



## Dietary intake pattern among elderly people in the urban Cox's Bazar, Bangladesh

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### Abstract

**Introduction:** The number of elderly people is increasing in Bangladesh due to the aggravating life expectancy. It is a matter of concern to ensure the health and nutritional status of elderly people. Dietary intake patterns and behavior are essential factors to ensure the health and nutritional status of elderly people. Thus, this study was conducted to assess the dietary intake pattern among elderly people.

**Objective:** A descriptive type of cross-sectional study was conducted in urban Cox's Bazar in Bangladesh among 175 respondents aged between 60 to 72 years. A semi-structured questionnaire was used for collecting socio-demographic and dietary intake-related information from the respondents. 24-hour recall and 7 days recall methods were used to collect dietary information. Data were analyzed using SPSS software.

**Results:** More than three-fourths (76%) of the respondents were aged between 60 to 65 years. About three-fourths (72.6%) of the respondents used to take meals 3 times in 24 hours. Most of the respondents (59.4%) were taking rice 2-3 times a day. A total of 73.7%, 52.6% & 42.1% of the respondents regularly consumed food containing carbohydrates, protein, and fat regularly. Overall, it was found that only 21.1% of the respondents were practicing a healthy diet whereas the rest (78.9%) weren't.

**Conclusion:** It was found that the majority of the respondents are consuming an unhealthy diet whereas most of the respondents weren't which is indicating the lack of nutritional knowledge among the elderly people. Thus, the dissemination of nutritional education can be recommended to encourage healthy eating among elderly people

**Keywords:** elderly people, Cox's Bazar, good nutritional

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### 1. Introduction

Aging is a continuous process of maturation through childhood, puberty, and young adulthood and followed by declination through middle and later age (Canbaz *et al.*, 2003) <sup>[3]</sup>. A population is said to be aging when the proportion of elder people increases and the proportion of elder people decreases (Rahman *et al.*, 2018) <sup>[13]</sup>. The elderly population is the population whose age is greater than 65 years and this elderly population is divided into early elderly (65 to 74 years) and late elderly (above 75 years) (Orimo *et al.*, 2006) <sup>[11]</sup>. The number of elderly people is increasing rapidly around the world (Wyka *et al.*, 2012) <sup>[20]</sup>. From a projection, it is seen that there will be an increase in the elderly population aged above 60 years from 550 million to 930 million between the years 2000 to 2030 (Razon *et al.*, 2022) <sup>[15]</sup>. 7.7% of the world's total population is elderly people reported in 2013 and it was estimated that there will be an increase in the elderly population by 10.2%, 20.8%, and 27.7% by 2023, 2050, and 2075 respectively (Nazan *et al.*, 2018) <sup>[10]</sup>. For long life expectancy and good social conditions, quality of life has been emphasized. Although genetics plays an important role in determining the life span of people, diet and nutrition play a crucial role in influencing the life cycle, health, and quality of life in the elderly (Tur *et al.*, 2005) <sup>[18]</sup>.

The good nutritional status of elderly people has been found to have a positive impact on morbidity, functional capacities, and death rates (Payette *et al.*, 1995) [12]. A variety of reasons for example inadequate dietary intake, underlying illness, gender (women are likely to be more malnourished), and poor economic conditions associated with the nutritional status of the elderly (Kabir *et al.*, 2006) [6]. To ensure optimal health and good quality of life for elderly people, optimum dietary intake of food is essential (Jungjohann *et al.*, 2005) [5]. The progression of many diseases related to elderly people is contributed by inadequate dietary intake (Volkert *et al.*, 2019) [19]. Again, the low-calorie intake of food leads to nutritional deficiencies and nutritional deficiencies lead to malnutrition. There is a shift in the consumption pattern of elderly people. Inadequate dietary intake resulting from poor appetite works as a triggering factor for malnutrition (Khoie *et al.*, 2018). The occurrence of multimorbidity is found to be associated with increasing age and is very common in developing countries (Lahiri *et al.*, 2015) [8]. Globally, 11% of the total population is older people (age above 65 years) and 23% of them are malnourished (Rahman *et al.*, 2021) [14]. Being a developing country, Bangladesh is one of the worst suffers from malnutrition of older people and about 50% of the older adult are malnourished (Rahman *et al.*, 2021) [14]. As dietary intake of food is closely associated with the well-being of elderly people, the study aims to assess the pattern of dietary intake among elderly people in urban areas of Cox's Bazar district.

