30% of patients malnutrition status occurs during hospitalisation, whereas in 70% of undernourished patients admitted to hospitals, the state deepens during the stay in hospital [12].

The own research was conducted among hospitalised patients at wards with substantial percentage of elderly people, namely at internal diseases ward, general surgery and trauma wards. They consisted in post-hoc analysis, no retrospective study was conducted, hence, it was not possible to determine the percentage of respondents in whom malnutrition status occurred or deepened during hospitalisation.

The data show that in the European population malnutrition affects 23% of patients aged 65 years and above, whereas the risk of malnutrition occurs in 46% (according to Mini Nutritional Assessment) [8]. Slightly lower percentage was obtained as a result of own research; malnutrition was observed in 18.00% of respondents, and the risk of malnutrition concerned 28.67% of seniors (deviation from the standard was diagnosed in the total of 46.67%). Proper nutritional status was diagnosed in 53.33% of the respondents. For comparison, the results of the research conducted by Włodarek and Głąbska [13], who assessed the nutrition needs of elderly females (aged 60–89) staying at home, depending on the risk of malnutrition, show that they did not find malnutrition in any of the studied female seniors, the risk of malnutrition concerned 18.7% of females, whereas proper nutritional status the other 81.3%. Similarly, Wyka et al. [14] implementing a study among seniors living at their own homes in Oleśnica region did not find malnutrition in anybody, whereas the risk of malnutrition was recognised in 16% of the respondents. On the other hand, the findings of the research conducted by WOBASZ-SENIOR proved that bad and poor nutrition status occurred in about one-third of people in old age in the Polish population [15].

According to the data of PolSenior programme implemented in years 2007–2011 [16], short weight was found out in 1.5% of the respondents (1.4% of women and 1.6% of men), overweight in 40.8% (36.4% of women and 44.6% of men), whereas obesity concerned 31.9% (39% of women and 25.6% of men). A detailed analysis of the above results with

own research results is not possible due to differences in methodology. The research team of PolSenior programme assessed nutritional status based on the BMI of the respondents, in accordance with WHO standards. However, a lot of researchers emphasise that there is a need to establish cut-off points of BMI for the elderly, which will be an international standard [17]. According to some authors, the desired BMI in this age group should be 24–29 kg/m², which in healthy people would prove to be overweight [18]. The authors of this work also made anthropometric measurements and calculated BMI. However, the obtained results were classified into ranges making up the MNA-SF questionnaire.

The average number of coexisting diseases in the respondents was 7.65 and it ranged from 1 to 17. The most common chronic diseases in the surveyed group were diseases of cardiovascular system, osteoarticular system, sensory organs related diseases and urogenital system diseases. Also Słowińska and Wądołowska [19], who analysed health with regard to nutrition model of seniors proved, that the prevailing part of elderly people (more than 70%) declared the occurrence of at least one chronic disease, and among most frequently used there were: diseases of circular system, diabetes, diseases of locomotor system, respiratory system and digestive system.

The most important factor favouring malnutrition in old age are chronic diseases and relative therapy [4]. The analysis of own research proved that a bigger number of coexisting diseases was connected with worse nutritional status of the respondents ($p < 0.05$). It was proven that urogenital system diseases, diseases of osteoarticular system, neurological disorders and sensory organs related diseases ($p < 0.05$) were related to worse nutritional status of surveyed seniors. Different results were obtained by Strugała and Wieczorowska-Tobis, who assessed the nutritional status of patients of Geriatric Ward in the context of their functional ability. However, they did not find any relationship between nutritional status and the number of chronic diseases [20].

Seniors are one of main consumers of drugs, and according to the literature of the subject, the risk of malnutrition increases with the number of pharmacological preparations taken. Research of Finnish scientists proved that in the group of elderly people taking more than five drugs daily, as many as every second person was undernourished or risk of malnutrition was diagnosed in them [21]. The relation was proved in this research: the more drugs were taken, the fewer points on the nutrition scale the surveyed patients obtained ($p < 0.001$). It is worth emphasising that the average number of oral drugs taken permanently by the respondents was as many

as 6.75 and ranged from 2 to 16. The above relationship was not proved by the researcher team from Poznań, conducting their study among the patients of Geriatric Ward [20].

Disability of the elderly is also a factor connected with malnutrition. The own research proved that almost three-fifths of the respondents did not undertake physical activity at all or undertook it irregularly. The average number of points obtained by the respondents on the everyday activities scale was 15.9, which is the average score. It was proven that people who declared to be physically inactive were nourished worse than other respondents ($p < 0.001$). What is more, the more points in the everyday activities scale were obtained by surveyed patients, the more points in the nutrition scale they obtained (namely, they were better nourished) ($p < 0.05$). On the other hand, Strugała and Wieczorowska-Tobis [20] in their research assessed the functional condition with the use of the Barthel scale. The authors confirmed the existence of positive relationship between the results of the Barthel scale and MNA — people in a better functional condition were at the same time better nourished ($p < 0.001$). The relation between the nourishing status of hospitalised elderly and the functional performance index was also proven by cross-sectional research carried out by Oliveira et al. [22], in which it was demonstrated that worsening of nutritional status was accompanied by reduced self-service performance, and people with nutrition disorders (malnourished or at risk of malnutrition) were more dependent on third parties.

An open question is the influence of gender on nutritional status. The own research confirmed the relations in this respect: in males more often than in females both proper nutritional status and malnutrition occurred. The state of risk of malnutrition was diagnosed in them more seldom ($p < 0.05$). On the other hand, such a relation was not observed by Skokowska et al., who assessed nutritional status in elderly patients treated operationally ($p > 0.05$) [23]. Also Schlegel-Zawadzka et al. [24], when analysing self-service and self-care capabilities of the elderly, considering nutritional behaviours, found out that gender does not have significant influence on the nutritional status of respondents ($p > 0.05$).

To conclude, it is worth emphasising that among the most important tasks in geriatric prevention there are: preventing, discovering and treating obesity and malnutrition [16]. In Polish and foreign literature there are numerous interesting reports, the knowledge of which may contribute to an increase in the level of nutrition care for patients treated in hospitals in Poland. This work is to constitute the supplementation of research conducted in this area.

Conclusions

1. Nutritional status depends on the number of coexisting diseases (urogenital system diseases, diseases of osteoarticular system, neurological disorders and sensory organs related diseases), the number of oral drugs taken, undertaken physical activity and gender.
2. Worse functionality in performing everyday activities is related to a bigger number of coexisting diseases, namely neurological diseases, disorders of urogenital system, osteoarticular system sensory organs related disorders.
3. The number of coexisting diseases and oral drugs taken in the surveyed group was assessed as high.
4. The most common chronic diseases in the surveyed group were diseases of cardiovascular system, osteoarticular system, sensory organs related diseases and urogenital system diseases.

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