

Original Article

**SOCIO-DEMOGRAPHIC FACTORS ON FOOD INSECURITY AMONG RURAL SCHOOL GOING CHILDREN IN BANGLADESH**

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**ABSTRACT**

**Background:** This study aimed to assess the extent of socio-demographic factors that affect food insecurity among rural school going children.

**Methods:** A school based cross-sectional study was conducted among 460 rural school going children (class 4 to class 10) in Saltha upaziila of Faridpur district, Bangladesh from January-December, 2019. Children providing assent after getting consent from their parents were inducted as study participants. Semi-structured questionnaire was used to collect data on the food insecurity and socio-demographic variables. The study was conducted in Saltha upaziila of Faridpur district, Bangladesh from January-December, 2019

**Results:** Among the participants about 59.3% were moderately food insecure which means they were deprived of psychological and physical access to food. 53.7% were female and 88.3% of them were Muslims, 30.7% were from class 8, 70.7% were from nuclear family, 93% had siblings, 92% resided into house on their own land, 78.5% had own agricultural land and in 52.7% cases participant's father were farmer and their mean income was 98208.18 ± 13618.196 Taka per. 35.2% lived in both Semi Pucca house and Tin Shade house and 71% had domestic animal in their house, such as goat, sheep, cow, duck, hen etc., 41.5% had television in their house but 52% didn't have refrigerator in their house. There was a statistically significant relationship between food insecurity and age of participants (p=0.000), educational status (p=0.000), head of family (p=0.008), occupation of father (p=0.010), yearly income of family member (p=0.000), house type (p=0.000).

**Conclusion:** National policies and programs need to stress on how to improve family income earning capacity and socioeconomic status to handle food insecurity.

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**Key Words:** Socio-demographic factors, Rural, School going children, Food Insecurity.

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**INTRODUCTION**

Bangladesh is a highly population dense developing country in the world. According to Bangladesh Education Statistics, BANBEIS, 2017 there are about 1,75,215 institutions for primary and post primary education which accompanying about 3,58,60,599

students<sup>1</sup>. Like other developing countries in the world Bangladesh is also currently experiencing remarkable deprivations in food insecurity<sup>2-4</sup>. According to UNICEF out of 147 countries 19% of household with children are severely food insecure, 41% are moderately food insecure, 45% of respondents reported not having enough money to buy food in the

last year<sup>4,5</sup>. This represents 605 million children who are food insecure<sup>4</sup>. According to World Bank (2015) among some selected Asian highly population dense countries Bangladesh has the lowest Global Food

not started yet. The limited practical experience and clear understanding on how to implement as well as the lack evidence on the types of effective strategies for the country setting are among the socio-demographic factors that hinder implementation of school-based health and nutrition education in the country<sup>5</sup>. Agriculture is a dominant form of livelihood in Faridpur zone. However, recent evidences show that chronic food insecurity related to the escalation of food prices is pervasive among children in different upazilas of Faridpur district interfering with the school attendance and health of adolescents<sup>6</sup>.

## **METHODS**

A school based cross-sectional study was conducted among 460 school going children (class 4 to class 10) in Saltha upazila of Faridpur district, Bangladesh from January-December, 2019. Children providing assent after getting consent from their parents were inducted as study participants. Semi-structured questionnaire was used to collect data on the food insecurity and socio-demographic variables. Inclusion criteria was school going children and willing to participate and giving inform written assent and consent. Exclusion criteria was unable to participate severely ill. The study area was stratified into rural schools. Seven schools were selected from 4 unions. Then, from each school, sections (classes) was identified and eligible study participants was randomly selected who were permanent residents attending the school of the study area was randomly selected using their rosters as a frame. Since the largest calculated sample size was found to be 384. To minimize non-respondent after 20% increase in the size was 460. A semi-structured questionnaire was developed in English. The questionnaire was developed using the selected variables according to the specific objectives.

The questionnaire was contained questions related to:

1. Socio-demographic characteristics of participants and their family.
2. Measurement of food insecurity among the participants.

