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# ASSESSMENT OF NUTRITIONAL STATUS OF ELDERLY POPULATIONS IN RURAL MINIA, EGYPT

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**Abstract:** *Aim:* This study was conducted to identify the magnitude of undernutrition and to determine the associated risk factors among elderly populations in rural Minia, Egypt. *Subjects and methods:* A cross sectional study was conducted on 350 elderly chosen by systematic random sample in the period from December 2011 till May 2012. An interview administered questionnaire about demographic characteristics of elderly subjects and Mini Nutritional Assessment (MNA) were carried out. *Results:* Based on MNA score, 38.3% of participated elderly have malnutrition or are at risk of malnutrition. Elderly females were significantly more likely to be affected by malnutrition than males (9.8% vs 6.6%). Nearly 38% of persons ≥ 80 years were malnourished vs 5.8% of persons in age group 60-69 years ($p<0.001$). Malnutrition was higher among elderly persons who had chronic and acute disease. *Conclusion:* This study revealed that the percentage of malnutrition and malnutrition risk in this elderly group were 8.6% and 29.7% respectively, with higher percentages in females. These results highlight the need to screen and monitor elderly people and to involve families in the proper nutritional care of elderly.

**Key words:** Malnutrition, elderly, MNA score, risk factors.

## Introduction

Malnutrition in the elderly is defined as inadequate nutritional status; undernourishment characterized by insufficient dietary intake, poor appetite, muscle wasting and weight loss. Malnutrition in the elderly is a multidimensional concept encompassing physical and psychological elements (1).

Several risk factors for malnutrition have been identified, including physical, social, and medical factors. Physical factors that affect malnutrition include oral health, physical impairments, early satiety, and taste and smell changes. Poor dentition can cause difficulty with chewing food and swallowing, leading to a decrease in nutrient intake (2). Physical impairments such as physical immobility or the inability to feed oneself can cause difficulty in acquiring, preparing, and eating foods. Older adults experience less of a feeling of hunger and experience a feeling of fullness more quickly as compared to younger adults. Malnutrition impacts morbidity, mortality, hospital length of stay, functional disabilities, and physical complications (3).

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### *Aim of the study*

1- Assess nutritional status of elderly people in rural Minia, Egypt using MNA questionnaire.
2- Identify risk factors for development of malnutrition.

## Materials and methods

The study is a cross-sectional community based study; this study was conducted on a random sample of elderly people aged 60 years or more in El-Burgaia village which was chosen randomly from villages of Minia, Egypt. The number of elderly people in the village was 1630 person (6.3% of the total number of population).

### *Criteria of inclusion in this study*

Subjects who were 60 years old or more who live in this village in El-Minia district. Criteria of exclusion were: 1) Age less than 60 years. 2) Older people from urban area present in the village during study. 3) Hospital admitted geriatric people.

In this study, data of 350 elderly people were collected through systematic random sample by choosing a central landmark in the village and choosing one direction to follow at random and to start with, then the first house was randomly chosen and then every 5th house. There were 365 subjects (calculated using EPI Info 2000) from whom 350 subjects were agreed to be interviewed and to participate in the study. The aim of the study was

**Table 1**
Distribution of malnutrition (based on MNA questionnaire) according to socio-demographic factors among the studied elderly people in rural Minia Egypt, 2012

| MNA (Score) | Age group | | | | | | Total | | $x^2$ P value |
|---|---|---|---|---|---|---|---|---|---|
| | 60-69 years | | 70-79 years | | ≥80 years | | | | |
| | No | (%) | No | (%) | No | (%) | No | (%) | |
| Malnourished | 14 | (5.8) | 5 | (6.4) | 11 | (37.9) | 30 | (8.6) | 50 |
| Risk of malnutrition | 60 | (24.7) | 32 | (41) | 12 | (41.4) | 104 | (29.7) | <0.001 |
| Normal | 169 | (69.5) | 41 | (52.6) | 6 | (20.7) | 216 | (61.7) | |
| Total | 243 | (100) | 78 | (100) | 29 | (100) | 350 | (100) | |

| MNA (Score) | Sex | | Total | | | | |
|---|---|---|---|---|---|---|---|
| | Male | Female | | | | | |
| | n | (%) | n | (%) | n | (%) | 6.2 |
| Malnourished | 9 | (6.6) | 21 | (9.8) | 30 | (8.6) | 0.04 |
| Risk of malnutrition | 32 | (23.5) | 72 | (33.6) | 104 | (29.7) | |
| Normal | 95 | (69.9) | 121 | (56.6) | 216 | (61.7) | |
| Total | 136 | (100) | 214 | (100) | 350 | (100) | |

explained to the participants when they gave their verbal consent.

