

Impact of nutritional education in malnourished elderly patients with the comparison of Mini nutritional assessment (MNA) score

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ABSTRACT

Introduction: Prevalence of malnutrition is high in the elderly. Very few studies exist mentioning the prevalence of malnutrition in elderly. In India around 7.7% of the total population belong to elderly age group and in Kerala older adults constitute 13% of its population. The health of the elderly contributes to the health status of the population. Malnutrition is commonly seen in elders. There are multiple factors contributing to malnutrition in this age group. **Material and Methods:** A sample of 30 patients, 60 years and above fulfilling the inclusion criteria are enrolled in the study. Malnutrition was assessed by MNA score. The score ranges from 0 to 30 points. The score above 24 show patient that are healthy with no nutritional problem, scores within range 17-23.5 indicate patients vulnerable to malnutrition and score below 17 as malnourished. MNA scoring was repeated after 3 months giving the dietary education. **Results:** 29 patients were found to be at risk of malnutrition and 1 patient was found to be malnourished. After 3 months of dietary intervention, 23 attained normal. **Conclusion:** MNA is a very accurate and effective tool for identifying malnutrition in elderly. Nutrition is an important area that need to be addressed in elder population.

Keywords: Elderly Malnutrition, MNA Score

Introduction

According to global nutrition report, malnutrition is a universal problem that has many forms.

The World Health Organization (WHO) estimates the total number of older or elderly people (≥ 60 years) worldwide would cross 1.2 billion by 2025, including around 840 million people from low-income countries.^[1] In India, around 7.7% of the total population belong to elderly age group. Hence, the health status of the elderly population has a significant impact on the wellbeing of the country.

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A retrospective pooled analysis of elderly people from 12 countries reported that the overall prevalence of malnutrition was approximately 23%. The highest prevalence was observed in rehabilitation settings (50.5%), followed by hospitals (38.7%), nursing homes (13.8%), and communities (5.8%).^[2]

The health of the elderly is an important issue defining the health status of a population. Malnutrition in elderly people is very common because daily food consumption decreases with old age. The consumed food is low in calories, contributing to nutritional deficiencies and malnutrition.^[3] Other factors like feeding difficulty, psychological distress, reduced mobility being widowed, illiteracy, caring for children, poverty, and poor access to health and social services make elderly more vulnerable for malnutrition.^[4] The magnitude of malnutrition among the elderly in India is under reported. Studies have shown that more than

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50% of the older population is underweight^[5] and more than 90% has an energy intake below the recommended allowance.^[6]

The Mini Nutritional Assessment (MNA) is an 18-question nutritional screening tool that was developed to diagnose the risk of malnutrition in elderly individuals. It was developed in 1994, patented under Nestle. MNA has gained worldwide acceptance, relying on a thropometrical, medical, lifestyle, dietary, and psychosocial factors.^[7] It was designed specifically for elderly population and has been validated in many care settings, including communities, hospitals, and nursing homes.^[8]

Studies that have been conducted in India and other developing countries using this questionnaire have found it to be useful and accurate.^[9,10]

This study has aimed to assess the malnutrition in elderly, and the impact of nutritional education using the comparison of pre and post-MNA score in geriatrics population.

Methodology

In Kerala, older adults constitute 13% of its population. Knowing their nutritional status can help in reducing the morbidity associated with aging and aid in improving their quality of life.^[11]

Amrita Institute of Medical Sciences is a 1,450 bedded super speciality tertiary care centre in Kochi, Kerala. The department of Geriatrics is a speciality department catering services to person above 60 years of age. The present study was conducted among the outpatients (male and female) visiting Geriatrics OPD. Patients who are not willing to take part in the study was excluded. The study was commenced after getting the approval and clearance from the Institutional Ethics Committee. Approved ethics committee 29.06.2019.

