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**EVALUATION OF NUTRITIONAL STATUS
OF PATIENTS AGED 65 AND OLDER RESIDING
IN LONG-TERM CARE FACILITIES IN THE
PODKARPACKIE VOIVODESHIP**

**Ocena stanu odżywienia pacjentów w wieku powyżej 65 roku życia
przebywających w zakładach opieki długoterminowej na terenie województwa
podkarpackiego**

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A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

Abstract (in Polish):

Cel pracy

Celem pracy była ocena stanu odżywienia pacjentów powyżej 65 roku życia przebywających w zakładach opieki długoterminowej na terenie województwa podkarpackiego.

Materiał i metody

Materiał i metody Badaniem objęto 247 osób powyżej 65 r.ż. Badania przeprowadzono za pomocą skali MNA, pozwalającej ocenić stan odżywienia pacjentów, który zależy od wieku czy preferencji żywieniowych. Wszystkie obliczenia związane z przeprowadzonymi badaniami wykonano na podstawowym teście Chi- kwadrat.

Wyniki

Osoby starsze są najbardziej narażone na wystąpienie niedożywienia a sposób w jaki się odżywiają należy uważnie kontrolować, zapewniając organizmowi wszelkiego rodzaju składniki odżywcze i mineralne. Po przebadaniu całej grupy pacjentów stwierdzono, że u 31,7% stan odżywienia jest prawidłowy. 37,6% pacjentów zagrożonych jest niedożywieniem, z powodu występujących chorób współistniejących oraz stanu w jakim się znajdują. Natomiast 29,7% osób cierpi na niedożywienie, dlatego ich stan zdrowia jest pod stałą kontrolą lekarzy.

Wnioski

Osoby w wieku powyżej 65 lat przebywające w placówkach opieki długoterminowej mają zapewnione regularne posiłki i pomoc osób trzecich we wszystkich czynnościach życia codziennego, a personel może w łatwy sposób monitorować, jak pacjent je, ile spożywa z podawanych posiłków, i czy ich waga pozostaje niezmienną. Na poziom odżywienia badanych istotnie wpływa ich stan zdrowia oraz stopień otępienia. Ponieważ odżywianie pacjentów w badanych placówkach opieki długoterminowej jest zróżnicowane, należy podjąć środki w celu zapewnienia, że wszyscy pacjenci otrzymują wystarczającą ilość składników odżywczych.

Abstract (in English):

Aim

The aim of this study was to evaluate the nutritional status of patients over 65 years of age residing in long-term care facilities in Podkarpackie Voivodship.

Material and methods

The study included 247 persons over 65 years of age. The study was carried out using the MNA scale, which allows to assess the nutritional status of patients, which depends on age and dietary preferences. All calculations related to the performed tests were performed on the basic Chi-square test.

Results

Elderly people are most at risk of malnutrition and their diet should be carefully monitored to ensure that the body receives all kinds of nutrients and minerals. After examining the entire group of patients, it was found that 31.7% had normal nutritional status. 37.6% of the patients are at risk of malnutrition, due to the comorbidities present and the condition they are in. On the other hand, 29.7% are suffering from malnutrition and therefore their health status is under constant medical supervision.

Conclusions

Elderly people over 65 years of age residing in long-term care facilities are provided with regular meals and assistance from third parties in all activities of daily living, and staff can easily monitor how the patient eats, how much they eat from the meals served, and whether their weight remains unchanged.

The nutritional level of the respondents is significantly influenced by their health status and the level of dementia. As patients nutrition in the surveyed long-term care facilities studied varies, measures must be taken to ensure that all patients receive sufficient nutrients.

Keywords (in Polish): ocena żywieniowa, zakłady opieki długoterminowej, osoby starsze.

Keywords (in English): elderly, nutritional assessment, long-term care facilities.

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Ocena żywieniowa pacjentów ZOL

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Authors (short)

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Introduction

Global malnutrition is considered one of the most common problems among the elderly and can significantly affect the evolution of their health status. Protein-calorie malnutrition contributes to increased mortality and susceptibility to infections and reduced quality of life, and may cause even greater functional problems among individuals residing in long-term care facilities for the elderly [1,2,3].