In this study, the food insecurity was measured by 10 questions, which was previously used to measured

Security Index. According to this the higher the index, the higher the level of food security<sup>4,5</sup>. In Bangladesh, comprehensive school health and nutrition intervention are

food insecurity level among rural school going children in by Bernal in their study at 2017<sup>5</sup>. The questionnaire was translated into Bangla and it was pretested among participants of similar characteristics. The questionnaire was finalized after necessary modification according to the finding of pretesting. After the collection of whole range of data, they were processed and tabulated. Editing, coding and decoding of collected data were done simultaneously, avoiding irrelevant and unreliable information. The turbulent data was analyzed and described according to the aims and objectives of the study, using SPSS version 26. The rest statistics was used to analyze the data was Chi Square, Fisher's Exact Test. Level of significant was set at 0.05. The results were presented in the form of tables and graphs.

10 questions were asked related to food insecurity. The minimum score of the scale was 0 and maximum was 20. The maximum total score of this study was found on the basis of 3 itemed was 14 and the minimum score was 0. Food insecurity was categorizing into 4 groups according to their total score. Total score "0", "1-3", "4-7" and "≥8" indicated food security, mild food insecurity, moderate food insecurity, severe food insecurity respectively.

## **RESULTS**

Among the participants about 59.3% were moderately food insecure which means they were deprived of psychological and physical access to food. 53.7% were female and 88.3% of them were Muslims, 30.7% were from class 8, 70.7% were from nuclear family, 93% had siblings, 92% resided into house on their own land, 78.5% had own agricultural land and in 52.7% cases participant's father were farmer and their mean income was  $98208.18 \pm 13618.196$  Taka per. 35.2% lived in both Semi Pucca house and Tin Shade house and 71% had domestic animal in their house, such as goat, sheep, cow, duck, hen etc., 41.5% had television in their house but 52% didn't have refrigerator in their house. There was a statistically significant relationship between food insecurity and age of participants ( $p=0.000$ ), educational status ( $p=0.000$ ), head of family ( $p=0.008$ ), occupation of father ( $p=0.010$ ), yearly income of family member ( $p=0.000$ ), house type ( $p=0.000$ ).

**Table: Association Between Socio-demographic Factors and Level of Food Insecurity**

Level of Food Insecurity							
	Food Security n (%)		Mild Food Insecurity n (%)	Moderate Food Insecurity n (%)	Severe Food Insecurity n (%)	Total n (%)	Test of Significance p-value
	1						
Age group (In full years)	1	1 (0.2)	23 (5)	94 (20.4)	23 (5.0)	141 (30.7)	0.000
	12-14	6 (1.3)	80 (17.4)	136 (29.6)	20 (4.3)	242 (52.6)	
	≥15	0 (0.0)	32 (7)	43 (9.3)	2 (0.4)	77 (16.7)	
Educational Status	Class 4	0 (0.0)	8 (1.7)	27 (5.9)	13 (2.8)	48 (10.4)	0.000
	Class 5	1 (0.2)	18 (3.9)	57 (12.4)	12 (2.6)	88 (19.1)	
	Class 6	0 (0.0)	12 (2.6)	28 (6.1)	0 (0.0)	40 (8.7)	
	Class 7	2 (0.4)	32 (7.0)	35 (7.6)	2 (0.4)	71 (15.4)	
	Class 8	4 (0.9)	32 (7.0)	92 (20.0)	13 (2.8)	141 (30.7)	
	Class 9	0 (0.0)	12 (2.6)	12 (2.6)	4 (0.9)	28 (6.1)	
Family Head	Father	7 (1.5)	134 (29.1)	264 (57.4)	40 (8.7)	445 (96.7)	0.008
	Mother	0 (0.0)	1 (0.2)	09 (2.0)	5 (1.1)	15 (3.3)	
Father's Occupation	Farmer	1 (0.2)	62 (13.5)	175 (38.0)	25 (5.4)	263 (57.2)	0.010
	Daily labor	0 (0.0)	4 (0.9)	12 (2.6)	5 (1.1)	21 (4.6)	
	rickshaw Puller	0 (0.0)	3 (0.7)	6 (1.3)	2 (0.4)	11 (2.4)	
	ervice holder	2 (0.4)	25 (5.4)	29 (6.3)	4 (0.9)	60 (13.0)	
	Business	4 (0.9)	38 (8.3)	48 (10.4)	9 (2.0)	99 (21.5)	
	Others	0 (0.0)	3 (0.7)	03 (0.7)	0 (0.0)	6 (1.3)	
Yearly Family Income	<85000	0 (0.0)	0 (0.0)	71 (15.4)	19 (4.1)	90 (19.6)	0.000
	85000-95000	0 (0.0)	20 (4.3)	96 (20.9)	12 (2.6)	128 (27.8)	
	>95000	7 (1.5)	115 (24.6)	106 (24.0)	14 (2.8)	242 (64)	
House Type	Kuccha	0 (0.0)	1 (0.2)	52 (11.3)	17 (3.7)	70 (15.2)	0.000
	Tin shade	1 (0.2)	30 (6.5)	121 (26.3)	10 (2.2)	162 (35.2)	
	Semi Pucca	3 (0.7)	70 (15.2)	76 (16.5)	15 (3.3)	164 (35.7)	
	Pucca	3 (0.7)	34 (7.4)	24 (5.2)	3 (0.7)	64 (13.9)	