A sample of 30 patients 60 years and above fulfilling the inclusion criteria was selected and interviewed for the study. Malnutrition was assessed using MNA score. It composed of 18 questions which is further divided into four parts and these include anthropometric measurements (consideration is given to the elderly weight loss, weight, height, mid-arm, and calf circumference) General assessment (in these segment the lifestyle, medications, health status, mobility, neuropsychological problems, and skin lesions are looked into), dietary assessment (examines the meal duration, meal and liquid intake, appetite, and functionality of the taste bud), subjective assessment or evaluation (individual perception of nutrition status in line with others health status). The score ranges from 0 to 30 points. The scores above 24 show patient that are healthy with no nutritional problems, scores within the range of 17–23.5 indicates patients that are vulnerable to malnutrition and below 17 score are malnourished. With this scoring, sensitivity was found to be 96%, specificity 98%, and predictive value 97%.^[12]

It is an interventional study, paired *t*-test is used to compare the mean MNA score before and after giving nutritional education

.Based on the mean and standard deviation of MNA score before (21.4 ± 1.12) and after (23.15 ± 1.71) giving the nutritional intervention obtained from the pilot study, and with 90% power and 99% confidence, the minimum sample size comes to 19. In this study, 30 samples are included.

Result

Table 1 shows the comparison of Pre and Post MNA score of 30 patients who was included in this study.

Most of the patients in this study was found to be at the risk of malnutrition. Paired *t*-test was used for the comparison of pre- and post-MNA scores.

Statistical comparison of samples

After evaluating the pre-MNA scores of 30 samples, 29 patients was found to be at risk of malnutrition and one patient was found to be malnourished. After giving nutrition education, patients was reassessed with MNA after 3 months. Among 29 patients who were at risk of malnutrition, 23 attained a normal nutrition status. Malnourished patient also had a normal nutritional status while in six patients no difference was noted.

In the comparison of pre- and post-MNA scores, 80% of patients have improved nutritional status and 20% of patients remaining the same. So there is significant difference between the scores of pre- and post-MNA with a *P* value of <0.001 . This result indicate that nutritional education have beneficial impact in the nutritional status of the elderly. Table 2 and 3 shows the details of paired sample statistics of the study population.

Discussion

We compared and studied the impact of nutritional education using pre- and post-MNA score in geriatrics population.

A study was conducted among 129 people aged above 60 years, residing in Pathanamthitta district, Kerala. MNA tool was used to classify the respondents as having “normal nutrition,” in this study, malnutrition was seen in 11.6% of older adults. In our study, we selected malnourished and vulnerable to malnourished elderly.^[13]

A similar study from Kochi, metro city of Kerala had found 7% of the elderly to be malnourished and 40% to be at risk of malnutrition.^[14]

The study conducted in rural Pudukcherry to identify the malnutrition in elderly showed that about 17.9% of elderly were malnourished and about 58.7% of elderly was at risk of malnutrition,^[3,4] studies done using MNA questionnaire in rural area of south Nutrition screening, assessment, intervention, monitoring, and evaluation is a continuous process to ensure patients optimum nutritional status (American Dietetic Association, 2008).^[15]

Donini *et al.*, 2013^[16] and Wilma *et al.*, 2015^[17] mentioned that the majority of elder patients presented with nutritional inadequacies and malnutrition were of lower educational levels. This might be justified that lower level of education and limited literacy hindering elder people from access to proper nutrition related information.

According to Willaing *et al.*, 2004^[18] and Pedersen 2005,^[19] in malnourished elderly patients, nutritional counseling is effective in improving dietary habits. This study also revealed that dietary

counseling have significant impact in the nutritional status of the elderly.

A recent study of 1,269 malnourished inpatients showed that 30-day readmissions and length of stay were significantly lowered by the use of a complete nutrition care and intervention strategy that included an electronic medical record-cued malnutrition screening tool, prompt provision of ONS, patient/caregiver education, and sustained nutrition support during hospitalization and after hospital discharge.^[20]

Nguyen *et al.*, 2020^[21] evaluates the malnutrition among elderly people above 75 years of age. In their study, total of 821 participants were included with the average age at 82 ± 5.7 . Average MNA-SF score was 12.3 ± 2.0 , in which over 75% ($n = 621$) of the elderly people had the score of 12 or greater. MNA-SF confirmed that 21% of older people at danger of malnutrition and biochemical tests had a 3.5% incidence of malnutrition. After the research, they found that MNA-SF is a simple tool to diagnose the malnutrition in elderly at the initial phase and can effectively cured by the attending physician they also mentioned that diet counseling enhanced the biochemical parameters and MNASF score.

