MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.12.220.226

A Study on Malnutrition Among the Elderly with MNA Scale, Attending Geriatric Clinic of Medical College Kolkata

[1]Anjali S. Jainendran, [2]Nirmalya Manna, [3]Sayantan Das Mazumdar and [4]Sudipto Mondal

[1-4]Department of Community Medicine, Medical College Kolkata 88,College Street, Kolkata, West Bengal, India 700073

ABSTRACT

The health of the elderly is a major determinant of the overall health of a population. Maintaining senior citizen's health, mobility and quality of life depends heavily on their diet. Early identification of abnormalities or dietary deficiencies is crucial for preventing illnesses or chronic disorders. To screen the elderly population for malnutrition using Mini nutritional assessment short form scale, attending geriatric outpatient department of Medical College Kolkata. An institution based cross sectional study was conducted among 143 elderly population, attending geriatric out patent department of Medical College Kolkata, in the month of September to October 2023.Using systematic random sampling technique with a structured questionnaire including Mini nutritional assessment scale short form. Data was analyzed using descriptive statistics and logistic regression using SPSS version 23. The mean age±(SD) i.e., 65.81±6.10 years, ranging from sixty to eighty four years were studied. Out of the 143 elderly participants studied, 72(50.3%) of them were males and 71(49.7%) of them were females. About 24(16.8%) were found to be malnourished, 81(56.6%) were found to be at risk of malnutrition, 38(26.6%) and normal nutrition respectively. It was discovered that age (adjusted OR=1.127, 95% CI (0.99-1.27)), Education ((adjusted OR=4.24, 95% CI (1.15-15.59)), presence of co morbidity ((adjusted OR=10.17, 95% CI (2.9-34.59)), financial dependency (adjusted OR=0.079, 95% CI (0.01-0.569)) all at a significance level of p value of <0.05. A significant proportion of the elderly are vulnerable to malnutrition. Because malnutrition has many contributing factors, it should be treated using a multidisciplinary approach to health education that places a particular focus on eating a healthy diet in both quantity and quality.

OPEN ACCESS

Key Words
Malnutrition, elderly, mini nutritional assessment

Corresponding Author
Anjali S. Jainendran,
Department of Community Medicine Medical College Kolkata 88, College Street, Kolkata, West Bengal, India 700073

Author Designation
[1,3,4]3rd Year Junior Resident
[2]Professor

Received: 10 August 2024
Accepted: 30 October 2024
Published: 23 November 2024

Citation: Nirmalya Manna, Anjali S. Jainendran, Sayantan Das Mazumdar and Sudipto Mondal, 2024. A Study on Malnutrition Among the Elderly with MNA Scale, Attending Geriatric Clinic of Medical College Kolkata. Res. J. Med. Sci., 18: 220-226, doi: 10.36478/ makrjms.2024.12.220.226

INTRODUCTION

Every individual should have the chance to live a long and healthy life in every nation on earth. A growing proportion of the population is 60 years of age or older. One billion persons were 60 years of age or older in 2019. By 2030, there will be 1.4 billion of them and by 2050, there will be 2.1 billion. This growth is happening at a never-before-seen rate and will pick in speed in the upcoming decades, especially in developing nations. Due to this historically large shift in the world's population, all sectors of society must alter their organizational structures. For instance, urban planning, housing, transportation and health and social services. One crucial and pressing aspect of our shifting demographics is the need to work toward making the world more age-friendly[1].

The health of the elderly is a major determinant of the overall health of a population. Maintaining senior citizen's health, mobility and quality of life depends heavily on their diet. Early identification of abnormalities or dietary deficiencies is crucial for preventing illnesses or chronic disorders[2].

Deficits, excesses, or imbalances in an individual's energy and or nutrient consumption are referred to as malnutrition[3]. Malnutrition is encouraged by the numerous physiological and psychological changes that people go through as they age, it is caused by a variety of lifestyle and societal variables, including isolation, poverty, loneliness, living alone, lack of dietary knowledge and the inability to shop or cook meals[4]. Elderly people's diet and health are frequently overlooked. The extent of elderly malnutrition in India is not well documented. According to the few studies that have been conducted, over 90% of the elderly population consumes less energy than is advised and over 50% of them are underweight[2].

