

## A comparative study on fish intake and nutritional status of children in different areas of Sylhet district, Bangladesh

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### ABSTRACT

A cross-sectional study was conducted on 75 children aged five to ten years old from three different areas (urban,  $N = 25$ , sub-urban,  $N = 25$  and rural,  $N = 25$ ) in Sylhet district, Bangladesh. This present study was undertaken in order to analyze and compare the fish consumption rate and nutritional status of children among these areas. Nutritional status of the target children (both sex) were analyzed with the help of anthropometric measurements which included weight, height Body Mass Index (BMI) and fish consumption rate. This study found that the average heights for both male and female children were 1.16 m, 1.15 m and 1.13 m in urban, sub-urban and rural areas respectively. At the same time, the average weight was 20.08 kg, 19.19 kg and 18.19 kg in urban, sub-urban and rural areas respectively. On the other hand, the average BMI for both sex were 17.35, 14.69 and 14.36 in urban, sub-urban and rural areas respectively. The average fish consumption rate were also calculated and the highest average fish consumption were found in urban area which was 88.98 g and lowest average fish consumption were found in rural area that was 81.85 g for both sex. These findings also revealed that the children in rural area were stunted, underweight and severe thinness than urban and sub-urban areas.

**Key words:** Fish intake, nutritional status, children, Sylhet, Bangladesh.

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### INTRODUCTION

Although Bangladesh has made considerable progress in increasing national level of food availability, the intake of fish nutrients and other essential nutrients is still below the requirements and recommended dietary allowances (World Bank, 2005). Malnutrition among children is a major public health problem in developing countries resulting from consumption of poor diet over a long period of time. Malnutrition is a common problem in Bangladesh (Mohammad *et al.*, 2010) and it is a result and cause of the social and economical underdevelopment (Rahman *et al.*, 2013). Women, mainly children in Bangladesh suffer from high levels of malnutrition. Malnutrition in children has long-lasting effects and affects negatively to the overall growth,

cognitive development, morbidity, educational attainment and adult productivity (Viteri and Gonzalez, 2002). Because of this, the nutritional status of children, particularly between five to ten years of age, is seen as one of the most sensitive indicators of a country's vulnerability to food insecurity and overall socio-economic development.

Nutrition is a basic human need and pre-requisite to a healthy life. A proper diet is essential from the very early stages of life for proper growth, development and to remain active. Fish is the principal source of animal protein providing protein, essential fatty acids and micronutrients. Fish is more nutritious than staple foods (Gibson and Hotz, 2001) and contributes 60% of total animal protein supply to reduce malnutrition. In

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Bangladesh, the nutritional statuses vary in different areas mainly in urban, sub-urban and rural areas. That is why the present study was undertaken to analyze the fish consumption rate and nutritional status of children aged between five to ten years old and compare it among the urban, sub-urban and rural areas in Bangladesh.

## MATERIALS AND METHODS

A cross-sectional study was conducted at Shenpara (urban area), Baluchar (sub-urban area) and Ibrahimpur (rural area) in Sylhet district, Bangladesh. The required subjects included 75 children (aged 5-10 years) from three different areas (urban,  $N = 25$ , sub-urban,  $N = 25$  and rural,  $N = 25$ ) in Sylhet district. Fish intake rate which shows the nutritional status of the target children (both sex) were analyzed with the help of anthropometric measurements. Anthropometric measurements included weight, height and Body Mass Index (BMI).

Body weight of children were weighed by using digital weighing scale, which was calibrated with known weight and balanced at zero before each series of measurements. Standing height of children was measured by using a vertical scale. Weight and height were used for computing BMI (weight [kg]/height [m<sup>2</sup>]) according to the reference of World Health Organization (WHO). In this study, BMI under 16.00 was referred to as severe thinness, 16.00–16.99 as moderate thinness, 17.00–18.49 as mild thinness, 18.50–24.99 as normal range and over 25.00 as overweight.

Data were collected through questionnaire interviews according to the objectives of the study. The collected data were coded, summarized and processed for analysis. The data were verified to eliminate all possible errors and inconsistencies. The analysis of collected data was mainly based on tabular description technique. Tabular technique was applied for the analysis of data by using simple statistical tools like averages and percentages. Collected data were analyzed by Microsoft Excel through computer.

