



Research Paper

## Comparison of KAP, Household Food Security and Nutritional Status between Rural Secondary School Boys and Girls in Chandpur, Bangladesh

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### Abstract

A comparative study was carried out among selected rural secondary school boys and girls of Chandpur district in Bangladesh to find whether there is any difference in KAP, household food security and nutritional status. A total number of 607 (304 boys and 303 girls) students were enrolled for the present study. The results from the study revealed that the KAP percent score of boys was significantly higher than girls ( $p=0.001$ ). Households of girls were more food secured than boys and the differences were statistically significant ( $p=0.009$ ). 91.09% of girls and 87.25% of boys had normal BMI. On the other hand, anemia prevalence was higher in girls than boys (52.8% girls and 44.1% boys). Schools must spread information on nutrition, cleanliness, and personal hygiene in order to enhance kids' nutritional status. Importance should be given on dietary adequacy and dietary patterns of them.

**Key words:** KAP, Household Food Security, Nutritional Status, Rural Secondary School Students.

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### I. Introduction

Bangladesh, as an emergent country, has made eminent progress in providing food, health and nutrition for its large population. In spite of such advancement, the country is yet to confront high and tenacious levels of undernourishment and malnourishment (Headey et al., 2015). One of the most important variables affecting how well people live is nutrition. One of the important health indicators to assess a country's health standard and morbidity trend is nutritional status. (Mohammad et al., 2018). A balanced diet, or food including carbs, proteins, fats, vitamins, and minerals, is important for several reasons, including ensuring consumption (Jahan et al., 1998). For individuals to lead a healthy lifestyle, they require both nutritional knowledge and food intake-related behaviours (Bhuiyan et al., 2021). For a nation to grow, there must always be enough food for everyone, in both quantity and quality (Tantu et al., 2017). According to Worku et al. (2014), one of the major issues affecting public health in both developing and developed countries is household food insecurity. According to a research by the Food and Agricultural Organization (FAO), 805 million (11.3%) people worldwide were unable to achieve their dietary energy needs in 2012–2014. 791 million people in underdeveloped nations suffer from hunger. Attaining food security for all people at all times remains a massive challenge for several developing countries (Tantu et al., 2017). On a global basis, household food insecurity and hunger have insidious effects on the health and well-being of household members (Khanna, S.K., 2020). Bangladesh has set a hard target to achieve Sustainable Development Goal No. 2 by 2030, which includes eradicating hunger and malnutrition and ensuring that everyone has access to sufficient, healthy food (General Economic Division (GED), Bangladesh Planning Commission, G. 2018). Through agricultural innovation, nutrition programs, and food production, the nation has made significant progress toward achieving significant food self-sufficiency since gaining its independence (USAID, 2019). Despite these efforts, about 25% of Bangladesh's population experienced food insecurity in 2019 (USAID, 2019). According to the National Food Policy (NFP) of Bangladesh, the malnourishment rates are higher among the urban slum and rural landless households. A balanced diet is still beyond the reach of this section of the country. Therefore, slum and rural landless households are identified as the most distressed population in terms of attaining food security (Ministry of Food and Disaster Management 2006) (Bhattacharjee et al., 2021). Household food insecurity is associated with poor nutritional health (Cook et al., 2008 and Cook et al., 2004). Malnutrition, especially micronutrient malnutrition in the form of

insufficiencies in vitamin A, iron and iodine, is a serious public health issue in Bangladesh (Talukder et al.,2000). According to Dey et al. (2012), 93% of Bangladeshi families are said to be deficient in vitamin C, 85% in riboflavin, 81% in vitamin A and calcium, 60% in protein, and 59% in calories. Children in school-age who receive proper nutrition have an indirect and long-term impact on growth and development in addition to immediate and short-term effects on physical and mental development (Zebsyn et al., 2018). In order to improving dietary intake patterns in school-aged children nutritional learning may be a key link (Oosthuizen et al.,2011). Secondary school children lying under the age group of 10-19 come beneath the category of adolescent. Adolescence is a stage between childhood and adulthood that is marked by rapid physical, biochemical, and hormonal changes that cause an individual to reach sexual, psychological, and behavioral maturity. Boys and girls experience this phase differently, and it is known as the second growth spurt of life (Viret al., 2014). A balanced diet is therefore essential at this time. This study compared the knowledge, attitudes, and practices of rural secondary school boys and girls in Bangladesh's Chandpur district about a balanced diet, household food security, and nutritional status.

## **II. Materials and Methods**

### **Study design and settings**

A comparative study was conducted among 607 secondary school students (304 boys and 303 girls from class six to ten) of six selected high schools in Chandpur district to investigate their KAP score, food security and nutritional status. The locations were selected purposively.

### **Collection of Data**

#### **Information pertaining to Knowledge, Attitude, and Practices (KAP)**

A set of questions on food beliefs, fads, and fallacies, as well as the components of a balanced diet, functions of food, food hygiene, and sanitation, etc., were obtained by direct interview in order to assess the current level. For each question, a score of 1 was given for the correct response, a score of 0 for the incorrect response, and a score of 0.5 for a partially accurate response.

#### **Measure of food insecurity**

The questions for the Household Food Insecurity Access Scale (HFIAS) have a memory span of four weeks (30 days). First, the respondent was asked if the condition in the question had occurred at all in the previous four weeks (yes or no). If the responder selected "yes," a question about frequency-of-occurrence was posed to determine how frequently (once or twice), occasionally (three to ten times), or frequently (more than ten times) the incident had occurred over the previous four weeks. The value was "0" when the response to the associated occurrence question was "no." When the response was "rarely," "sometimes," or "often," the corresponding codes were "1," "2," and "3." An HFIAS score variable was created by adding together the codes for each frequency-of-occurrence inquiry. The more the household scored highly, the more food insecurity it had, and vice versa (Coates et al., 2007).

