

# Does Depression Affect Consumption of Food among 10-19 Years Old Adolescent Boys and Girls in Bangladesh?

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**Rationale and objectives**



**Methods**



**Results**



**Implications**



# Rationale and objectives

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- Prevalence of depression is high (24.5%) among adolescents in Bangladesh.<sup>1</sup>
- Studies reported significant association between food habits and depression.<sup>2</sup>
- There is little evidence about the choice of food groups among depressed adolescents in Bangladesh.

We aimed to explore the relationship between depression and consumption of food from different food groups among adolescent boys and girls in Bangladesh.

1. Mridha MK, Hossain MM, Khan MSA, Hanif AAM, Hasan M, Mitra D, Hossaine M, Ullah MA, Sarker SK, Rahman SMM, Bulbul MMI, Shamim AA. Prevalence and associated factors of depression among adolescent boys and girls in Bangladesh: findings from a nationwide survey. *BMJ Open*. 2021 Jan 17;11(1):e038954. doi: 10.1136/bmjopen-2020-038954. PMID: 33455924; PMCID: PMC7813352.
2. Khalid S, Williams CM, Reynolds SA. Is there an association between diet and depression in children and adolescents? A systematic review. *British Journal of Nutrition*. 2016;116(12):2097-2108. doi:10.1017/S0007114516004359





# Methods

# Methods

## 1. Study design and areas

Bangladesh National Nutrition Surveillance Study: 2018-19 round cross-sectional in design conducted in eight divisions of Bangladesh

## 3. Sample size

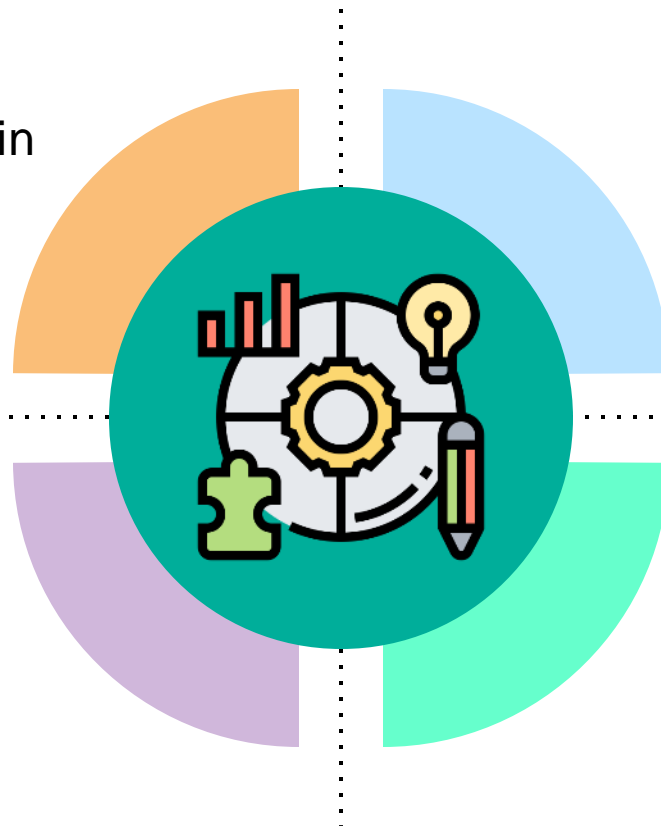
A total of 9,772 adolescents participated (boys: 4,907 and girls: 4,865)

## 2. Sampling procedure

Multi-stage cluster sampling method, separate selection methods for rural, non-slum urban and slum areas.