## RESULTS AND DISCUSSION

Fish is the primary source of animal protein as well as minerals and vitamins for Bangladeshi population, especially poor rural households. Fishes are the major source of animal protein providing 7% of total protein supplies. But consumption pattern tends to vary among urban, sub-urban and rural areas and is shown to be lower among female members (Tsai and Ali, 1997). A very few studies were carried out regarding fish intake and nutritional situation of children in urban, sub-urban and rural areas. A descriptive study was surveyed on fish intake rate in order to compare the nutritional status of 75 children aged from 5 to 10 years among three different regions in Sylhet district with same economic class. In the present study, we observed that the average height, average weight and average Body Mass Index (BMI) were higher in urban area compared to sub-urban and rural areas (Table 1).

Table 1

A comparative anthropometric measurements of child (5-10 years old) in urban, sub-urban and rural areas in Sylhet district in Bangladesh.

Region	Anthropometric measurements											
	Average height (meter)			Average weight (kilogram)			Average BMI			Average Fish consumption rate (g/day/child)		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
Urban	1.17	1.14	1.16	20.57	19.59	20.08	17.53	17.17	17.35	85.69	77.73	88.98
Sub-urban	1.2	1.09	1.15	20.38	18.0	19.19	14.14	15.24	14.69	84.47	75.01	86.50
Rural	1.17	1.09	1.13	19.29	17.09	18.19	14.07	15.68	14.36	80.22	72.48	81.85

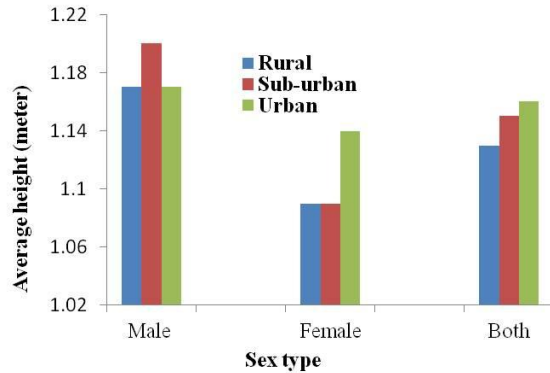


Figure 1

A comparative study on average height (meter) of child (5-10 years old) in urban, sub-urban and rural areas in Sylhet district in Bangladesh.

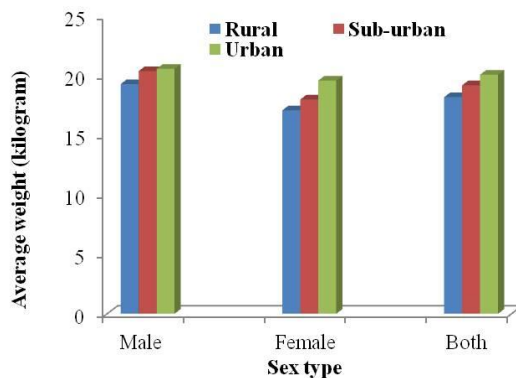


Figure 2

A comparative study on average weight (kilogram) of child (5-10 years old) in urban, sub-urban and rural areas in Sylhet district in Bangladesh

The average heights were 1.16 m for both sex where 1.17 m for male and 1.14 m for female children in urban area. On the other hand, the lowest average heights were found in rural area where average heights were 1.13 m for both sex among them 1.17 m for male and 1.09 m for female children. In sub-urban area the average heights were more or less similar to that rural area where average heights were 1.15 m for both sex, 1.2 m for male and 1.09 m for female children (Figure 1). The present study found that the children in rural area were stunted than urban and sub-urban areas. This finding was agreed with

Kamal (2011), who also found that most of the children in rural areas were stunted in Bangladesh. In case of weight, we have found similar results as height of the children from three different areas (Figure 2). The highest average weight was found in urban area where average weights were 20.08 kg, 20.57 kg, and 19.59 kg for both sex, male and female children respectively. The lowest average weight was found in rural area where average weights were 18.19 kg, 19.29 kg, and 17.09 kg for both sex, male and female children respectively. In sub-urban area, average weights for males were 20.38 kg and average weights for females were 18.0 kg. This result showed that the children from rural area were underweight rather than overweight but inverse results were found for urban children. This finding was similar to Bharati *et al.* (2009), who's found that the children in urban area were heavier and taller compared to the rural children.