#### **Assessment of nutritional status**

According to accepted procedures, anthropometric data (such as height and weight) were acquired (Jelliffe and Jelliffe 1989). Body Mass Index (BMI) was computed using the accepted procedures. Using Anthro Plus, BMI for age Z-scores was computed in accordance with the 2007 WHO standard for children aged 5 to 19 (Onis et al., 2007).

#### **Blood collection and biochemical analysis**

For analysis of biochemical indices, 5ml of venous blood was collected from each of the participants. Analyses of haemoglobin and serum ferritin were done on the same day of blood collection. Haemoglobin concentration was determined by cyanmethemoglobin method (Reference and selected procedures, 1994) using a commercial kit (Boehringer Mannheim, Germany), and serum ferritin level was estimated by enzyme-linked immunosorbent assay (ELISA) method (White et al., 1986 and Tietz Ed.NW.,1995) using a commercial kit (Bio check, Inc).

### **Statistical analysis**

The IBM SPSS 20 version Windows application was used for all statistical analyses and other data processing. Paired t-test comparison analysis was carried out. P values less than 0.05 were deemed significant in all statistical tests.

## **III. Results**

Table 1 illustrates the distribution of the age category by gender of the participants. The ratio of boys and girls in the age categories are almost equal.

**Table 1:** Distribution of age of the respondents' by gender

Age Category	Gender	Frequency	Percent
10 to 13 years	Boys	154	25.37

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	Girls	150	24.71
14 to 18 years	Boys	150	24.71
	Girls	153	25.21
	Total	607	100.0

The knowledge, attitude, and practice score were compared among boys and girls in Table 2. The KAP percent score of boys was significantly high than girls ( $p=0.001$ ).

**Table 2:** Mean KAP score percent of the respondents' by gender

Gender	N	Mean $\pm$ SD	p Value
Boys	304	61.19 $\pm$ 14.32	0.001
Girls	303	53.71 $\pm$ 16.26	

According to the Household Food Insecurity Access Scale (HFIAS), the level of food security was evaluated. The fraction of households with access to food and those without it for boys and girls is shown in Table 3. Households of girls were more food secured than boys and the difference were statistically significant ( $p=0.009$ ).

**Table 3:** State of food security in the household of respondents' by gender

State of food security	Boys	Girls	p Value
Food Secure	44.0%	68.0%	0.009
Mildly Food Insecure	12.0%	7.0%	
Moderately Food Insecure	21.0%	12.0%	
Severely Food Insecure	23.0%	13.0%	

Comparing with the World Health Organization's body mass index reference for children and adolescents, the study participants were classified accordingly as severe, moderate malnourished, and normal groups. Table 4 demonstrates the prevalence of malnutrition among the respondents. 91.09% of girls and 87.25% of boys had normal BMI.

**Table 4:** Prevalence of malnutrition with z BMI (Body mass index Z score) among the respondents' by gender

Gender	Severe Malnutrition	Moderate Malnutrition	Normal
Boys	0.98%	11.76%	87.26%
Girls	2.97%	5.94%	91.09%

Table 5 depicts the hematopoietic indices of the participants. The prevalence of anemia (measured by hemoglobin) was 44.1% and 52.8% in boys and girls respectively. Serum ferritin level shows the number of iron store depleted participants. Out of 303 girls, 6 were iron store depleted. On the other hand, serum ferritin level of all boys were normal.

**Table 5:** Anemia prevalence (measured by hemoglobin) and serum ferritin level in respondents

Gender	Anemia Prevalence		Serum Ferritin Level	
	Normal n (%)	Anemic n (%)	Normal n (%)	Iron depleted n (%)
Boys	170 (55.9%)	134 (44.1%)	304 (100%)	0 (0.0%)
Girls	143 (47.2%)	160 (52.8%)	297 (98%)	6 (2.0%)

#### IV. Discussion

Comparing the KAP, family food security, and nutritional condition of chosen rural secondary school boys and girls was the aim of the study. Boys and girls received KAP percent scores of 61.19 and 53.71, respectively.. The difference was highly significant. A study in Bangladesh showed that more than half of the adolescent school girls did not have good knowledge about a balanced diet (Ghosh et al., 2020). In case of household food security, households of girls were more food secured as compared to the boys. Results showed that 56% of the households of the boys were food insecure. While the percentage was 32 for the girls. About 37.6% households were found food insecure in a study in Southern Ethiopia (Tantu et al., 2017). As revealed in the present study, the prevalence of malnutrition (as per BMI) was higher among boys as compared to girls. In a study in India, the prevalence of undernutrition was found higher among boys than girls (Ahrwar et al., 2017). In another study in India, the same result was found for the boys as compared to the girls (Sasikala et al., 2016).

## V. Conclusion

Personal hygiene plays a significant role in the health status of personnel. To develop the health status of the school children, schools need to provide knowledge and awareness about personal hygiene, sanitation and nutrition. A vast body of information shows that dietary diversification is significant for health, nutrition, and human capital formation. In Bangladesh, a large fraction of households limit their intake to a small number of food groups which is insensitive to poverty status and raises household food insecurity. Nutrition education has an optimistic outcome on the nutritional status of a person, which would be more effective for the secondary school children.

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