## 4. Data collection

Face-to-face interview using a structured questionnaire. Patient health Questionnaire (PHQ-9) and MDD-W tools were used for data collection



# Cluster selection methods

## Rural

8 divisions

Randomization ↓

2 districts in each

Randomization ↓

1 sub-district in each

Randomization ↓

2 unions in each

Randomization ↓

2 clusters from each union (250-400 households per cluster)

## Non-slum urban

8 divisions

Randomization ↓

1-2 wards from each division

Randomization ↓

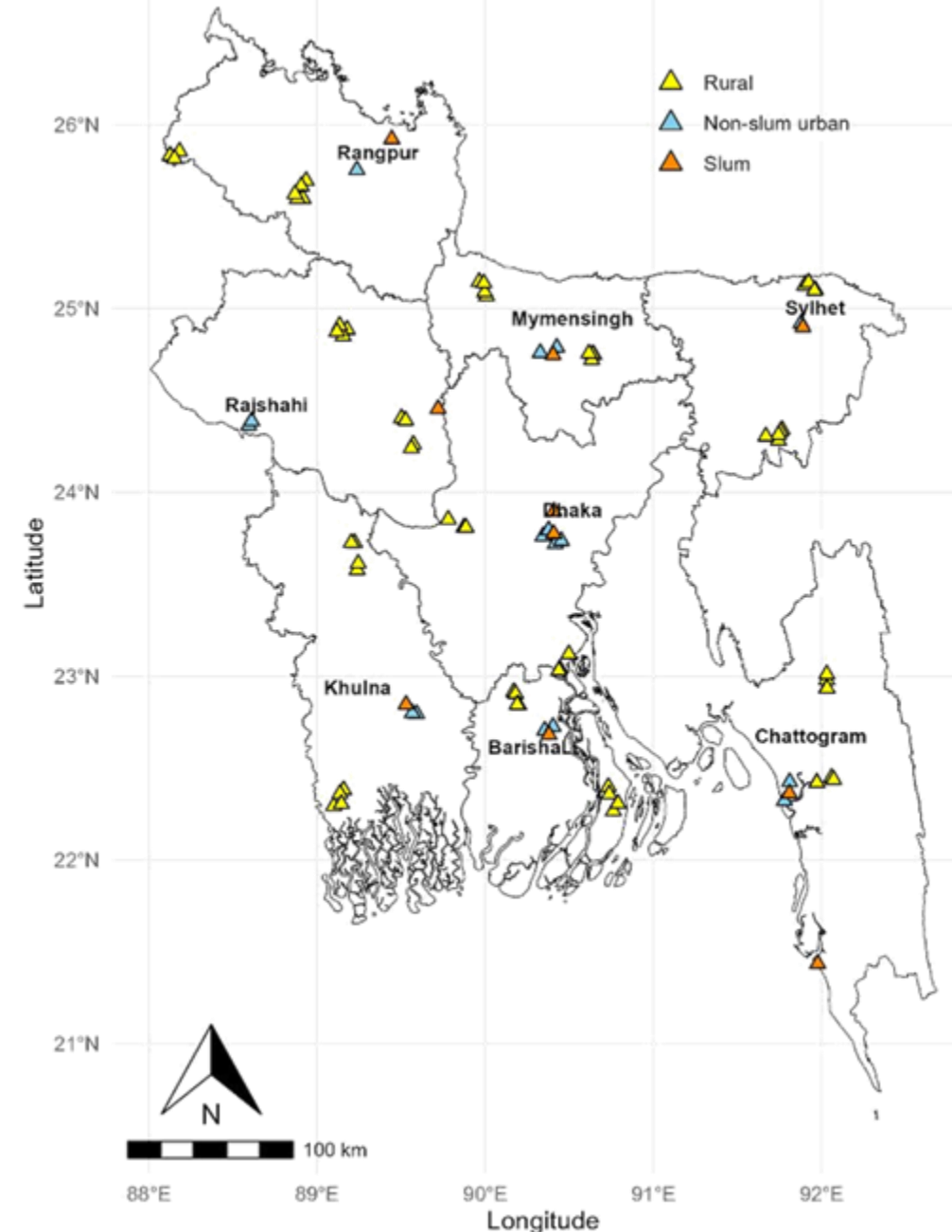
1 cluster from each ward (250-400 households per cluster)

## Slum

Sampling frame generated from the Census of Slum Areas and Floating Population 2014 list

Randomization ↓

2 clusters from each of Dhaka and Chattogram divisions and 1 cluster from each of the other 6 divisions



# Study participant selection process

82 clusters from 8 divisions (rural:57, non-slum urban:15, and slum:10)