The incidence of malnutrition in older individuals varies from >1% to almost 25% worldwide., Northern Europe has the lowest frequency (<1%), while South-East Asia has the highest (24.8%).

In high-income countries, the percentage of undernourished individuals is declining globally, but in low- and middle-income countries, the percentage has increased recently. According to World Health Organization (WHO) estimates, undernourishment affects around one-third of people in low-and middle-income nations, with the percentage varying by age group[5].

The prevalence of overweight and obesity, which has been recognized worldwide as a risk factor for non-communicable diseases like diabetes, hypertension and cardiovascular diseases as well as all-cause mortality, is skyrocketing in India. However, the highest rate of underweight among adults worldwide is found in India. Since India is a developing nation, undernutrition and overnutrition coexist together, which is becoming a serious public health concern[5]. Malnutrition is quite common among various health problems, including mental health, disability, ocular morbidity, chronic noncommunicable diseases and it always coexists with other disorders. In India, the extent of elderly malnutrition is not well documented. The majority of nutritional intervention programs target pregnant and breast feeding women, young children, adolescents and newborns. In India, elderly people's diet and health are frequently disregarded, especially in rural areas. Malnutrition in the elderly is a widespread and largely undiagnosed condition. Poor nutrition and various co morbidities exacerbate the health of the elderly, creating a vicious cycle that unnecessarily increases the financial burden on their family and the healthcare system[6].

The national health policy's emphases are mainly on infectious diseases, maternity health and child health, but older people's health has not got much attention. And malnutrition being an easily preventable condition once a proper attention is given and early intervention measures are undertaken. When it comes to assessing malnutrition in the elderly, there is no gold standard. If used alone, BMI may not detect significant unintended weight loss and may be unreliable when confounding variables like edema or ascites are present. Furthermore, postural changes, loss of muscular tone and spinal compression might make it challenging to measure height accurately in the elderly[7].

The mini-nutritional assessment tool is a straightforward and trustworthy method for evaluating elderly patients at risk for malnutrition. It was created specifically for primary care doctors and other healthcare professionals who offer in-home or hospital care for sick and fragile senior patients[8].

This tool is a popular and validated instrument for assessing malnutrition in the elderly, which satisfies many screening and diagnostic measures. Nowadays, most of the studies on elderly are mainly focusing on rural elderly populations and also there is dearth in data from this study setting. After obtaining the ethical permission to conduct this research, this study was carried out in view of potential effects on future health care services. The study aimed to estimate the prevalence of malnutrition among the elderly population attending the geriatric outpatient department of Medical College, Kolkata and to ascertain the relationship between the presence of these conditions and socio demographic characteristics.

MATERIALS AND METHODS

- **Study Type:** A descriptive epidemiological observational study.
- **Research Design:** Cross sectional design.
- **Study Setting:** Geriatric outpatient department in super speciality block of Medical College and Hospital, Kolkata.

- **Study Period:** Months of September-October 2023.
- **Study Population:** This study was carried out among the elderly population attending the geriatric outpatient department.

Inclusion Criteria:
- The study participants were elderly (≥60 years old) attending the Geriatric outpatient department of Medical College, Kolkata and who gave consent to take part in the study.

Exclusion Criteria:
- Elderly who were severely ill .
- Elderly who had severe problems with vision, hearing, or speaking and were unable to participate in face to face interview.

Sample Dimensions and Sampling Methodology: By Cochrane formula, $n=4PQ/l^2$, In a research by Dr. K T Moly *et al.* in geriatric Outpatient department of a territiary care centre Kerala, 34.2% of participants over 60 were estimated to have malnutrition. (P=34.2)[9].
- Q=100-53.7=65.8.
- Consequently, n=143, using a non-responsive rate of 10%, given an absolute error of 10% and design effect of 1.5.
- Thus, 143 elderly who gave consent and who doesn't include in the exclusion criteria were considered for the study.

Sampling Technique Followed was Systematic Random Sampling:
- Systematic random sampling technique was used to select the study participants. Based on three month patient flow trend prior to conduction of study, on an average 106 patients attended the outpatient department. The required sample size was 143.
- Total 8days was obtained for data collection. Per day 143/8=17.87~18, 18 participants were interviewed, with a sampling interval of 106/18 =5.8~ 6, till required sample was obtained.
- **Method of Data Collection:** study participants were interviewed with a pretested, predesigned, data collection form which was translated into local Bengali language.