In Poland, detailed rules for the assessment of the nutritional status of hospitalized persons are regulated by the Regulation of the Minister of Health of 22 November 2013 on guaranteed services in the field of hospital treatment. According to it, the healthcare provider providing inpatient services is obliged to perform a screening assessment of nutritional status in all persons admitted for treatment (except in a hospital emergency department) according to the principles defined in the Standards for Parenteral Nutrition and Enteral Nutrition of the Polish Society for Parenteral, Enteral and Metabolism (PTŻPDiM) and using recommended tools [4]. Proper nutritional status is an important factor in maintaining the health of seniors [5]. The most common abnormalities among the elderly are excessive body weight, protein-calorie malnutrition and vitamin-mineral deficiencies. They represent a serious clinical, psychosocial and economic problem in this age group. Epidemiological data are inconclusive and indicate that malnutrition affects approximately 5-30% of the elderly residing in the home environment, 25-60% living in nursing homes and as many as 30-65% of all hospitalized persons. In the PolSenior Study, on the other hand, 44% of people aged 65 years and older had poor nutritional status. Malnutrition is often preceded by a condition referred to as “risk of malnutrition”, which occurs in a latent manner,

without specific clinical symptoms. This fact makes it significantly more difficult to reliably estimate the extent of the phenomenon. These data pose a great challenge for the whole health care system [6].

Unintentional weight loss and malnutrition are major problems among older adults living in long-term care facilities. Malnutrition is particularly manifested by weight loss and low body mass index (BMI) and is associated with increased morbidity and mortality, as well as functional decline. There are many factors associated with poor nutritional status and affecting protein and energy intake and/or energy expenditure [7]. These include age 85 years or older, low nutrient intake, loss of ability to eat independently, difficulty swallowing and chewing, bedridden, bedsores, history of femoral neck fracture, dementia, depressive symptoms, and two or more chronic diseases. Nutritional assessment is an important part of a comprehensive geriatric assessment (CGA), which includes various methods such as BMI as well as several validated tools such as the Mini-Nutritional Assessment (MNA) [8].

The aim of this study was to evaluate the nutritional status of patients over 65 years of age residing in long-term care facilities in Podkarpackie voivodship.

Materials and Methods

The study was conducted with the consent of the directors, in a group of patients residing in long-term care facilities in the Podkarpackie Voivodeship. The inclusion criteria were age above 65 years, stay in the institution for more than 6 months, stable health status and informed consent to participate in the study. The exclusion criteria were terminal state and advanced dementia. The study was carried out in compliance with the ethical norms set out in the relevant version of the Declaration of Helsinki (64th WmA general Assembly, Fortaleza, Brazil, October 2013) and in line with Polish legal regulations. After obtaining the approval of the CM Bioethics Committee – decision.

Our own study was conducted between 01.10.2020r. and 28.02.2021r. Data were collected by nurses working in long-term care facilities and a clinical dietician. From the medical history, information was collected on gender, age, date of admission to the facility and health status. The respondents were weighed on an electronic standing scale with a height gauge or using a chair scale, depending on their health status and level of functional ability. Body mass index BMI was calculated according to the accepted formula as $\text{body weight}/\text{height}^2$. Mid-upper arm circumference (MUAC) and calf circumference (CC) were measured using an elastic measuring tape. The Mini Nutritional Assessment (MNA) questionnaire was used to assess nutritional status, where a score of less than 17 was classified as malnourished. A score of 17-23.5 points indicated a risk of malnutrition, while a score above 24 points indicated satisfactory nutritional status. The analysis was performed using the IBM SPSS 26.0 package along with the Exact Tests module. All calculations related to the conducted research were performed on the basic Chi-square test, through which we can obtain an accurate analysis if the theoretical abundance is not less than unity and no more than 20% of the theoretical abundance is less than 5. Measures of the strength of the relationship for the aforementioned coefficients range from 0 to 1, with a higher coefficient value indicating a stronger relationship.

