FACTORS ASSOCIATED WITH ADOLESCENT FOOD SECURITY AND NUTRITIONAL STATUS IN A SELECTED RURAL AREA OF THE CENTRAL REGION OF BANGLADESH

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ABSTRACT

Food insecurity affects physical growth, health of adolescents and nutritional status while food insecurity is common in rural area of Bangladesh. During adolescence, individuals have gone through series of key transitions into adulthood which may be hindered by food insecurity and poor nutritional status. The present study aimed to identify the most relevant factors that may be associated with food security and nutritional status of adolescents. Additionally, this study also tried to explore the association between adolescent food security and their nutritional status. This Cross-sectional study was carried out among 317 unmarried adolescents aged 10 to 19 years in a selected rural area of central region of Bangladesh. Multistage cluster sampling and purposive sampling were followed to select households and enroll adolescents into the study. Other than descriptive statistics, chi-square test was performed to test the difference between groups as well as to evaluate expected associations between different predictors and outcome variables. Additionally, univariate logistic regression was carried out to estimate the effect of predictor variables on the outcome variable. Moreover, multivariate logistic regression analysis was conducted to control the potential confounder effects upon desired outcome variables. It is observed that around 32.5% adolescents were food secure whereas 67.5% adolescents were food insecure. Our study also reveals that two predictor variables such as family income and family size had significant association with food security where odds of becoming food secure were higher among the adolescents from higher income families (AOR=6.1; 95% CI=2.240-16.718) and smaller families (AOR=3.4; 95% CI=1.563, 7.495). Furthermore, prevalence of underweight, normal nutritional status and overweight was 13%, 83% and 4% respectively where adolescent educational qualification and occupation were significantly associated with normal nutritional status. Adolescents with higher educational qualification (AOR=12.3;95% CI=5.270,28.479) and involved in work (AOR=12.3;95% CI=5.270,28.479) were more likely to have normal nutritional status compared to those who were primarily educated and not involved in work. Further study is recommended to replicate the findings and to generate new knowledge about relevant factors associated with adolescent food security and nutritional status.

KEYWORDS: Adolescent, Food security, Nutritional status, BMI-for- age.

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Introduction

Adolescence is considered as the most crucial stage of the human life cycle that comprises the individuals between 10 to 19 teras of age. During this transitional period adolescents have gone through multiple biological, psychological, mental and social changes (WHO, 2005, WHO, 2001, UNICEF, 2011). Adolescence period is recognized as second window of opportunity for catchup growth and characterized by accelerated growth and development while 50%, 20% and 50% of the adult weight, height and skeletal mass respectively are achieved(Shahid et al., 2009). Around 1.8 billion adolescents inhabit globally which is equal to 16% of the world total population. Among these 1.8 billion, almost 90 percent of the adolescents resided in developing countries(Christian and Smith, 2018). In Bangladesh estimated number of adolescents is over 32 million which accounted for 22% of the country's total population(UNICEF, 2017) and it is expected that by 2030 the number of adolescents may increase additional ten percent(UN Department of Economic and Social Affairs, 2018).

FAO defined food insecurity (FI) as "a situation that exists when people lack regular access to adequate amount of safe and nutritious food for normal growth and development and an active and healthy life." Findings from different studies of developed (Popkin et al., 2016) and developing (Faye et al., 2011, Spieker et al., 2022) countries illustrated that food insecurity (FI) may be responsible for poor health outcomes for individuals from different age category especially for young children (Gundersen and Ziliak, 2015, Oronce et al., 2021). Additionally, adolescents are more vulnerable towards FI where in developing countries around 50% of adolescents were food insecure(Sheikh et al., 2020, Belachew et al., 2012). Food insecurity can lead to numerous consequences among

adolescents like wasting, stunting, nutritional deficiencies, anaemia, and increased risk of cardiovascular diseases(Zaçe et al., 2020, Moradi et al., 2019, Schmeer and Piperata, 2017).