- **Study Variables:**

A)Socio Demographic Characteristics: The factors are age, religion, place of residence, educational attainment, marital status, family structure, living arrangement, current occupation, financial reliance, presence of chronic illnesses and substance use. (The modified B.G. Prasad's scale for socioeconomic status was updated in January 2024.)

B)To Screen Elderly for Malnutrition: The mini nutritional assessment short form (MNA-SF) is a validated questionnaire for quickly assessing the nutritional status of the senior population. The mini nutritional assessment questionnaire-Short Form is a widely used international tool for evaluating the nutritional status of the elderly. It has a high sensitivity (98.9%), specificity (94.3%) and accuracy (98%) when compared to a comprehensive nutritional assessment that includes biochemical tests, anthropometric measurements and dietary assessments. The technique consists of 6 questions divided into sections: anthropometric evaluation (BMI or calf circumference), general assessment (such as food intake, weight loss, mobility, acute disease and dementia as a cognitive condition)[10].

On the basis of the scores obtained in the questionnaire there they were categorised into those with, normal nutritional status=12-14 points, at risk of malnutrition=8-11points and malnourished=0-7 points. To analyze the relationship between important variables and nutritional status, the categories as at risk and normal nutrition were clubbed together as Not malnourished and others were categorised as malnourished.

Operational Definition:
- The 1999 National Policy for Older People classifies anyone over 60 as elderly or senior citizens[11].
- **Financial Dependency:** Elderly individuals who can support themselves financially are considered "financially independent," while those who rely on others for support are considered "financially dependent"[12].

Data Analysis and Ethical Consideration: The Medical College of Kolkata's Institutional Ethics Committee for Human Research and Scientific Advisory Committee approved the project. Data was tabulated in a Microsoft Excel © 2021 spreadsheet and analyzed using the statistical package for the social sciences software, student version 23.0.

RESULTS AND DISCUSSIONS

A total of 143 study participants with the mean age±(SD) i.e., 65.81±6.10 years, ranging from sixty to eighty four years were studied. 72(50.3%) of them were males and 71(49.7%) of them were females. Out of the 143 elderly populations, majority of them belonged to age group of 60-64years (49.0%), followed Hinduism (90.2%) and hailed from nuclear family (76.9%). Majority of them were illiterate (59.4%) and unemployed (85.3 %,). The (41.3%) belonged to Class IV (upper lower) economic class. The 65.0% of them were married and resided with their spouse and kids.

Table 1: Socio Demographic Details of the Study Population. (n=143)

Socio demographic variables	Category	Frequency(n)	Percentage(%)
Age in completed years	60-64	70	48.9
	65-69	26	18.2
	70-74	32	22.4
	75-89	12	8.4
	≥80	3	2.1
Gender	Male	72	50.3
	Female	71	49.7
Education	Illiterate	85	59.4
	Primary	47	32.9
	Higher Secondary	11	7.7
Type of family	Nuclear Family	110	76.9
	Joint Family	33	23.1
Current marital status	Married	93	65.0
	Not married	50	35.0
Socio economic status*	Upper Middle class(III)	45	31.4
	Lower Middle class(IV)	59	41.3
	Lower class(V)	39	27.3
Living Arrangement	With spouse and children	93	65.0
	With children only	50	35.0
Occupation status	Currently employed	21	14.7
	Currently unemployed	122	85.3
Economic Dependency	Dependent	127	88.8
	Independent	16	11.2

Table 2: Distribution of Study Participants According to their Morbidities. (n=143)

Variables	Category	Frequency (n)	Percentage (%)
Morbidity Status	Present	108	75.5
	Absent	35	24.5
Type of Morbidities*	Hypertension	70	48.95
	Diabetes Mellitus	65	45.45
	Musculoskeletal disorder	49	34.26
	Ischemic Heart Disease	10	6.99
	Chronic Obstructive Pulmonary Disorder	12	8.39
	Acid Peptic Disorder	40	27.97

*Multiple Responses present.

