Sivri D, et al., J Food Sci Nutr 2024, 10: 202
DOI: 10.24966/FSN-1076/100202

HSOA Journal of Food Science and Nutrition

Research Article

Determination of Nutritional Status and Mindful Eating of Elderly Individuals

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Abstract

Objectives: This cross-sectional study, conducted between September-November 2021 with 234 elderly, aimed to assess nutritional status and mindful eating, as well as explore relationship between these factors.

Methods: Participants, aged 60 and over, were enrolled at third-age University. Data were obtained online through a socio-demographic questionnaire, the Mini Nutritional Assessment Test-Short Form (MNA-SF), and Mindful Eating Scale (MEQ). Analyses were performed using non-parametric tests via SPSS 22.0.

Results: The mean MNA-SF score was 13.06±1.29, while the mean MEQ score was 3.68±0.35. Findings indicated that all underweight individuals were malnourished, and 9.3% of normal-weight and 27.3% of obese (class II) individuals were at risk of malnutrition. Moreover, 97.9% of participants demonstrated high mindful eating levels.

Discussion: Regular nutritional screenings and addressing factors influencing nutrition are crucial for preventing malnutrition, and mindful eating practices can be integrated into obesity treatments for elder.

Keywords: Elderly; Malnutrition; Mindful Eating; Nutritional Status

Introduction

Aging is a universal process that includes cellular, physiological and psychological changes that start in the intrauterine period and continue until death [1]. The elderly population in Turkey, much like the global elderly population, is experiencing rapid growth. According to data from the Turkish Statistical Institute (TÜİK), the proportion of individuals over the age of 65 within the total population was 10.2% in 2023, up from 8.8% in 2018. Projections suggest that this ratio will further increase to 12.9% by 2030 and 16.3% by 2040 [2].

Physiological and physical factors associated with aging, such as changes in taste and smell perception, reduced saliva production, impaired swallowing reflexes, and declining organ function, can significantly impact nutritional status and contribute to weight loss and malnutrition. Additionally, oral and dental health issues, chronic diseases, and medication usage are also influential factors. Socioeconomic determinants, including income and education level, living arrangements (such as living alone), and challenges in meal preparation, cooking, and grocery shopping, further exacerbate the risk of malnutrition [3].

Malnutrition encompasses both overnutrition, which includes conditions like diet-related non-communicable diseases, overweight, and obesity, as well as undernutrition, which encompasses underweight, stunting, wasting, and macro-micronutrient deficiencies [4]. Current estimates suggest that approximately a quarter of older individuals aged 65 years and over are either malnourished or at risk of malnutrition [5].

The Mini Nutritional Assessment-Short Form (MNA-SF) is utilized for screening nutritional status among elderly individuals. The prevalence of malnutrition in older populations varies significantly depending on the screening tool employed and the specific demographic studied. For instance, in a study involving 8,529 individuals in China, the malnutrition rate was reported at 9.7% using the MNA-SF screening tool [6]. In Turkey, a study with 872 individuals aged 65 years and over found malnutrition rates of 7% among those living alone and 4% among those living with their families, utilizing the MNA screening tool [3].

Mindful eating contributes to reducing food cravings, moderating eating speed, and promoting regular eating habits, thereby aiding in weight management [7]. Given that sufficient and balanced nutrition, along with mindful eating, significantly impacts the quality of life and disease prevention in elderly individuals who are at a heightened risk of malnutrition, it is essential to periodically assess their nutritional status and mindful eating. The number of studies that associate nutritional status with mindful eating is limited. Mindful eating can help improve the nutritional status of older, supporting a healthy lifestyle and reducing the risk of chronic health conditions [8]. This study provided information for future research on mindful eating in older and contributed to ongoing strategies to prevent overeating, obesity, and malnutrition. Hence, this study aimed to evaluate the nutritional status and mindful eating of individuals aged 60 years and older, as well as explore the relationship between these factors.

Methods

This cross-sectional study was conducted between October and November 2021, a survey form created using ‘Google Forms’ was

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Citation: Sivri D, Yur F (2024) Determination of Nutritional Status and Mindful Eating of Elderly Individuals. J Food Sci Nutr 10: 202.