Data were collected by using an interview questionnaire. The questionnaire included personal demographic characteristics and MNA questionnaire which provides a simple and quick method of identifying elderly persons who are malnourished, or who are at risk for malnutrition before severe changes in weight or serum protein levels occur.

The MNA is a two step procedure: (1) the Mini Nutritional Assessment –Short Form (MNA-SF) to screen for malnutrition and risk of malnutrition; (2) assessment of nutritional status with the full MNA. The MNA is well validated. MNA score >23.5 points means normal nutritional status, 17-23.5 points indicates risk of malnutrition, while a score <17.0 points indicates existing malnutrition. (4) Weight and height were measured using standardized methods. The study was carried out during the period from December 2011 to May 2012. The average time for interviewing and examination was 20 minutes.

## *Statistical analysis*

The Statistical Program SPSS for Windows version 11 was used for data entry and analysis. Quantitative data were presented by mean and standard deviation, while qualitative data were presented by frequency distribution. Chi Square test was used to compare between more than one proportion. Student t-test was used to compare two means. The probability of less than 0.05 was used as a cut off point for all significant tests.

## Results

The age of the subjects ranged between 60-93 years (mean age 67.7±6.6), Weight ranged between 40-140 kg (73.9±16.2), Height ranged between 110-205 cm (164.6±8.6), BMI ranged between 16.7-62 (mean ±SD: 27.3±6.1). There were 136 males (38.9%) and 214 females (61.1%). Males were older than females (mean±SD: 68.3±5.9 vs 67.3±6.9) but the difference was not statistically significant (p=0.2) & the mean BMI of males was 26.9±5.9 and the mean BMI for females was 27.6±6.2 (p= 0.3). According to the MNA results 8.6% of the group members were malnourished, 29.7% were at risk of malnutrition and 61.7% were well nourished. Studied populations were divided into three age-groups: 60-69, 70-79, and ≥80 years. More than half of the persons in this study belonged to first age group. Chi squared test showed that the distribution of malnourished subjects among age-groups was significantly different as 37.9% of persons ≥80 years were malnourished vs 5.8% of persons in age group 60-69 years (P<0.001). Elderly females were more likely to be affected by malnutrition, where there was a significant difference between males and females regarding malnutrition as 9.8% of females were malnourished vs 6.6% males (table 1). As reported in (table 2) malnutrition was higher among elderly persons who had chronic diseases (such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes) and acute disease (include colds, influenza) vs those who had not (13.2% vs 5.3% and 16.9% vs 0% respectively). This difference was statistically significant (P< 0.001). Malnutrition affected more frequently the subjects who did not eat one serving of dairy product, meat, fish or poultry /day. There was no significant relation between MNA score and consumption of fruits or vegetables/day (p=0.9) (Table 3).

## Discussion

Many studies have concluded that malnutrition is more common in the elderly population not because that malnutrition is an inevitable side effect of ageing, but because many changes associated with the process of ageing can promote malnutrition (5). Out of 350 rural elderly participants in Minia, Egypt, 29.7% were found to be at risk of malnutrition. This figure approximate that reported by Yap et al. (2007) (6) who assessed nutritional risk level of community-dwelling older Chinese in Singapore and found that 25.5% had moderate nutritional risk and 4.6% had high nutritional risk. It was found that an obvious upward trend was noticeable regarding malnutrition in relation to age. As age increases, the risk of malnutrition increases. Females were more likely to be

affected by malnutrition, as 9.8% of females were malnourished vs 6.6% males. These findings were in coherence with a study findings of Cuervo et al. (2009) (7) who concluded that MNA total score was significantly higher in men than in women and lower in the oldest than in the youngest subjects (p<0.001) in both genders.

