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Nutritional Assessment of Elderly Population from Rural Areas of Punjab by using Mini Nutritional Assessment Tool

Noohela Khan[1], Sania Mujahid[1], Umer Ahmed[1], Aiza Batool[1], Warda Mustafa[1], Dua Ijaz[1], Anam Saeed[2]

[1] Department of Nutrition, Rashid Latif Medical Complex, Lahore, Pakistan
[2] University of Veterinary & Animal Sciences, Lahore, Pakistan

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Address of Correspondence

Sania Mujahid
Department of Nutrition, Rashid Latif Medical Complex, Lahore
saniamujahid299@gmail.com

A B S T R A C T

Background: Elderly individuals with ages 65 and above are at risk of malnutrition and those already malnourished had loss of essential processes with deficiency of nutrients as well as psychological, physiological activity. Elder malnutrition arises because of decreasing food consumption with lesser necessary nutrients and calories.

Objectives: The objective of this study includes the identification of older adults (≥65 Years) who are at risk of becoming malnourished and those who are malnourished. To examine the relationship between BMI categories (underweight, normal weight, overweight, and obesity) and the nutritional status of the elderly in rural areas, as determined by the MNA tool.

Methodology: The study was conducted over a month in "Raja Bhola Village" and "Mustafabad" with a convenient sampling strategy and a sample size of 187 adults aged 65 and over. During data collection, the Mini Nutritional Assessment Tool (MNA) was utilized to assess nutritional status.

Results: The study had 187 participants, and the results revealed important information on the demographic composition and nutritional health of the participants. Men outnumbered women by a margin of 65.2% to 34.8%. According to the survey's BMI categories, 15.5% of respondents were underweight, 47.6% were normal weight, 26.7% were overweight, and 10.2% were obese. The significant incidence of malnutrition, which impacted 21.4% of persons while 46% were at risk, was a surprising finding that showed a huge public health issue.

Conclusion: In conclusion, the MNA questionnaire was put into use to identify malnutrition and nutritional status among older adults, stressing the prevalence of malnutrition and those who are susceptible in various age and BMI categories.

Keywords: Malnutrition, Older adults, Mini Nutritional Assessment Tool (MNA), BMI categories, Nutritional status, Convenient sampling.

Introduction

Aging is the normal development of getting older. During the aging phase, the body goes through certain mechanisms and changes in structural and physiological functions. While aging is the usual process, some factors play an important role in deteriorating one's health. Genetics plays the greatest role in one's health, however, the environment can also affect health directly or indirectly. Mortality risk due to a number of different causes also increases greatly with aging. A supportive environment, availability of resources, and a good lifestyle all have long-term, lasting effects on how people age.[1] According to the World Health Organization (WHO), aging and nutrition are two challenges that are becoming more prevalent on a global scale.[2] Modifications to lifestyle variables such as eating habits may aid in the prevention, slowing, or even reversal of the beginning of many illnesses associated with aging. As a result, identifying such lifestyle variables that protect the elderly from illnesses is critical.[3] The elderly with inadequate nutritional status increase the illness load on the present health care

system.[4] According to current studies, Asia accounted for half of the world's elderly population in 1990, as well as figure is expected to rise to 58% by 2025. Because the Asian continent is predominantly made up of developing countries, a higher emphasis has been placed on the elderly population within developing countries.[5]

"Malnutrition is any condition triggered by excessive or insufficient food energy or nutrient intake or by an imbalance of nutrients". Because of the loss of various basic processes, older people are more likely to become malnourished. Elder malnutrition arises because of decreasing food consumption. Furthermore, the food they eat lacks the necessary nutrients and calories.[6] Because of psychological, physiological, nutritional, and environmental factors, malnutrition is a risk factor for older people. Weight reduction leads to muscle mass decrease, which influences functional status.[7] A brief nutritional assessment tool is designed to identify older people (65 years) who are susceptible to becoming malnourished or already malnourished. A minimal nutritional evaluation is a strategy for detecting malnutrition. This approach is quick and straightforward, requiring only basic measurements and inquiries.[8] It is utilized in emergency rooms, hospitals, and nursing homes. It is also utilized to diagnose protein-energy malnutrition early, as well as to produce reliable and quick nutritional status assessments, and requires no laboratory data.[9]The MNA questionnaire comprises six questions and requires the following information: Weight change, BMI, muscular circumference; Dietary intake- dietary pattern; Functional impairment, independence, and living situation; Psychological difficulties, and self-evaluation.[10] Questionnaire scores of 12-14 indicate appropriate nutritional status; scores of 8-11 suggest that the person is at increased risk of becoming malnourished; and scores of 0-7 indicate malnutrition. To lower the risk of malnutrition, early detection of malnutrition in older people should be researched. For the avoidance of the risk of malnutrition, older people should be offered a well-balanced diet rich in nutrients and comprising reasonable amounts of all food categories.[11] Keeping in mind their nutritional status, the elderly must be given an adequate diet. The aim of this study was to identify older adults (ages 65 and above) who were at risk of becoming malnourished or were malnourished. The study also aimed to examine the relationship between the different BMI categories (underweight, normal, overweight, obese) and the nutritional status of the elderly in rural areas. This was determined using the MNA tool.

