Original Research Article

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20210202

Urban-rural differentials in nutritional status of ageing in Bangladesh

M. Taj Uddin¹, Momduha Akter¹, Mohammad Kamal Hossain³*, Mohammad Ali Raju⁴, M. Shah Noor²

¹Department of Statistics, ²Department of Mathematics, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh

Received: 01 November 2020 Revised: 14 December 2020 Accepted: 29 December 2020

*Correspondence:

Dr. Mohammad Kamal Hossain, E-mail: kamalbsmrstu@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The growth rate of elderly is the fastest in most of the developing countries including Bangladesh. Nutrition plays fundamental role in maintaining good health especially in old age. This study was an attempt to assess the nutritional status of elderly and to compare it with their location.

Methods: A total of 400 elderly in urban and rural area of Sunamgonj district have been interviewed through a structured questionnaire during July to September, 2019. A person aged 60 and above is included in the sample. Body mass index (BMI), mini nutritional assessment (MNA) short form, descriptive statistics, and Chi square test for association have been used for data analysis.

Results: The analysis revealed that 17 percent elderly were under-weight, 66 percent were normal nutrition, 13 percent were over-weight and 4 percent were obese. The prevalence of malnutrition was found to be 40 percent. The rural elderly were at more risk of being malnourished compared to urban elderly. The mean BMI and MNA score of urban elderly were significantly different from the rural elderly.

Conclusions: The findings show that more proportion of urban elderly are over-weight and obese compared to rural elderly. Therefore, measures should be taken to improve the nutrition status of elderly especially in rural area.

Keywords: Elderly, MNA, Nutritional status, Urban and rural

INTRODUCTION

Ageing is a natural phenomenon. It is a biological reality.¹ Ageing is a continuing physiological process that starts from birth, continues throughout life, and ends with death.² The people with age 60 years or more are considered as the ageing population and in this aged people passes a vulnerable situations in the natural process of life.³ The United Nations uses 60 years as the cut-off points to describe older people.⁴ This age is commonly used as a chronological definition of old or aged. The term oldest old refers to the people with age 80 years and more.⁵

The percentage of elderly is increasing all over the world at an unexpected rate. It has been projected that during the year 2000-2030, the ageing population will be increased from 6.9 to 12 percent globally and 6 to 12 percent in Asia. It is expected that between the years 2000-2050, the world wide ageing population will be doubled from 6.9 to 16.4 percent.⁶ The percentage of elderly population in Bangladesh is increasing gradually. In 2011, it was about 5 percent, whereas in the last year of projection it will be about 25 percent in 2070 which indicates the percentage of the elderly population will be about 5 times in 2070 compared in 2011.⁷ Nutrition is one

³Department of Statistics, Bangabandhu Shiekh Mujibur Rahman Science and Technology University, Gopalganj, Bangladesh

⁴Medical officer, Oasis Hospital, Sylhet, Bangladesh

of the most important factors related to the health of an individual especially among the elderly.

Since the prevalence of diseases generally increases with increasing age, the risk of developing disease-related malnutrition is also high among elderly. To get proper nutrition and maintain a good health status, elderly need adequate food, safe water, proper sanitation facilities and maintaining hygienic standards. WHO recommended establish age-friendly primary health care centers and separate wards/units in the hospitals in order to give the elderly special medical care. 9

The MNA-SF is a screening tool that helps to identify elderly who are malnourished or at risk of malnutrition. The MNA-SF provides a simple and quick method of identifying elderly persons who are at risk for malnutrition, or who are already malnourished. The MNA-SF was developed by Nestlé and leading international geriatricians and remains one of the few validated screening tools for the elderly. It has been well validated in international studies in a variety of settings and correlates with morbidity and mortality. 10-12 The MNA-SF is a well-validated screening tool, based on the full MNA.13 Nutrition plays a very significant role in health condition of a person especially in old age. Nutritional status of the elderly population is seldom focused upon. Comparative data on the nutritional status of urban and rural elderly are limited. So, there is an enormous need of studies on the nutritional status of the elderly in both urban and rural area of Bangladesh. The main objective of the study was to assess urban-rural gap in nutritional status of the elderly. It was also tried to find out the important factors that are associated with malnutrition of the elderly.

