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Nutritional Status and Dietary Pattern among Elderly Populations in Selected Urban Areas of Bangladesh

Sonia Saif[1]*, Abdullah Al Masum[2], Mohammad Tanvir Islam[3], Md. Alfanuzzaman[4], Natasha Tarannum[5]

Abstract

Introduction: Nutrition plays an essential role in determining the health and functional ability of the elderly. With the global elderly population expanding rapidly, there is a heightened risk of malnutrition and associated morbidity among them. This risk may further exacerbated by the absence of an elderly-specific health and nutrition surveillance system, particularly evident in our country. In this study the nutritional status have been assessed with the Mini Nutritional Assessment (MNA) tool in association to the food consumption pattern (24 hour recall of dietary consumption) in elderly urban population of Bangladesh.

Methods: A cross sectional study have been conducted by Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University (BSMMU) in 3 districts in Bangladesh over a period of one year from January 2021 to December 2021. Purposive sampling method was used to reach the target population from the 'Help Age' NGO census of the selected districts. The sample consisted of 220 healthy elderly people.

Results: In this study, the aged between 65 to 90 years with the mean age of 73.48 ± 7.11 years. The percentage of male respondents was 53.2%, while that of female respondents was 46.8%. Among them, 40.5% were malnourished, 16.4% were at risk of malnutrition, and the remaining 43.1% were in a nourished status. The food consumption patterns at breakfast and lunch found to be linked to the nourishment status of the respondents ($p<0.05$). At breakfast, the nourished group of respondents exhibited a higher prevalence of rice consumption ($p<0.05$). In this group, meat consumption at lunch was significantly more prevalent ($p<0.05$). Sugary food, saturated fat food, high potassium foods are associated with the nourishment status of the respondents ($p<0.05$).

Conclusion: The proportion of salty food consumption was higher, while adequate water intake, consumption of fruits, or fiber-rich food was low in this sample, although they were not significantly associated with the nutritional status ($p>0.05$). In conclusion, the sample of this study exhibited low food diversity and high malnourishment, highlighting the urgent need for rapid intervention as well as awareness generation among the elderly group of population for the attainment of better nutrition to facilitate healthy aging.

Keywords: Elderly Nutrition, Malnutrition; Mini Nutritional Assessment (MNA); Food Consumption Patterns; Bangladesh.

Affiliation:

[1]Specialist, Department of Internal Medicine, Sheikh Fazilatunnesa Mujib Memorial KPJ Specialised Hospital and Nursing College, Gazipur, Bangladesh

[2]Assistant Professor, Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[3]Professor, Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[4]Registrar, 250 Beded General Hospital, Thakurgaon, Bangladesh

[5]Specialist, Department of Hepatology, Sheikh Fazilatunnesa Mujib Memorial KPJ Specialised Hospital and Nursing College, Gazipur, Bangladesh

***Corresponding author:**
Dr. Sonia Saif, Specialist, Department of Internal Medicine, Sheikh Fazilatunnesa Mujib Memorial KPJ Specialised Hospital and Nursing College, Gazipur, Bangladesh.

