

## NUTRITIONAL STATUS IN OLDER PATIENT WITH OSTEOPOROSIS

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## SUMMARY

**Objective:** To evaluate of nutritional status of elderly patients with osteoporosis in hospital base. **Methods:** A cross-sectional study on older patients with osteoporosis, aged 60 years or older who were treated at The National Geriatric Hospital. The Mini Nutritional Assessment – Short Form (MNA-SF) was used to assess the nutritional status of the participants. **Results:** The average MNA score is  $11.26 \pm 2.43$  near (range 8-11). 64 women were classified as undernourished/ at risk of undernutrition and 4 men were in the same group. Mean T-score of the femoral neck is:  $-1.51 \pm 1.17$  and the mean T-score lumbar spine is  $-3.32 \pm 0.70$ . **Conclusion:** Overall, the nutritional status was poor in this group of patients. Assessment of nutritional status should be applied as a regular clinical practice for older osteoporosis patients.

**Keywords:** Osteoporosis; Nutritional status

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## INTRODUCTION

Malnutrition is a condition that occurs in all ages, especially the elderly<sup>1</sup>. Elderly people with osteoporosis are those who are

at risk of malnutrition or higher risk than those without the disease, affecting health and reducing the quality of life if untreated. 3 factors affect bone: a diet full of calcium and minerals; making sure you get enough vitamin D to help absorb calcium; concentration of endogenous substances. Secretion plays a role in bone development. If there is a lack of substances in the body, it can easily lead to osteoporosis. It is forecasted that by 2050, there will be 6.3 million cases of femoral neck fractures due to osteoporosis worldwide and 51% of these will be in Asian countries, where the daily diet is very calcium deficient<sup>2,3</sup>. The current Vietnamese diet does not meet the need to limit osteoporosis. The average amount of calcium put into the body is 524mg/day, much lower than the average requirement of 800- 1000mg/person/day for adults. So malnutrition is a big problem, and early identification of nutritional status in elderly patients with osteoporosis is very important and necessary to help support the treatment process, improve quality of life, and disease prevention

Improving health and quality of life, especially nutrition, for these patients are important goals and tasks for medical staff in general and nurses in particular. Identifying factors that may be related to nutritional status in this group of patients is one of the approaches to the problem. We conducted the study to evaluate of nutritional status of elderly patients with osteoporosis in a central geriatric hospital.

## METHODS

### Study design

The study was a descriptive cross-sectional study

### Study subject, sampling, and sample size

#### Study subjects

Osteoporosis patients aged 60 years and older were being diagnosed and treated at National Geriatric Hospital.

#### ❖ Inclusion criteria

- 60 years old or older
- Being diagnosed with osteoporosis according to the criteria of the World Health Organization (WHO) in 1994, measuring bone density in the lumbar spine and femoral neck according to the DEXA method at the National Hospital of Geriatrics: (1 out of 3 criteria):

- T-score femoral neck (R):  $\leq -2.5$
- T-score femoral neck (L):  $\leq -2.5$
- T-score lumbar spine (total):  $\leq -2.5$

- Having a caregiver who either lives with the participant or visits for at least four hours per week.

#### ❖ Exclusion criteria

- Acute and malignant diseases (advanced cancers, end-stage chronic diseases, acute myocardial infarction, acute stroke, symptomatic cardiovascular disease).

- Clinical evidence of schizophrenia, psychiatric or bipolar disorder

- Alcoholism or substance dependence (according to DSM-5 criteria, currently, or within the past 2 years).

- Severe loss of vision, hearing, or communicative ability (according to the interrail Community Health Assessment).

- Individuals or families refused to participate in the study.

#### Sampling and sample size

- The sample was selected according to the entire sampling method.

- The sample size is calculated using the

$$\text{formula: } n = \frac{(Z_{1-\alpha/2})^2}{d^2} \cdot p \cdot (1-p)$$

- n: study sample size;
- $\alpha$ : statistical significance level, with  $\alpha = 0,05$  ( $Z_{1-\alpha/2} = 1,96$ )
- $p = 0.23$ <sup>4</sup>
- d = expected error (d = 0.1).
- From the formula, the estimated minimum sample size is n = 68 elderly patients with osteoporosis. Our study was performed on 141 patients.

