# Nutritional Status in Early Marriage and Teenage Pregnancy – A Cross-Sectional Study in Rural and Semi Urban Area of Bangladesh

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ARTICLE INFO

**Received:** 8 Apr 2026
**Accepted:** 16 Apr 2026
**Published Online:** 5 May 2026

DOI: 10.5281/zenodo.20031406

Volume: 9, Number: 2, Page: 117-119

e-ISSN: 2789-5912
ISSN: 2617-0817

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ABSTRACT

**Introduction:** Adolescence is a critical period of growth and development, during which adequate nutrition is essential to meet increased physical and cognitive demands. In Bangladesh, early marriage and teenage pregnancy remain common, particularly in rural and semi-urban areas, exposing young girls to heightened risks of undernutrition, anaemia, and poor dietary intake. This study aims to describe the nutritional status of married adolescent girls and pregnant teenage women in selected rural and semi-urban areas of Bangladesh. **Methods & Materials:** This was a cross-sectional study conducted from January 2024 to December 2024 in the Department of Obstetrics & Gynaecology, Dhaka Dental College, Dhaka, Bangladesh. A total of 72 married adolescent girls aged 13–19 years, including both pregnant and non-pregnant participants, were recruited using purposive sampling. Data were analysed using SPSS version 26. **Result:** In this study, 40.3% were underweight, 47.2% had normal BMI, and 12.5% were overweight, with underweight more prevalent among pregnant adolescents (50%) than non-pregnant (29.4%). Anaemia was observed in 56.9% overall, affecting 65.8% of pregnant participants. Dietary assessment revealed limited diversity, with high consumption of cereals but low intake of dairy (29.2%), fruits (38.9%), and animal-source foods (45.8%). Early marriage was significantly associated with poorer nutritional status, as underweight prevalence decreased from 57.7% among those married ≤15 years to 18.8% among those married ≥18 years. **Conclusion:** This study revealed that early marriage and teenage pregnancy significantly impact the nutritional status of adolescent girls in rural and semi-urban areas of Bangladesh. A considerable proportion of participants were undernourished, with low BMI, anaemia, and inadequate dietary intake.

***Keywords:*** *Teenage Pregnancy, Nutritional Status, Anaemia*

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## INTRODUCTION

Early marriage and teenage pregnancy continue to be major public-health challenges in Bangladesh, particularly in rural and semi-urban communities where socioeconomic disadvantage, limited educational attainment and constrained access to health and nutrition services disproportionately affect young women. Recent national data indicate that a significant proportion of girls marry before the age of 18 and begin childbearing in adolescence, a pattern that intersects intimately with poor maternal nutritional outcomes [1]. These phenomena are further exacerbated by the fact that adolescent mothers are often embedded in households with lower income, lower education and food insecurity, factors which also impede optimal nutritional status [2]. Nutrition of adolescent and young women is critical for both their own growth and development and for optimal pregnancy outcomes. In Bangladesh, the nutrition of women of reproductive age has shown persistent deficits: underweight, micronutrient deficiencies, and short stature remain prevalent, especially among younger mothers [3]. Studies conducted among adolescents in rural Bangladesh found that diet quality is very low: for example, over 70 % of adolescent girls had inadequate intake of calcium, vitamin A, folic acid and vitamin B12, and their overall dietary adequacy was significantly worse than that of adult women of reproductive age [4]. Adolescent pregnancy imposes a “double burden” on young women: biologically, they may still be growing, while socially, they take on the demands of motherhood. A cross-sectional survey in Bangladesh revealed that compared to adult pregnant women, adolescent mothers weighed less (45.8 kg vs 47.1 kg) and had lower BMI (19.7 vs 21.3), and their infants had poorer anthropometric outcomes (for example, height-for-age z-score -0.89 vs -0.74) [5]. Further, analyses of nationally-representative demographic and health survey data in Bangladesh show that adolescent birth is associated with child undernutrition: children born to mothers aged 10-15 had height-for-age z-scores that were on average 0.29 SD lower compared to children of adult mothers, and a higher prevalence of stunting and underweight was also documented [6]. These inter-generational links illustrate how early age at marriage and childbearing can perpetuate a cycle of poor nutritional status across generations. The socio-demographic context is equally important. Married adolescents typically have less decision-making power, fewer assets and lower educational attainment than older mothers, which impacts both their nutritional status and access to care [5,6]. Food security and educational status were also significant predictors of adolescent nutritional status in a rural Bangladeshi study, which reported an underweight prevalence of 13 % among adolescents and found that higher education was associated with normal nutritional status [7]. This study, therefore, aims to describe the nutritional status of married adolescent girls and pregnant teenage women in selected rural and semi-urban areas of Bangladesh.

## METHODS & MATERIALS

This was a cross-sectional study conducted from January 2024 to December 2024 in the Department of Obstetrics & Gynaecology, Dhaka Dental College, Dhaka, Bangladesh. A total of 72 married adolescent girls aged 13–19 years, including both pregnant and non-pregnant participants, were recruited using purposive sampling. Inclusion criteria were girls who had married before 19 years of age and were willing to participate, while exclusion criteria included those with chronic illnesses (e.g., renal, hepatic, or

endocrine disorders), severe acute illness, or refusal to provide informed consent. Data were collected through structured interviews and anthropometric measurements. Socio-demographic information (age, education, socioeconomic status, age at marriage, and place of residence) was recorded. Nutritional status was assessed using weight, height, and body mass index (BMI), and haemoglobin levels were measured to identify anaemia. Dietary diversity was assessed using a 24-hour recall questionnaire covering major food groups. Data were entered and analysed using SPSS version 26. Continuous variables were expressed as mean ± standard deviation (SD) and categorical variables as frequency and percentage. Associations between variables (e.g., age at marriage and nutritional status) were tested using Chi-square tests. A p-value <0.05 was considered statistically significant. Ethical approval was obtained from the Institutional Review Board of Dhaka Dental College, and written informed consent was obtained from all participants or their guardians where applicable.