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Introduction

The demographic of population aged 65 and above represents the most rapidly expanding age cohort worldwide. As of 2018, globally older individuals surpassed children under the age of five, marking a historic demographic shift. Moreover, it is estimated that, by 2050, By 2050, the elderly population is anticipated to surpass the number of adolescents and youth aged 15 to 24 [3]. In Bangladesh, individuals aged 60 years and older comprise 9.28% of the total population. This populace population is growing 3.41 times more rapidly than the overall population, resulting in 1.53 crore of population aged 65 or above in the country at present [4]. With the increase of elderly population, demand for healthcare services and specialized treatments for age-related diseases are going to increase, that can pose enormous challenge for the national healthcare system. For sustaining overall health and well-being, maintaining proper nutrition becomes crucial with the course of aging. The elderly population faces unique nutritional challenges due to factors such as changes in metabolism, decreased appetite, and the presence of chronic diseases [5]. Adequate nutrition plays a pivotal role in supporting immune function, preserving muscle mass and strength, promoting bone health, and preventing as well as effectively modulating various chronic conditions [6,7]. A diet that is nutritionally adequate is considered an important part of a lifestyle targeted at enhancing healthy and successful aging [8]. Furthermore, proper nutrition can enhance cognitive function, mood stability, and quality of life among elderlies resulting in a healthier and more resilient aging [9,10]. Thus, understanding and addressing the nutritional requirements of the elderlies are essential for ensuring a higher quality of life. On the other hand, inadequate intake of essential nutrients can lead to weight loss, muscle wasting, and decreased strength, increasing the susceptibility to infections and impairing the body's ability to recover from illness or injury [5,11,12]. Malnutrition also heightens the likelihood of developing chronic morbidities [13]. Furthermore, nutritional deficiencies can exacerbate existing health issues and contribute to a decline in functional independence, diminishing the elderly individual's quality of life and potentially necessitating increased medical intervention and healthcare costs [14–16]. In the context of increasing longevity and a growing population of older adults, by prioritizing nutritional support for elderly individuals, healthcare systems can potentially reduce the burden of age-related chronic diseases, enhance overall health outcomes, and ultimately mitigate healthcare costs associated with managing these conditions [16]. This, in turn, may lead to fewer hospitalizations, and long-term care admissions, consequently reducing the burden on the healthcare system alleviating strain on healthcare resources and reducing expenditures. Evaluating the nutritional status of elderly individuals should be integrated into their care. The Mini Nutritional Assessment test (MNA) is aa commonly used tool to identify nutritional risks in elderlies [17]. Data on the nutritional status and related factors of the elderly population residing in urban areas of the country are limited in quantity. Therefore, the nutritional status have been assessed in association to the food consumption pattern in elderly urban population of Bangladesh in this study.

Methods

Subjects and setting of the study: This is a cross sectional study, conducted by Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University (BSMMU) in Kandipara & Kumarvog of Munshigonj city, Munshipara & R. K rd. of Rangpur city, and Adabor, Mohammadpur & Dhanmondi of Dhaka city for one year from January 2021 to December 2021. Purposive sampling technique was used in this study according to the data of elderly population from the 'Help Age' NGO census of Dhaka, Rangpur and Munshigonj district. Healthy elderly people aged ≥60 years living in the study areas, who were willing to participate were included in the study. People who were too ill to give interview or having medical emergency, comorbidities require for food restriction (Chronic Kidney Disease, gastrointestinal disorders, or cognitive impairment remained excluded.

Data collection and analysis: Data was collected for 6 months following the sanction of the protocol. Total 220 elderly people were enrolled in this study who met the selection criteria. Trained interviewers conducted face-to-face interview of each elderly participants at their home setting, with a pretested semi-structured questionnaire. Data included- age, sex, dietary habits, assessment of nutritional status through MNA scale. The data were recorded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Continuous variables were expressed as means ± standard deviations (SD). Frequency and percentage were used to describe categorical variables. Chi-square test was considered to express the association between categorical variables. Statistical significance was determined with a p-value of less than 0.05.

Evaluation of dietary consumption: 24 hour recall of dietary consumption was noted including meals at breakfast, lunch, dinner and fluid intake. Differences in sugary food, saturated fat food, salty food, fruits, fiber-rich-food were evaluated based on the history of food intake.

Nutritional status assessment: Nutritional status of the respondents was assessed with MNA questionnaire, which is a widely used validated tool for assessing nutritional status of elderlies. It is an 18-item scale. Participants can achieve a maximum score of 30 on the scale. A score below 17 refers to malnutrition, while a score between 17 and 23.5 suggests a risk of malnutrition and a score of 24 or higher refers to normal nutritional status. [19].

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Addressing potential biases: Potential biases have been addressed and managed in this study. The chances of selection bias have been mitigated by increasing outreach efforts to ensure diverse participation from the 'Help Age' NGO census of the elected districts. To minimize recall bias of the meals, we utilized clear instructions to participants. Additionally, efforts to mitigate measurement bias of the MNA scale, appropriate translation and standardized administration of the scale have been ensured.