Methodology

The Mini Nutritional Assessment Tool (MNA) had been employed to detect malnourished or at-risk elderly individuals. The study design is cross-sectional. The research was conducted in "Raja Bhola Village" and "Mustafabad," and data was obtained using an appropriate sampling strategy. 227 participants aged 65 and up were recruited for this investigation. The research lasted for one month. The study used a sample size of 187 study participants and a 95% confidence level, ±5% margin of error, and taking expected proportion of 50% respectively.[7]

Open-reel tape" (measuring tape) was used to determine height. A flat section of the wall was chosen, and participants were instructed to remove their shoes and anything on their heads that may interfere with an accurate measurement, such as braids and headbands. Any bulky clothing that could make it difficult to stand flat against the wall has been removed. They stood with their heels on the corner where the floor and wall met. The wall was built to make touch with the head, shoulders, and buttocks. Stand up straight with your gaze fixed forward. The chin and line of sight were parallel to the ground, and the readings were closest to 14 inches or 0.5cm.[9]

Weight was determined using a weighing scale. The scale had been calibrated and set to zero prior to weighing. Individuals were instructed to remove their shoes and anything else on their heads that might interfere with an accurate measurement. It was ensured that they were dressed lightly and stood motionless without moving. The measurements were taken as close to 12 pounds or 0.2 kg as possible.[9]

The individuals were asked the following questions:

- Decline in food intake in the past 3 months
- Weight loss in the past 3 months
- Either suffered from any acute disease in the past 3 months
- Neurological disease or mobility issues

Individuals' overall nutritional status was evaluated to determine who is at risk of becoming malnourished or who is malnourished.[9]

Data were analyzed using “IBM SPSS STATISTICS 23” to calculate the frequency and percentages of the collected data in graphical forms. Chi-square and p-tests were also applied to calculate the expected results.

Results

The survey had been conducted among 187 people, with 122 (65.2%) men and 65 (34.8%) women participating. The majority were between the ages of 65 and 75, with 35 (18.7%) between the ages of 76 and 85. According to the results, 29 (15.5%) were underweight, 89 (47.6%) were normal weight, 50 (26.7%) were overweight, and 19 (10.2%) were obese. To estimate the

frequencies and percentages of malnutrition and nutritional status, the MNA questionnaire was employed. The findings revealed that 17.1% of those aged 65 to 75 were malnourished, 25.7% were in normal nutritional status, and 67 (35.8%) were in danger of developing malnutrition. According to the MNA questionnaire, 20 (10.7%) people were malnourished, and 9 (4.8%) were at susceptible to malnutrition. In addition, 9 (4.8%) of the overweight people were malnourished, 18 (9.6%) were normal, and 12 (1.3%) were at risk of developing malnutrition. The MNA questionnaire was utilized to determine the prevalence, percentages, and nutritional status of the population.

Table I: Demographic and anthropometric data of the study population.

Parameters	**Total count**
Age (years)	**N (%)**
65-75	147 (78.6)
76-85	35 (18.7)
>85	5 (2.7)
Gender	
Male	122 (65.2)
Female	65 (34.8)
BMI Ranges	
Underweight	29 (15.5)
Normal weight	89 (47.6)
Overweight	50 (26.7)
Obese	19 (10.2)
Nutritional status	
Malnourished	40 (21.4)
Normal nutritional status	61 (32.6)
Risk of malnutrition	86 (46)

Lower Chi-square esteem suggests that the watched and anticipated frequencies are near, showing that there's less proof of a critical affiliation between the two factors. In this case, a p-value of 0.89 is or may be tall. A p-value less than 0.05 is regularly respected as measurably noteworthy. The invalid speculation cannot be rejected since the p-value is more prominent than 0.05, indicating that there's no noteworthy relationship between sexual orientation and wholesome status within the information obtained.