### Methodology

It was a descriptive type of cross-sectional study. Respondents were randomly selected following the inclusion criteria from different paces of Cox's Bazar city. The sample size was 175 which was calculated using the formula " $n = z^2 pq/d^2$ " in 95% confidence interval and 5% level of significance. The respondents were aged from 60 to 72 years and residents of Cox's Bazar city. A random sampling technique was used for sampling and 175 people from 60 to 72 years and above were interviewed from the urban area of Cox's Bazar. These respondents were from different areas of the urban part of Cox's Bazar. A semi-structured questionnaire was used for data collection. The questionnaire was pretested and translated into the local dialect. Respondents were interviewed directly. For dietary data, 24-hour recall and 7 days recall methods were used. Data entry and analysis were done by using SPSS (Version 20). Before collecting the data, informed consent was taken from respondents. Also, the respondents were assured that all their information will be kept confidential and they have to right to withdraw their names from the study at any time.

### Results

The socio-demographic characteristics of the study respondents are presented in table 1. Among the 175 respondents, 76% were aged between 60 to 65 years followed by 17.7% of respondents who were aged between 66 to 71

years. The mean age for the respondents was 65.31 years. Most of the respondents (26.3%) had a secondary school level of education, followed by uneducated (18.9%), and primary education (15.4%). About 13.7% had a higher secondary level of education and only 5.7% had a master's level of education. More than 40% of the respondent's monthly income was between BDT 10001-15000, followed by 15001-20000 (19.4%), 5000-10000 (16%) and 14.3% were earning 20000 & above. A total of 9.7% had no monthly income and the mean monthly income was BDT 13000.51.

**Table 1:** Socio-demographic characteristics of the respondents

Socio-demographic characteristics	Frequency (n)	Percentage (%)
<b>Age (years)</b>		
60-65	133	76.0
66-71	31	17.7
72 and above	11	6.3
Mean $\pm$ SD	65.31 $\pm$ 12.29	
<b>Level of education</b>		
Uneducated	33	18.9
Primary	27	15.4
Secondary	46	26.3
Higher Secondary	24	13.7
Bachelor	22	12.6
Masters	10	5.7
Others	13	7.4
<b>Monthly income (BDT)</b>		
5000-10000	28	16.0
10001-15000	71	40.6
15001-20000	34	19.4
20000 & above	25	14.3
No Income	17	9.7
Mean $\pm$ SD	13000.51 $\pm$ 2102.05	

More than Two-thirds (72.6%) of the respondents used to take meals 3 times in 24 hours, followed by 4-5 times (17.1%) and the rest (10.3%) used to take meals 6 times and above in 24 hours (Table 02).

**Table 2:** Frequency of taking meal

Meal taking frequency	Frequency (n)	Percentage (%)
3 times	127	72.6
4-5 times	30	17.1
6 & above	18	10.3

Most of the respondents (59.4%) were taking rice 2-3 times a day and about 45.1% were taking biryani per day. About 69.7% of the respondents were taking singara (a local snack made of flour and potato) at least ones in a day and 54.3% were taking ruti (Bread) once per day. More than half (51.4%) of the respondents used to take meat/beef once per day and 53.7% used to take chicken once a day. About 29.1% used to take fish once a day and 38.9% of the respondents used to take eggs at least once a day. 18.3% of respondents were having milk and milk products (Table 03).