#### Study setting

The research was conducted at the National Geriatric hospital from March, 2022 to October, 2022.

#### Nutritional status: Mini Nutritional Assessment – Short Form (MNA-SF):

Performing: The MNA-SF was used to assess the nutritional status of the participants<sup>5</sup>. It contained 6 items about food intake, weight loss, mobility, psychological stress or acute disease, neuropsychological problems, and BMI. Patients were scored following the tool's guidelines.

Evaluation: The score ranges from 0 to 14: Malnourished (0-7 points), At the risk of malnutrition (8-11 points), Normal nutritional status (12-14 points)

#### Data analysis

The data were coded, entered using REDCap software, and analyzed using SPSS software version 22.0. Descriptive statistics: we constructed a frequency distribution table for qualitative variables; mean, maximum value, and minimum value were used for quantitative variables.

#### Ethical consideration

Participants in the study have fully explained the purpose and content of the evaluation study as well as the benefits and problems that might be encountered. Research subjects had the right to ask questions about the purpose of the study

and the researcher would be responsible for answering them. They had the right to refuse or discontinue participation in the study if there was any doubt. The subjects refused participation in the study would not affect their ability to receive services at the facility.

## RESULTS

A total of 141 patients eligible to participate in the study, the mean age was 73 years. Most of the participants lived with their families (93.6%).

**Table 1.** Social demographic characteristics distribution (n=141)

Characteristics		Frequency (n)	Percentage (%)
Mean age (year)		73.12± 8.62	
Age group	60 – 69	50	35.5
	70-79	55	39.0
	≥80	36	25.5
Gender	Male	8	5.7
	Female	133	94.3
Living status	With family	132	93.6
	Alone	9	6.4
Smoking	Yes	5	3.5
	No	136	96.5
Drinking	Yes	2	1.4
	No	139	98.6

There are 2 patients currently drinking alcohol, the remaining patients are either non-smokers, drinkers or have quit.

**Table 2.** Osteoporosis-related characteristics (n=141)

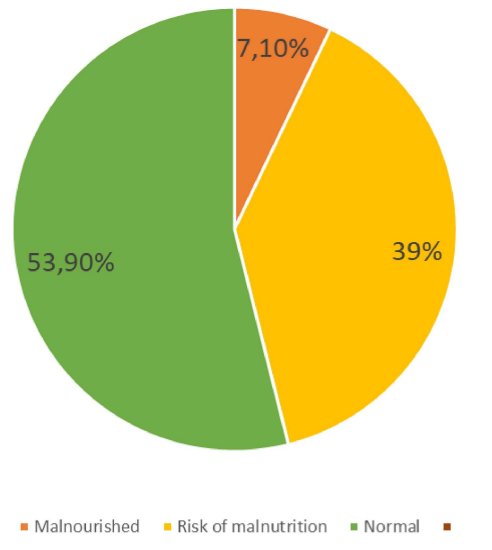
		$\bar{X} \pm SD$	
Mean T-score femoral neck		-1.51 ± 1.17	
Mean T-score lumbar spine (total)		-3.32 ± 0.70	
Family history of osteoporosis	Yes	11	7.8
	No	130	92.2

<b>History of musculoskeletal surgery</b>	Yes	6	4.3
	No	135	95.7
<b>History of fracture from middle age (40 years old)</b>	Yes	9	6.4
	No	132	93.6

The mean time patients were diagnosed with osteoporosis was 1.7 years. The mean T-score in the femur and lumbar spine is -1.51 and -3.32.

Family history of patients with osteoporosis accounts for a small percentage of 7.8%. Out of a total of 141 study participants, only 6 patients (4.3%) had a history of musculoskeletal surgery, and 9 patients (6.4%) had a history of fracture before age 40.