Results

The study was conducted in a group of 247 patients residing in long-term care facilities in Podkarpackie Voivodeship using the MNA scale. The nutritional status of the elderly was assessed in 247 patients: 132 women (53.5%) and 115 men (46.5%). The largest part of the study group consisted of people aged 71-85 years (57.4%), 21.8% of patients were older than 85 years. Patients aged 65- 70 years

constituted the smallest part with 20.8%. Patients residing in Long Term Care Facilities are largely self-managed when eating out, and their food restriction has not changed in the last 3 months in 59.4% of the subjects. 32.7% of persons have moderate limitation in eating, while a small part of 7.9% are persons with severe limitation in eating. Only 1 person shows weight loss of more than 3 kg. In 11.9% of patients in Facilities, the weight loss is unknown. 30.7% of patients lost weight between 1 and 3 kg, while 56.4% of patients maintained their weight without losing it. 48.5% of patients are able to move around and 45.5% are immobile in bed or in a chair. Only 5.9% of patients can get out of bed without leaving the room. 82.2% of the residents did not suffer from psychological stress. 17.8% of the residents suffered from psychological stress or severe illness. 42.6% were both patients without diagnosed psychological disorders. The same number of respondents 42.6% were patients with mild dementia. 14.9% of patients in Facilities have severe dementia or depression.

In the study group, 38.6% of patients had a BMI score above 23. 26.7% of patients are between 21 - 23 BMI. 20.8% of the subjects obtained a BMI between 19 - 21. Only a small part of the study group - 13.9% obtained an index below 19. (Table 1)

Table 1. BMI screening assessment score.

			BMI				Total
			underweight	normal weight	overweight	obesity	
Screening score (0-14 points)	malnutrition (0-16 pts.)	%	75.0%	19.7%	10.5%	0.00%	23.8%
	risk of malnutrition (17-23.5 pts.)	%	25.0%	47.0%	15.8%	25.0%	37.6%
	proper nutritional status (24-30 pts.)	%	0.00%	33.3%	73.7%	75.0%	38.6%
Total			100%	100%	100%	100%	100%
Kendall's tau-b	0.396	0.073	5.449	0.000	0.000		
coefficient	value	Standard error	Approximate T	p	Monte Carlo p		

Source: own.

With higher BMI, a higher screening score is evident. The correlation is statistically significant and has a clear strength of association.

74.3% of the study subjects take more than 3 types of medications per day. On the other hand, only 25.7% do not take such large amounts of drugs and in 10.9% of patients they are identified. In the studied group of patients 95% of patients consume 3 full meals a day. Considering protein intake in at least one serving of dairy products (milk, cheese, yogurt) per day: 72.5% of patients consume meals containing these products. 24.85% of the subjects do not consume dairy products. The protein contained in two or more servings of legumes or eggs per week is consumed by 78.2% of respondents in the patient group studied. 21.8% of the respondents do not consume products in such quantities weekly. The intake of protein contained in a portion of meat, fish or poultry daily is not absorbed by 15.8% of respondents. In the study group, 80.2% of patients consume adequate amounts of fruits or vegetables per day. On the other hand, 19.8% do not assimilate into the body two or more servings of fruits or vegetables per day.

Almost 1% of the subjects consume less than 3 glasses of beverages per day. 30.7% of patients consume between 3 and 5 glasses of beverages per day. In the study group as many as 68.3% of patients consume more than 5 glasses of beverages per day. In the study group, 41.6% of patients take their meals independently, without requiring the help of third parties. 30.7% of patients take their meals independently, with some difficulties requiring the help of third persons. 27.7% of the patients require the help of third parties during meal consumption.

In the study group of 247 patients, only 2% of patients claimed to be malnourished. 45.5% of the surveyed patients are not sure of their own nutritional status, while 52.5% of the patients do not see any problem in their nutritional status. Half of the surveyed group believes that their own health status is as good as other patients. According to 14.9% of the patients, their health status is much better than other peers. 32.7% of the patients say that they cannot evaluate their own health status, while only 2% of the patients note that their health status is not as good as the others. The health status of the respondents should be taken into account when interpreting the subjective assessment. Mid-Arm Circumference (MAC) and Calf Circumference (CC) values are helpful in assessing nutritional status in the elderly. The risk of malnutrition is recognized at $MAC \leq 22\text{cm}$ and $CC \leq 31\text{cm}$.