Received: October 18, 2024; **Accepted:** November 05, 2024; **Published:** November 13, 2024

distributed to closed WhatsApp groups by third-age university campus managers.

To determine the sample size, based on the individuals registered in these WhatsApp groups (700 individuals), it was calculated that 200 participants were required to achieve 80% power, with a sampling error of 0.05 and a 95% confidence interval using the G*Power 3.1.9 software programme. Considering potential dropouts and incomplete responses, the sample size was increased by 20%, resulting in a total of 240 participants included in the study.

A total of 240 elderly individuals aged 60 and above, who volunteered to participate in the study, were included. These individuals were easy to communicate with, literate, and members of the closed WhatsApp groups affiliated with third-age university. Participants who expressed a desire to withdraw from the study or provided incomplete questionnaire responses were excluded (6 individuals).

Third-age university operates as a social responsibility project, offering theoretical and practical courses to elderly individuals from universities. Lecturers participate voluntarily in this initiative [9].

Research data were collected with the help of google forms questionnaire. Questions about the socio-demographic information, MNA-SF and Mindful Eating Questionnaire (MEQ) were used to collect data. Age, gender, educational status, marital status was questioned in socio demographic information. Researchers obtained self-reported weight and height information from participants online to calculate Body Mass Index (BMI) values. BMI is calculated by dividing weight (kg) by height squared (m^2). According to the World Health Organization classification, BMI values below 18.5kg/m^2 indicate underweight, 18.5 to 24.9kg/m^2 indicate normal weight, 25 to 29.9kg/m^2 indicate overweight, and 30 kg/m^2 and above indicate obesity [10].

Nutritional status was evaluated using the MNA-SF, with scores categorized as follows: below 8 indicating malnutrition, 8-11 indicating risk of malnutrition, and above 12 indicating well nourished [11]. Mindful eating of individuals was assessed using the MEQ, a validated and reliable tool available in Turkish. This scale employs a 5-point likert scale (1: never, 2: rarely, 3: sometimes, 4: often, 5: always). Sub-dimensions and total scores are calculated by averaging responses, with a score of 3 or above indicating the presence of the evaluated feature in each sub-dimension [12]. The scale contains 20 reverse items and these questions are reverse scored (reverse scoring: 5=1, 4=2, 3=3, 2=4, 1=5) [13]. In this study, Cronbach's α coefficient of the MEQ-30 was found to be 0.77.

The study obtained ethical approval from the Muğla Sıtkı Koçman University Health Sciences Ethics Committee on September 13, 2021, with decision number 199. Additionally, permission to conduct the study was granted by the Muğla Sıtkı Koçman University Rectorate Directorate of Ageing Studies Application and Research Centre. Before commencing the study, participants were informed of their rights and the principle of autonomy was upheld by allowing them the option to withdraw from the study. Additionally, an informed consent form was obtained from all participants.

The data collected from the study were analyzed using the SPSS 22.0 software package in a Windows environment. Categorical variables were presented as numbers (n) and percentages (%), while quantitative variables were described using the arithmetic mean ($\bar{X}$), standard deviation (SD), minimum (min.), and maximum (max.) values. Due to the non-normal distribution of the data, non-parametric tests were employed for analysis. The Chi-square test was utilized to assess categorical variables. For comparing measurement values from two unrelated samples, the Mann-Whitney U test (Z-table value) method was applied, while the Kruskal-Wallis H test was used to compare measurement values among more than two groups. Pairwise comparisons of variables showing significant differences ($p<0.05$) in the Kruskal-Wallis H test were conducted using the Independent-Sample Kruskal-Wallis test. Correlation analysis (Spearman) was performed to evaluate relationships between scale means, with significance set at $p<0.05$ for all calculations.

Results

The demographic characteristics of the study participants are summarized in table 1. The study was completed with 234 individuals, of whom 65.8% were female and 34.2% were male. The prevalence of chronic disease among study participants was 57.3%, while 42.7% reported not having a chronic disease. The mean age of the individuals was 66.49±5.14 (between 65-76 age) years, and the mean BMI was 26.54±4.12kg/m^2. MNA-SF total scores was 13.06±1.29, MEQ score was 3.68±0.35.