**DISCUSSION**

In this study 16.7% was 15 or above years of age, majority 52.6% were between 12 years and 14 years of age followed by those who was between 9 years and 11 years of age was about 30.7%. The younger on was 9 years old while the older one was 17 years old. Mean was 12.87 ± 1.886 years<sup>6</sup>. A cross-sectional study in

which distribution of participants according to their age category was below 14 years 54.6% and above 15 years 43.9%. In present study majority (53.7%) were female and rest of them (46.3%) were male<sup>7</sup>. In a study the children were composed of 42.6% males and 57.4% females respectively<sup>8</sup>. In another study male and female percentage was 78% and 22% respectively. According to another study<sup>9</sup> male and female

percentage was 46.9% and 53.1% respectively. In present study majority (88.3%) of them were Muslims and rest of (11.7%) were believing in Hinduism<sup>10</sup>. In a study the distribution of participants according to religious view was 70.8% and 29.15% of Christian and Muslims respectively. In present study 70.7% were from nuclear family which means these families consisting of a pair of parents and their dependable children and only 29.3% were from joint family which means these family consisting of parents like father, mother, and their children, aunts, uncles, grandparents, and cousins, all living in the same household<sup>11</sup>. In a study about 40.36% lived in joint family and about 59.65% lived in nuclear family. In present study about 96.7% cases father was considered as the head of family. In only 3.3% cases mother was act as family head<sup>12</sup>. In a study the distribution of participants according to the head of their family was, in 48.3% cases father act as family head and in 47.7% cases mother was family head. Only in 4.1% cases family head was someone else rather than their parents<sup>13</sup>.

In several studies showed that the distribution of participants according to the head of their family was, in 83.2% cases father was act as family head and in 16.38% mother was family head. Only in 4.68% cases family head was someone else rather than their parents<sup>14-20</sup>. In present study about 57.2% participant's father was farmer. Other 21.5%, 13.0%, 4.6%, 2.4% were respectively Businessman, Service-holder, Daily labor and rickshaw puller. About 1.3% respondent's father done various types of work for living hood, such as some were teacher, technician, pharmacist, mechanic, electrician and many others professions.

In a study the distribution of participants according to their father's occupation about 48.3% father was farmers and rest of them were about 60% and 53.6% of government employee and others profession<sup>21-23</sup>. In present study about 96% participant's mother was housewife. Other 1.5%, 1.1% and 0.7% were respectively service holder, businesswomen and daily labor. About 0.9% respondent's mother done various types of work for living hood, such as teaching in madrasa, tailoring, selling domestic animal products and many others professions.