**Table 3:** Intake of different food items by the Respondents

Name of the food	1/day N (%)	2-3/day N (%)	None N (%)
Rice	71(40.6)	104(59.4)	--
Biryani (Any kind of rice with meat)	79(45.1)	19(10.9)	77(44.0)
Singara*	122(69.7)	18(10.3)	35(20.0)
Ruti**	95(54.3)	21(12.0)	59(33.7)
Paratha***	101(57.7)	14(8.0)	60(34.3)
Muri	76(43.4)	63(36.0)	36(20.6)
Meat/Beef	90(51.4)	53(30.3)	32(18.3)
Chicken	94(53.7)	32(18.3)	49(28.0)
Vegetables and Non-leafy vegetables	66(37.7)	74(42.3)	35(20.0)
Fish	51(29.1)	33(18.9)	91(52.0)
Milk & Milk Product	32(18.3)	13(7.4)	130(74.3)
Egg	68(38.9)	29(16.6)	78(44.6)
Beans	83(47.4)	21(12.0)	71(40.6)
Fruits	61(34.9)	53(30.2)	61(34.9)
Khichuri (Hotchpotch)	47(26.9)	31(17.7)	97(55.4)
Puri****	68(38.9)	19(10.9)	88(50.3)
Noodles	71(40.6)	21(12.0)	83(47.4)
Biscuit	32(18.3)	14(8.0)	129(73.7)
Soft drinks	67(38.3)	19(10.9)	89(50.9)

\*A snack made with flour and potato

\*\*Bread

\*\*\*Bread with oil

\*\*\*\*A snack made with flour and pulse

About three-fourths (73.7%) of the respondents consumed food containing carbohydrates. More than half (52.6%) of the

respondents' food contained protein and 42.1% of respondents' food contained fat (Table 04).

**Table 4:** Food Distribution based on macronutrients (Multiple responses)

Type of macronutrient	Frequency (n)	Percentage (%)
Carbohydrate	19	73.7
Protein	10	52.6
Fat	8	42.1
Others	4	21.0

Overall, it was found that only 21.1% of the respondents had a healthy diet whereas the majority of the respondents

(78.9%) had an unhealthy diet (Table 05).

**Table 5:** Overall dietary intake of the Respondents

Diet type	Frequency (n)	Percentage (%)
Healthy diet	37	21.1
Unhealthy diet	138	78.9

## Discussion

The age of the respondents was not significantly associated ( $P=0.140$ ) with the dietary intake of the respondents. Most (37.8) of the respondents that had healthy dietary intake were found to be between 66-71 years of age group. The educational level of the respondents was significantly associated ( $P=0.001$ ) with their dietary intake of the

respondents. Most of the respondents that had healthy dietary intake were found to have higher educational levels such as bachelor's degree and above. The monthly income of the respondents was found to be significantly associated ( $P=0.021$ ) with their dietary intake of the respondents. The study respondents who had higher monthly incomes were found to have a healthy dietary intake.

**Table 6:** Association between the dietary intake and socio-demographic characteristics of the Respondents

Socio-demographic variables	Dietary intake			Chi-square	P value
	Healthy diet N (%)	Unhealthy diet N (%)	Total N (%)		
<b>Age (years)</b>					
60-65	13 (35.1)	120 (87.0)	133 (76.0)	20.901	0.140
66-71	14 (37.8)	17 (12.3)	31 (17.7)		
72 and above	10 (27.1)	1 (0.7)	11 (6.3)		
<b>Total</b>	<b>37 (21.1)</b>	<b>138 (78.9)</b>	<b>175 (100.0)</b>		
<b>Level of education</b>					
Uneducated	1 (2.7)	32 (23.1)	33 (18.9)	31.512	0.001
Primary	2 (5.4)	25 (18.1)	27 (15.4)		
Secondary	3 (8.1)	43 (31.2)	46 (26.3)		
Higher Secondary	7 (18.9)	17 (12.3)	24 (13.7)		