Variables	n	%
Sex		
Female	154	65.8
Male	80	34.2
Chronic Disease		
Yes	134	57.30
No	100	42.70
Nutrition Education		
Yes	157	67.10
No	77	32.90
MNA-SF Score		
Malnourished	2	0.90
Risk of malnutrition	30	12.80
Well nourished	202	86.30
MEQ Score		
<3	5	2.10
≥3	229	97.90
	$\bar{X}$±SD	
Age	66.49±5.14	
BMI	26.54±4.12	
MNA-SF	13.06±1.29	
MEQ	3.68±0.35	

Table 1: General Characteristics of Elderly Individuals.

Note: *Chi-square test was used in the evaluation of categorical variables.

Obesity (class II) ($p<0.05$; $p=0.00$). Among underweight individuals, all were classified as malnourished, while 9.3% of normal individuals and 27.3% of obesity (class II) individuals were at risk of malnutrition. The proportion of individuals without nutritional issues among those classified as normal according to BMI classification was significantly higher compared to the other groups ($p<0.05$; $p=0.00$) (Table 2).

Variables	Underweight		Normal		Overweight		Obesity (1st Class)		Obesity (2st Class)		Binary Comparison **
	X̄±Ss		X̄±Ss		X̄±Ss		X̄±Ss		X̄±Ss		
MNA-SF Total Score	8.00±0.00		12.91±1.16		13.29±1.11		13.19±1.17		13.18±1.40		
	p=0.00		H=20.71*								
	n	%	n	%	n	%	n	%	n	%	Underweight-normal Underweight- Overweight Underweight- Obesity (1st class) Underweight- Obesity (2nd class)
MNA-SF Score											
Malnourished	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00	
Risk of Malnutrition	0	0.00	9	9.30	12	12.90	6	19.40	3	27.30	
Well Nourished	0	0.00	88	90.7	81	87.10	25	80.60	8	72.70	
					p=0.00***						

Table 2: Mean (X̄), standard deviation (SD) values of MNA-SF total scores and nutritional status of individuals according to BMI classification.

Note: *H Independent-Sample Kruskal-Wallis Test value was used in pairwise comparisons of variables with significant difference (p<0.05) in Kruskal-Wallis H test. **Groups with significant difference. ***Square exact test was used in the evaluation of categorical variable.

Variables	Total	Underweight	Normal	Overweight	Obesity (1st class)	Obesity (2st class)	*p	Binary Comparison **
	X̄±SD	X̄±SD	X̄±SD	X̄±SD	X̄±SD	X̄±SD		
Disinhibition	4.01 ±0.65	4.40±0.00	4.09±0.74	3.95±0.53	3.85±0.62	4.18±0.66	0.05	
Emotional Eating	4.09±0.78	3.20±0.00	4.19±0.76	3.98±0.83	4.11±0.53	4.16±1.03	0.08	
Eating Control	3.91±0.70	4.25±0.00	4.06±0.66	3.93±0.68	3.22±0.60	4.20±0.31	0.00	Obesity (1st class)- Overweight Obesity (1st class)-Normal Obesity (1st class)- Obesity (2nd class)
Mindfulness	3.16±0.39	3.20±0.00	3.20±0.43	3.13±0.35	3.05±0.25	3.16±0.39	0.73	
Eating Discipline	3.15±1.02	3.25±0.00	3.08±1.11	3.40±0.93	2.93±0.82	2.65±0.89	0.01	Obesity (1st class)- Overweight
Conscious Nutrition	3.38±0.44	3.20±0.00	3.40±0.47	3.33±0.46	3.13±0.30	3.58±0.25	0.00	Obesity (1st class)- Obesity (2nd class)
Interference	4.03±0.58	3.50±0.00	4.12±0.60	3.99±0.59	4.00±0.39	3.82±0.68	0.12	
MEQ Total Score	3.68±0.35	3.57±0.00	3.74±0.40	3.67±0.35	3.51±0.13	3.64±0.24	0.00	Obesity (1st class)-Normal

Table 3: Mean (X̄) and standard deviation (SD) values of MEQ-30 sub-factors according to BMI classification.