Ethical consideration: This study was performed following obtainment of ethical clearance for the protocol from Institutional Review Board (IRB) of BSMMU. Informed written consent from all respondents was availed prior to the participation in the study. The anonymity and confidentiality was maintained. Collected information was used only for research purposes not otherwise.

Result

Respondents of the study aged between 65 to 90 years with the mean age of 73.48 ± 7.11 years. The percentage of male respondents was 53.2%, while that of female respondents was 46.8% (Table 1).

Table 1: Sociodemographic characteristics of the respondents (N=220)

Sociodemographic characteristics of the respondents (N=220)			
	Range	Mean/Frequency	SD/Percentage
Age (in years)	65-90	73.48	7.11
Sex	Male	117	53.20%
	Female	103	46.80%

When evaluated with MNA scale, 40.5% of the respondents were malnourished, 16.4% were at risk of malnutrition. Rest of the 43.1% was in nourished status (Figure 1).

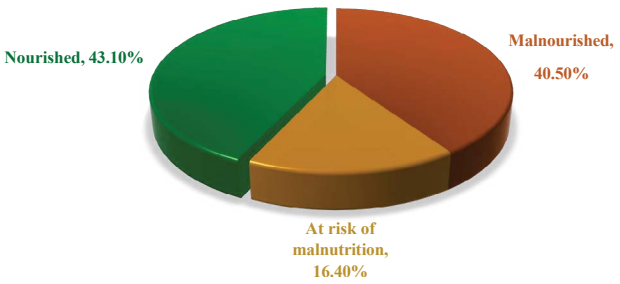

Figure 1: Nutritional status of the respondents according to MNA (Mini Nutritional Assessment) scale (N=220).

The pattern of foods consumed by the respondents showed that, majority of the respondents (57.3%) claimed to have bread with vegetable at breakfast. Rice is consumed by 37.7% of the respondents in the breakfast, among whom 20.9% eat rice with fish and 16.8% eat rice with mashed potato. Rice, vegetable and meat was consumed by majority of the respondents at lunch (44.1%) and dinner (46.4%). Rice, vegetable and fish was consumed by 35.0% respondents at lunch and 25.9% respondents at dinner. Water intake found to be approximately 2 liters per day for 47.3% of the respondents and 3 liters per day for 32.7% of the respondents. 20.0% of the respondents gave history of drinking around 1 liter of water per day. When assessed for food consumption from different food groups, 53.64% of the respondents gave history of consuming sugary food, 67.73% of the respondents gave history of consuming saturated fat containing food, 56.82% of the respondents gave history of consuming salty foods on a regular basis. Fruits and fiber rich food found to be consumed by very few of them (12.73% and 10.00% respectively) (Table 2).

Table 2: Food consumption pattern among the respondents (N=220)

Food consumption pattern among the respondents (N=220)			
	Consumed foods	Frequency (n)	Percentage (%)
Breakfast	Bread with vegetable	126	57.30%
	Rice with fish	46	20.90%
	Rice and potato	37	16.80%
	Fruits and biscuit	11	5.00%
Lunch	Rice, vegetable and meat	97	44.10%
	Rice, vegetable and fish	77	35.00%
	Bread and vegetable	46	20.90%
Dinner	Rice, vegetable and meat	102	46.40%
	Rice, vegetable and fish	57	25.90%
	Bread and vegetable	61	27.70%
Water intake per day	1 liter	44	20.00%
	2 liter	104	47.30%
	3 liter	72	32.70%
Food groups	Sugary food	118	53.64%
	Saturated fat food	149	67.73%
	Salty food	125	56.82%
	Fruits	28	12.73%
	Fiber-rich-food	22	10.00%

The food consumption pattern was compared between the respondents who found to be nourished and respondents who were malnourished or at risk of malnutrition. It has been observed that, the pattern of food consumption at breakfast and lunch are associated with the nourishment status of the respondents ($p<0.05$). At breakfast, majority of the respondents of the malnourished or at risk of malnutrition

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group found to eat bread, whereas, majority of the respondents of the nourished group found to eat rice ($p<0.05$). At lunch, meat consumption showed to be significantly more in the nourished group compared to the malnourished or at risk of malnutrition group ($p<0.05$). Water intake did not have significant association with nourishment status of the respondents ($p>0.05$). On the other hand, sugary food, saturated fat food, high potassium foods are associated with the nourishment status of the respondents ($p<0.05$) (Table 3).