In a study the distribution of participants according to their mother's occupation 32.29% were housewife followed by 67.71% were working women<sup>24,25</sup>. In this study highest amount of earning was 135000 Taka per year and the lowest one was 75000 Taka per year, mean was  $98208.18 \pm 13618.196$  Taka per year. Majority of them (52.6%) earned more than 95000 Taka per year. Other 27.8%, 19.6% earned respectively within 85000-95000 Taka and less than 85000 Taka per year.

In this study majority (30.7%) were from class 8 which was followed by 19.1%, 15.4%, 10.4%, 9.6%, 8.7% and 6.1% were respectively from class 5, class 7, class 4, class 10 class 6 and class 9. In this study majority of them (93%) had siblings. Only 7% were single child of their parents. In this study participant's majority of them (92%) resided into house on their own land. Only 8% were unable to manage their housing system own land for living purpose and among them majority had their (78.5%) own agricultural land. About 21.5% didn't belong any agricultural land and (35.2%) lived in both Semi Pucca house and Tin Shade house. Only 15.2% and 13.9% lived in Kuccha and Pucca house respectively. In recent study most of them which was about 71% had domestic animal in their house, such as goat, sheep, cow, duck, hen etc. and 29% didn't have such types of domestic animals and majority of them (41.5%) had television in their house. About 4.1% had radio and 15.2% had television and radio both in their house. A large portion which was about 39.1% neither had television nor radio in their house. Among them 52% didn't have refrigerator in their house. About 48% had refrigerator in their house. There was no significant association between food insecurity and gender, religion, family type, occupation of participant's mother. Food insecurity was significantly associated with age of participant, educational status of participants, head of family member, occupation of participant's father, total family income, type of house.

## CONCLUSION

In a nutshell, socio-demographic and socio-economic factors may be a key contributor of food insecurity status. Paternal responsibility towards family, his occupation, overall earning capacity of family, educational status of children and their housing type may contribute a significant role in household food insecurity level. Improvement of these factors may improve overall food security status.

## RECOMMENDATIONS

Planners and policy maker should take necessary actions to improve the food security status of rural school going children and their family. There is a need of multisector efforts among different sectors to improve household earning capacity and socio-economic status to tackle household food insecurity. Introducing "MID-DAY" meal may help to improve household food insecurity status.

## ETHICAL APPROVAL

The objectives and importance of the research were explained to all participants prior to recruitment. Participation in the study was voluntary. The confidentiality of the participants was maintained, and

written informed consent as well as ascent were obtained from all participants and their parents. The study was approved by the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM) and obtained an ethical clearance waiver from same source. The Code of approval was: NIPSOM/IRB/2019/162.

#### **DECLARATION**

No funding facilities were available for this study and all authors have read and approved the final version of the manuscript and also none of the participating authors has a conflicting financial or other interest related to the work detailed in this manuscript.