A Chi-square score of 2.178 in this example suggests that there may be some variance in the general distribution of nutritional status between age groups, but it is not statistically significant. A higher p-value (0.7) indicates that there is insufficient evidence to reject the null hypothesis in this circumstance. In other words, disparities in nutritional status between age groups may not be statistically significant.

A greater Chi-square value shows that the observed and expected frequencies are significantly different, suggesting a potentially important link between the two variables. An exceptionally low p-value (around 0 in this case) indicates that there is substantial proof against the null hypothesis. It suggests that there is a highly significant correlation between BMI and Nutritional Status in the sample data.

Discussion

Growing older naturally occurs as we age. As people age, their bodies undergo several changes that reduce their physical and mental capacities and raise their chance of

Table II: Comparison of gender with nutritional status.

Gender	**Nutritional status**			**Chi-square**	***p-value***
	Malnourished **N (%)**	Normal **N (%)**	Risk of malnutrition **N (%)**		
Male	25 (13.4)	41 (21.9)	56 (29.9)	0.24[a]	0.89
Female	15 (8)	20 (10.7)	30 (16)		

[a] 0 cells (.0%) have expected count of less than 5. The minimum expected count is 13.90.

Table III: Comparison of age with nutritional status.

Age groups	**Nutritional status**			**Chi-square**	***p-value***
	Malnourished **N (%)**	Normal **N (%)**	Risk of malnutrition **N (%)**		
65-75	32 (17.1)	48 (25.7)	67 (35.8)	2.178	0.7
76-85	6 (3.2)	11 (5.9)	18 (9.6)		
>85	2 (1.1)	2 (1.1)	1 (0.5)		

Table IV: Comparison of BMI with nutritional status.

BMI	**Nutritional status**			**Chi-square**	***p-value***
	Malnourished N (%)	Normal N (%)	Risk of malnutrition N (%)		
Underweight	20 (10.7)	0	9 (4.8)		
Normal weight	11 (5.9)	37 (19.8)	41 (21.9)	53.7[a]	0.0
Overweight	9 (4.8)	18 (9.6)	23 (12.3)		
Obese	0	6 (3.2)	13 (7)		

contracting several fatal diseases. Genetics, environment, resource availability, and lifestyle are a few aspects that play a significant influence in one's health deterioration. These factors all have a long-lasting impact on how people age. As a result, a study is being done to determine the nutritional health of older persons.

In Northwestern Spain, a cross-sectional study involving 728 elderly adults was conducted. There were 265 males (36.4%) and 463 women (63.6%). According to the BMI results of this study, there were 120 (16.5%) underweight people, 170 (23.4%) normal people, 223 (30.7%) overweight people, and 223 (30.7%) obese people. This research found 91 (12.5%) malnourished people, 418 (57.5%) at risk of malnutrition, and 218 (30%) with acceptable nutritional status based on screening scores. In the current study, 187 people participated, including 122 (65.2%) males and 65 (34.8%) women. The present study's BMI results suggest that underweight people were 29 (15.5%), normal people were 89 (47.6%), overweight people were 50 (26.7%), and obese people were 19 (10.2%). According to screening scores, the current study showed 40 (21.4%) malnourished persons, 86 (46%) at risk of malnutrition, and 61 (32.6%) with acceptable nutritional status.[12]

Transversal research was undertaken in the southeast of Brazil with 89 old people, 57 (64%) of whom were males and 32 (36%) of whom were women. The screening score for malnourished persons in this research was 25 (28.1%), at risk of malnutrition was 45 (50.6%), and normal nutritional status was 19 (21.3%). The current study, on the other hand, included 187 senior people, 122 (65.2%) of whom were men and 65 (34.8%) of whom were women. According to the current study, the findings of the mini-nutritional assessment for malnourished persons were 40 (21.4%), 86 (46%) at risk of malnutrition, and 61 (32.6%) with normal nutritional status.[13]

Cross-sectional research with 339 individuals was done in Nepal, comprising 181 (53.3%) male participants and 158 (46.7%) female participants. According to that study, the findings of the mini-nutritional assessment for malnourished persons were 84 (24.8%), 168 (49.6%), and 87 (25.6%) for those at risk of malnutrition. In comparison, the current study included 187 elderly citizens, including 122 (65.2%) males and 65 (34.8%) women. A recent study's mini-nutritional evaluation revealed that 40 (21.4%) of the participants were malnourished, 86 (46%) were at risk of malnutrition, and 61 (32.6%) had acceptable nutritional status.[14]

