Original article

Gender Differentials In Nutritional Status of Elderly People In Selected Rural Areas of Bangladesh

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Abstract

Background: The present cross sectional study was undertaken to assess the food habits and nutritional status among elderly people in rural Bangladesh and to compare the same between male and female. A simple random sampling and geographical re-conciliation method was used to select the study population. All the patients in a pre-publicized medical camp were approached and a total of 186 male and 237 female participated in the study. Data were collected through face to face interview with a semi-structured questionnaire and anthropometric measures were collected using instruments. Associations between dietary intake and World Health Organization (WHO) referred Body Mass Index (BMI) range was done using cross tabulation. *Results:* The mean age of male was 67.69 years and that of female was 65.46 years. The female subjects were higher than males in number in this study. The rate of male literacy was found to be 39.8% where literacy among the female was 13.9%. Among all, 79.6% males were found to be living with their spouse where the rate of living with spouse among the female amounted 53.2%. About half of elderly people were found to be living under poor and 32% in low middle class socio-economic condition. Study revealed that 80.6% male and 78.9% female got no opportunity to take protein-rich food more than three days per week. Again 95.7% male and 97.5% female had no opportunity take more than two servings of protein rich food per week. The similar case occurred in case of taking fatty food, vegetable and fruits per week. Similarly 100 % male and 99.6% female reported that they were taking more than two servings of fatty food per week. No significant association was found between BMI and food intake. The significance was tested by Pearson chi-square. In this test the p –value for protein rich food was 0.234 (p?0.05), while fatty food (0.712), vegetable (0.502) and fruits (0.274) which was more than referred significance p-value ?0.05. Hence, the study confirmed that malnutrition remains a common problem among older people living in rural Bangladesh though there is no significant association was found between food intake and nutrition. *Conclusion:* Management of malnutrition in case of elderly population requires a multidisciplinary approach that treats pathology and uses both social and dietary forms of intervention.

Key Words: Nutritional status; Elderly people; Gender differentials; Bangladesh

Introduction

Aging of population is gradually emerging as an issue not separate from social integration, gender advancement, economic stability or poverty. Demographically, population ageing is a global experience and Bangladesh is also not left untouched by this demographic reality[1]. Bangladesh, has started to experience another emerging issue of population ageing in its highly vulnerable population and development context[2]. In 2007, the number of the elderly people aged 60 and over in this country was 9.41 million and it has increased from 1.94 million in 1951 which is quite phenomenal[3,4]. More than half of the world's

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older population lives in developing countries[4-5]. Medical scientists are expecting that a person can live up to 200 years, even up to 300 years. To increase life expectancy every person has to practice physical work regularly, walk regularly and has to take meals on time with sufficient nutrition[6]. Bangladesh is one of the twenty countries in the world with the largest elderly populations, and by 2025, along with four other Asian countries, will account for 44% of world's total elderly population. This rapidly increasing population is a new and important group in terms of social and health policy in the country[7].

People are living longer; the average life expectancy at birth in Bangladesh has increased to over 60 years[8]. It is found that in poor families, both in rural and urban areas, older people are often unable to meet the demand due to extreme poverty where food is the top priority[9,10]. It has traditionally been the responsibility of the family to provide food and shelter to its elderly members in Bangladesh[11].

Most of the elderly people of Bangladesh are not in a good socio-economic condition due to various problems such as poverty, wage discrimination, want of essential goods and commodities, shelter and compulsory retirement from job when age limit is attained[12]. A small proportion (around 6%) of the total population of Bangladesh constitutes the elderly population, but the absolute number of them is quite significant (about 7.2 million) and the rate of their increase is fairly high[13]. The majority are male in the urban area while most are women in the rural area. About 90% of the urban elderly males live alone and are married, whereas 89% of the rural elderly women living alone are widowed[14]. An extensive study on the importance of health education for improving the health quality of the rural elderly of Bangladesh was conducted b. They concluded that provision of community-based health education intervention might be a potential public health initiative to enhance the health status of the elderly[15]. The work revealed that marital status, work status, monthly income, habit of intoxication significantly affects the health status of female elderly of rural in Bangladesh[16]. The government of Bangladesh has initiated some programs like pension, gratuity, welfare fund, aged persons fund, group insurance and provident fund for the retired government officials and employees. Health care issue of the elderly people in Bangladesh has not yet received any importance, though it is increasing alarmingly.

