Household food security status of early adolescence in Colombo city

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ABSTRACT

Food insecurity is a leading public health problem in the world, and the food security status of Sri Lanka has not achieved better progress so far. The early adolescent period is more vulnerable to energy and nutrient deficiencies, and studies are lacking to determine food security during early adolescence. A cross-sectional study aimed to determine the food security status of early adolescents at 12 randomly selected schools in Colombo city. A total of 634 adolescents aged 11-13 years surveyed using a multistage stratified cluster sampling technique. Household food security status during the past 12 months was determined using USDA Food Security / Hunger Survey Module. Socio-demographic data were collected using a general questionnaire. The prevalence of food security was 61%, and food insecurity was 39%. The prevalence of food insecurity without hunger was 27%, food insecurity with moderate hunger was 10%, and food insecurity with severe hunger was 3%.

Keywords: Early adolescence, Food insecurity, Hunger severity.

INTRODUCTION

Food insecurity is a leading public health problem globally (Alisha *et al*, 2013; Ali, Saha and Nguyen, 2013). In addition to that, world hunger has risen again with increasing the global number of undernourished people to 812 million in 2017 at the rate of 10.8% (FAO, IFAD, UNICEF, WFP and WHO, 2019).

The food security status of Sri Lanka has not achieved better progress so far. Global Hunger Index (GHI) ranked Sri Lanka as 66th out of 117 countries, with a 17.1 score indicating a moderate hunger level (Global hunger index, 2020). Global Food Security Index (GFSI) ranked Sri Lanka as 66th out of 113 countries in 2019 (The Economist, 2020). Despite that, the prevalence of undernourishment of the population was 9% during the period of 2016- 2018 (FAO, 2019). The Colombo city is the economic centre, and the capital of the country is a multi-cultural, multi-ethnic, multi-religious and the most populous city in Sri Lanka, living nearly one-fourth of Colombo District population (555,031) and having the highest population density ($17353/km^2$) in the district(Colombo Municipal Council, 2015).

Moreover, Colombo District had the highest proportion (58.3%) of food insecure population in the country from 2009 to 2010 (Mayadunne and Romeshun, 2013). Early adolescence is the transitional phase between childhood and adulthood, during which accelerated growth and development occur. Thus, adequate nutrient intake is crucial in this period, and food insecurity adversely affects adequate energy and nutrients intake. Hence, this study was carried out to find out the household food security status of early adolescents in Colombo.

METHODOLOGY

Study sample

A cross-sectional study conducted using 634 adolescents aged 11-13 years studying in 12 schools located in Colombo city from June 2019 to November 2019. The adolescents were surveyed using a multistage stratified cluster sampling technique. The first stage was 'administrative district' (North Colombo, Central Colombo A, Central Colombo B, Borella, East Colombo and West Colombo), the second stage was 'type of school' (national schools and provincial schools), and the third stage was 'school category' (Sinhala medium, Tamil medium, Sinhala and Tamil media, Muslim schools). A proportionate sample of adolescents in each stratum was used for subject recruitment. The number of subjects recruited from North Colombo, Central Colombo A, Central Colombo B, Borella, East Colombo, and West Colombo was 67, 114, 63, 233, 28 and 129. The subjects representing national schools were 327, and provincial schools were 307. Further, subjects from Sinhala medium, Tamil medium, Sinhala and Tamil media and Muslim schools were 402, 51, 78 and 75, respectively. The sample was comprised of 336 boys and 270 girls. A cluster sample of subjects in a single classroom from each randomly selected school was drawn for the study. The subjects who were unhealthy not belong to the particular administrative district, living outside the city of Colombo and away from parents were excluded from the sample.

Data collection

Household food security data: The past 12-month household food security status of the subjects was measured using the translated form of 18 items United States Department of Agriculture (USDA) Household Food Security/ Hunger Survey Module (Gary *et al*, 2000). The questionnaire was self-administered to the mother of the subject.

Socio-demographic data: A pre-tested general questionnaire was self-administered to the mother or guardian

of the subject to collect socio-demographic information of subjects. The monthly household income categorized into five ordinal levels as 'below LKR 25000', 'between LKR 25001–50000', 'between LKR 50001–75000', 'between LKR 75001–100000' and 'above LKR 100000'.

Analysis

Household food security status: According to the 18 items USDA Household Food Security/ Hunger Survey Module, affirmative responses were assigned as "1", and negative responses were assigned as "0". The summation of all the affirmative responses was used to determine the household food security status of the subjects. Household food security status was categorized into four levels as "food secure" if affirmative responses = 0-2, "food insecure without hunger" if affirmative responses = 3-7, "food insecure with moderate hunger" if affirmative responses = 8-12 and "food insecure with severe hunger" if affirmative responses = 13-18. The percentage of subjects in each food security status category was calculated.