METHODS

The empirical data of this study was collected from 400 randomly selected respondents in both rural and urban area of Sunamgonj district in Bangladesh during July to

September, 2019. The respondents were the persons aged 60 years and above. A person aged 60 and above was included in the sample. A simple random sampling technique was used to select the respondents. The required sample size was determined by using the formula as:

$$n = \frac{Z_{\alpha/2}^2}{e^2} \sigma^2$$

Where, $Z\alpha_{/2}$ is tabulated value of Z at 5% level of significance. σ is the standard deviation and e is the margin of error. Assuming $Z\alpha_{/2} = 1.96$, $\sigma = 0.50$, e = 0.05, the sample size becomes 384 approximately. Therefore, we may select at least 384 respondents to conduct the survey. For rounded-up, the sample size would increase 400. A structured questionnaire was administered for collecting the required information. The respondents are interviewed after they gave an informed consent. Descriptive statistical tools along with body mass index (BMI), mini nutrition assessment (MNA) short form, mid-arm circumference (MAC) and Chisquare test have been applied for data analysis.

RESULTS

Table 1 shows the socio-demographic characteristics of the elderly. Most (60%) of the elderly belonged to 60 to 69 years of old. About 59% elderly were females and the rest were males in the both area. Most (60%) of the elderly from both areas belonged to the age group 60 to 69 years. About 83.2% elderly were Muslim. About 61% elderly were illiterate and the rest were literate. More than two third (75%) of elderly belonged to below middle income. About 67.5% urban elderly had financial solvency but in case of rural elderly only 38% had. Among the elderly, 32% lives in nuclear family. The proportion of nuclear family was higher in rural than in urban. On the other hand, the proportion of extended family was higher in urban area than in rural area.

Table 1: Socio-demographic characteristics of the elderly with respect to locality.

Characteristics		Urban N (%)	Rural N (%)	Total N (%)
	60-69	130 (65)	108 (54)	238 (60)
Age (in years)	70-79	46 (23)	70 (35)	116 (29)
	80 and above	23 (11.5)	21 (10.5)	46 (11.5)
Sex	Male	82 (41)	82 (41)	164 (41)
Sex	Female	118 (59)	118 (59)	236 (59)
Religion	Muslim	133 (66.5)	200 (100)	333 (83.2)
Kengion	Hindu	67 (33.5)	0 (0)	67 (16.8)
Marital Status	Married	109 (54.5)	128 (64)	237 (59.2)
	Unmarried	3 (1.5)	0 (0)	3 (0.8)
	Widow	87 (43.5)	71 (35.5)	158 (39.5)
	Divorce	1 (0.5)	1 (0.5)	2 (0.5)
Education	Illiterate	77 (38.5)	167 (83.5)	244 (61)
	Primary	72 (36)	29 (14.5)	101 (25.2)

Continued.

Characteristics		Urban N (%)	Rural N (%)	Total N (%)
	SSC	22 (11)	2(1)	24 (6)
	HSC	16 (8)	0 (0)	16 (4)
	Graduate and above	13 (6.5)	2(1)	15 (3.8)
	Agriculture	124 (62)	115 (57.5)	239 (59.8)
	Housewife	38 (19)	33 (16.5)	71 (17.8)
Occupation	Service	3 (1.5)	1 (0.5)	4(1)
	Business	18 (9)	8 (4)	26 (6.5)
	Retired	17 (8.5)	43 (21.5)	60 (15)
	Below middle income	111 (55.5)	189 (94.5)	300 (75)
Income	Middle income	56 (28)	11 (5.5)	67 (16.8)
	Above middle income	33 (16.5)	0 (0)	33 (8.2)
Financial solvency	No	65 (32.5)	124 (62)	189 (47.2)
Financial solvency	Yes	135 (67.5)	76 (38)	211 (52.8)
	Nuclear	50 (25)	78 (39)	128 (32)
Family type	Joint	93 (46.5)	72 (36)	165 (41.2)
	Extended	57 (28.5)	50 (25)	107 (26.8)
	Single	37 (18.5)	42 (21)	79 (19.8)
Living arrangement	Double	94 (47)	101 (50.5)	195 (48.8)
	Extended	69 (34.5)	57 (28.5)	126 (31.5)

Table 2: Association of nutritional status of elderly with socio-demographic characteristics.