The present study was undertaken to gather overall information on factors effecting the food habit and nutritional Status of old age people in Bangladesh motivated by the recognition that the best approach to enhance the aged people's dietary habit on the basis of nutritional intake in their daily food in taking condition and lifestyle in Bangladesh. Specifically, the attempt in this study was to investigate the knowledge and habit of elderly people in terms of nutrition intake and prohibiting malnutrition that influence the successful/positive aging of the old age people of the country.

Methodology

The present cross-sectional study was carried out in some rural areas of Boidderbazar Union of Sonargaon Upazilla under Narayanganj district of Bangladesh from January through June 2012. Study population were all men and women aged 60 years who resided in the study area permanently at least for last one year. A simple random sampling method was used to draw the adequate respondents and a total of 423 subjects were selected to interview. A house hold list was collected from the Boidderbazar union parishad. Then elderly population were Identified from the listed house hold based on House to house visit and Government GRN data. Eligible elderly was approached those who consented were recruited. All live old age people whose ages were over 60 years during the study period were included in the study, the respondents who refused to participate in the study and would not willing to provide information was excluded. A Bengali semi-structured questionnaire was prepared based on the stated research question and objectives of the study. WHO's STEP manual and framework followed to design the dietary habit related questionnaire. After explaining the purpose of the study data were collected through face to face interview using questionnaire. Measurement tape and weight machine was used for recording the anthropometric data. The data from the complete questionnaires were entered and analyzed by means of SPSS (statistical package for Ethical approval: This protocol was approved by local Ethics Committee.

Results

Data was collected in this cross sectional study through face to face interview and organizing health camp for getting anthropometric data. A total of 423 respondents including 186 male and 237 female respondents participated in this study whose mean age from male group were 67.69 ± 10.918 and from female group it was 65.46 ± 10.918 years . In this study number of female respondents is higher than number of male respondents. The rate of literacy among the respondents

were 39.8 %male and 13.9 %(n-33) female . Here we found that the literacy of male is almost three times higher than female respondents. Female

intakes in three to five days in a week among the male respondents are 9.1 % (n=17) and in female respondents it is 7.6 %(n=18). Besides

Table 1. Distribution of respondents by weekly food intake (n=423)

Sex	Days/ per week	Protein rich food	Fatty food	Vegetable	Fruits
Male	<3 day/week	150(80.6%)	124(66.7%)	49(26.3%)	182(97.8%)
	3-5 days/week	17(9.1%)	18(9.7%)	15(8.1%)	4(2.2%)
	>5 days/week	19(10.2%)	44(23.7%)	122(65.6%)	0(0%)
	Total	186(100%)	186(100%)	186(100%)	186(100%)
Female	<3 day/week	187(78.9%)	183(77.2%)	38(16.0%)	214(90.3%)
	3-5 days/week	18(7.6%)	17(7.2%)	34(14.3%)	11(4.6%)
	>5 days/week	32(13.5%)	37(15.6%)	165(69.6%)	12(5%)
	Total	237(100%)	237(100%)	237(100%)	237(100%)

Mean ±SD for male respondents=1.30±0.64, 1.60±0.14,   2.37±0.88,   1.02±0.14
Mean ±SD for female respondents=1.35±0.70, 1.38±0.74,   2.53±0.75,   1.14±0.46

respondents reported that their spouse are absent from their life for some certain causes like; died, divorced widowed or separated. The rates of spouse live in male group were higher than female group.