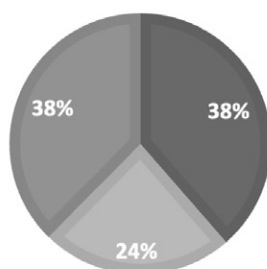
Mid-length arm circumference (MAC) in cm - 48.5% of the patients studied have an arm circumference (MAC) above 22. Arm circumference between 21 and 22 is found in 39.6% of the patients. In contrast, 11.9% of patients have an arm circumference below 21.

Calf circumference (CC) in cm - 57.4% of the study participants had a calf circumference of over 31, while the remainder had a calf circumference of less than 31.

Of the 247 patients studied, 23.8% suffer from malnutrition. 37.6% - 38 patients are at risk of malnutrition. On the other hand, 38.6% had normal nutritional status (Fig.1).

SCREENING SCORE (0-14 PTS.)

■ malnutrition (0-7 pts.) ■ risk of malnutrition (8-11 pts.)
 ■ proper nutritional status (12-14 pts.)



Of the 247 patients studied, 31.7% had normal nutritional status. 37.6% of the patients are at risk of malnutrition, due to the comorbidities present and the condition they are in. On the other hand, 29.7% are suffering from malnutrition; therefore, their health status is under constant medical supervision (Fig. 2).

Patients aged 71 - 85 show better nutritional outcome compared to patients younger or older than them. The relationship in non-monotonic sense is within statistical trend (Chi-square=8.336, $p=0.080$, p Monte Carlo=0.077) (Table 2).

The final score of the nutrition assessment is not statistically significantly dependent on gender (Table 3).

FINAL EVALUATION RESULT (0-30 PTS.)

- malnutrition (0-16 pts.)
- risk of malnutrition (17-23.5 pts.)
- proper nutritional status (24-30 pts.)

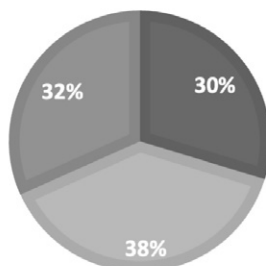


Table 2. Assessment score from age screening.

			Age			Total
			65-70	71-85	85+	
Screening score (0-14 points)	malnutrition (0-16 pts.)	%	38.1%	17.2%	27.3%	23.8%
	risk of malnutrition (17-23.5 pts.)	%	47.6%	34.5%	36.4%	37.6%
	proper nutritional status (24-30 pts.)	%	14.3%	48.3%	36.4%	38.6%
Total			100%	100%	100%	100%
Kendall's tau-b	0.396	0.073	5.449	0.000	0.000	
coefficient	value	Standard error	Approximate T	p	Monte Carlo p	
Kramer's V	0.203	8.336*	4	0.080	0.077	
Coefficient	Value	Chi-square	df	p	Monte Carlo p	

Source: own.

Table 3. Assessment score from sex screening.

			Sex		Total
			male	female	
Screening score (0-14 points)	malnutrition (0-16 pts.)	%	27.7%	31.5%	29.7%
	risk of malnutrition (17-23.5 pts.)	%	46.8%	31.5%	38.6%
	proper nutritional status (24-30 pts.)	%	25.5%	37.0%	31.7%
Total			100%	100%	100%
Kramer's V	0.164	2.702*	2	0.259	0.274
coefficient	value	Chi-square	df	p	Monte Carlo p

Source: own.

Elderly people over 65 years of age residing in long-term care facilities are provided with regular meals and third-party assistance in all activities of daily living and can easily observe how the patient eats, how much he/she eats of the meals served, and whether his/her weight remains the same.