25,371 households (HH) were listed with 10,529 boys and 10,211 girls

6,348 boys and 6,338 girls were randomly selected for interview

Data from 9,772 participants were collected and analysed

Boy (n=4,907)

Girl (n=4,865)



# Data analysis

## Food groups:

We followed the Minimum Dietary Diversity for Women (MDD-W) guideline to categorise the food groups.<sup>1</sup>

## Outcome variable:

Frequency of consumption of specific food groups:

- **More frequent:** If consumed more than or equal to the median frequency of consumption
- **Less frequent:** If consumed less than median frequency of consumption

## Explanatory variable:

Age, religion, marital status, maternal education, paternal education, food security, wealth index, any depression (mild to severe)

**Data analysis:** Stata (v17.0) software was used. Descriptive and inferential analysis were performed. Pearson's Chi-squared test and binomial logistic regression were used to check association. The variables with a p-value  $\leq 0.2$  in the unadjusted analysis were included in the adjusted analysis for binomial logistic regression.<sup>2</sup>

1. <https://www.fantaproject.org/monitoring-and-evaluation/minimum-dietary-diversity-women-indicator-mddw>

2. (2) Maldonado G, Greenland S. (1993). Simulation study of confounder selection strategies. Am J Epidemiol;138:923-36



# Results

# Background characteristics of the participants

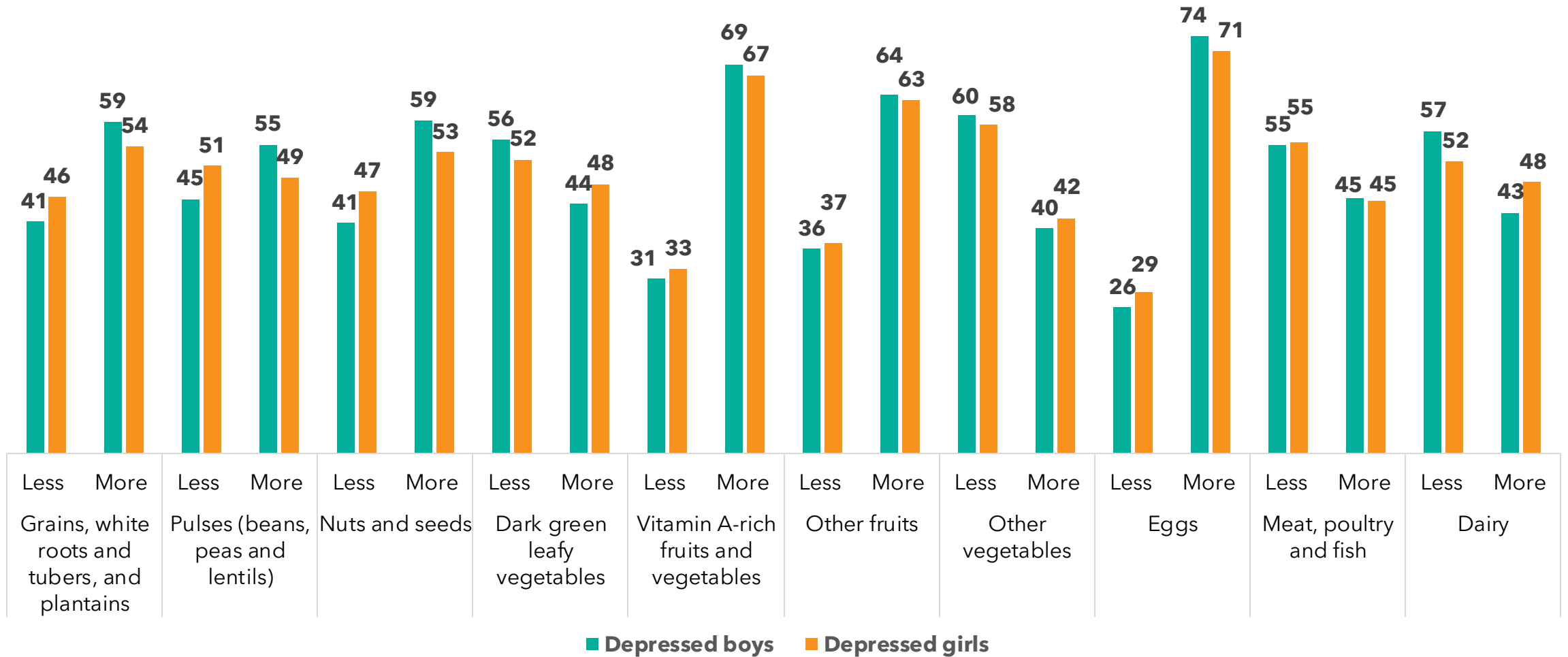
Table 1: Prevalence of depression among adolescents