It was found that 80.6 % (n=150) males among the male respondents and 78.9 %   (n=187) females among the female respondents reported they took protein rich food more than three days in a week. More over 66.3 % (n=124) male and 77.2 % (n=183) female told they took same amount of fatty food in a week. From the male respondents 26.3 % (n=49) male and from the female respondents 16.0% (n=38) female expressed that they took vegetable where 97.8% (n=182) males and 90.3 % (n=214) females reported that they took fruits three days in a week.

From this table we instigate that protein rich food

9.7%(n=18) male and 7.2% (n=17) females reported that they took fatty food where 14.3%(n=34) female and 8.1% (n=15) males took vegetable and 2.2% (n=4) male and 4.6%(n=11) took fruits in three to five days in a week.

Considerably it is noticed that protein rich food, fatty food, vegetable and fruits intake pattern for more than five days in week among the female respondents are 13.5 % (n=32), 15.6% (n=37), 69.6% (n=165) in that order . In this regard it was also found that among the male respondents more than five days in a week protein rich food , fatty food and vegetable intake pattern is 10.2%(n=19), 23.7% (n=44), 65.6% (n=122) consequently. No male respondents found who too fruits more than five days in a week.

Among the respondents, 95.7% (n=178) male

Table 2. Distribution of respondents by weekly servings of food intake (n=423)

Sex	Servings/ per week	Protein rich food	Fatty food	Vegetable	Fruits
Male	< 2 servings	178(95.7%)	186(100%)	157(84.4%)	186(100%)
	>2 servings	8(4.3%)	0(0%)	29(15.6%)	0(0%)
	Total	186(100%)	186(100%)	186(100%)	186(100%)
Female	< 2 servings	231(97.5%)	236(99.6%)	135(57.0%)	236(99.6%)
	>2 servings	6(2.5%)	1(0.4%)	102(43.0%)	1(0.4%)
	Total	237(100%)	237(100%)	237(100%)	237(100%)

Mean for male respondents =   104±0.20,   1.00±0.00,   1.15±0.36,   1.00±0.00
Mean for female respondents=1.02±0.60, 1.00±0.06, 1.43±0.06,   1.00±0.06

respondents reported that they are taking more than two servings of protein rich food in a week where 100 % (n=186) male reported that they are taking more than two servings of fatty food, 84.4 % (n=157) told that they are taking more than two servings of vegetable and 100 % (n=186) said that they also taking more than two servings of fruits in a week. At the same time, 97.5% (n=231) female respondents reported that they are taking more than two servings of protein rich food. Where 99.6% (n=236) are taking fatty food, 57% (n=135) taking vegetable and 99.6% (n=236) are

Table 3. Association of BMI and servings of foods intake in a week (n=423)

BMI range (WHO referred range)	Food servings day/ week	Protein rich food	Fatty Food	Vegetable	Fruits
>18.50	< 2 servings	115(28.1%)	118(28.0%)	77(26.4%)	117(27.7%)
	>2 servings	3(21.4%)	0(.0%)	41(31.3%)	1(100.0%)
	Total	118(27.9%)	118(27.9%)	118(27.9%)	118(27.9%)
18.50 ▯ 24.99	< 2 servings	241(58.9%)	251(59.5%)	176(60.3%)	252(59.7%)
	>2 servings	11(78.6%)	1(100.0%)	76(58.0%)	0(.0%)
	Total	252(59.6%)	252(59.6%)	252(59.6%)	252(59.6%)
≤ 25.00	< 2 servings	53(13.0%)	53(12.6%)	39(13.4%)	53(12.6%)
	>2 servings	0(.0%)	0(.0%)	14(10.7%)	0(.0%)
	Total	53(12.5%)	53(12.5%)	53(12.5%)	53(12.5%)
	Total	423(100.0%)	423(100.0%)	423(100.0%)	423(100.0%)
Statistical test (Pearson Chi-Square)		p=0.234	p=0.712	p=0.502	p= 0.274

Table 4. Descriptive statistics of nutritional factors (n=423)