Table 3: Food consumption pattern and nutritional status of the respondents (N=220).

Food consumption pattern and nutritional status of the respondents (N=220)				
		Malnourished or at risk of malnutrition	Nourished	p value*
		n=125	n=95	
	Consumed foods	n (%)	n (%)	
	Bread with vegetable	97 (77.6%)	29 (30.5%)	
Food at Breakfast	Rice with fish	12 (9.6%)	34 (35.8%)	<0.05
	Rice and potato	5 (4.0%)	32 (33.7%)	
	Fruits and biscuit	11 (8.8%)	0 (0.0%)	
Food at Lunch	Rice, vegetable and fish	60 (48.0%)	17 (17.9%)	
	Rice, vegetable and meat	41 (32.8%)	56 (58.9%)	<0.05
	Bread and vegetable	24 (19.2%)	22 (23.2%)	
Food at Dinner	Rice, vegetable and fish	38 (30.4%)	19 (20.0%)	
	Rice, vegetable and meat	59 (47.2%)	43 (45.3%)	0.072
	Bread and vegetable	28 (22.4%)	33 (34.7%)	
Water intake per day	1 liter	29 (23.2%)	15 (15.8%)	
	2 liter	53 (42.4%)	51 (53.7%)	0.204
	3 liter	43 (34.4%)	29 (30.5%)	
	Sugary food	82 (65.6%)	36 (37.9%)	<0.05
	Saturated fat food	72 (57.6%)	77 (81.1%)	<0.05
Food groups	Salty food	65 (52.0%)	60 (63.2%)	0.064
	Fruits	16 (12.8%)	12 (12.6%)	0.569
	Fiber-rich-food	9 (7.2%)	13 (13.7%)	0.087
	High potassium foods	20 (16.0%)	38 (40.0%)	<0.05

*p value was determined by Chi-square test after adjusting with Fisher's exact. Data expressed in column

Discussion

Bangladesh lacks a dedicated health and nutrition surveillance and monitoring system specifically tailored to address the needs of the elderly population. While the country has made significant progresses in healthcare and nutrition initiatives, there remains a notable gap in adequately tracking and addressing the nutritional challenges faced by older adults. The current trend in demographic shifts resulting in an increased number of elderly populations' demands documentation of data regarding the health status, dietary habits, and general well-being of the elderly to plan for strategies to alleviate the increased burden of illnesses linked to malnutrition. Such documentation is crucial for designing targeted healthcare interventions, implementing preventive measures, and allocating resources effectively to meet the specific needs of older adults. In this context, the current research work conducted a comprehensive assessment of 220 elderly individuals residing in three distinct urban areas of Bangladesh through a systematic series of house-to-house visits. The sample presented with a mean age of 73.48 ± 7.11 years within the range of 65 to 90 years, among whom 53.2% and 46.8% of the respondents were male and female (respectively. Among these respondents, 40.5% were malnourished, 16.4% were at risk of malnutrition and 43.1% were in well-nourished status. A recent study community based study in selected upazilas of Bangladesh found that, in a sample of 400 elderlies, the respondents with malnutrition was 25.4%, people at risk of malnutrition was 58.8% and respondents with satisfactory nourishment status was 15.8% when assessed with MNA scale [20,21]. The difference of proportion of respondents with well-nourishment between these two studies suggests huge discrepancy in nutritional attainment of the elderly people living in urban versus rural locality in Bangladesh. From various other research studies, disparities in the nutritional well-being of elderly individuals residing in urban and rural areas have been observed, with urban seniors generally exhibiting superior nutritional status [22,23]. In other studies malnutrition among elderlies have been recorded as 26%, 40%, 53.8% [24–26].

