# Nutrición Hospitalaria

## Trabajo Original

Nutrición en el anciano

# Malnourishment in the overweight and obese elderly
*Desnutrición en el anciano con sobrepeso y obesidad*

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## Abstract

**Background:** the prevalence of obesity in the elderly has increased in recent years. Malnutrition is a syndrome characterized by inadequate intake and absorption of nutrients. Obesity could mask the presence of malnutrition.

**Objective:** this study aimed to determine malnutrition using the Mini Nutritional Assessment (MNA) test in obese and overweight elderly.

**Methods:** one hundred and eighty-seven overweight or obese elderly have been taken under review and nutritional status was assessed with the Mini Nutritional Assessment-Short Form (MNA-SF).

**Result:** there were 101 (54.3%) male and 86 (45.7%) female elderly. Body mass index (BMI) variability of the sample group was between 25.0 and 48.9. Malnourishment percentile is 49.7% for elderly people whose BMI is over 25.

**Conclusion:** elderly individuals, especially those who are overweight or obese, are under more health threats and should be evaluated more carefully.

## Resumen

**Introducción:** la prevalencia de obesidad en el anciano ha aumentado en los últimos años. La desnutrición es un cuadro que se caracteriza por una ingesta y una absorción de nutrientes insuficiente. La obesidad puede enmascarar la presencia de desnutrición.

**Objetivo:** este estudio pretende determinar la presencia de desnutrición medida mediante el Mini Nutritional Assessment (MNA) en ancianos con sobrepeso u obesidad.

**Métodos:** se evaluaron 187 ancianos con sobrepeso u obesidad mediante el cuestionario corto MNA

**Resultados:** la muestra incluyó 101 varones (54,3%) y 86 mujeres (45,7%). El rango de índice de masa corporal (IMC) osciló entre 25,0 y 48,9. Se encontró desnutrición en el 49,7% de los ancianos con IMC > 25.

**Conclusiones:** los ancianos con sobrepeso u obesidad están sometidos a una mayor amenaza para la salud y deberían ser evaluados cuidadosamente.

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## INTRODUCTION

The prevalence of obesity in the elderly has increased dramatically in recent years (1). Normal ageing is associated with a progressive increase in fat mass, which normally peaks at about age 65 in men and later in women (2). In fact, along with ageing, reasons such as the reduction in the basal metabolism rate, the increase in body fat percentage and the limitation of movement ability cause an increase in body mass index (BMI) (3). Age-related body composition changes and the increased prevalence of obesity in the elderly produce a combination of excess weight and reduced muscle mass and/or strength, which has been defined as sarcopenic obesity (4).

Sarcopenia has been defined as the loss of skeletal muscle mass and strength that occurs with advancing age (5). Body fat distribution also changes with age, with visceral abdominal fat increase and subcutaneous abdominal fat decrease (6). BMI predicts disease risk both in those termed underweight and in those who are obese. BMI may be unreliable because of difficult measurements of height and weight in the elderly such as vertebral compression, loss of muscle tone, postural changes, oedema and may not identify significant unintentional weight loss and the loss of muscle mass or undernourishment that occurs with ageing ara occur even in relatively weight stable individuals like as sarcopenic obesity (7,8).

Malnutrition is a syndrome characterized by inadequate intake and absorption of nutrients (9). Malnutrition is associated with increased length of hospital stay, reduction in quality of life, delayed wound healing, and reduction in the adverse health conditions such as infection and functional capacity. Malnutrition is especially determinative for morbidity and mortality in the elderly (10).

Measuring malnutrition is difficult in all settings and confused with the signs of aging (11). Total body fat increases with age, and peaks at 70 and higher BMI or waist circumference could mask the presence of malnutrition (12,13). The Mini Nutritional Assessment-Short Form (MNA-SF) is an effective tool designed to identify older adults at risk of developing malnutrition. The MNA-SF test is sensitive, specific and accurate in identifying nutrition risk (14). MNA-SF tests are applicable to screen malnutrition in Turkish geriatric patients (15). In this study, we aimed to determine the risk of malnutrition and malnutrition using the MNA test in obese and overweight elderly.

## MATERIALS AND METHODS

### SETTING AND SAMPLING

Written informed consent was obtained from all participants. This study was approved by the institutional review board of the Kirklareli University and complied with the Declaration of Helsinki.

In between January 2016 and December 2017, 1,205 elderly persons were asked whether they would like to participate in this single-center cross-sectional study or not. Face-to-face interviews were conducted with 596 elderly people who agreed to partici-

pate in the study. Past medical history and feeding habits were determined with a standardized questionnaire. The exclusion criteria were: current malignancy, severe renal failure, earlier gastric ulcer or intestinal surgery, known eating disorder and body mass index (BMI) < 25 kg/m$^2$ or normal waist circumference (WC) (females ≤ 80 cm, males ≤ 94) (n:355). Eventually, 187 overweight or obese elderly (101 females, 86 males) older than 65 years of age were taken under review. Body weight, height, waist circumference (WC), hip circumference (HC), mid-upper arm circumference (MUAC) and calf circumference were measured by the researcher according to proper methods (16). All anthropometric measurements were taken on two different days and the average of all these values was calculated. Thus, the occurrence of faults depending on intra-observer and inter-observer variability was prevented.