Variable	sex	Mean	Std. Deviation	Minimum	Maximum	Percentiles 25	Percentiles 75	Statistical Test
Height in cm	Male	161.84	07.58	145.00	177.00	155.00	168.00	t=13.859
	Female	150.83	08.49	95.00	165.00	146.00	156.00	p=0.000
Weight in kg	Male	54.82	12.84	35.00	91.00	45.00	62.00	t=5.918
	Female	48.39	09.49	29.00	76.00	40.50	55.00	P=0.000
BMI	Male	20.82	04.16	13.01	34.67	17.90	22.77	t=-1.072
	Female	21.23	03.70	15.01	42.11	18.63	23.30	p=0.285
HIP	Male	88.61	10.65	70.00	113.00	80.00	93.00	t=0.672
	Female	87.88	11.58	70.00	113.00	77.50	93.00	p=0.502
WAIST	Male	73.30	09.11	50.00	86.00	66.00	81.00	t=0.788
	Female	72.56	09.83	50.00	86.00	63.50	81.00	p=0.431
WHR	Male	0.82	0.04	0.67	0.89	0.80	0.86	t=0.335
	Female	0.82	0.04	0.71	0.90	0.80	0.86	p=0.738

taking more than two servings of fruits in a week. Among the respondents, less than two servings of protein rich food, fatty food, vegetable and fruits intake is considerably very poor. In male respondents only 4.3 %(n=8) and 15.6 %(n=29) respectively are taking protein rich food and vegetable in a week which is less than or equal to two servings. In female respondents 2.5 % (n=6) are taking protein rich food, 0.4 % (n=1) fatty food, 43% (n=102) vegetable and 0.4 % (n=1) are taking fruits in a week which is quantify as less than two serving.

A cross tabulation was done to find out the association between servings of food intake in a week and World Health Organization (WHO) referred Body Mass Index (BMI) range. No significant association was found when the cross tabulation was tested by Pearson chi-square. In this test the P –value of protein rich food is 0.234, fatty food 0.712, vegetable 0.502 and fruits 0.274 which is more than referred significance P-value ?0.05. So from this tabulation and statistical test we can say that there is no significant association between food habit and BMI.

The above table shows that the mean height and weight of male is 161.84 cm and 54.82kg where the mean height and weights of females are 150.83 cm and 48.39 kg respectively. Among the males the maximum height was 177 cm and minimum were 145 cm and the maximum weights of the males were 91 kg where minimum weight was 35 kg during the survey. Besides the maximum heights of the females were 165 cm where the minimum were 95 cm. and maximum weight among them were 76 kg where minimum was 29 kg. Among the respondents the mean BMI of males 20.82 and females are 21.23 and maximum BMI of male is 34.67 where the minimum is 13.01. On the other hand the maximum BMI among females are 42.11 and minimum is 15.01. The mean hip ratio of male is 88.61cm and female is 87.88cm and the mean waist ratio of male and females are 73.30 cm and 72.56 cm respectively. The mean waist-hip ratios (WHR) among the male respondents are 0.82 cm, the same mean of WHR found in the female respondents (0.82cm). The maximum WHR among male and female are not far difference from each other respondents. In male respondents the maximum WHR is found 0.89 and minimum is 0.67 cm where female respondent's maximum WHR are 0.90 and minimum is 0.71cm. The minimum WHR among the female respondents are little bit higher than male respondents. No significant relation was found both male and female except height and weight.

Discussion

The present cross sectional study has confirmed that malnutrition remains a common problem among older people living in rural areas of Bangladesh. During the last 15 years a considerable number of studies have examined the nutritional status of institutionalized elderly people and reported prevalence figures for malnutrition and nutritional problems, this study was conducted among the 423 male and female senior citizen of Boidderbazar union of Sonargaon upazilla of Narayanganj district. The male female ratio in this study was 186 male and 237 female.

The mean age of the interviewed male participants of this study were 67.69 years where the mean ages of female were 65.46 years. Ideally the respondents were selected age over sixty years as the elderly people defined as the age not less than 60 years. So the selection of sample by age category for this study was very correct. Based on the availability the respondents were interviewed and in this regards the number of female were higher than number of male respondents. Female respondents were more available during the field work. Its actually Bangladeshi social context that female is more home seeker than male. During the old age female are become dependent on other family member that's why during household listing more female were found in the house than female.