Discussion

Proper nutrition, regardless of age, is an important factor in the overall health of a person. In this process, abnormalities may occur throughout life leading to many disorders in the system. Malnutrition in the geriatric age group is a broad concept and does not refer only to the lack or limited food intake [9]. It can result from many factors including: disorders of secretory function, digestion, absorption, the onset of many diseases, medication, psychiatric disorders, and self-care insufficiency [10]. The aim of the present study was to evaluate the nutritional status of geriatric ward patients and to determine the causes of nutritional disorders. Our study included 247 patients of Long Term Care Facilities over 65 years of age. Nutritional assessment was performed using the MNA - Mini Nutritional Assessment scale. After examination of the whole group of patients it was found that in 31.7% of patients nutritional status is normal. 37.6% of patients are at risk of malnutrition due to coexisting diseases and their condition. On the other hand, 29.7% suffer from malnutrition, so their health status is under constant control of doctors. Similarly, Kamińska and Brodowski from the Independent Primary Health Care Laboratory of the Medical University of Szczecin conducted a study on 120 elderly patients of a selected health care facility. The aim of the study was to assess the nutritional status of the patients using the MNA scale. More than 70% of the patients' nutritional status was characterized as good, while 29.2% were at risk of malnutrition. There was no significant relationship between age and nutritional status of the patients in the whole study group. We can note that in the study conducted by Kaminska and Brodowski and our own study, it is confirmed that age has no significant effect on the nutritional status of elderly patients [11]. The study conducted by Nishida et al. included 36 men and 80 women with a mean age of 82 years. The MNA - SF study showed that 80 subjects were malnourished. Sixty-six participants received rehabilitation for more than 1 hour per week and 50 received rehabilitation for <1 hour. The proportion of malnourished participants who returned home was significantly lower ($p = 0.003$) than among those who did not return home. Multivariate logistic regression analysis showed that malnutrition was independently associated with return home [12]. The purpose of the study by Pezzana et al. was to gather information on the actual need for nutrition interventions in long-term care facilities and the role of institutional factors in nutrition care. The authors showed that in long-term care in elderly residents, nutritional disorders are very common, unrecognized and untreated and nutritional assessment should be part of routine care [13].

The aim of the study conducted by Wysokiński et al. was to assess the nutritional status of elderly people living in the Lublin voivodeship. The study showed that malnutrition more often reaches women (15.5%) than men (7.4%). Older people over 80 years of age were found to be more malnourished than those under 65 years of age. 3% of the study subjects who were found to be overweight had better nutritional status than normal or below normal weight subjects where malnutrition occurred. The study found that most of the respondents had normal nutritional status. However, considering age, gender and also marital status and BMI have a significant impact on the assessment of nutritional status [14].

Salva et al. found that unintentional weight loss and malnutrition are major problems among older adults living in long-term care facilities. Nutritional assessment is an important part of a comprehensive geriatric assessment (CGA) and making a diagnosis and treating malnutrition requires a multidisciplinary approach that may include improving diet and environment and treating multiple comorbidities [15].

Machado, Coelho, and Veras found that malnutrition is common and negatively affects the health of older adults [16]. The aim of the study by Boström et al. was to assess nutritional status and identify risk factors for malnutrition in an urban veterans' long-term care (LTC) facility in western Canada. Analyses of the results indicate that managers, physicians, and staff must focus on residents with depression and dementia and those with unstable health status. Ethical considerations are important in selecting appropriate interventions because many residents in long-term care facilities are in the end of life [17]. Park et al. conducted a study to assess the nutritional status of older adults with dementia living in 248 randomly selected long-term care facilities. The malnutrition rate was 38.4%, with 54.7% of participants at risk for malnutrition. The largest population with malnutrition was in long-term care hospitals (47.9%), followed by nursing homes (34.1%) and group homes (25.9%). The age and gender of the respondents as well as higher functional dependence and level of disability had a significant impact on nutritional status [18].

A wide range of flexible dietary recommendations, culturally sensitive food and nutrition services, physical activity, and supportive care tailored to older adults is needed to ensure successful aging and minimize the effects of disease and disability [19]. A number of effective interventions are available to support adequate nutrition and hydration in older adults to maintain or improve nutritional status and improve clinical course and quality of life. These interventions should be implemented in clinical practice and routinely used [20].

Conclusions

Elderly people over 65 years of age residing in long-term care facilities are provided with regular meals and assistance from third parties in all activities of daily living, and staff can easily monitor how the patient eats, how much they eat from the meals served, and whether their weight remains unchanged. The nutritional level of the respondents is significantly influenced by their health status and the level of dementia. As patients nutrition in the surveyed long-term care facilities studied varies, measures must be taken to ensure that all patients receive sufficient nutrients.

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