Among adolescents malnutrition manifests in two forms like undernutrition and overweight where undernutrition comprises underweight/thinness, wasting and stunting(WHO, 2017). Findings from different relevant studies reported that the crisis of adolescent undernutrition is high in low and middle-income countries like Bangladesh(Caleyachetty et al., 2018). Even though the number of undernourished adolescent girls are declining in Bangladesh, still the rate is high. Bangladesh demographic health survey report 2017–2018 demonstrated that among adolescent girls during the period of 2004 to 2017 underweight reduced from 39.53% to 30.96% while overweight enhanced from 1.79% to 11.40% (NIPORT, 2019). Undernutrition during adolescence has negative consequences for their cognitive development which leads to growth retardation, poor learning skill and thus hinder the school performance(Guilloteau et al., 2009, Dewey and Begum, 2011). Findings from numerous studies illustrated that different category such as sociodemographic, dietary habit and environmental factors are associated with adolescent undernutrition(Demilew and Emiru, 2018, Gebregyorgis et al., 2016, Wassie et al., 2015, Teji et al., 2016, Tegegne et al., 2016, Girma et al., 2017).

Due to adolescent growth spurt food and nutrient requirements are much higher at this stage which makes adolescents more vulnerable to food and nutrition inadequacy and thus increase the risk of undernutrition and food insecurity. Thus, the present study aims to assess food security and nutritional status of adolescents as well as to identify the most relevant sociodemographic factors that may be associated with adolescent food insecurity and normal nutritional status.

Materials and Methods

Study population and sampling technique

A cross-sectional study was conducted among unmarried adolescents aged between 10-19 years in a selected area called "Baraid village" in Saturia Upazilla of Manikgonj district of the central region of Bangladesh. To select the study participants both multistage cluster sampling technique and purposive sampling technique were followed. The study area 'Baraid village' had 1055 households where 300 HHs met the inclusion criteria of the study that is they had at least one unmarried adolescent between 10 to 19 years of age which accounts for 317 adolescents (Male: 154; Female: 163). A total of 317 adolescents from 300 HHs were included into the study to assess food security and nutritional status, and further investigation.

Data Collection

One validated structured questionnaire was used to collect information and during the study data was collected through face-to-face interview with the respondents. Additionally, height and weight scales were used to measure the weight and height of the adolescents. Data regarding household food security and level of family income were obtained from the head of the households where adolescents provided information about their age, gender, health status, dietary intake, educational qualification.

Study Variables:

Dependent Variable

Adolescent food security status- Adolescent food security provides information on food accessibility, availability, and utilization of adolescents. Based on the collected information adolescents were categorized into food secure and food insecure groups. Adolescent food security status was assessed by using a modified four items questionnaire derived from previously validated household food security questionnaires in developing countries (Coates et al., 2006, Frongillo and Nanama, 2006, Melgar-Quinonez et al., 2006, Webb et al., 2006). The details of the modified adolescent food security questionnaire was illustrated in other studies (Hadley et al., 2008, Belachew et al., 2011) where positive answer to the questions is considered as food insecurity.

Nutritional Status- Nutritional status of adolescents was assessed by BMI- for-age, Z-score. It is categorized into 3 groups- underweight: BMI- for-age, Z-score <-2SD; normal nutritional status (BMI- for-age, Z-score -2SD to +1SD and overweight BMI- for-age, Z-score > +1SD. For subsequent logistic regression, nutritional status was dichotomized into malnourished and well-nourished groups where malnourished groups consists of underweight and overweight. For calculating BMI, height and weight of adolescents were recorded.

***Independent Variables*:** it comprises variables the represents both Adolescent and Household characteristics.

Adolescent Characteristics

Age - It is categorized into 2 groups: (1) early adolescent (10-14 years) (2) late adolescent (15-19 years). Birth certificates or immunization cards were used to verify the age of the adolescents. In case of unavailability of either of the cards, the age was confirmed through memory recall of the mother or caregiver.

Gender- The adolescents were either male or female.

Educational qualification- The categories were 'primary education', 'secondary education and above. Primary education means completion of 5 grades whereas secondary education means completion of 10 grade and above.

Occupational Level - These variables are categorized into 3 groups namely not working (who were both unemployed and not student), working (who were dropout and worked in field, shop) and student.

Household characteristics

Level of Family Income: Family income emphasized on the income of all family members which was categorized into 3 tertiles: lower, middle, higher income groups. The lower income group lies below 4000 BDT whereas the higher income group lies above 8000 tk. Income between 4000 to 8000 BDT represented middle income group.