Sex	Depression (n=9,772)
Boy	22.0%
Girl	27.0%
Overall	24.5%

Table 2: Background characteristics of the participants

Variables	Total	Boy	Girl
	n=9,772	n=4,907	n=4,865
<b>Age group (years)</b>			
10-14 years	5,462 (55.9%)	2,789 (56.8%)	2,673 (54.9%)
15-17 years	3,026 (31.0%)	1,524 (31.1%)	1,502 (30.9%)
18-19 years	1,284 (13.1%)	594 (12.1%)	690 (14.2%)
<b>Place of residence</b>			
Rural	6,828 (69.9%)	3,438 (70.1%)	3,390 (69.7%)
Non-slum urban	1,752 (17.9%)	873 (17.8%)	879 (18.1%)
Slum	1,192 (12.2%)	596 (12.1%)	596 (12.3%)
<b>Educational attainment</b>			
No education	219 (2.2%)	161 (3.3%)	58 (1.2%)
Partial primary	2,601 (26.6%)	1,518 (30.9%)	1,083 (22.3%)
Complete primary	1,376 (14.1%)	658 (13.4%)	718 (14.8%)
Partial secondary	4,322 (44.2%)	1,973 (40.2%)	2,349 (48.3%)
Complete SSC or more	1,254 (12.8%)	597 (12.2%)	657 (13.5%)
<b>Household food security</b>			
Food secure	5,627 (57.6%)	2,817 (57.4%)	2,810 (57.8%)
Mild food insecure	2,460 (25.2%)	1,244 (25.4%)	1,216 (25.0%)
Moderate food insecure	493 (5.0%)	248 (5.1%)	245 (5.0%)
Severe food insecure	1,187 (12.2%)	595 (12.1%)	592 (12.2%)