The majority of participants, accounting for 57.3%, reported having bread with vegetables for breakfast. The majority of participants consumed rice, vegetables, and meat for both lunch (44.1%) and dinner (46.4%). Additionally, rice, vegetables, and fish were consumed by 35.0% of respondents at lunch and 25.9% at dinner. The food consumption at breakfast and lunch significantly impacts the nourishment status of the respondents in this study ($p<0.05$). At breakfast, bread was more commonly consumed by the malnourished or at risk of malnutrition group, whereas, rice was more commonly consumed by the nourished group of respondents ($p<0.05$). Rice was commonly consumed food at lunch and dinner in both the nourished and malnourished or at risk of

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malnutrition groups. Research findings suggest that including rice into the diet of the elderly is recommended for maintaining optimal nourishment, which aligns with the observations made in our study [27]. At lunch, meat consumption showed to be significantly higher in proportion in the nourished group compared to the consumption of malnourished or at risk of malnutrition group ($p<0.05$). For better nourishment, meat is advocated to include in the diet of an elderly, as it offers high biological value protein and essential trace elements, contributing to a balanced nutritional intake [28]. Scientists also recommend eating enough meat to remain functional at older age [29]. The traditional and cultural background of Bangladesh contributes to an increased consumption of meat among its people which is also observed in this study.

Water intake found to be below the recommended guideline [30] for majority of the respondents, where less than half of the respondents claimed to drink 3 liters of water per day. Though was no significant association observed between water intake and nourishment status of the respondents ($p>0.05$), However, there was a higher percentage of respondents in the malnourished or at-risk- of-malnourishment group who consumed less water, specifically 1 liter. Findings from other studies also showed inadequate water intake significantly increases the risk of malnutrition among elderlies [31].

When assessed for food consumption from different food groups, 53.64% of the respondents found to consume sugary food, 67.73% of the respondents found to consume saturated fat containing food, 56.82% of the respondents gave history of consuming salty foods. Fruits and fiber rich food found to be consumed by very few of them (12.73% and 10.00% respectively). In another study in Bangladesh also depicted low prevalence of consuming fruits and high prevalence of consuming carbohydrate and fat rich foods [32]. We found that, sugary food, saturated fat food, high potassium foods are linked with the nourishment status of the sample ($p<0.05$). In this study, sugar containing food was consumed less in amount by malnourished or at risk of malnutrition group compared to the nourished group of respondents. However, saturated food was reported to be consumed by higher proportion of nourished group of respondents. Higher consumption of meat, consequent in higher intake of saturated fat in this sample. Additionally, high potassium foods found to be consumed significantly higher in proportion by respondents with nourished status than malnourished or at risk of malnutrition group ($p<0.05$). Adequate potassium intake proved to be crucial for the nutritional well-being of elderly individuals. Potassium is crucial for numerous bodily functions, such as the regulation of blood pressure, supporting muscle function, maintaining bone health, ensuring proper kidney function, and balancing electrolytes [33]. Overall, food intake from diversified food groups found to be low among this sample. Dietary diversity significantly impacts nutritional status in older adults [34]. Inadequate diversity of food among elderlies is common among Bangladeshi elderly population which found to be related with poor nutrition [26].

Limitation

The findings of the present study may lack generalizability beyond urban settings. Furthermore, cross-sectional design with a small sample size may diminish the ability to establish causal relationships in this study.

Conclusion

The pattern of foods consumed by the elderlies showed that, inadequate dietary diversity was common among this sample. Rice and meat was most consumed foods. Consumption of water, fruits, fiber-rich foods, or foods high in potassium intake was less than adequate among majority of them, while a high proportion consume sugary, saturated fat, and salty foods. This study finding suggests that, even in absence of food insecurity, malnutrition is common among elderlies which mandated for nutrition monitoring and awareness generating through nutritional education among this population. Further large scale study can depict the nationwide situation of the nutritional status of the elderlies in our country which will be beneficial for planning and implementing nutrition targeted policies for elderlies.

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