Household head Occupation- the occupation of the household heads were classified as agricultural worker, job holder and others.

Family size: it includes the total number of family members which was categorized as smaller family (up to 4 members) and larger family (more than 4 members).

Analysis of Data

SPSS version 16 statistical software was used to analyze the data. Normal descriptive especially frequency analysis was used to examine the distribution of the respondent adolescents in terms of number and percentage of all categorical variables included in the study. Cross tabulation was conducted to establish the association between dependent variables and different categories of independent variables. A chi-square test

was done to observe whether the association is statistically significant or not. Binary logistic regression was conducted to evaluate whether there are one or more variables that determine the outcome where outcome is measured as dichotomous variable. During our analysis both the univariate and multivariate logistic regression were conducted. Univariate analysis has been performed to get the effect of each independent variable on the dependent variable. The results were presented with crude odd ratio (OR^C) and 95% confidence interval. Multivariate logistic regression was done accordingly as univariate logistic regression. But in this case the OR is the adjusted OR as it controls the effect of the confounding variable. The result is presented as AOR /OR, 95% confidence interval and p value to indicate statistical significance. Though, during statistical analysis emphasis was given on the factors that were significantly associated with the outcome variables, the association of all the covariates included in the multivariate logistic analysis would be checked. Since logistic regression assumes that p(Y=1) is the probability of the event occurring, in the present analysis the dependent variables were coded in such a way that the factor level 1 represent the desired outcome. In multivariate analysis of nutritional status four models were established to control the effects of factors which may confound the association.

Results

Characteristics of the Study Population

Table 1 represents the characteristics of adolescent as well as household heads. According to the table 52.1% adolescents were within the age group of 10 to 14 years (early adolescent) whereas 47.9% were between 15-19 years of age and thus considered as late adolescents. In case of gender, adolescents were fairly evenly distributed, 48.6% were male whereas 51.4% were female. Out of 317 adolescents, 234 have completed Secondary or above educational level. It is also observed from the table that majority (73.2%) of the adolescents were student. Additionally, more than half 56.2% of the adolescents were from lower income families while around 16.4% were from higher income groups. The study also shows that most (72.9 %) of the adolescents were from small size families (above 4 member). Moreover, around two thirds of the household heads were (72.6%) agriculture workers.

Table 1. Characteristics of the study population

Variables	Number	Percentage (%)
Adolescent Characteristics:		
Adolescents age		
Early adolescent (10-14 years)	165	52.1
Late adolescent (15-19 years)	152	47.9
Gender		
Male	154	48.6
Female	163	51.4
Educational qualification		
Primary education	83	26.2
Secondary education and above	234	73.8
Occupation		
Working	56	17.7
Student	232	73.2
Non-working	29	9.1
Characteristics of Household:		
Level of family income		
Lower	178	56.2
Medium	87	27.4
Higher	52	16.4
Family size		
Small family (Up to 4 members)	86	27.1
Larger family (More than 4 members	231	72.9
Occupation of household head		
Agricultural worker	230	72.6
Job Holder	28	8.8
Others	59	18.6

Figure 1 and 2 highlights the frequency of nutritional status and food security status of adolescents. Around 83.65% adolescents were in normal nutritional status while 13.25% were underweight /thinness and the rest (4.10%) of the adolescents were overweight. Additionally, 32.5% and 67.5% of the adolescents were in food secure and food insecure respectively.

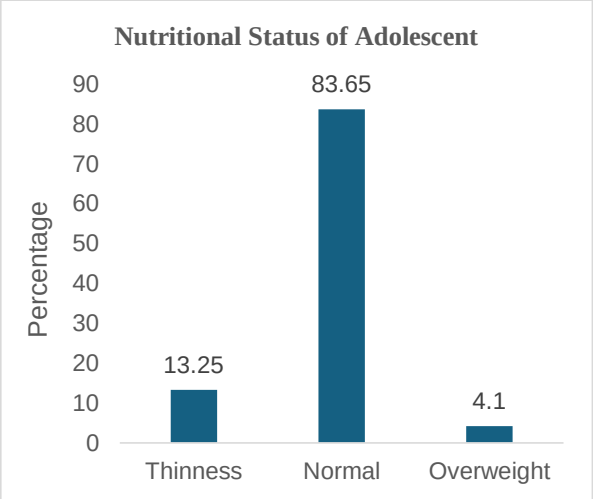

Figure 1. Distribution of adolescents based on the nutritional status (BMI for age, Z-score)