The literacy of the respondents were categorize into two broad category one is literate and another is illiterate. Persons those who had no formal or informal education they are in illiterate category and those who had at least one or more years of education are in literate category. The literacy rate among the male is higher than the female. The rate of male literacy is 39.8% where among the female is 13.9% almost three times lower than male elderly people.

In some studies, the level of education was directly associated with nutritional status. In a study at Iran found, nutritional status was also associated with education. A higher level of education was possibly associated with higher income and better lifestyle, Depression is also extremely prevalent in older adults, but is a problem that is often overlooked. It contributes to illness, alcohol and prescription drug abuse, mortality and suicide. Despite these obstacles, seniors, especially in rural areas, often exhibit a strong sense of independence and coping, determination, and a sense of community[17]. The habits and lifestyles that have led to resiliency (i.e. a greater ability to cope with stress and adversity) in these elderly people is the focus

of the current study. In the following sections, studies examining resiliency, the importance of gender and a rural setting, along with the uniqueness of using a narrative approach are reviewed.

The average life expectancy in Bangladesh is ± 60 years. Generally it is found that after the age of 60, the old age people become alone as because of dead of husbands or wife. In some cases before age of 60 separations or divorce lead old age people to become couple less. During this study it was found that 79.6% males are living with their spouse where the rate of living with spouse among the female were 53.2%. On the other hand 20.4% males and 46.8% females spouse is absent from their life due to some certain causes like, died, widow, divorce etc. It is found that the spouses present among the males are higher than female respondents.

Psychological and socio-economic problems such as depression, life events and loneliness may reduce appetite. Loneliness and reluctance to eat may complicate an already marginal situation for nutritional risk in the elderly. Elderly people are especially vulnerable to loneliness. As an interesting and surprising subject, loneliness is also an important problem for many elderly people in Iran.

A bigger number of old age people have no any occupation. They are doing nothing in this retirement period. The proportion of this group of senior citizen found in this study is 35.9%.As this proportion citizens are doing nothing they said they have no self income. In this regard 60.8 % older people found who have no any income. Interestingly it is found in this study that 23.6% elderly are involved in home work , some 18.7% are in agriculture sector and 10.2% are in day labour and/or rickshaw puller. So we can say that our senior citizen are not our burden, they are our resource. We just need to ensure their good health.

Older people's health may also be compromised by poor diet and nutrition. A study in central Ethiopia found that 67% of older people were malnourished; a third of these were severely malnourished[18]. Malnutrition's causes may include poverty, responsibility for supporting grandchildren, living alone or age-related disabilities such as immobility, blindness and/or loss of teeth[19].

Most of the elderly people of Bangladesh aren't in a good socio-economic condition due to various problems such as poverty, wage discrimination, want of essential goods and commodities, shelter and compulsory retirement from job when age limit is attained.

As the socio-economic impact of ageing population on the society is evident, it is important to consider not only the degree but also the pace of the changes in the age structure.

In this study it is found that almost 50% of elderly people are living under poor and 32% are in low middle class socio-economic condition. The nutritional status found in this study was associated with some of socio-economic conditions such as education, marital status, gender, number of child, type of living and taking medicine

Social and economic conditions can adversely affect dietary choices and eating patterns. Elderly people become vulnerable to malnutrition owing to inappropriate dietary intake, poor economic status and social deprivation, in this study it is found that 0nly 10.2% male and 13.5% female elderly can have protein rich food more than five days in a week. Major portion that is 80.6% male and 78.9% female have no opportunity to take protein rich food more than three days in a week. Again 95.7% male and 97.5% female had no opportunity take more than two servings of protein rich food in a week. The similar case is occurred in taking fatty food, vegetable and fruits in a week. In this study it is found that the percentage of more than three days in a week fatty food, vegetable and fruits intake among the male elderly is 66.7%, 26.7% and 97.8%. In female the rate is 78.9% fatty food, 77.2% vegetable and 90.3% fruits.