		Urban			Rural			
Variables		Malnutrition n (%)	At risk of malnutrition n (%)	P value	Malnutrition n (%)	At risk of malnutrition n (%)	P value	
Gender	Male	42 (51.2)	40 (48.8)	0.217	28 (34.1)	54 (65.9)	0.020	
Gender	Female	50 (42.4)	68 (57.6)	0.217	41 (34.7)	77 (65.3)	0.930	
A (i	60-69	47 (36.2)	83 (63.8)		31 (28.7)	77 (71.3)		
Age (in	70-79	26 (56.5)	20 (43.5)	0.000	25 (35.7)	45 (64.3)	0.023	
years)	80 and above	19 (79.2)	5 (20.8)		13 (59.1)	9 (40.9)		
Education	Illiterate	44 (57.1)	33 (42.9)	0.012	55(32.9)	112 (67.1)	0.295	
Education	Literate	48 (39)	75 (61)	0.012	14 (42.4)	19 (57.6)		
Occupation	Retired	62 (50)	62 (50)	0.147	44 (38.3)	71 (61.7)	0.102	
Occupation	Not retired	30 (39.5)	46 (60.5)	0.147	25 (29.4)	60 (70.6)	0.193	
Turanuna	Below middle	53 (47.7)	58 (52.3)	0.500	64 (33.9)	125 (66.1)	0.422	
Income	Above middle	39 (43.8)	50 (56.2)	0.580	5 (45.5)	6 (54.5)	0.432	
	Nuclear	20 (40)	30 (60)		20 (25.6)	58 (74.4)		
Family type	Joint	46 (49.5)	47 (50.5)	0.555	31 (43.1)	41 (56.9)	0.078	
	Extended	26 (45.6)	31 (54.4)		18 (36)	32 (64)		

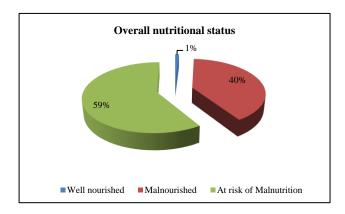


Figure 1: Nutrition status of elderly according to MNA-SF.

According to MNA-SF score, only 1% elderly belong to normal nutritional status. About 59% elderly were at risk of being malnourished and 40% were being malnourished (Figure 1). So, more elderly were at risk of being malnourished than the elderly who were actually malnourished.

It was observed that more proportion of rural elderly (66%) were at risk of being malnourished compared to urban elderly (53%). On the other hand, more proportion of urban elderly (46%) were malnourished compared to rural elderly (35%). Only a few percentages of urban elderly (1.5%) were well nourished when there were no well-nourished respondents in rural (Figure 2). The current study was similar to the finding of the study conducted in India which showed that the prevalence of

malnutrition among elderly was 17.9% and the risk of malnutrition was 58.8%. ¹⁴

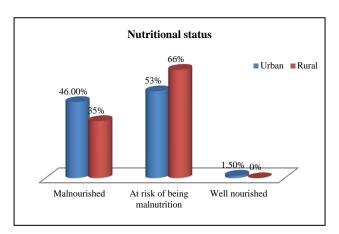


Figure 2: Nutritional Status among elderly in urban and rural area.

A significant association (p<0.05) was found between the nutritional status and age of elderly in both urban and rural areas. More oldest old elderly (79.2%) in urban were being malnourished compared to other age groups. On the other hand, more young old (63.8%) in urban were at risk of malnourished compare to other age groups. The same scenario of nutritional status of elderly had been observed in rural area. The study showed that nutritional status was significantly associated with education only in urban area. No significant association was found between nutritional status with gender, occupation, income and family type. However, female elderly (57.6%) were more vulnerable at risk of malnourished than male (48.8%) in urban area (Table 2).

According to BMI, it was observed that 66% elderly had normal weight, about 17% were under-weight, 13% were over-weight and 4% were obese (Figure 3).

More percentage of urban elderly were over-weight (18.7%) and obese (5.7%) compared to rural elderly where over-weight and obese were 7% and 2% respectively (Figure 4).

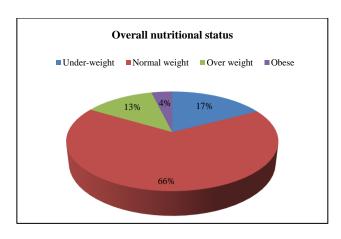


Figure 3: Nutritional status of elderly according to BMI.

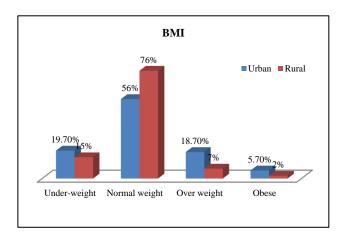


Figure 4: urban-rural gap in nutritional status among elderly.

The study showed that nutritional status was significantly associated with location (urban-rural area) and gender. It is found that 21.9% female elderly and 10.6% male elderly were suffering from under-weight. More female elderly were over-weight and obese compared to male elderly. Less percentage (63.4%) of female elderly were in normal weight compared to male elderly where 73.1% were normal weight (Table 3).