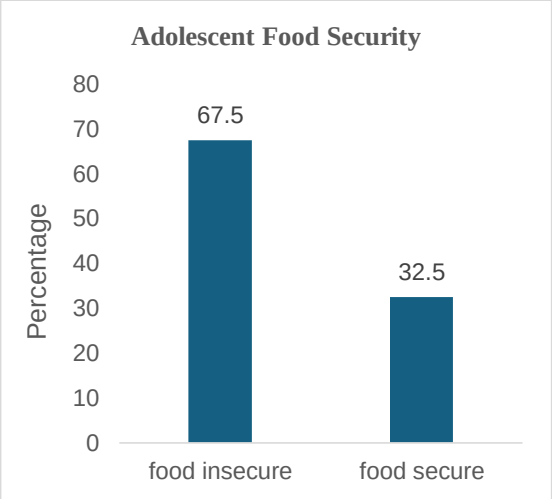

Figure 2. Distribution of adolescents according to their food security status

Table 2 illustrates the crosstabulation and association between adolescent food security status and different categories of independent variables. It is observed that among different independent variables, adolescent educational qualification, family income and number of family member showed statistically significant ($p<0.05$) association with adolescent food security status. Around 36.8% of the adolescents with secondary or above educational qualifications were food secure where for primarily educated adolescents it was 20.5%. Additionally, a higher percentage of adolescents (76.9%) from higher income families tend to be food secure compared to those from lower income (14%) groups. Moreover, the percentage of food secure adolescents was higher among small family groups (47.7%) than larger families (26.8%) and the difference was statistically highly significant($P<0.000$). On the contrary, adolescent age, gender, and occupation as well as occupation of the household head did not show any significant association with adolescent food security status.

Table 2. Cross tabulation and association between adolescent food security and independent variables

Variables	Adolescent Food Security		Chi-square (P value)
	Food Insecure n (%)	Food Secure n (%)	
Age			
Early Adolescent (10-14)	111(67.3)	54(32.7)	0.926
Late Adolescent (15-19)	103(67.8)	49(32.2)	
Gender			
Male	104(67.4)	50(32.6)	0.993
Female	110(67.6)	53(32.4)	
Educational qualification			
Primary	66(79.5)	17(20.5)	0.007**
Secondary & above	148(63.2)	86(36.8)	
Occupation			
Working	40(71.4)	16(28.6)	0.115
Student	150(64.7)	82(35.3)	
Non-Working	24(82.8)	5(17.2)	

Family income			
lower	153(86)	25(14)	0.000**
Medium	49(56.3)	38(43.7)	
Higher	12(23.1)	40(76.9)	
Family size			
Small family (Up to 4 members)	45(52.3)	41(47.7)	0.000**
Larger family (More than 4 members)	169(73.2)	62(26.8)	
Occupation of household head			
Agricultural worker	157(68.3)	73(31.7)	
Job Holder	20(71.4)	8(28.6)	0.646
Others	37(62.7)	22(37.3)	

** *P<0.01= statistically highly significant*

Cross tabulation and association of adolescent nutritional status with different categories of independent variables are demonstrated in table 3. It is observed that adolescent age and gender, and occupation of household head did not show any significant association with nutritional status. On the contrary, numerous variables such as adolescent educational qualification and occupation as well as family income and family size were significantly associated with nutritional status. According to the table, around 91.5% of the adolescents with secondary or higher educational qualification were in normal nutritional status while for primarily educated adolescents it was 57.8%. Additionally, the percentage of underweight was higher among the primarily educated adolescents compared to those with secondary and above educational qualifications. Around 36.1% of the adolescents who completed primary education was underweight whereas for secondary and above educated adolescents it was only 5.1%.