Body mass index (BMI) is an important indicator for assessing the health status. In the study, we found highest average BMI in urban area, and lowest average BMI was found in rural area for the children aged five to ten. The average BMI for both sex were 17.35, 17.53 for male and 17.17 for female in urban area. In rural area, the average BMI for both sex were 14.36 where 14.07 for male and 15.68 for female. At the same time, the average BMI were 14.69 for both male and female, among them 14.14 was for male and 15.24 for female in sub-urban area in Sylhet district (Figure 3). According to the WHO, the children in urban area were mild thinness; the children in sub-urban area were severe thinness, the children in rural area were also severe thinness. The above results revealed that the health condition of the children aged five to ten were not satisfactory in different areas of Sylhet district in Bangladesh. The health status was comparatively good in urban areas than sub-urban and rural areas. This health condition is similar with the results of Aziz and Devi (2012) where they found that rural children had lower prevalence of obesity compared to urban children.

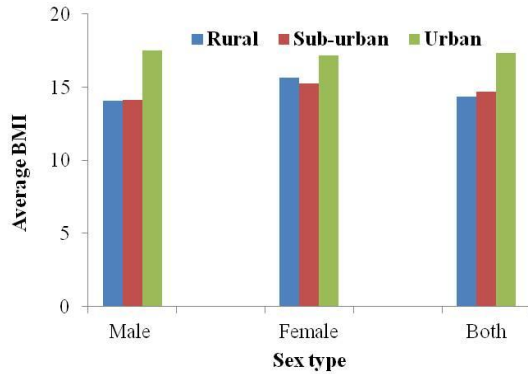


Figure 3

A comparative study on average BMI of child (5-10 years old) in urban, sub-urban and rural areas in Sylhet district in Bangladesh.

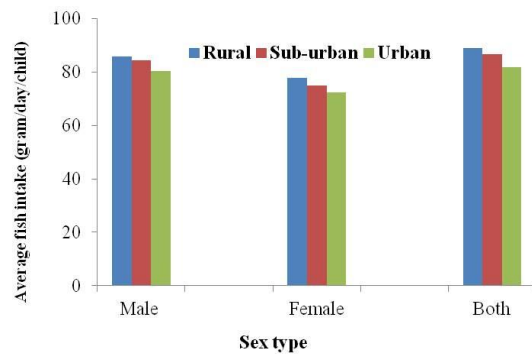


Figure 4

A comparative study on average fish intake (gram/day/child) of child (5-10 years old) in urban, sub-urban and rural areas in Sylhet district in Bangladesh.

From the survey report we observed that most of the people of these areas eat small indigenous species (SIS) including tengra, gulsha, ayre, gang magur, tara baim, kakila, gutum etc. and a little portion of the people eat big fishes including catla, rui, boal, mrigal, common carp etc. But the proportions of eating large fishes were comparatively higher in urban areas than sub-urban and rural areas in Sylhet district. In our study, we also calculated the average fish consumption rate in gram per day per child. In urban areas, the average fish consumption were 88.98 g/day/child for both sex where 85.69 g/day/child in male and 77.73 g/day/child in female. In sub-urban areas, the average fish consumption was 84.47 g/day/child and 75.01

g/day/child for male and female respectively. In rural areas, the average fish consumption were 81.85 g/day/child for both sex where 80.22 g/day/child for male and 72.48 g/day/child for female (Figure 4). Roos (2001) found that the average fish intake in the peak fish production season mainly in October was 82 g per person per day in Kishoreganj, an area in northern Bangladesh which is more or less similar with our findings. At the same time, this study suggests that the fish consumption pattern in the rural areas is different from that in the urban and sub-urban areas and it is comparatively poor.

Finally it can be concluded that the nutritional status and fish consumption rate for the children aged five to ten years old were comparatively higher in urban areas than the sub-urban and rural areas in Sylhet district in Bangladesh. This may be due to average family expenditure for food, food habit frequency, market price of food, food availability, periodic food shortage, physical activities, age, disease, cultural practices, socio-economic status, educational background and geographical location. Besides this, the present study also found that the average fish consumption rate in these areas is comparatively much higher than other regions of Bangladesh as Sylhet supports an enormous diversity of fishes and fishes are available throughout the years round.

## CONCLUSION

Nutritional status is globally considered the best indicator for the well being of young children and a parameter for monitoring progress, since the early years of life are crucial for future growth and development. The present study revealed that the fish intake and nutritional status is comparatively better in urban area than sub-urban and rural areas in Sylhet district, Bangladesh, but overall health condition of these areas are not satisfactory. Yet more work is needed to identify the more influential factors which can improve the nutritional status among children in Sylhet district, Bangladesh as the quality of future human resources depends on the present day children.

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