Table 3: Distribution of Study Participants According to the Responses Obtained for MNA-SF Questionnaire. (n=143)

Responses	Frequency(n)	Percentage(%)
1)Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?		
a) Severe decrease in food intake (0)	29	20.2
b) Moderate decrease in food intake (1)	48	33.6
c) No decrease in food intake (2)	66	46.2
2) Have you lost any weight without trying over the last 3 months?		
a) Weight loss greater than 3kg (0)	0	0
b) Does not know(1)	71	49.6
c) Weight loss between 1 and 3kg (2)	30	21.0
d) No weight loss(3)	42	29.4
3) How would you describe your current mobility?		
a) Bed or chair bound(0)	0	0
b) Able to get out of bed/chair but does not go out(1)	9	6.3
c) Goes out (2)	134	93.7
4) Has suffered psychological stress or acute disease in the past 3 months?		
a) Yes(0)	15	10.5
b) No(2)	128	89.5
5) Neuropsychological problems		
a) Severe dementia or depression(0)	23	16.1
b) Mild dementia(1)	20	14.0
c) No psychological problems(2)	100	69.9
6) Body Mass Index (BMI)=weight in kg / (height in m)^2		
a) BMI less than 19(0)	28	19.5
b) BMI 19 to >21(1)	18	12.5
c) BMI 21 to >23(2)	66	46.2
d) BMI 23 or greater(3)	31	21.8
Nutritional status based on the scores obtained		
Normal nutritional status(12-14)	38	26.6
At risk(8-11)	81	56.6
Malnourished (0-7)	24	16.8

Table 4: Logistic Regression for Predictors of Malnutrition Among Elderly.(n=143)

Dependent Variable Coding: **(0) no malnutrition**
(1) malnutrition

Predictor variables	n (%)	p-value	df	AOR(95%CI)
Age in completed years		<0.05	1	1.1(0.9-1.3)
Education				
Literate				
(reference)	58(40.6)			
Illiterate	85(59.4)	0.03	1	4.2(1.2-15.6)
Morbidity status				
Absent				
(reference)	35(24.5)			
Present	108(75.5)	<0.05	1	10.2(2.9-34.5)
Financial Dependency				
Dependent (reference)	127(88.8)			
Independent	16(11.2)	0.01	1	0.08(0.01-.0.57)

Of them, 127 (88.8%) relied on their income. Only 21(14.7%) reported the habit of substance use among the elderly study population**. (Table No.1)** 108(75.5%) of them were found to have co morbidities like Hypertension, Diabetes mellitus, Musculo skeletal disorders , Ischemic heart disease, Chronic obstructive pulmonary diseases and Acid peptic disorders. **(Table No.2).**

Screening of Malnutrition Among Elderly Using Mini Nutritional Assessment Short Form: Among the 143 elderly participants, on the basis of the scores obtained for the mini nutritional assessment short form questionnaire, about 24(16.8%) were found to be malnourished, 81(56.6%) were found to be at risk of malnutrition, 38(26.6%) and normal nutrition respectively. **(Fig. No.1, Table No.3).**

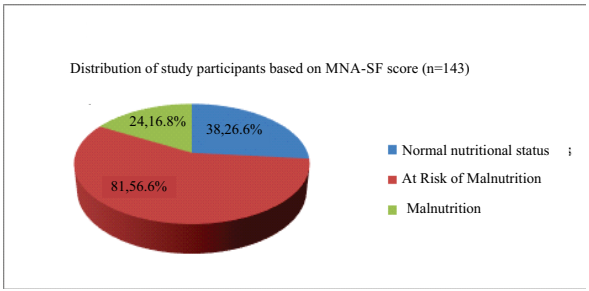

Fig. 1: Distribution of Study Participants Based on MNA-SF Score.(n=143)

Factors Associated with Malnutrition Among Elderly: The most common reasons reported by the elderly population for reduced intake of food were reduced apatite (27.9%), difficulty in swallowing (23.7%), indigestion (18.1%) as well as financial constraints (16.2%). Gender, Education status, marital status and the living arrangements were found to be statistically significant factors association with malnutrition among elderly, with a significant p value of <0.05.

