

Assessment of nutritional status among elderly population in a rural area of West Bengal, India

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Abstract

Background: Geriatric population is a potentially vulnerable group for malnutrition as per 2002 census of the World Health Organization.

Objectives: To estimate the prevalence of malnutrition and risk of malnutrition among elderly population in Arkhali village, North 24 Parganas, West Bengal, India.

Materials and Methods: This community-based cross-sectional study was carried out in Arkhali village, Amdanga Block, rural field practice area of Department of Community Medicine, R. G. Kar Medical College and Hospital, Kolkata, West Bengal, India, among 235 elderly individuals aged ≥ 60 years during February to March 2014 by applying Mini Nutritional Assessment (MNA) questionnaire. Elderly individuals were interviewed after obtaining informed verbal consent.

Results: MNA showed 29.4% elderly had malnutrition and 60.4% were at risk of malnutrition. Females (59.4%) were significantly more malnourished than males (40.6%). Older age ($p < 0.001$), lower income of family ($p < 0.001$), low literacy level ($p < 0.001$), decreased food intake ($p < 0.001$), and fewer consumption of meals ($p < 0.001$) were independently associated with lower MNA scores.

Conclusion: Nutritional status of elderly subjects is very poor as detected in this study. There is need and scope for geriatric nutritional interventions in rural population.

KEY WORDS: Mini Nutritional Assessment, geriatrics, malnutrition, West Bengal

Introduction

The health of the elderly is an important issue defining the health status of a population.^[1] Malnutrition in elderly people is very common because daily food consumption decreases with old age. Also, the consumed food is low in calories, contributing to nutritional deficiencies and malnutrition. Multimorbidity associated with increasing age is common and is found to be more frequent in developing countries.^[2]

In India, geriatric age group (aged 60 years and above) constitute 8.6% of the total population as per 2011 census.^[3] Majority of them live in rural India.^[4] The magnitude of

malnutrition among the elderly in India is underreported. Studies have shown that more than 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) scale was developed to diagnose the risk of malnutrition in elderly individuals. The objective of this scale was to provide a simple and quick evaluation of the nutritional state of elderly people who are in hospital, in geriatric institutions, or in the community. It is an 18-item validated nutritional screening instrument^[7,8] that has a sensitivity of 54%–90% when compared with a detailed nutritional assessment.^[9] It is simple and noninvasive, which facilitates its use in the community.^[7] It correlates well with biochemical markers of malnutrition^[10] and is able to detect subjects at risk of malnutrition before significant changes occur in weight or serum albumin.^[7]

Studies that have been conducted in India and other developing countries using this questionnaire have found it to be useful and accurate.^[11,12] The aim of the study was to estimate the prevalence of malnutrition and risk of malnutrition among elderly in a village of West Bengal using the MNA scale and to look for associated risk factors.

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Materials and Methods

This observational and cross-sectional study was conducted in Arkhali village, Amdanga Block, North 24 Parganas, West Bengal, Kolkata, India (rural field practice area of R. G. Kar Medical College and Hospital) from February to March 2014. The study population comprised elderly individuals aged 60 years and above. In this study, 235 elderly individuals (prevalence^[11] of risk of malnutrition 62%, 10% relative precision, 95% CI) were interviewed by simple random sampling after obtaining informed verbal consent.

The MNA questionnaire was used, which is an instrument specifically designed for elderly people. It comprised 18 items, which are based on the following components: anthropometric measurements, dietary questionnaire, global health and social assessment, and subjective assessment of health and nutrition. Subjects were weighed with a floor scale to the nearest 0.1 kg, and height, mid-arm circumference, and calf circumference were measured to the nearest 0.1 cm. Malnutrition indicator scores of <17 were considered malnourished, between 17 and 23.5 were considered at risk of malnutrition, between 24 and 30 were considered normal.

Background Information

Demographic, socioeconomic information, and data on self-reported morbidity were collected during the interview. The demographic indicators used here included age and sex of the respondent. Education was noted up to the completed class and was later classified into illiterate, primary (I–IV), middle school (V–VIII), and high school and above. Socio-economic status (SES) of the respondents was assessed by modified BG Prasad Scale.

Statistical Analysis

Analysis was done using the SPSS software (version 20). To identify possible risk factors associated with poor nutritional status, univariate linear regression analysis was performed with each factor and the total MNA score. Those factors that were found to be associated with the MNA score ($p < 0.15$) were included in the multivariate regression model to identify their independent effect. Age and sex were included in the final model. Statistical significance was set at $p < 0.05$ in the final analysis.