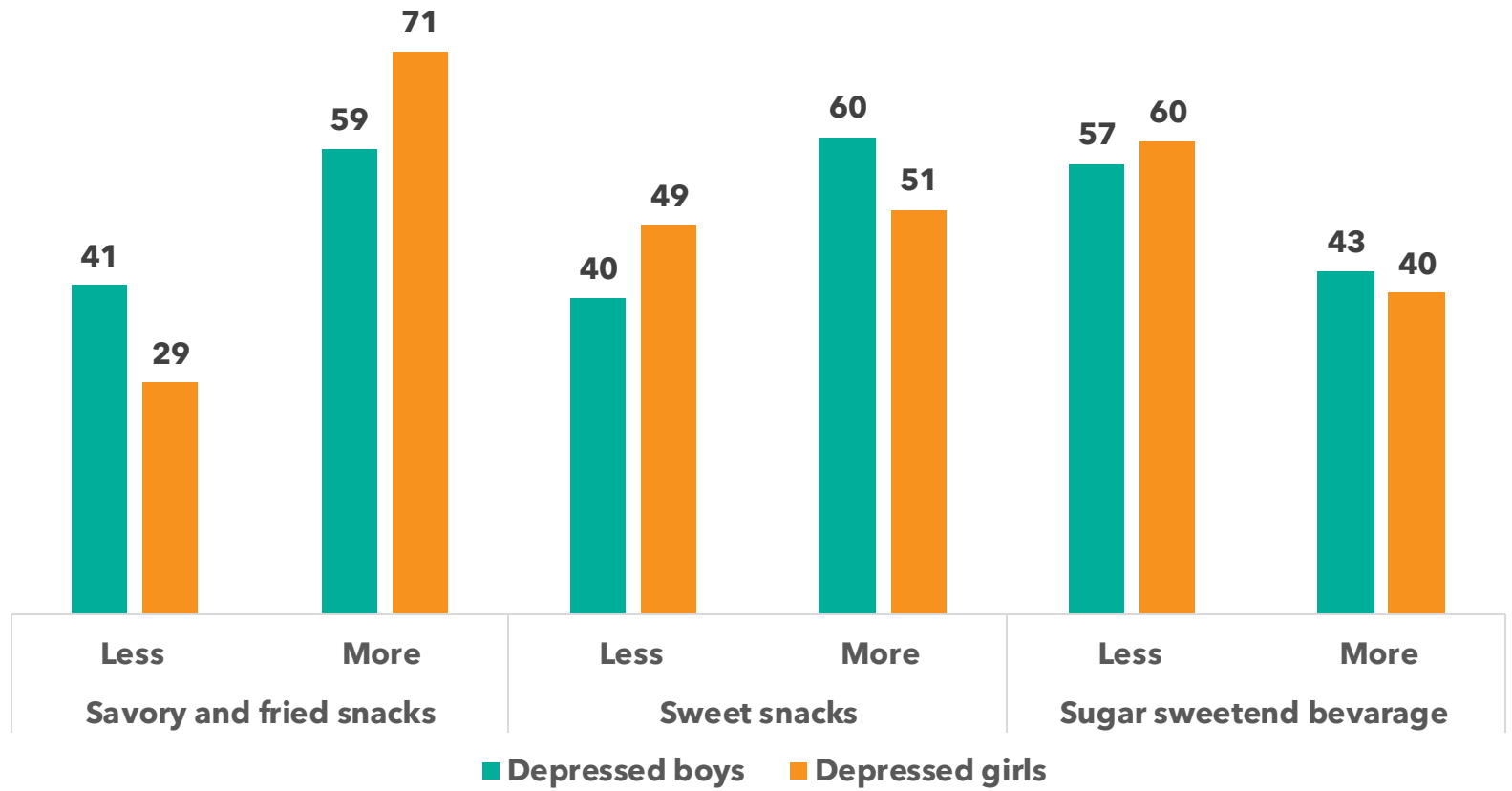
# Consumption of food items from different food groups among depressed adolescents by sex



# Consumption of processed food items among depressed adolescents by sex



Photo source: <https://www.thequint.com/fit/ultra-processed-food-mental-health-new-study>