Predictors of Malnutrition Among Elderly: A binary logistic regression analysis was performed using the risk factors that were discovered to be substantially linked to the malnutrition among elderly. After adjusting for other pertinent variables, it was discovered that age (adjusted OR=1.127, 95% CI (0.99-1.27)), Education ((adjusted OR=4.24, 95% CI (1.15-15.59)), Presence of co morbidity ((adjusted OR=10.17, 95% CI (2.9-34.59)), financial dependency (adjusted OR=0.079, 95% CI (0.01-0.569)) all at a significance level of p value of <0.05. **(Table No.4)**.

The results on the study of malnutrition among the elderly population attending geriatric outpatient department of Medical College and Hospital, Kolkata revealed that about 16.8% of them were malnourished and 56.6% of them were at risk of malnutrition.

The majority of the elderly belonged to category of 60-64 years similar to a study conducted on malnutrition by Vaish, *et al.* among elderly population in Delhi[13]. Globally, malnutrition rates among the elderly range from 0%-65%, according to MNA scale. The frequency of malnutrition in the elderly varies among cultures and study settings (hospital based studies compared with community-based studies) in different countries[14]. In a study conducted by Ananthesh B G *et al.*, in Karnataka, they found that the elderly population malnourished were about 18.6% which were similar to our study where about 16.8% were malnourished as well as to another study conducted in rural Kerala, where they obtained prevalence of malnutrition as 14.3%.These slight variations in the prevalence may be due to the differences in the socio demographic characteristics of the populations and the differences in study settings[15,16]. In this research it was found that about 56.6% of the elderly were at risk of malnutrition, which were seen similar to results obtained in another study done by Uddin *et al.*, in Bangladesh, were they found out about 59% of elderly population they studied were at risk for malnutrition[17]. In another study conducted by Mathew *et al.*, on prevalence of malnutrition among elderly in urban areas of Coimbatore reported the prevalence of malnutrition (19.47%) more and prevalence of those at risk of malnutrition (24.7%) very less compared to this study[7].

In this study the female gender was more significant for malnutrition with poor scores in mini nutritional assessment which was similar findings reported in many other studies[10,18]. Where as a study in Rajasthan by Gandhi S J *et al.,* could not find any significant association between gender and malnutrition, once again stressing to the fact that the results might vary due to the variation in the socio demographic and geographical variations of the study setting and study participants[19]. In this study age, education, financial dependency and presence of co morbidities were found to be significant predictors of malnutrition. Similar results were found in another study by Vaish *et al.*, where other than these above mentioned ones, gender, residential status, family size were also significant predictors[13]. Where as in rural area of West Bengal, similar study among elderly could not find any significant association between age or education with the malnutrition[6]. Ramya M S *et al.,* conducted a similar study in urban area of Bangalore also supported the fact that age, education, financial dependency and living arrangements were important significant factors for malnutrition among elderly population[20]. On determining the predictors for malnutrition, in this study couldn't identify being single, widow or widower is more prone for malnutrition, but this was found to be significant predictor variable in the study conducted by Mathew *et al.,* among elderly population in the urban areas of Coimbatore[7]. Therefore, it is evident from the study's findings that malnutrition is becoming a rising public health issue. Addressing this extremely prevalent public health concern among the elderly requires prompt response, routine screening and effective

preventative strategies. One of the study's limitations was that many research participants were not accompanied by caregivers, making referrals or counselling challenging. The individuals may have under reported their chronic illnesses because of undetected morbidities, as they self-reported their co-morbidities. However in this study, the data were collected based on the individual participants response as well as their previous medical records with them. There was no study of biochemical indicators for nutritional status or haemoglobin done on the study participants to support the study findings. The only way to protect, promote and extend old age is to improve quality of life. Geriatric nutritional status assessment identifies malnourished and at-risk individuals, allowing for early treatments to improve quality of life.

CONCLUSION

According to our findings, a significant proportion of the elderly are vulnerable to malnutrition. It is simple to determine who is malnourished and who is at risk of malnutrition and would benefit from early intervention by utilizing the simple mini nutritional assessment short form tool. By encouraging regular assessment of nutritional status and implementing early intervention measures for population who is malnourished and at risk of malnutrition will enhance quality of life, save healthcare costs, improve health outcomes and delay the onset of impairment among the elderly population. By organizing educational programmes and strengthening the community based outreach measures, provide regular informations through social media, newsletters and pamphlets for the people who have normal nutritional status to increase awareness among them. Thus, by these measures implemented consistently can help the senior citizens to improve their nutritional well being and resulting in a healthy ageing.