## NUTRITIONAL STATUS OF THE ELDERLY

Nutritional screening was performed with MNA-SF consisting of six items: food intake, weight loss, mobility, psychological stress or acute disease, neuropsychological problems and BMI. The maximum score of MNA-SF is 14. A score equal to or less than 7 points is regarded as an indicator of malnutrition, 8-11 points indicate a risk for malnutrition (≥ 11 is malnourishment) and equal to or more than 12-14 points indicate that the person is well-nourished (17).

## STATISTICAL ANALYSES

Data were analyzed with SPSS version 20.0 (Chicago, IL, USA), using number (n), percentage (%), mean (X), standard deviation (SD) and median values. The significance in the variables was tested by using the independent t-test. p values are two-sided, and a p value of < 0.05 was considered to be significant.

## RESULTS

### SOCIO-DEMOGRAPHIC CHARACTERISTICS

The socio-demographic characteristics of those participating in the study are shown in table I. There were 101 (54.3%) male and 86 (45.7%) female elderly. Only 5.3% of the elderly were illiterate, 42.5% were literate without formal education and 52.2% had formal education. One of the elderly people had a private insurance and the rest of the group had institutional social security; 89.5% of the elderly were married, 8.9% were widowed and 1.6% were divorced. Still, smoking ratio was 22.7%, 47.4% had quit smoking and 30.0% had never smoked. As regards their previous occupations, 17.0% of them were workers; 31.6% were housewives; 28.7%, farmers; 13.8%, officers; and 8.9%, tradesmen. Their most prevalent health problems were hypertension (72.5%), diabetes *mellitus* (53.8%) and osteoporosis (53.0%).

**Table I.** Socio-demographic characteristic percentages of the elderly (n = 187)

| Socio-demographic characteristics | | n | % |
|---|---|---|---|
| Gender | Male | 101 | 47.0 |
| | Female | 86 | 53.0 |
| Education status | Illiterate | 13 | 5.3 |
| | Literate (without formal education) | 105 | 42.5 |
| | Primary school | 70 | 28.3 |
| | Secondary school | 32 | 13.0 |
| | High school | 22 | 8.9 |
| | University | 5 | 2.0 |
| Social security status | Social security institution | 244 | 98.8 |
| | Private insurance | 1 | 0.4 |
| | None | 2 | 0.8 |
| Marital status | Married | 221 | 89.5 |
| | Widowed | 22 | 8.9 |
| | Divorced | 4 | 1.6 |
| Smoking status | Smoker | 56 | 22.7 |
| | Quit | 117 | 47.4 |
| | Never | 74 | 30.0 |
| Previous occupation | Worker | 42 | 17.0 |
| | Housewife | 78 | 31.6 |
| | Farmer | 71 | 28.7 |
| | Officer | 34 | 13.8 |
| | Tradesman | 22 | 8.9 |
| Diagnosed diseases | Hypertension | 179 | 72.5 |
| | Cardiovascular | 68 | 27.5 |
| | Rheumatic | 70 | 28.3 |
| | Diabetes mellitus | 133 | 53.8 |
| | Respiratory | 100 | 40.4 |
| | Gastrointestinal | 74 | 30.0 |
| | Osteoporosis | 131 | 53.0 |
| | Nervous | 35 | 14.2 |
| | Kidney disorders | 27 | 10.9 |
| | Others | 48 | 19.4 |

*Eye (n = 22), hearing (n = 2), oral-dental (n = 8), skin (n = 3), prostate (n = 18), goiter (n = 9) and allergy (n = 1) problems.*

## NUTRITIONAL STATUS

The sampling group consisted of persons aged 65-88, with a weight of 63-120 kg. BMI variability of the sample group was between 25.0 and 48.9. The anthropometric measurements of the participants by gender are presented in table II. The mean age was 70.2 ± 5.0 years (male: 70.1 ± 5.6; female: 70.3 ± 5.2 years; p > 0.001), mean BMI was 31.9 ± 4.9 (male: 30.7 ± 3.1; female 34.6 ± 4.4; p < 0.001), mean WC was 106.4 ± 10.7 (male: 108.0 ±

**Table II.** Nutritional status of overweight and obese elderly

| | Male (n:101) $X \pm SD$ (range) | Female (n:86) $X \pm SD$ (range) | p |
|---|---|---|---|
| Age | 70.1 ± 4.9 (65-87) | 70.3 ± 5.2 (65-88) | NS |
| Height (cm) | 170.3 ± 8.1 (150-190) | 156.5 ± 7.2 (140-170) | < 0.001 |
| Weight (kg) | 85.7 ± 9.8 (65-120) | 76.1 ± 11.8 (63-110) | < 0.001 |
| BMI (kg/m²) | 30.7 ± 3.1 (25-40.3) | 34.6 ± 4.4 (25-49) | < 0.001 |
| WC (cm) | 108.0 ± 9.6 (90-168) | 105.0 ± 11.5 (72-143) | < 0.001 |
| HC (cm) | 107.6 ± 6.8 (90-123) | 113.0 ± 11.2 (61-135) | < 0.001 |
| W/H ratio | 1.01 ± 0.08 (0.9-1.6) | 0.93 ± 0.12 (0.7-1.8) | < 0.001 |
| MUAC (cm) | 27.8 ± 4.8 (18.3-38.8) | 29.2 ± 5.7 (20.2-44.4) | NS |