Results

A total of 235 elderly subjects were included in the study, of which 131 were men (55.7%) and 104 women (44.3%). Mean age for men was 69 years [standard deviation (SD) = 7.5] and for females 70 years (SD = 6.3). Among the subjects, 7.7% were illiterate and 72.8% had education only up to primary level. Majority (93.6%) of the subjects lived in joint family. According to the modified BG Prasad Scale, only 1.7% belonged to Class I status, and majority were from Class III (51.5%), Class IV (18.3%),

and Class V (16.2%) SES. Of the 235 elderly subjects, 208 were married and the rest were widow/widower. Majority were financially dependent (77.4%) on other family members, whereas 17% were partially dependent. Only 5.5% subjects were financially independent.

Mean malnutrition indicator score for men was 19.25 (SD = 3.51) and that for women was 18.41 (SD = 3.78). The MNA classified 29.4% as malnourished and 60.4% as at risk of malnutrition [Figure 1]. Using body mass index as the only indicator, only 8.9% were found to be underweight. According to the MNA classification, women (59.4%) were more malnourished than men (40.6%), which was statistically significant ($\chi^2 = 9.263$, $df = 2$, $p < 0.05$).

Only 14.9% elderly consumed three meals daily, 57% consumed two meals daily, and consumption pattern varied with nutritional status [Figure 2]. Daily protein consumption was less in malnutrition and at risk of malnutrition group [Figure 3]. Two or more servings of fruits and vegetables were consumed by 75% subjects in normal nutritional status group but only 11.3% and 34.8% subjects in risk of malnutrition and malnutrition group, respectively, [Figure 4].

Possible factors associated with the MNA scores ($p < 0.15$) identified by univariate linear regression included age, sex, family income, literacy, financial dependence,

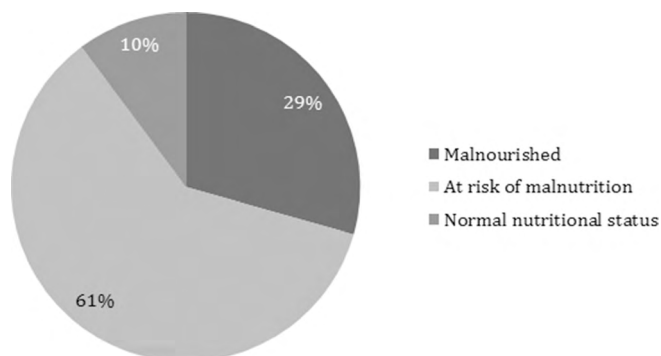


Figure 1: Pie diagram showing distribution of the study population according to nutritional status.

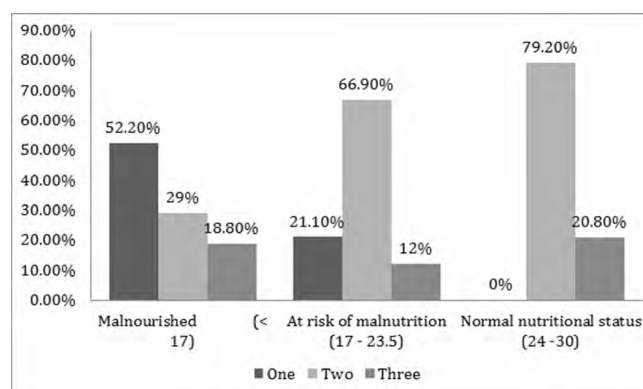


Figure 2: Nutritional status according to daily meal consumption.

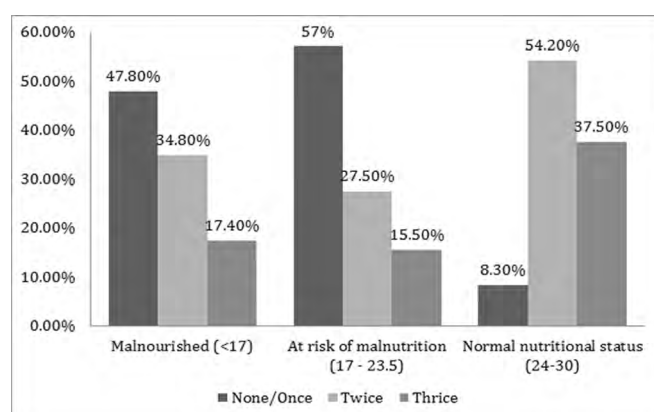


Figure 3: Nutritional status according to daily protein consumption.