A home-based trial in elderly patients that prescribed a daily intake of 500 kcal/day of high energy and high protein oral nutrition supplements for 2 months post-hospitalization identified weight increment and improved MNA score among the at risk group (Gazzotti *et al.*, 2003).^[22] In my study, pre-MNA assessment was done during the first visit in the OPD, and the follow-up after 3 months. There was significant improvement in MNA score among the study participants.

In general, the My Plate Food Guidance System is a useful tool in promoting adequate intake of essential nutrients. Elderly individuals need 3–4 servings of milk, dairy, or calcium-rich foods per day, 2–3 servings of protein-rich foods (meat, beans, fish, poultry, tofu), 3–5 servings of vegetables, 2–4 servings of fruit, and 6–12 servings of bread, grains, or cereals.^[23]

In our study, we found that most of the geriatric patients who are at risk of malnutrition have very poor nutrient-based food intake and improper timings of meals, and are taking two to three times meals only. So nutritional education mainly concentrated on nutrient dense intermittent feeding and the correction of meal timings, which help them to maintain a healthy body weight by eating well and by daily physical activity. Their diet plan included plenty of vegetables and fruits, milk and milk products, leanmeat,

Table 1: Comparison of pre and post MNA score of the samples

Samples	Age	Pre MNA	Post MNA (after 3 Months)
1	82	21.5	24
2	76	19.5	25
3	74	20.5	25
4	71	20.5	23.5
5	78	21	20
6	70	21.5	22.05
7	69	22	22.5
8	84	23.5	24
9	80	21.5	24.5
10	69	22.5	21
11	83	22	25
12	78	16	24.5
13	87	21.5	26
14	76	22.5	27.5
15	68	21	28
16	70	19	18.5
17	63	20	24.5
18	61	23.5	27
19	84	18	25
20	74	19.5	24.5
21	85	21.5	26.5
22	71	21.5	26.5
23	78	23.5	26.5
24	82	21.5	24
25	73	21	25.5
26	72	23.5	25.5
27	78	21	27.5
28	86	23.5	24
29	69	23.5	24
30	68	19	25.5

Table 2: Paired sample statistics

PAIR 1	Mean	n	Std. deviation	Std. error mean
Pre MNA	21.2167	30	1.78443	0.32579
Post MNA	24.6000	30	2.14315	0.39128

Table 3: Paired samples test

	Paired Differences	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	preMNA - postMNA	-3.38333	2.57870	0.47080	-4.34624	-2.42043	-7.186	29	0.000

poultry, eggs, nuts, seeds, or legumes and also advised to take adequate amount of liquids each day, which showed significant improvement in the nutritional status of the elderly population.

Limitation

One of the limitation in this study is inadequate data from previous studies on pre- and post-MNA assessment in elderly, hence the result of the present study could not be compared with previous studies. Hence more studies are encouraged to study the impact of nutritional counselling in elderly.

Conclusion

Our study specifically indicates that MNA is very accurate and effective tool for identifying malnutrition in elderly, and also we found that nutrition deserves a special attention as people reach older age and is essential for good health. Healthy aging is associated with physiological, cognitive, social, and lifestyle changes that influence dietary intakes and nutritional status. Nutritional education plays a key to overcome the malnutrition in geriatric age group. Proper health education and diet plan has positive impact on the health status of elderly. Finally we concluded that a well-accepted nutritional education package can promote healthy ageing and also reduces the risk of chronic diseases and malnutrition in elderly.

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Conflicts of interest

There are no conflicts of interest.

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