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#### **REFERENCES**

1. BANBEIS: Educational Database, Bangladesh Education Statistics (2019).  
Available at:<http://data.banbeis.gov.bd/>
2. Ali A, Khan M. Livestock ownership in ensuring rural household food security in Pakistan. *J Anim Plant Sci.* 2013;23(1):313–8.
3. Diana F, Edward A, Sonya J. Food insecurity affects school children's academic performance, weight gain, and social skills. *J Nutr.* 2005;135:2831–9.
4. Z. and Wan, G. (2017) Food Insecurity in Asia.
5. Bernal, J. et al. (2014) 'Food Insecurity in Children but Not in Their Mothers Is with Altered Activities', (24), pp.1619–1626.
6. doi:10.3945/jn.113.1899–85.
7. Tamiru, D. et al. (2016) 'Household food insecurity and its association with school absenteeism among primary school adolescents in Jimma zone, Ethiopia', *BMC Public Health.* *BMC Public Health*, pp. 1–8. doi: 10.1186/s12889-016-3479-x.
8. Naser, I. A. et al. (2014) 'Association between household food insecurity and nutritional outcomes among children in Northeastern of Peninsular Malaysia', 8(3), pp. 304–311. doi: 10.4162/nrp.2014.8.3.304.
9. Mwenjeri G Waithaka (2015) 'Analysis of Household Food Insecurity and The Implication of Measurement Error, Mandera County, Kenya', (April).
10. Kimani-murage, E. W. et al. (2010)-a 'Food Security and Nutritional Outcomes among Urban Poor Orphans in Nairobi, Kenya', 88(7139065), pp. 282–297. doi: 10.1007/s11524-010-9491-z.
11. Napoli, M., Muro, P.D. and Mazziotta, M., n.d. towards a Food Insecurity Multidimensional Index (FIMI). p.72.
12. Zhou, Z., Wan, G. and Asian Development Bank Institute eds., 2017. Food insecurity in Asia: why institutions matter. Tokyo: Asian Development Bank Institute.
13. Kimani-Murage, E.W., Holding, P.A., Fotso, J.-C., Ezech, A.C., Madise, N.J., Kahurani, E.N. and Zulu, E.M., 2011-b. Food Security and Nutritional Outcomes among Urban Poor Orphans in Nairobi, Kenya. *Journal of Urban Health*, 88(S2), pp.282–297.
14. Ali Naser, I., Jalil, R., Wan Muda, W.M., Wan Nik, W.S., Mohd Shariff, Z. and Abdullah, M.R., 2014b. Association between household food insecurity and nutritional outcomes among children in Northeastern of Peninsular Malaysia. *Nutrition Research and Practice*, 8(3), p.304.
15. Macharia, T.N., Ochola, S., Mutua, M.K. and Kimani-Murage, E.W., 2018. Association between household food security and infant feeding practices in urban informal settlements in Nairobi, Kenya. *Journal of Developmental Origins of Health and Disease*, 9(1), pp.20–29.
16. Levinger B. Nutrition, health, and learning: current issues and trends. *School nutrition and health network monograph series 1.* 1992.
17. Hickson M, Cuba S, Weiss I, Donofrio G, Cook J. Too Hungry to learn: food insecurity and school readiness. 2013.
18. Tefera B, Craig H, David L, Abebe G, Carl L, Patrick K. Food insecurity, school absenteeism and educational attainment of adolescents in Jimma Zone Southwest Ethiopia: a longitudinal study. *Nutr J.* 2011;10:29.
19. Winicki J, Jemison K. Food insecurity and hunger in the kindergarten classroom: its effects on learning and growth. *Contemp Econ Policy.* 2003;21(2):145–57.
20. Belachew T, Lindstrom D, Gebremariam A, Lachat C, Huybregts L, Kolsteren P. Predictors

- of chronic food insecurity among adolescents in southwest Ethiopia. *BMC Public Health*. 2012;12:604.
21. Hadley C, Stevenson E, Tadesse Y, Belachew T. Rapidly rising food prices and the experience of food insecurity in urban Ethiopia: impacts on health and well-being. *Soc Sci Med*. 2012;75(12):2412–9.
  22. Muro P, Burch F. Education for rural people and food security: a cross country analysis, Rome. 2007.
  23. Matheson D, Varady J, Varady A, Killen J. Household food security and nutritional status of Hispanic children in the fifth grade. *Am J Clin Nutr*. 2002;76(1):210–7
  24. Roustit C, Hamelin A, Grillo F, Martin J, Chauvin P. Food insecurity: could school food supplementation help break cycles of intergenerational transmission of social inequalities? *Paediatrics*. 2010;126:1174–81.
  25. Tamiru D, Argaw A, Gerbaba M, Ayana G, Nigussie A, Belachew T. Household food insecurity and its association with school absenteeism among primary school adolescents in Jimma zone, Ethiopia. *BMC Public Health*. 2016;16:802.