Nutritional status of participants



**Figure 1.** Nutritional status distribution (n=141)

Pie chart illustrates the distribution of nutritional status of elderly osteoporosis patients. People with dietary problems accounted for 46.1%. The mean score of MNA-SF is 11.26 ± 2.43 points.

**Table 3.** Mini nutritional assessment – short form (MNA-SF) items (n=141)

Items	Frequency (n)	Percents (%)
<b>Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?</b>		
0 = severe decrease in food intake	6	4.3
1 = moderate decrease in food intake	41	29.1
2= no decrease in food intake	94	66.7
<b>Involuntary weight loss during the last 3 months?</b>		

0 = weight loss greater than 3kg	7	5.0
1 = does not know	8	5.7
2 = weight loss between 1 and 3kg	33	23.4
3 = no weight loss	93	66.0
<b>Mobility?</b>		
0 = bed or chair bound	2	1.4
1 = able to get out of bed/chair, but does not go out	9	6.4
2 = goes out	130	92.2
<b>Has the patient suffered psychological stress or acute disease in the past 3 months?</b>		
0 = yes	20	14.2
2 = no	121	85.8
<b>Neuropsychological problems?</b>		
0 = severe dementia or depression	10	7.1
1 = mild dementia	6	4.3
2 = no psychological problems	125	88.7
<b>Body mass index (BMI)</b>		
0 = BMI less than 19	20	14.2
1 = BMI 19 to less than 21	27	19.1
2 = BMI 21 to less than 23	38	27.0
3 = BMI 23 or greater	56	39.7

More than half of the study participants did not lose weight (66.7%) and maintained their weight in the past 3 months (66%). Only a small part of them complained of a serious decrease in eating and drinking and lost more than 3kg.

Regarding mobility, most patients were able to leave the house (92.2%). Most of these elderly people did not suffer from any acute illness or stress during the past 3 months. Only 6 patients had mild dementia and 10 patients had dementia or major depression. Participants with a BMI of 23 or more accounted for the largest proportion (39.7%) and the lowest was the group with a BIM less than 19 reaching 14.2%.

## DISCUSSION

We used MNA-SF to assess nutritional status in this study. Patients with normal nutrition had the highest rate of 53.9%, followed by the risk of malnutrition at 39% and malnutrition at 7.1%. The mean MNA-SF score was  $11.26 \pm 2.43$  at the risk of malnutrition. Elderly osteoporosis patients at the National Geriatric Hospital have poor nutritional status. Nearly 50% of participants experienced moderate and severe reductions in food intake in the past 3 months. Furthermore, the rate of weight loss was 34%. 60.3% of the patient's BMI had an index less than 23.

Our study showed a lower proportion of

malnourished patients than the results of the research in Netherlands. The cross-sectional study enrolled 40 hip fracture patients (mean  $\pm$  SD age  $82 \pm 8.0$  years) from the geriatric rehabilitation departments of two nursing homes in the Netherlands. The assessments included nutritional status, 73% of participants were malnourished or at risk of being malnutrition<sup>6</sup>. The results of our study are similar to a cross-sectional study assessing the nutritional status of 80 patients with hip fractures (mean age 80 years). Nutritional risk was detected with 8.8% of patients were undernourished. 43.7% of study population were at risk of malnutrition and 47.5% well-nourished according to the MNA test<sup>7</sup>

In the study in India, among 360 elderly aged 60 years or older, 15% were found to be malnourished and 55% were at risk of malnutrition<sup>8</sup>. The prevalence of malnutrition in the elderly was found to be 32.2% which is significantly associated with changes in food intake and weight over past three months, mobility, neuropsychological problems, acute disease/ psychological stress and BMI. The rate of malnutrition and the risk of malnutrition in this study is higher than in my study because the number of studies is more, nutrition, material and life are different in each place.

### CONCLUSION

The rate of risk of malnutrition and malnutrition in older patients having osteoporosis was high. Assessment of nutritional status should be applied as a regular clinical practice for older osteoporosis patients.

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