Table 3. Cross tabulation and association of adolescent nutritional status with different independent variables

Variables	**Adolescent Nutritional Status**			**Chi-square (P value)**
	Overweight/ Thinness n (%)	Normal n (%)	Overweight n (%)	
Age				
Early Adolescent(10-14yrs)	24(14.5)	134(81.2)	7(4.2)	0.764
Late Adolescent(15-19yrs)	18(11.8)	128(84.2)	6(3.9)	
Gender				
Male	17(11)	133(86.4)	4(2.6)	0.196
Female	25(15.3)	129(79.1)	9(5.5)	
Educational qualification				
Primary	30(36.1)	48(57.8)	5(6)	0.000**
Secondary & above	12(5.1)	214(91.5)	8(3.4)	
Occupation				
Working	3(5.4)	51(91.1)	2(3.6)	0.000**
Student	23(9.9)	198(85.3)	11(4.7)	
Non-Working	16(55.2)	13(44.8)	0(0)	
Family Income				
lower	33(18.5)	139(78.1)	6(3.4)	0.015*
Medium	6(6.9)	75(86.2)	6(6.9)	
Higher	3(5.8)	48(92.3)	1(1.9)	
Family size				
Small family (Up to 4 members)	5(5.8)	74(86)	7(8.1)	0.008**
Larger family (More than 4 members)	37(16)	188(81.4)	6(2.6)	

Occupation of household head				
Agricultural worker	28(12.2)	192(83.5)	10(4.3)	0.693
Job Holder	5(17.9)	23(82.1)	0(0)	
Others	9(15.3)	47(79.7)	3(5.1)	

$^{*}P < 0.05$=statistically significant, $^{**}P < 0.01$= statistically highly significant

It is also articulated that a higher percentage of adolescents who were working (91.1%) and students (85.3%) by occupation were in normal nutritional status than those who were not working (44.8%). On the other hand, the percentage of underweight adolescents was highest among non-working group (55.2%) compared to student (9.9%) and working (5.4%) adolescents and the difference was statistically highly significant. Moreover, the percentage (16.0%) of underweight was higher among adolescents of larger families compared to those from small families (5.8%). For overweight the situation was different where 8.1% and 2.6% of the adolescents from smaller and larger families respectively were found to be overweight. Furthermore, a greater tendency to be normal nutritional status was found among adolescents of higher (92.3%) and medium (86.2%) income families than lower income families. The table also showed that the percentage of underweight was highest (18.5%) among adolescents from lower income families while for overweight the percentage was highest (6.9%) medium income families.

Univariate and Multivariate Logistic Regression Analysis

The associations of different independent variables with being food secure is illustrated in table 4. It is observed that during univariate analysis adolescent educational qualification showed statistically significant ($p<0.05$) association with food security where the odds of being food secure were 2.3 (OR=2.3; 95% CI: 1.24,4.09) times higher among adolescents with secondary and above educational qualification compared to those with primarily educated. But during multivariate logistic regression analysis that adjusted for the relevant confounding variables asserted that the association is not statistically significant ($p>0.05$). Similar findings were obtained for the factor family income which showed highly significant association with food security. The univariate logistic regression analysis indicated that the odds of becoming food secure were 4.7 (OR=4.7; 95% CI: 2.61,8.63) and 20.4 (OR=20.4; 95% CI: 9.43,44.11) times higher among adolescents from medium and higher income families respectively than those from lower income group. Additionally, multivariate analysis demonstrated that after controlling the confounding factors, the association remained statistically significant where the odds of being food secure were 6.1 (AOR=6.1; 95% CI: 2.24,16.72) times higher among adolescents of higher income group families compared to those from low-income group families. Family size is another important predictor of adolescent food security where in comparison with the reference group, adolescents who lived in a smaller family of 4 or less member were 2.5 times (OR=2.5; 95% CI: 0.49, 4.15) more likely to be food secure and after adjustment for the confounder variables the association still prevailed significant.