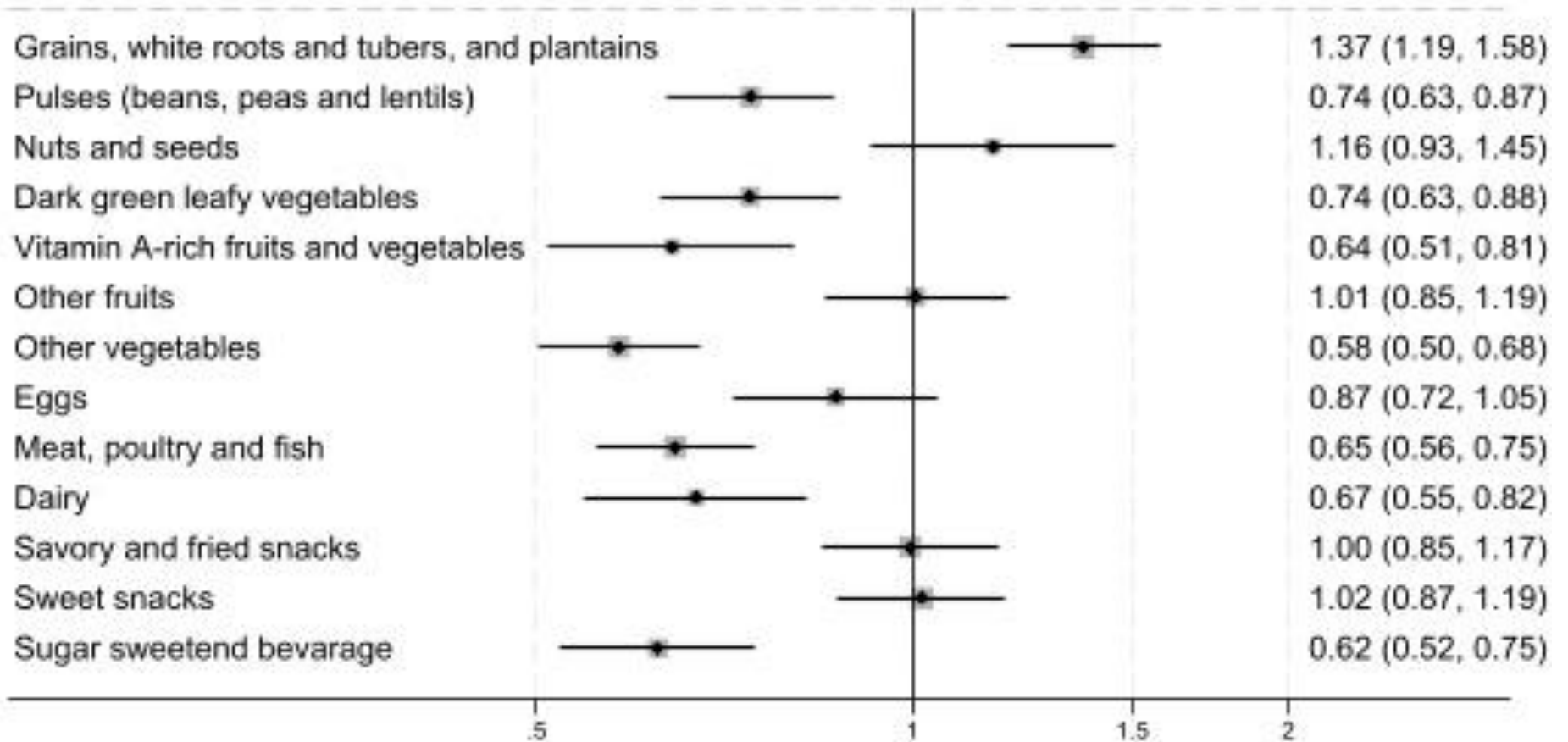


# Association of depression (adjusted for other covariates) with consumption of food among boys



## Food groups

## Odds ratio (95% CI)



# Association of depression (adjusted for other covariates) with consumption of food among girls

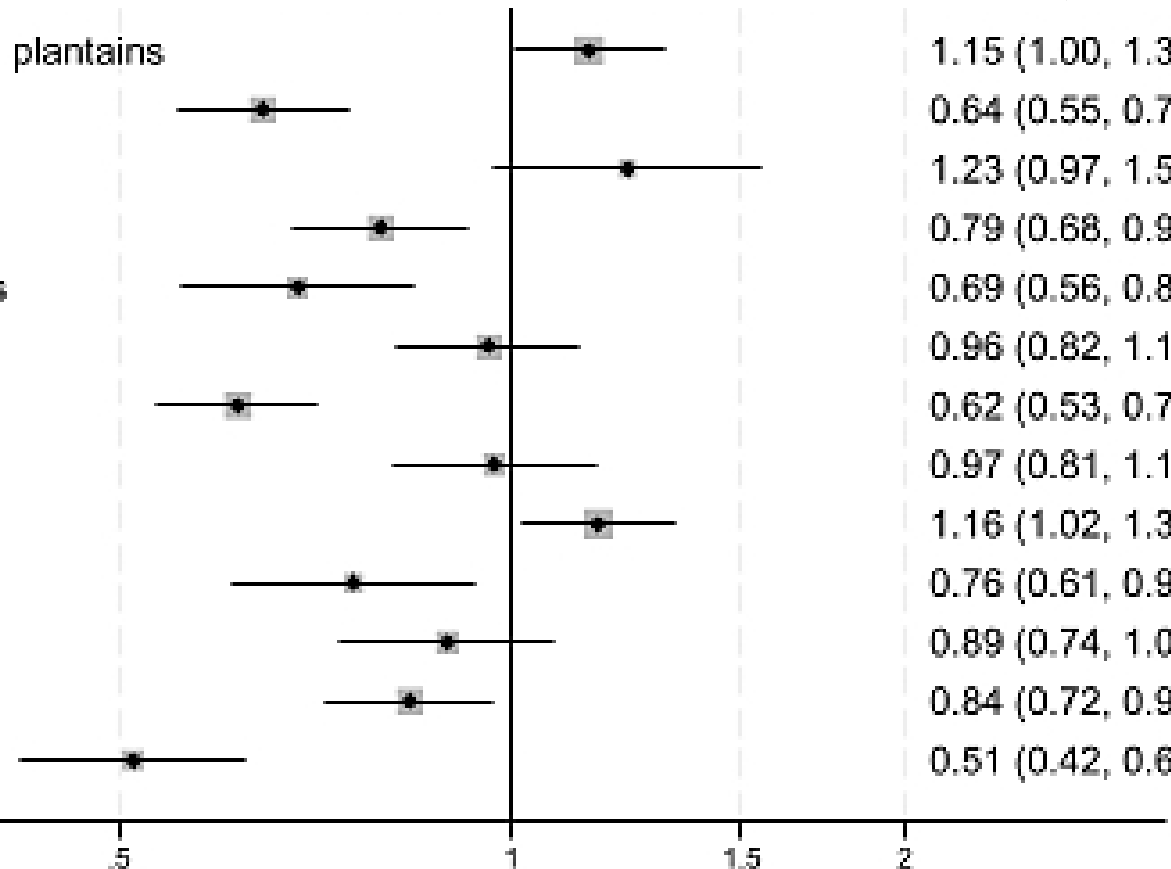


## Food groups

Grains, white roots and tubers, and plantains  
 Pulses (beans, peas and lentils)  
 Nuts and seeds  
 Dark green leafy vegetables  
 Vitamin A-rich fruits and vegetables  
 Other fruits  
 Other vegetables  
 Eggs  
 Meat, poultry and fish  
 Dairy  
 Savory and fried snacks  
 Sweet snacks  
 Sugar sweetened beverage

## Odds ratio (95% CI)

1.15 (1.00, 1.31)  
 0.64 (0.55, 0.75)  
 1.23 (0.97, 1.55)  
 0.79 (0.68, 0.93)  
 0.69 (0.56, 0.84)  
 0.96 (0.82, 1.13)  
 0.62 (0.53, 0.71)  
 0.97 (0.81, 1.16)  
 1.16 (1.02, 1.33)  
 0.76 (0.61, 0.94)  
 0.89 (0.74, 1.08)  
 0.84 (0.72, 0.97)  
 0.51 (0.42, 0.62)



## Results: Summary of associated factors

Association	Boys with depression	Girls with depression
<b>Higher odds of frequent consumption</b>	<ul style="list-style-type: none"> <li>Grains, white roots and tubers, and plantains</li> </ul>	<ul style="list-style-type: none"> <li>Grains, white roots and tubers, and plantains</li> <li><b>Meat, poultry and fish*</b></li> </ul>