REFERENCES

1. BG, A., G.V. Bathija and D.D. Bant., 2017. A community based cross-sectional study to assess malnutrition among elderly population residing in urban and rural areas of a district in Karnataka, India. International Journal of Community Medicine and Public Health., Vol. 4 .
2. Naik, R., P. Dudeja, N. Thamban, C. Jain and V. Aggarwal, 2018. Nutrition assessment of elderly residing in urban areas and urban slum: A hospital based comparative study. Indian J. Community Health, 30: 390-394.
3. Singh, A. and A. Chattopadhyay, 2023. Malnutrition among older adults in India: Does gender play a role? Aging Health Res., Vol. 3 .10.1016/j.ahr.2023.100143.
4. Ghosh, A., A. Dasgupta, B. Paul, S. Sembiah, B. Biswas and N. Mallik., 2017. Screening for malnutrition among the elderly with MNA scale: a clinic based study in a rural area of West Bengal. Int J Contemp Med Res., 4: 1978-1982.
5. Mathew, A., D. Das, S. Sampath, M. Vijayakumar, N. Ramakrishnan and S. Ravishankar, 2016. Prevalence and correlates of malnutrition among elderly in an urban area in Coimbatore. Indian J. Public Health, 60: 112-117.
6. Vijayageetha, M., Y. Krishnamoorthy, S. Kumar, S. Rajaa and T. Rehman, 2018. Prevalence of malnutrition and its associated factors among elderly population in rural Puducherry using mini-nutritional assessment questionnaire. J. Family Med. Primary Care, 7: 1429-1433.
7. Moly, K.T., 2022. Prevalence of malnutrition and its contributing factors among geriatric patients. Journal of Positive School Psychology., 6: 4529-4536.
8. Ghosh, A., A. Dasgupta, B. Paul, S. Sembiah, B. Biswas and N. Mallik., 2017. Screening for malnutrition among the elderly with MNA scale: a clinic based study in a rural area of West Bengal. Int J Contemp Med Res., 4: 1978-1982.
9. Malik, C., S. Khanna, Y. Jain and R. Jain, 2021. Geriatric population in India. J. Family Med. Primary Care, Vol. 10 .10.4103/jfmpc.jfmpc_1794_20.
10. Akhtar, S.N. and N. Saikia, 2023. Economic Dependency, Chronic Illness and Insurance Coverage Among the Elderly. Handbook Aging, Health Public Policy, 1-37.
11. Goswami, A.K., B. Nongkynrih, M. Kalaivani, S.K. Gupta and C.S. Pandav., 2016. Double burden of malnutrition among elderly population of Delhi. Indian Journal of Community Health., 28: 324-330.
12. Patra, S., K. Vaish and P. Chhabra, 2020. Nutritional status among elderly: A community -based cross-sectional study. Indian J. Public Health, 64: 266-270.
13. Ananthesh, B., V. Geeta and D. Dattatraya., 2017. A community based cross sectional study to assess malnutrition among elderly population residing in urban and rural areas of a district Karnataka, India. Int J Community Med Public Health., 4: 53-56.

14. Govind, R., J. Rajeev and A. Bhatt, 2020. Malnutrition among community dwelling older adults in a rural block area of South India. J. Family Med. Primary Care, 9: 5982-5987.
15. Uddin, M., M. Akter, M. Noor, M. Hussain and I. Chowdhury, 2020. Prevalence and disparity of malnutrition among elderly: A cross-sectional study. J. Indian Acad. Geriatrics, 16: 145-150.
16. Agarwalla, R., A. Saikia and R. Baruah, 2015. Assessment of the nutritional status of the elderly and its correlates. J. Family Community Med., 22: 39-43.
17. Gandhi, S.J., M.K. Choudary, R. Kumar and D. Bhatnagar, 2018. Nutritional status of the geriatric population in the field practice area of a medical college in Rajasthan. Int. J. Of Community Med. And Public Health, 5: 220-224.
18. Ranganath, T. and J.S. Jyothi., 2017. To assess the nutritional status among elderly and factors influencing it, in an urban area, Bengaluru - a cross sectional study. Int. J. Of Community Med. And Public Health, 4: 17-27.