Table 4. Univariate and multivariate logistic regression to reveal the association of independent variables with food secured adolescents

Food Secured				
Predictors	**Univariate Logistic Regression**		**Multivariate logistic Regression**	
	OR^{c} (95% CI)	***P***	**AOR (95% CI)**	***P***
Adolescent educational qualification				
Primary	1		1	
Secondary & Above	2.3(1.243-4.09)	0.007**	1.2(.74-3.83)	0.586
Family Income				
Lower	1		1	
Medium	4.7(2.61-8.63)	0.000**	3(1.39-6.29)	0.005**
Higher	20.4(9.43-44.12)	0.000**	6.1(2.24-16.72)	0.000**

Family size				
Small family (Up to 4 members)	2.5(0.49-4.15)	0.001**	3.4(1.56-7.49)	0.002**
Larger family (More than 4 members)	1		1	

**P< 0.01= statistically highly significant

Table 5 presents the univariate and multivariate logistic regression in order to reveal the association of each of included individual independent variables with normal nutritional status.

Table 5. Univariate and Multivariate Logistic Regression to depict the association of independent variables with normal nutritional status

Normal Nutritional Status				
Predictors	**Model I**	**Model II**	**Model III**	**Model IV**
	OR[C](95% CI)	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Adolescent educational qualification				
Primary	1	1	1	1
Secondary & Above	7.8(4.15-14.68) **	11.5(4.9-26.73) **	12.1(5.32-27.80) **	12.3(5.27-28.48) **
Adolescent occupation				
Not Working	1	1	1	1
Working	12.5(3.88-40.63) **	9.7(2.78-33.82) **	10.4(3.03-35.76) **	10.5(3.06-36.23) **
Student	7.1(3.16-16.23) **	1.3(0.47-3.81)	1.4(0.51-4.01)	1.4(0.51-4.07)
Family size				
Small family (Up to 4 members)	1.4(0.70-2.82) **	1.1(0.36-2.35)		
Larger family (More than 4 members)	1	1		
Family Income				
Lower	1	1		
Medium	1.7(0.87-3.55)	1.3(0.61-3.03)		
Higher	3.3(1.14-9.91) *	1.7(0.51-5.37)		

*P < 0.05=statistically significant, **P< 0.01= statistically highly significant
Model I (univariate analysis)- All categories of the independent variables showed statistically significant association with adolescent nutritional status in chi-square analysis.
Model II (multivariate analysis)- All the independent variables showed significant association in the univariate analysis.
Model III- All the independent variables that were significantly associated with normal nutritional status in Model II.
Model IV- Independent variables included in Model III plus Adolescent Food security.

Here in the table, Model I comprises all categories of the independent variables that showed statistically significant association with adolescent nutritional status in chi-square analysis while Model II includes all the independent variables which showed significant association during univariate analysis of Model I. Additionally, Model III includes independent variables that were significantly associated with normal nutritional status in Model II. Finally, Model IV consider independent variables included in Model III and adolescent food security as predictor variable.

Model I: In Model I all different categories of independent variables which showed significant association with adolescent nutritional status in chi-square test were included for univariate analysis. Findings of the univariate analysis demonstrated that all the included variables were significantly associated with normal nutritional status where the odds of having normal nutritional status likely to be 7.8 times higher among the adolescents with secondary and above educational qualification than those with primary education. Similarly, compared to non-working adolescents, the odds of normal nutritional status were 7.1 and 12.5 times higher among student and working adolescents respectively. Additionally, the odds of normal nutritional status were likely to be 1.4 times and 3.3 times higher among the adolescents from smaller families and higher income families respectively.

Model II: All independent variables that showed significant association with normal nutritional status in univariate

analysis were included in Model II. The model showed that among the variables, only two variables named adolescent educational qualification and adolescent occupation were significantly associated (p<.001) with normal nutritional status where other two variables such as family income and number of family member did not show any significant association (p>0.05) with desired outcome variable. The study also presented that adolescents who completed secondary or above education were 11.5 times more likely to have normal nutritional status compared to those who completed primary education (OR=11.5; 95% CI=4.99-26.73). Moreover, odds of having normal nutritional status were 9.7 times (OR=9.7; 95% CI=2.78-33.82) and 1.3 times (OR=1.3;95%CI=0.47-3.81) higher among working adolescents and students respectively compared to those who were non- working.