	Location		Total		Gender			
BMI	Urban n (%)	Rural n (%)	n (%)	P value	Male n (%)	Female n (%)	Total (%)	P value
BMI<18.5 (Underweight)	38 (19.7)	30 (15)	68 (17.3)		17 (10.6)	51 (21.9)	68 (17.3)	
18.5 <bmi<24.9 (normal="" th="" weight)<=""><th>108 (56)</th><th>152 (76)</th><th>260 (66.2)</th><th>0.00</th><th>117 (73.1)</th><th>143 (61.4)</th><th>260 (66.2)</th><th>0.03</th></bmi<24.9>	108 (56)	152 (76)	260 (66.2)	0.00	117 (73.1)	143 (61.4)	260 (66.2)	0.03
25 <bmi<29.9 (overweight)<="" th=""><th>36 (18.7)</th><th>14 (7)</th><th>50 (12.7)</th><th></th><th>20 (12.5)</th><th>30 (12.9)</th><th>50 (12.7)</th><th></th></bmi<29.9>	36 (18.7)	14 (7)	50 (12.7)		20 (12.5)	30 (12.9)	50 (12.7)	
30 and above (obese)	11 (5.7)	4(2)	15 (3.8)		6 (3.8)	9 (3.9)	15 (3.8)	
Chi square value	21.22				8.95			

	Location	Location						
Anthropometry	Urban		Rural	Rural				
	Range	Mean±SD	Range	Mean±SD				
Height (in meter)	1.34-1.70	1.55±0.071	1.27-1.78	1.52±0.105	0.004			
Weight (in kg)	30-75	53.55±10.571	35-75	49.24±8.151	0.000			
BMI	13.67-34.60	22.32±4.120	12.84-37.07	21.30±3.294	0.007			
MNA	2-12	7.44 ± 2.09	2-11	7.87±1.81	0.03			
MAC	18-26	22.45±1.964	17-26	21.43±1.945	0.000			

Table 4: Anthropometric indicators of the elderly according to locality.

The anthropometric measurements and MNA score of the elderly according to residence are depicted in Table 4. The mean height, weight, BMI and MAC are significantly (p<0.05) higher in urban elderly than rural elderly. On the other hand, the mean MNA score was significantly (p<0.05) higher in rural elderly than in urban elderly (Table 4).

DISCUSSION

A study was conducted on elderly people and revealed that 62% rural elderly are at risk of malnutrition and only 12% were actually malnourished. This study is very similar to the present study, because this study revealed that more elderly are at risk of being malnourished than actually malnourished.

Another study shows that 31.2% rural male elderly were malnourished where 50% were at risk of being malnourished. This study also revealed that more elderly were at risk of malnutrition than actually being malnourished.

A report shows that more proportion of rural elderly were malnourished (28.4%) and at risk of malnutrition (40.2%) when compared to urban elderly where 8.8% were malnourished and 37.3% were at risk of malnutrition. 17 But the present study shows that more urban elderly (46%) were malnourished compared to rural elderly (35%) and in the case of risk of being malnourished more rural elderly (66%) were at risk than urban elderly (53%). Thomas et al conducted a study which reported that about 30% elderly participants were malnourished and 63% were at risk of being malnourished which is very close to the present study. 18 Because the present study reveals that 60% elderly were at risk of being malnourished and 40% were actually malnourished.

It is clear that there is a gap in nutritional status between urban and rural. Ananthesh et al carried out a study which is very close to our study.¹⁷ Because they observed that urban elderly were over-weight and obese more compared to rural elderly.

A study was conducted in Guwahati city which found that about 65.28% elderly have normal weight, 22.22% were

under-weight, 9.72% were over-weight and 2.77% were obese. This study is very similar to the present study. Because in the present study showed that 66.2% elderly have normal weight, about 17.3% were under-weight, 12.7% were over-weight and 3.8% are obese.

A study in Cambodia showed that the overall prevalence of overweight and obesity of school going children was higher among urban children than the children living in rural areas. Similarly the overall mean height and weight of urban children was higher than rural children.¹⁹ The present study is similar the mentioned study.

Since the study was conducted in some areas of Sunamgonj district with a small sample size, the findings of the study may not represent the actual scenario of nutritional status of urban rural elderly of the country. Further large scale in-depth studies with appropriate design are strongly recommended to get a complete picture of the nutrition status of elderly in the country.

CONCLUSION

The present study concludes that more elderly are at risk of being malnourished than the elderly who are actually malnourished. A very little number of elderly were found to be well nourished. A significant association was observed between nutritional status and age of the elderly in both urban and rural area. The young old and old-old group of elderly are more likelihood to be at risk of malnutrition than the oldest old elderly. The analysis shows that rural elderly are at more risk of being malnourished compared to urban elderly. The mean BMI and MNA score of urban elderly are significantly different from the rural elderly. The findings show that more proportion of urban elderly are over-weight and obese compared to rural elderly. These findings may suggest policymakers to plan appropriate intervention in order to improve the quality of life and successful ageing.