According to the one review of 79 published studies conducted on elderly people[20], the proportion of elderly people suffering from malnutrition varies between 1 %and 74%and the risk of malnutrition were between 8 % and 87. % in the study performed in all nursing homes in Helsinki, malnutrition was common among elderly residents living in nursing homes and according to the Mini Nutritional Assessment, 11 %to 57 %of the elderly people studied actually suffered from malnutrition, and 40 %to 89 %were at risk of malnutrition, whereas only 0 %to 16 %was in good nutritional status[21, 22].

Among the respondents, 95.7% male and 97.5% female respondents reported that they are taking more than two servings of protein rich food in a week where 100 % male and 99.6% female reported that they are taking more than two servings of fatty food in a week. 84.4 % male and 57% female told that they are taking more than two servings of vegetable and 100 % male and 99.6% female said that they also taking more than two servings of fruits in a week.

The lower scores of Mini Nutritional Assessment were associated in our study with female gender .Findings of other studies were similar.

Nutritional status, eating patterns and energy intake in those institutionalized elderly individuals who respond positively to interventions. A cross tabulation was done to find out the association between servings of food intake in a week and World Health Organization(WHO) referred Body Mass Index (BMI) range. No significant association was found when the cross tabulation was tested by Pearson chi-square. In this test the P –value of protein rich food is 0.234, fatty food 0.712, vegetable 0.502 and fruits 0.274 which is more than referred significance P-value ?0.05. So from this tabulation and statistical test we can say that there is no significant association between food habit and BMI.

Inadequate micronutrient intake among older people is common due to diminished amount of food intake. In this study it was found that a major portion (81.6%) of the respondents reported that they are not taking any kind of vitamin. Only 18.4 % respondents said that "yes" they are taking some kind of vitamin currently.

In this study it was found that, 30.6% male are in low physical activities, 17.2 % are in medium physical activities and 52.2 % are involved in high physical activities. On the other hand 38.8% female are in low physical activities, 25.3% are in medium physical activities and 35.9% females are involved in high physical activities.

Associations between dietary intake and nutritional status were examined in 423 elderly people aged ?60 years and found no significant association between food intake and nutrition among the study population. The dietary patterns of the elderly are in general "healthier" than that of younger adults except for higher salt intake among the elderly.

Conclusion and Recommendations

The present study revealed that malnutrition remains a common problem among older people living in rural Bangladesh though there is no significant association was found in food intake and BMI. Malnutrition in this group is an increasing hazard especially for women, for people having a disease, low level of education, number of child, and psychological problems. The elderly population is affected by many causes of malnutrition, which can be reversed if it is addressed earlier than the development of malnutrition.

Management of malnutrition in the elderly population requires a multidisciplinary approach that treats pathology and uses both social and dietary forms of intervention. Without intervention, it presents as a downward trajectory leading to poor health and decreased quality of life. It is important to assess elderly individuals' nutrition, pay attention to nutritional problems, use more nutritional supplements, and provide energy and protein-dense food which might delay malnutrition or even improve the nutritional status of elderly residents. Simple methods for assessing nutritional status as well as food and nutrient intake of elderly residents are needed.

Based on the key study findings, some very specific recommendations for further betterment of improving nutritional status of elderly people of Bangladesh considering gender sensitivity are suggested: (a) Ensuring equal access for all elderly irrespective of gender, class or education to take adequate nutritional food, shelter, medical care and other services that promote self-support and personal health.(b) Before any elderly peoples oriented nutritional intervention, this kind of study in large scale is needed for getting authentic information and large scale project planning and implementation. (c) There is a need for the package programmes to improve nutritional status as well as health care of the elderly people. (d) A National Policy for the elderly people is needed for the safeguard of the elderly peoples particularly for female elderly from malnutrition. (e) Nutrition based social safety-net security programme needed to design especially food for elderly population of the country should be extended.

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