Model III- Only the variables namely adolescent educational qualification and adolescent occupation which demonstrated statistically significant association with normal nutritional status during multivariate analysis in Model II were included in Model III. The results indicated that educational qualification was significantly associated with normal nutritional status where odds of normal nutritional status were likely to be 12.1 times (OR=12.1; 95% CI = 5.32-27.80) higher among adolescents of secondary and higher educational qualification than those who completed primary education. In the case of adolescent occupation, working adolescents were 10.4 times more likely to be normal nutritional status compared to non-working adolescents and that association was statistically significant.

Model IV- Model IV is built with a special interest in adolescent food security. In addition to the variables used in Model III, another important factor, namely adolescent food security was also included in this model. As the outcome of the multivariate logistic regression in model IV were almost same as in model III, it can be said that adolescent food security did not influence the normal nutritional status.

Discussion

Adolescence is considered as one of the crucial transitional periods of the human life cycle as during this stage all individuals have gone through several vital transitions into adulthood. nutritional status and adverse situations like food insecurity may have influence on some of these transitions. The present study was conducted among unmarried adolescents of 10 to 19 years in a selected rural area of central region of Bangladesh was aimed to investigate the nutritional status and food security status of included adolescents. Our study also aimed to explore the associations of different socio-demographic and economic factors with adolescent food security and nutritional status.

It is articulated from our study that prevalence of food security and food insecurity among adolescents were 32.5% and 67.5% respectively while with respect to gender there was no difference in food insecurity status. But contradictory finding was obtained from the study of Carter et.al stating that females have higher food insecurity than males(Carter et al., 2010). Another study conducted on adolescent girls of rural Bangladesh reported the only 7.3% of the study participants were food insecure(Ghosh et al., 2021) which is much higher than our study findings. The current study also presented that the variable named number of family members showed statistically significant association with adolescent food security where higher percentage of food insecurity was found among adolescents from larger families (73.2%) than smaller families (52.3%). Related findings were found from another study presenting that the odds of food insecurity were higher among adolescents from larger families(Mmari et al., 2021). Our study also showed that adolescent educational qualification was significantly associated with food security where the odds of being food secure were 2.3 times higher among adolescents with secondary and above educational qualification compared to those with primarily educated. Equally, family income also showed a significant association with food security while prevalence of food security increases with increasing family income.

Our study also depicted that 13.25 % of adolescents were underweight while among adolescent girls the prevalence is 15.3%. Almost similar findings were obtained from other studies where prevalence of thinness among adolescent girls were 15.8%(Hadush et al., 2021), 14.94%(Mansur et al., 2015) and 16%(Sarkar et al., 2015) while another Bangladeshi study conducted on urban adolescents indicated that around 45% of the studied adolescent girls were underweight(Kabir et al., 2010). Additionally, in our study no significant association was observed between adolescent age and nutritional status. Mixed findings were obtained from other similar studies such as study conducted by Tafasa et. al. showed that there is significant association between adolescent age and thinness while the odds of thinness 3.77 times higher among adolescent girls of early stage compared those of late stage (Tafasa et al., 2022). Opposite results was articulated from another study stating that older adolescent girls were more likely to be thin than early age adolescent girls(Tegegnework et al., 2023). Furthermore, our study illustrated that the variable called number of family member (family size) had significant association with adolescent nutritional status where the prevalence of thinness was higher among adolescents from larger family (more than 4 members) compared to those from smaller family (up to 4 members). Results of other studies reported that adolescents from families of 5 or more members were more likely to be thin than those from families from fewer than 5 members(Tegegnework et al., 2023). Furthermore, results of our study demonstrated that prevalence of underweight was significantly higher among the adolescents who were involved in working compared to those with non-working. Analogous finding was derived from another similar study illustrating that compared to unemployed, employed adolescents had higher risk of underweight(Assefa et al., 2015).

Conclusions

Adolescent food security and nutritional status were examined where around 32.5% adolescents were food secure and 67.5% were food insecure. Several predictor variables such as adolescent educational qualification, family income and number of family members showed statistically significant association with adolescent food security. Additionally, about 83% of the respondent adolescents had normal nutritional status, 13% were underweight and 4% were overweight. Numerous independent variables namely adolescent educational qualification, adolescent occupation, family income and number of family members were found to be significantly associated with adolescent nutritional status.

Additional research is necessary to have more information in this field and thus facilitate development of relevant policies to improve adolescent food security and nutritional status.

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