Note: *Independent-Sample Kruskal-Wallis Test significance value, **Groups with significant difference.

The 'eating control' score, which is one of the sub-dimensions of individuals' mindful eating, was found to be statistically significant lower in obese individuals with obesity (class II) than in normal, overweight and obesity (class II) individuals. The "eating discipline" score was found to be significantly higher in overweight than in obesity (class I) individuals (p<0.05; p=0.01) (Table 3).

No significant correlation was found between the MNA-SF and the MEQ score (r=-0.12; p=0.07). While there was no relationship between mindful eating and age (r=0.08; p=0.24) it was found that MNA-SF total score decreased with increasing age (r=-0.13; p=0.04) (Table 4).

While there was no relationship between mindful eating and age (r: 0.08; p: 0. 24) it was found that MNA-SF total score decreased with increasing age (r:-0.13; p: 0.04).

Variables	MNA-SF		MEQ	
	r	p	r	p
MNA-SF	1	-	-0.12	0.07
MEQ	-0.12	0.07	1	-
Age	-0.13	0.04*	0.08	0. 24
BMI	0.25	0.00**	-0.29	0.00**

Table 4: The relationship between various variables and MNA-SF and Mindful Eating.

Note: r Spearman correlation coefficient was used to evaluate the relationship between two variables. *p<0.05 **p<0.001

Discussion

This study aimed to assess the association between nutritional status and mindful eating among individuals aged 60 years and older enrolled in Third Age University. In recent years, obesity has become increasingly prevalent among elderly individuals, mirroring trends seen across other age demographics. Factors contributing to this include a higher body fat percentage and reduced mobility due to decreased basal metabolic rate. In our study, 39.7% of participants were classified as underweight, 13.2% as obesity (class I), and 4.7% as obesity (class II). Comparatively, a previous study found that 49% of individuals aged over 65 were underweight and 18% were obese. Additionally, it was observed that overweight rates were higher among women compared to men (23% and 13%, respectively; p<0.001) [3]. However, in our study, although the proportion of underweight individuals was higher among women, this gender difference was not statistically significant (p>0.05). In elderly individuals, BMI may lack reliability due to various factors such as height reduction, alterations in weight and body fat distribution, and conditions like ascites and edema. Additionally, sarcopenic obesity, characterized by the coexistence of obesity and muscle loss, may go unnoticed in obese individuals as changes in body composition may not be reflected solely

by body weight. The co-occurrence of sarcopenia and obesity in the elderly escalates the risks of disability, mortality, morbidity, and disease severity [14].

BMI serves as a straightforward screening tool for assessing nutritional status. The European Society of Parenteral and Enteral Nutrition (ESPEN) has defined a BMI <18.5kg/m^2 as indicative of malnutrition risk in elderly individuals [4]. Studies conducted among community-dwelling elderly populations have demonstrated an increased one-year mortality rate in individuals with a BMI <22kg/m^2, whereas mortality rates did not rise significantly in those with a BMI>27kg/m^2 [15]. Similarly, research has indicated a higher mortality risk among elderly individuals classified as underweight or experiencing undesirable weight loss compared to those without weight loss, including those who are obese or morbidly obese [16]. In our study, individuals classified as underweight according to BMI were associated with malnutrition risk, while normal and above-normal BMI appeared protective against malnutrition [17,18]. However, previous research has shown that malnutrition can occur in individuals with normal or higher BMI classifications [17]. Indeed, studies have highlighted the potential risk of malnutrition even in individuals classified as obese according to BMI criteria.