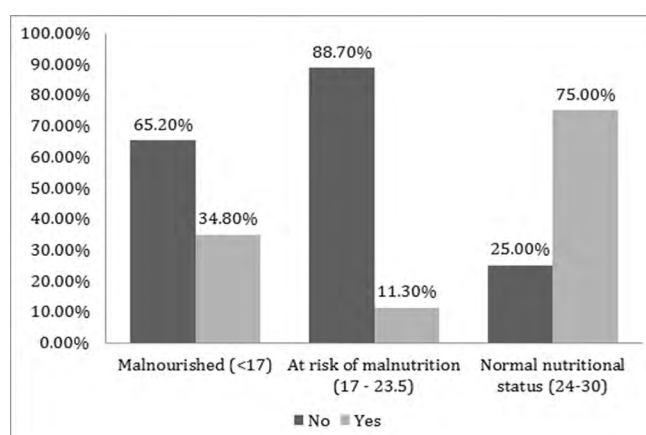


Figure 4: Nutritional status according to fruit/vegetables consumption.

Table 1: Factors associated with MNA scores in univariate and multivariate linear regression

Variable	Univariate analysis	Multivariate regression model	
	p-Value	Unstandardized β	p-Value
Age	0.053*	-0.099	<0.001**
Sex	0.081*	-0.549	0.102
Family income	<0.001*	-1.365	<0.001**
Marital status	0.213		
Literacy	<0.001*	1.004	<0.001**
Financial dependence	0.091*	-0.138	0.636
Full meals daily	<0.001*	1.703	<0.001**
Decline in food intake	<0.001*	2.332	<0.001**

Multivariate regression model using stepwise approach, adjusted for age and sex.

* $p < 0.15$ (level of significance set for factors to be included in multivariate model); ** $p < 0.05$.

number of meals per day, and decline in food intake (see Table 1). Multivariate regression analysis, adjusted for age and sex, was performed with these factors using a stepwise approach. This showed that the independent factors associated with the lower MNA scores were increasing age, monthly family income, literacy, decline in food intake, and fewer meals. Factors such as sex and financial dependence were not found to be significantly associated with the lower MNA scores.

Discussion

Previous study conducted using the MNA questionnaire in western Rajasthan showed a high prevalence of malnutrition and risk of malnutrition among the rural elderly compared with the urban elderly (11% and 62% vs. 2% and 36%, respectively).^[11] Compared with the results from a large study among rural elderly of Bangladesh,^[12] we found a similar high prevalence of malnutrition and risk of malnutrition among our population (29.4% and 60.4%, respectively). A large study conducted in Spain showed much lower rates of malnutrition and risk of malnutrition (4.3% and 25.4%, respectively) than our study.^[13]

Our results showed more elderly to be at risk of malnutrition than actually malnourished. This finding has been seen among community-dwelling elderly from India and other parts of the world.^[11,13-15] This is primarily because the MNA is better at identifying those at risk of malnutrition among healthy elderly in the community. More importantly, this emphasizes the fact that high prevalence of deficient protein-energy intake exists among the elderly without obvious malnutrition.

Older age was associated with the lower MNA scores in our population. This finding has been shown in some previous studies,^[12,13] whereas others have shown that age has no effect on the nutritional status.^[16,17] We observed that the older subjects were less active and often reported reduced appetite and decreased food intake. It is apparent that increased focus on nutritional status is required as the age of the elderly increases. Elderly woman were found more malnourished in this study. Our analysis showed that the lower MNA scores were associated with those subjects who had fewer than three meals per day. A similar finding was reported in Bangladesh, where most of the elderly who were malnourished or at risk of malnutrition consumed only two meals daily.^[12] Other studies involving community-dwelling elderly have shown that chewing problems and difficulty preparing or eating full meals

contribute to poor nutritional status.^[11,16] In this study, 46.4% elderly reported moderate-to-severe decline in food intake. The majority of these subjects indicated that decreased appetite was the cause for low food intake. Decreased appetite can be attributed to physiological changes during aging as well as medical conditions in the elderly.^[18,19] In our study, lunch was often the major and single meal of the day, and dinner was often omitted. A previous study had shown that insufficient income and inadequate knowledge of nutrient requirements were possible factors associated with low energy intake.^[6] We observed that lack of money was the main reason for not buying nutritious food. Level of education and expenditure on food are directly associated with nutritional status.

Conclusion

Result shows that almost 90% elderly had low MNA scores. Considering the high prevalence of poor nutritional status among elderly, more focus on diet and possible nutritional interventions are required. Lower income group should receive particular attention to meet their special needs. The promotion and implementation of low cost, prevention-based initiatives such as health, nutrition, and physical education, could significantly enhance the possibility of maintaining good nutritional status for the elderly.

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