**Table 2**
Relation between MNA scores and presence of diseases among the studied elderly people in rural Minia Egypt, 2012

| MNA (Score) | Chronic disease Yes | | No | | Total | | $x^2$ |
|---|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | n | (%) | P value |
| Malnourished | 19 | (13.2) | 11 | (5.3) | 30 | (8.6) | 18.8 |
| Risk of malnutrition | 55 | (38.2) | 49 | (23.8) | 104 | (29.7) | <0.001[a] |
| Normal | 70 | (48.6) | 146 | (70.9) | 216 | (61.7) | |
| Total | 144 | (100) | 206 | (100) | 350 | (100) | |
| **MNA (Score)** | **Suffering of acute disease Yes** | | **No** | | **Total** | | |
| | n | (%) | n | (%) | n | (%) | |
| Malnourished | 30 | (16.9) | 0 | (0) | 30 | (8.6) | 111 |
| Risk of malnutrition | 85 | (48.1) | 19 | (11) | 104 | (29.7) | <0.001[a] |
| Normal | 62 | (35) | 154 | (89) | 216 | (61.7) | |
| Total | 177 | (100) | 173 | (100) | 350 | (100) | |

a. Statistically significant

It is observed from the study that the prevalence of malnutrition was higher among elderly persons who had chronic medical conditions and acute medical conditions vs. those who are free from these. This is in agreement with Guigoz et al. (2002) (8) who found that malnutrition in community-dwelling elderly persons was related to chronic medical conditions. It is observed from the study that the malnutrition affected significantly more frequently the subjects who did not eat one serving of dairy product, meat, fish or poultry /day. These findings were in coherence with a study conducted by Cuervo et al. (2008) (9) who assess the nutritional status of 22,007 Spanish people aged 65 years or older using the MNA test. And found that undernourished and non-undernourished subjects, according to the MNA criteria, revealed different food consumption.

## Conclusion

Nearly 38% out of 350 randomly chosen rural community elderly population in Upper Egypt (Minia), had malnutrition or at risk of malnutrition using MNA score. Older age group and females were more affected by malnutrition than their counterparts. Chronic diseases and presence of acute illness were significantly associated with malnutrition occurrence among older populations.

## Recommendations

It is recommended to use MNA score as an easy and fast screening tool to sort out at risk older populations to take suitable intervention strategies. Paying attention to the nutritional needs of elderly population can to a great extent improve the health of elderly.

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*Conflict of interest:* No conflict of interest was declared.

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**Table 3**
Association between MNA scores and food consumption among the studied elderly people in rural Minia Egypt, 2012

| MNA (Score) | Consumption of at least one serving of dairy product/day Yes | | | No | | | Total | | $x^2$ |
|---|---|---|---|---|---|---|---|---|---|
| | n | (%) | | n | (%) | | n | (%) | P value |
| Malnourished | 17 | 5.7) | | 13 | (25) | | 30 | (8.6) | 27.1 |
| Risk of malnutrition | 84 | (28.2) | | 20 | (38.5) | | 104 | (29.7) | <0.001[a] |
| Normal | 197 | (66.1) | | 19 | (36.5) | | 216 | (61.7) | |
| Total | 298 | (100) | | 52 | (100) | | 350 | (100) | |
| **MNA (Score)** | **Consumption of meat, fish or poultry/day** | | | | | | **Total** | | |
| | **Yes** | **n** | **(%)** | **No** | **n** | **(%)** | **n** | **(%)** | |
| Malnourished | | 0 | (0) | | 30 | (9.6) | 30 | (8.6) | 10.7 |
| Risk of malnutrition | | 5 | (13.9) | | 99 | (31.5) | 104 | (29.7) | 0.005 [a] |
| Norma | | 31 | (86.1) | | 185 | (58.9) | 216 | (61.7) | |
| Total | | 36 | (100) | | 314 | (100) | 350 | (100) | |
| **MNA (Score)** | **Consumption of two or more servings of fruits or vegetables/day** | | | | | | **Total** | | |
| | **Yes** | **n** | **(%)** | **No** | **n** | **(%)** | **n** | **(%)** | |
| Malnourished | | 16 | (8.5) | | 14 | (8.7) | 30 | (8.6) | 0.04 |
| Risk of malnutrition | | 57 | (30.2) | | 47 | (29.2) | 104 | (29.7) | 0.9 |
| Normal | | 116 | (61.4) | | 100 | (62.1) | 216 | (61.7) | |
| Total | | 189 | (100) | | 161 | (100) | 350 | (100) | |

a. Statistically significant