Bachelor	18 (48.6)	4 (2.9)	22 (12.6)		
Masters	7 (18.9)	3 (2.2)	10 (5.7)		
Others	1 (2.7)	12 (8.7)	13 (7.4)		
<b>Total</b>	<b>37 (21.1)</b>	<b>138 (78.9)</b>	<b>175 (100.00)</b>		
<b>Monthly income (BDT)</b>					
5000-10000	3 (8.1)	25 (18.1)	28 (16.0)	18.101	0.021
10001-15000	4 (10.8)	67 (48.6)	71 (40.6)		
15001-20000	12 (32.4)	22 (15.9)	34 (19.4)		
20000 & above	17 (45.9)	8 (5.8)	25 (14.3)		
No Income	1 (2.7)	16 (11.6)	17 (9.7)		
<b>Total</b>	<b>37 (21.1)</b>	<b>138 (78.9)</b>	<b>175 (100.00)</b>		

This present cross-sectional study focuses on the dietary intake of elderly people living in the urban area of Cox's Bazar. The mean age of the participant was 65.31% and 76% of respondents was been 60 to 65 years. So, the selected participant is correct for the intended study (Ali *et al.*, 2013)<sup>[2]</sup>. The age of the respondents was not significantly associated ( $P=0.140$ ) with the dietary intake of the respondents although a study reported that age is a powerful predictor of the state of individual health (Khoie *et al.*, 2018). It might be due to the social and cultural practices prevalent in this area. Most of the respondent's food (73.7%) contained carbohydrates and about 52.6% of the food contained protein. About 42.1% of the food contained fat and the rest contained other nutrients. Similar findings were reported from a study conducted in India (Khoie *et al.*, 2018). The protein intake is relatively higher than in some other studies conducted in Bangladesh (Alam *et al.*, 2021)<sup>[11]</sup>. Another study conducted in Bangladesh and Ethiopia showed mixed responses where a high consumption of any type of animal protein was seen in Bangladesh and a low consumption pattern for animal protein was seen in Ethiopia (Coates *et al.*, 2017)<sup>[4]</sup>. Empirical pieces of evidence show that the availability of sea fish and the high consumption of dry fish are socially and culturally practiced. The majority (78.9%) of the respondents showed unhealthy dietary practices. A similar study result was found in a study conducted in Helsinki, Finland (Saarela *et al.*, 2014). A nationwide survey in Bangladesh about the nutrition and health status of elderly people shows that the majority of the elderly (59% in rural, 53% in non-urban slums, and 69% in slums) people have inadequate dietary intake. 89% of the respondents are found malnourished and 69% of people were at risk of malnutrition (Mridha *et al.*, 2021)<sup>[9]</sup>. Education level is found to be highly associated with dietary intake patterns. A previous study conducted in Dhaka about elderly people shows that elderly people with low education levels tended to be more malnourished than educated ones which is concurrent with our study (Rahman *et al.*, 2021)<sup>[14]</sup>. A study conducted in Colombia also shows a similar result (Lahiri *et al.*, 2015)<sup>[8]</sup>. The study shows that elderly people with higher incomes tend to have a healthier diet. This study's finding adheres to a study conducted in Nepal which shows that unemployed elders tend to have inadequate food and are malnourished (Tamang *et al.*, 2019)<sup>[17]</sup>.

### Conclusion

The findings reveal that the level of education and income of elderly people heavily influence their dietary behavior. Also, the majority of the respondents are consuming an unhealthy diet which is very alarming. It is indicating the lack of nutritional knowledge among the elderly people. It is very much important to understand the nutritional needs of elderly people to provide appropriate nutritional guidance. Thus,

nutritional education dissemination programs can be recommended to encourage healthy eating among elderly people. Also, a similar type of study with a larger sample size in different places is necessary to generalize the findings.

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### Conflict of interest

The authors declared no conflict of interest in this study.

### Consent for publication

All authors have given their consent to publish this article.

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