<b>Lower odds of frequent consumption</b>	<ul style="list-style-type: none"> <li>Pulses (beans, peas and lentils)</li> <li>Dark green leafy vegetables</li> <li>Vitamin A-rich fruits and vegetables</li> <li>Other vegetables</li> <li><b>Meat, poultry and fish*</b></li> <li>Dairy</li> <li>Sugar sweetened beverage</li> </ul>	<ul style="list-style-type: none"> <li>Pulses (beans, peas and lentils)</li> <li>Dark green leafy vegetables</li> <li>Vitamin A-rich fruits and vegetables</li> <li>Other vegetables</li> <li>Dairy</li> <li><b>Sweet snacks*</b></li> <li>Sugar sweetened beverage</li> </ul>

\*indicates these are unique for boys or girls



# Implications

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## The following recommendations can be helpful for adolescents with depression:

- Mandatory periodic mental health screening and dietary advice services for adolescents can be integrated into the primary health system and education institutions
- Targeted education programs for parents of adolescents can be done to facilitate healthy food choices at the household level
- Need focused interventions to increase fruit and vegetable, dairy and pulses consumption among adolescents with depression
- Reduced frequency of processed food consumption during depression is a good sign. Interventions are needed to sustain this pattern



**Thank you**  
**floor is open for Q & A**

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