The MNA-SF, a tool measuring appetite, weight loss, mobility, depression, and dementia levels, along with anthropometric measurements, is considered the gold standard for defining nutritional and malnutrition statuses among elderly individuals, regardless of their place of residence [19,20]. Research indicates that the risk of malnutrition is elevated among elderly individuals residing in hospitals or nursing homes compared to those living in the community. For instance, a study comparing the nutritional status of elderly individuals in nursing homes versus those in their own homes revealed that 7.7% of nursing home residents were malnourished, with 50% at risk of malnutrition, while these figures were 3.7% and 26%, respectively, for those living independently [21]. Similarly, studies conducted in Italy [22] and China [23], using the MNA-SF an tool reported varying rates of malnutrition risk among community-dwelling elderly individuals, with Italy reporting 8% at risk and China documenting a much higher risk at 70.4% [22,23]. Conversely, a Finnish study found a lower risk, with 15% of elderly individuals at risk of malnutrition or malnourished [24]. In our study, 0.9% of participants were malnourished, with 12.8% at risk of malnutrition, suggesting a lower prevalence of malnutrition among elderly individuals living in the community compared to those in institutional settings such as nursing homes.

Studies consistently indicate that women are more vulnerable to malnutrition compared to men. For instance, research by Madeira et al. [25], revealed a higher prevalence of malnutrition and malnutrition risk among women, particularly with increasing age. Similarly, other studies have reported significantly lower MNA total scores among women compared to men [26,27]. However, some studies have found no significant relationship between gender and MNA total score [28,29]. In our study, we observed significantly higher MNA-SF scores among men compared to women, with 19.5% of women at risk of malnutrition, while men showed no risk. Although our findings align with previous research, the prevalence of malnutrition and individuals at risk of malnutrition was lower in our study. This could be attributed to advancements in healthcare services, as well as increased nutrition education, awareness, and active lifestyle among individuals at Third University.

Mindful eating contributes to weight management by promoting portion control and inducing early satiety. Numerous studies have demonstrated its effectiveness in managing depression, increasing intake of fruits and vegetables, and reducing daily energy and fat intake. These findings suggest that mindful eating could serve as an effective strategy in obesity prevention among adults [30,31]. This notion instills confidence in individuals, particularly the elderly, regarding the potential of mindful eating as a positive approach in managing body weight and preventing obesity [8,32]. Coleman reported a mean score of 2.05±0.32 on the MEQ score for women, 2.23±0.55 for men, and 2.073±0.359 overall [8]. Framson et al. [31], found a mean score of 2.92±0.37 on the MEQ score, similar to the study by Apolzan et al. [33]. In contrast, our study revealed higher mean scores for mindful eating compared to existing research, with individuals scoring 3.68±0.35, males 3.67±0.33, and females 3.68±0.37 on the MEQ scale. Prior research has indicated a decrease in MEQ score with an increase in BMI [31,34]. Consistent with this, our study revealed a significant negative correlation between BMI and MEQ. Similar to Coleman's findings [8], no association was observed between age and MEQ score. However, there are no studies in the literature investigating the relationship between mindful eating and nutritional status in elderly individuals. In our study, no significant correlation was found between MNA-SF score and MEQ score.

We believe that the strength of our study lies in assessing the nutritional status and mindful eating of elderly individuals participating in social responsibility projects. However, the study has limitations, including the lack of information regarding the specific content of the training provided at the university, particularly in nutrition education. Additionally, anthropometric measurements were self-reported rather than directly measured.

Conclusıon

The growing elderly population contributes to increased healthcare expenditures. However, screening and assessing the nutritional status of elderly individuals living in the community can help mitigate some of these costs. Utilizing tools like MNA-SF enables quick and easy assessment at regular intervals. Our study highlights that malnutrition can be present in both underweight and overweight individuals. The concept of mindful eating can be a valuable tool for addressing health-related issues such as nutritional status. The findings suggest that more studies are needed to incorporate mindful eating as a strategy in nutrition education and counseling. Considering the sub-dimensions of mindful eating trainings can be given to the elderly and their effects can be observed. Further research is warranted to comprehensively understand the multifactorial aspects influencing the nutritional status of elderly individuals.

Acknowledgement

This article is based on a master's thesis.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Data Availability Statement

The datasets used in this study will not be made publicly available due to the fact that the data involves personal information, but are available from the corresponding author on reasonable request.

Author's Contribution

Plan, design: DS, FY; Material, methods and data collection: DS; Data analysis an comments: DS; Writing and corrections: DS, FY.

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