ACKNOWLEDGEMENTS

Authors would like to thanks to the SUST research center for supporting this study.

Funding: Shahjalal University of Science and Technology (SUST) Research center for supporting this study

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- 1. Saikia AM, Mahanta N. A study of nutritional status of elderly in terms of body mass index in urban slums of Guwahati City. J Indian Acad Geriatr. 2013;9(1):20-2.
- Kansal D, Baliga SS, Kruthika K, Mallapur MD. Nutritional Assessment among elderly population of rural Belagavi: a cross-sectional study. Int J Med Sci Public Health. 2016;5(4):1496-9.
- 3. Kharat DSM, Sagare DS, Pandve DHT. A comparative study of nutritional status among elderly population residing in community dwellings and old age homes. Scholars J Appl Med Sci. 2017;5(9D):3780-5.
- 4. World Health Organization. Active ageing: A policy framework. Non-communicable disease prevention and health promotion department, World Health Organization: Geneva; 2002.
- 5. World Health Organization. Men ageing and health: achieving health across the life span. Non-communicable disease prevention and health promotion department: Geneva; 2001.
- Haque MM, Uddin AKMM, Naser MA, Khan MZH, Roy SK, Arafat Y. Health and nutritional status of aged people. Chattagram Maa-O-Shishu Hosp Med Coll J. 2014;13(3):30-4.
- Hossain MM. Projection on elderly population in Bangladesh. Jahagirnagar Univ J Sci. 2016;39(1):1-10.
- 8. Stratton RJ, Green CJ, Elia M, eds. Causes of disease-related malnutrition: An evidence-based approach to treatment. CABI Publishing, Wallingford: UK; 2003.
- 9. Barikdar A, Ahmed T, Lasker SP. The situation of elderly in Bangladesh. Bangladesh J Bioethics. 2016;7(1):27-36.
- 10. Guigoz Y, Vellas B, Garry PJ. Mini nutritional assessment: a practical assessment tool for grading the nutritional state of elderly patients. In: Vellas B,

- ed. The Mini Nutritional Assessment (MNA). Supplement 2, Serdi Publisher: Paris; 1994;15-59.
- 11. Guigoz Y. The mini nutritional assessment (MNA) review of the literature- What does it tell us? J Nutr Health Ageing, 2006;10(6):466-85.
- 12. Murphy M, Brooks C, New S, Lumbers M. The use of the mini-nutritional assessment (MNA) tool in elderly orthopaedic patients. Eur J Clin Nutr. 2000;54(7):555-62.
- 13. Kaiser MJ, Bauer JM, Ramsch C, Uter W, Guigoz Y, Cederholm T, et al. Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): a practical tool for identification of nutritional status. J Nutr Health Aging. 2009;13(9):782.
- Krishnamoorthy Y, Vijayageetha M, Kumar SG, Rajaa S, Rehman T. Prevalence of malnutrition and its associated factors among elderly population in rural Puducherry using mini-nutritional assessment questionnaire. J Fam Med Prim Care. 2018;7:1429-33.
- Ferdous T. Determinants and functional impact of nutritional status among older persons in rural area. Clinical Nutrition and Metabolism, Uppsala University; 2009:42-50.
- Ghosh A, Dasgupta A, Paul B, Sembiah S, Biswas B, Mallik N. Screening for malnutrition among the elderly with MNA scale: a clinic based study in a rural area of West Bengal. J Contemp Med Res. 2017;4(9):1978-82.
- 17. Ananthesh B, Geeta V, Dattatraya D. A community based cross-sectional study to assess malnutrition among elderly population residing in urban and rural areas of a district in Karnataka, India. Int J Community Med Public Health. 2017;4(1):53-6.
- 18. Thomas DR, Zdrowski CD, Wilson MM, Conright KC, Lewis C, Tariq S, et al. Malnutrition in subacute care. Am J Clin Nutr. 2002;75(2):308-13.
- 19. Horiuchi Y, Kusama K, Kanha S, Yoshiike N. Urban-rural differences in nutritional status and dietary intakes of school-aged children in Cambodia. Nutrients. 2019;11:14.

Cite this article as: Uddin MT, Akter M, Hossain MK, Raju MA, Noor MS. Urban-rural differentials in nutritional status of ageing in Bangladesh. Int J Community Med Public Health 2021;8:558-63.