*The significance in the variables was tested by using the independent t-test. X: mean; SD: standard deviation; BMI: body mass index: WC: waist circumference; HC: hip circumference; W/H: waist/hip; MUAC: mid-upper arm circumference; NS: no score.*

9.6; female: 105.0 ± 11.5 cm; p < 0.001), mean HC was 110.5 ± 9.8 (men: 107.6 ± 6.8; women: 113.0 ± 11.2 cm; p < 0.001), mean waist/hip (W/H) ratio was 0.97 ± 0.11 (male: 1.01 ± 0.08; female: 0.93 ± 0.12; p < 0.001) and mean MUAC was 28.5 ± 5.3 (male: 27.8 ± 4.8; female: 29.2 ± 5.7 cm; p > 0.001).

According to the MNA-SF in male, malnutrition, risk of malnutrition and normal status were 18.8%, 30.7% and 50.5%, respectively, and in female they were 19.8%, 30.2% and 50.0%, respectively. In the whole group, malnutrition, risk of malnutrition and normal status were 19.2%, 30.5% and 50.3%, respectively. Our malnourishment percentile was 49.7% for elderly people whose BMI is over 25 (Table III).

## DISCUSSION

According to the MNA-SF results, 49.7% of our elderly people who are overweight are malnourished. In a study conducted by Lang et al. (18) on inpatients over 75 years old, 60% of normal weight, 42% of overweight and 40% of obese patients defined as malnourishment with the MNA score. Similarly, Rist et al. (19) found more than a third at risk of malnutrition. Turconi et al. (20) found 22 people at risk of malnutrition in their study of 184 people with MNA.

Bahat et al. (21) stated that the BMI of older adults living in a nursing home in Turkey is more than 25 kg/m². However, they reported that 9.8% of the people in this group were at risk of malnutrition or presented malnutrition. In a recent study, Kaiser et al. (22) found that 11% of the elderly living in a nursing home were at risk of malnutrition.

In the study of Winter et al. (23). the average BMI of the at-risk group was 23.6 kg/m², but this was significantly lower than the well-nourished group and 34% of at-risk subjects had a BMI in the overweight or obese range. Compared with the well-nourished group, significantly more subjects in the at-risk group had a BMI between 18.5 and 24.9 (p < 0.05), while fewer had a BMI in the overweight range of 25-29.9 (p < 0.05).

In a study of 42 people over the age of 60, 13 volunteers were classified as at risk of undernutrition by the MNA score. Eight

**Table III.** MNA-SF distributions of overweight and obese elderly

| | | **Male** | **Female** | | **All** |
|---|---|---|---|---|---|
| | | **n: 101** | **n: 86** | **p** | **n: 187** |
| MNA-SF | Malnutrition | 19 (18.8%) | 17 (19.8%) | NS | 36 (19.2%) |
| | Risk of malnutrition | 31 (30.7%) | 26 (30.2%) | NS | 57 (30.5%) |
| | Normal nutrition | 51 (50.5%) | 43 (50.0%) | NS | 94 (50.3%) |

*The significance in the variables was tested by using the independent t-test. MNA-SF: Mini Nutritional Assessment-Short Form; NS: no score.*

of them (63.5%) are over the normal weight limit, two of which are overweight and six are obese (24). In this study, like in ours, approximately half of the overweight or obese elderly who had a BMI over 25 kg/m$^2$ were malnourished.

Using BMI as a sole indicator of nutrition would fail to identify nutritional issues in these individuals. In addition, Sharma et al. (25) investigated the relationship between BMI and central obesity and mortality in elderly patients with coronary artery disease and they found that normal-weight central obesity defined using either WHR or WC is associated with high mortality risk in older adults with CAD, highlighting a need to combine measures in adiposity-related risk assessment. Similarly, Romero et al. (26) found significant differences (p < 0.05) in sarcopenic obesity according to ACE I/D genotype.

In general, there is a belief that obese people in the society are healthier. However, these studies and other studies have shown that obesity is one of the most important health problems in society because it causes illnesses at all ages and masks illnesses. There are some limitations in the study. Firstly, although various methods were applied to determine malnutrition, this study was performed with the MNA-SF test. Secondly, conducting the research at a hospital polyclinic led to a relatively higher capable elderly. Lastly, the number of hospitalized patients is limited and it does not reflect all elderly society.

## CONCLUSION

Elderly individuals, especially those who are overweight or obese, are under more health threats and should be evaluated more carefully. Obesity in the elderly is also dangerous not only in terms of malnutrition masking but also in raising the risk of other diseases.

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