Statistical analysis: All the statistical analyses were conducted using the statistical software, SPSS version 21 (SPSS Inc, Chicago, IL) statistical package. The difference of prevalence of household food security status by gender, ethnicity, type of school, administrative district and monthly household income was compared using the chi-squared test (Gupta, 2004) at the significant level of 0.05.

Ethical clearance: Ethical clearance was obtained from the Ethical Review Committee of the National Institute of Health Sciences. Written informed consent was obtained from the mother or guardian of the subjects after informing them about the data gathered by the researcher.

RESULTS AND DISCUSSIONS

The mean ($\pm$SD) score for the 18 item household food security survey module was 2.95 ($\pm$3.72), which indicates subjects were food insecure without hunger. The prevalence of food security was 61%, while the prevalence of food insecurity was 39% among 11-13 years in Colombo city. The majority of the food insecure adolescents were food insecure without hunger (27%) while, 10% were food insecure with moderate hunger, and 3% were food insecure with severe hunger (Figure 1).

Considering the type of school, the prevalence of food security was higher among adolescents studying in national schools than provincial schools; in contrast, a higher prevalence of food insecurity was reported among adolescents studying in provincial schools than national schools. Further, the highest prevalence of food security was reported from administrative district West Colombo, followed by Borella. The prevalence of food insecurity was highest among adolescents from administrative district North Colombo. These differences in

the prevalence of household food security status by type of school and administrative district were significant ($p<0.001$). However, there was no significant difference in household food security status by gender ($p>0.05$) (Table 1).
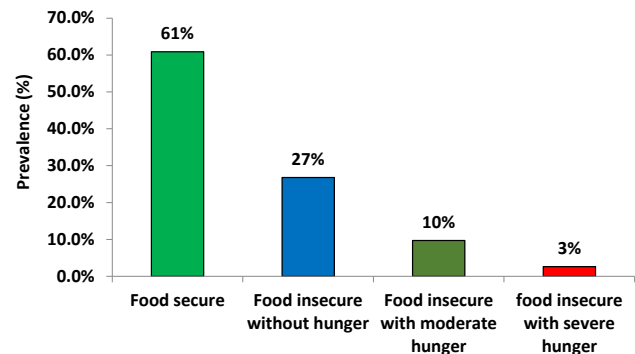

Figure 1: Prevalence of household food security status among 11-13 year adolescents in Colombo city

The highest prevalence of food security was reported among Sinhalese adolescents, while the highest prevalence of food insecurity was reported among Muslims. The highest percentage of food secure adolescents had a monthly household income above LKR 100000, while the highest percentage of adolescents with food insecurity had a monthly household income below LKR 25000. These differences in the prevalence of household food security status by ethnicity and monthly household income were significant ($p<0.001$) (Table 1).

In Sri Lanka, national and Colombo district food insecurity values based on the minimum dietary energy requirement were 18.9% and 38% in 2009-2010, respectively (Mayadunne and Romeshun, 2013). Further, as measured by the prevalence of undernourishment (POU) of the country, food insecurity was 9% from 2016 to 2018 (FAO, 2019). According to our study, the prevalence of household food insecurity was higher (39%) than the national (18.9%) and Colombo district values (38%).

The food security was higher in national schools than provincial schools because most adolescents in national schools were from affluent society, whose affordability is high due to higher household monthly income. Moreover, higher prevalence food security reported administrative districts, West Colombo and Borella had more national schools, while administrative district North Colombo had the highest prevalence of food insecurity having provincial schools only. According to this study, the majority of Muslim subjects had a monthly household income below LKR 25000, and therefore food insecurity was highest among Muslims.

CONCLUSION

The majority of the early adolescents aged 11-13 years in Colombo city are food secure, and 39 in every 100 adolescents are face issues due to food insecurity.

Table 1: Prevalence of household food security status by gender, type of school, administrative district, ethnicity and monthly household income

Features	Categories	Prevalence (%)			
		Food secure	Food insecure without hunger	Food insecure with moderate hunger	Food insecure with severe hunger
Gender[a]	Boys	65	27	7	2
	Girls	56	27	13	4
Type of school[b]	National	77	19	3	0
	Provincial	41	37	17	5
Administrative district[b]	North Colombo	32	47	17	4
	Central Colombo A	44	35	18	3
	Central Colombo B	41	26	22	11
	Borella	73	22	4	1
	East Colombo	44	31	19	6
	West Colombo	81	16	2	0
Ethnicity[b]	Sinhalese	73	20	5	2
	Tamil	45	44	11	0
	Muslim	43	31	20	6
Household monthly income level (LKR)[b]	< 25000	33	41	19	6
	25001-50000	55	30	14	2
	50001-75000	70	29	0	2
	75001-100000	85	8	4	2
	>100000	93	7	0	0

[a] No significant difference by chi-squared test ($p>0.05$)
[b] Significantly different by chi-squared test ($p<0.001$)

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