Cross-sectional research of 1,957 elderly people in Iran was conducted, with 914 (46.7%) men along with 1043 (53.3%) women taking part. According to the data, there were 235 malnourished people (12%), 887 people at risk of malnutrition (45.3%), and 835 individuals who had appropriate nutritional status (42.7%). The current study comprised 187 senior persons, 122 (65.2%) of whom were men and 65 (34.8%) of whom were women. According to the current study, the mini-nutritional assessment findings for malnourished persons were 40 (21.4%), 86 (46%), and 61 (32.6%) with normal nutritional status.[15]

A survey was conducted out at Sargodha. A total of 380 persons were analyzed at random, comprising 209 males and 171 women. 160 (42.10%) were malnourished, 21 (5.53%) were malnourished, and 199 (52.3%) were well-nourished. Malnutrition was a concern for 88 boys (23.16%) and 72 females (18.95%). Malnutrition affected 3.16% of men and 2.37% of women. In the current study, 187 senior people were evaluated, with 122 (65.2%) being men and 65 (34.8%) being females. 25 (20%) guys were underweight, 41 (33.6%) had normal nutritional status, and 56 (45.9%) were at risk of malnutrition. Whereas 15 (23%) girls were in danger of malnutrition, 20 (30.7%) were malnourished, and 30 (46.1%) were in a satisfactory nutritional status.[16]

At a family well-being middle, a study was done. This adds up to 102 patients in all, with 45 (44.1%) being male and 57 (55.9%) being female. The normal age extended between 65 and 92 for a long time. 39 (38.2%) were undernourished, 19 (18.6%) were at a more prominent hazard of ailing health, and 44 (43.1%) were in great dietary wellbeing. The show ponders included 187 elderly grown-ups. There were 122 (65.2%) guys and 65 (34.8%) females among them. There were a add up to of 40 (21.4%) malnourished individuals, 61 (32.6%) individuals with worthy wholesome status, and 86 (46%) individuals with a chance of lack of healthy sustenance.[17]

According to MNA findings (n= 245), 13% had good nutritional status, 48.3% were at risk of malnutrition, and 37.8% were malnourished in cross-sectional research. In the present study, 187 older people were evaluated. There were 122 (65.2%) males and 65 (34.8%) females among them. There were 40 (21.4%) malnourished people, 61 (32.6%) with normal nutritional status, and 86 (46%).[18]

The research was carried out in rural Belagavi. Out of a total of 190 individuals, 85 (44.70%) were underweight, 28 (14.70%) had a BMI of 19 to less than 21, 11 (5.80%) had a BMI of 21 to less than 23, and 66 (34.70%) had a BMI of 23 or above. Malnutrition was a concern for 31 (43.7%) boys and 52 (43.3%) females among the 190 participants. According to the present study's findings, among underweight people, 20 were malnourished and none were at danger of malnutrition. 41 individuals were at danger of malnutrition, 37 had normal BMIs, and 11 malnourished individuals had normal BMIs. In

comparison to 18 normal people and 9 malnourished adults, 23 overweight adults were at risk of acquiring malnutrition. There were no fat people who were malnourished, compared to six normal people.[19]

In Bangladesh, 320 elderly persons participated in the research. The mean SD value for male and female ages among the 320 senior adults was 67.25 6.5 and 67.32 7.7 years, respectively. The percentage of underweight persons grew with age, according to BMI categorization. Underweight people aged 60 to 75 made up 30.0% of the population. Individuals aged 76 to 85 years had underweight rates of 45.0% and 60.0%, respectively. According to the MNA score, 97 seniors were underweight, whereas 172 had SNAQ scores lower than 14. In contrast, the current study included 187 older people, including 122 (65.2%) women and 65 (34.8%) men. According to the findings of the latest study's mini-nutritional assessment, 61 (32.6%) of the participants had a normal nutritional status, 86 (46%) were at risk of malnutrition, and 40 (21.4%) were malnourished.[20]

Conclusion

In conclusion, the survey included 187 people, and the results provided substantial information about the demographic makeup and nutritional status of the participants. The men outnumbered the women by a margin of 65.2 percent to 34.8%. According to the survey's Body Mass Index (BMI) categories, 15.5% were underweight, 47.6% were normal weight, 26.7% were overweight, and 10.2% were obese. The prevalence of malnutrition, which impacted 21.4% of persons, while 46% were at risk of malnutrition, was a stunning discovery, exposing a huge public health concern. Men were at a higher risk of malnutrition (45.9%) than women (23%), despite the fact that a higher number of women (30.7%) were malnourished than men (20%). Furthermore, age-based study found that persons between the ages of 76 and 85 were the most susceptible, with 51.4% at risk of malnutrition, while those under 75 had a lower frequency.

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