## RESULTS

Most participants were aged between 17 and 18 years, with the majority residing in rural areas. Nearly half had completed primary education, while only one-third had attained secondary or higher education. More than 60% of participants belonged to the lower socioeconomic group, and most were housewives at the time of the study (*Table I*).

**Table I**
Socio-demographic characteristics of the study participants (*n* = 72).

| Variables | Categories | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age (years) | 15–16 | 24 | 33.3 |
| | 17–18 | 34 | 47.2 |
| | 19 | 14 | 19.5 |
| Residence | Rural | 46 | 63.9 |
| | Semi-urban | 26 | 36.1 |
| Education level | No formal schooling | 12 | 16.7 |
| | Primary | 35 | 48.6 |
| | Secondary or above | 25 | 34.7 |
| Socioeconomic status | Lower | 44 | 61.1 |
| | Middle | 28 | 38.9 |
| Occupation | Housewife | 56 | 77.8 |
| | Student | 16 | 22.2 |

Overall, 40.3% of participants were underweight, 47.2% had normal BMI, and 12.5% were overweight. Underweight was more common among pregnant adolescents, while a higher proportion of non-pregnant married adolescents had normal or overweight BMI. The difference in BMI distribution between the two groups was statistically significant (*Table II*).

**Table II**
Nutritional status of participants based on BMI (*n* = 72).

| BMI Category (kg/m²) | Total n (%) | Pregnant Adolescents (n = 38) | Non-pregnant Married Adolescents (n = 34) | *p*-value |
|---|---|---|---|---|
| < 18.5 (Underweight) | 29 (40.3%) | 19 (50.0%) | 10 (29.4%) | 0.048* |
| 18.5–22.9 (Normal) | 34 (47.2%) | 16 (42.1%) | 18 (52.9%) | |
| ≥ 23.0 (Overweight) | 9 (12.5%) | 3 (7.9%) | 6 (17.7%) | |

* *Statistically significant difference (p < 0.05)*

Anaemia was detected in 56.9% of participants. The prevalence of anaemia was higher among pregnant adolescents (65.8%) than non-pregnant married adolescents (47.1%), although this difference was not statistically significant (*Table III*).

**Table III**
Distribution of haemoglobin levels among participants (*n* = 72).

| Haemoglobin Level (g/dL) | Total n (%) | Pregnant Adolescents (n = 38) | Non-pregnant Married Adolescents (n = 34) | *p*-value |
|---|---|---|---|---|
| < 11.0 (Anaemia) | 41(56.9%) | 25 (65.8%) | 16 (47.1%) | 0.092 |
| ≥ 11.0 (Normal) | 31 (43.1%) | 13 (34.2%) | 18 (52.9%) | |

All participants consumed cereals or grains within the last 24 hours. Consumption of pulses and vegetables was moderate, while fruits, dairy products, and animal-source foods were consumed by less than half of the participants. Overall dietary diversity was low, with many relying mainly on cereal-based diets (*Table IV*).

**Table IV**
Dietary diversity among study participants (*n* = 72).

| Food Group Consumption (past 24 h) | Consumed n (%) | Not Consumed n (%) |
|---|---|---|
| Cereals and grains | 72 (100) | 0 (0) |
| Pulses and legumes | 46 (63.9) | 26 (36.1) |
| Green leafy vegetables | 40 (55.6) | 32 (44.4) |
| Fruits | 28 (38.9) | 44 (61.1) |
| Milk and dairy products | 21 (29.2) | 51 (70.8) |
| Meat, fish, or eggs | 33 (45.8) | 39 (54.2) |

Among those married at or before 15 years, 57.7% were underweight. The proportion of underweight participants decreased with increasing age at marriage, while overweight cases were more frequent among those married at 18 years or older. The association between age at marriage and nutritional status was statistically significant (*Table V*).

**Table V**
Association between age at marriage and nutritional status ($n$ = 72).

| Age at Marriage (years) | Underweight n (%) | Normal n (%) | Overweight n (%) | *p*-value |
|---|---|---|---|---|
| ≤ 15 | 15 (57.7%) | 10 (38.5%) | 1 (3.8%) | 0.036* |
| 16–17 | 11 (34.4%) | 18 (56.3%) | 3 (9.3%) | |
| ≥ 18 | 3 (18.8%) | 6 (37.5%) | 7 (43.7%) | |

** Statistically significant difference ($p < 0.05$)*

## DISCUSSION

In our sample, 63.9% lived in rural areas, 48.6% had only primary education, and 61.1% were in the lower socioeconomic group. Mridha et al. reported that the adolescents in their early-pregnancy cohort were predominantly rural and of low socioeconomic status (baseline n = 1552) [8]. Thus, the socio-demographic composition of our cohort (high rural proportion, low schooling, and low economic status) mirrors the documented profile of high-risk adolescent girls in Bangladesh [1,8]. We observed 40.3% underweight (BMI < 18.5 kg/m²), 47.2% normal BMI and 12.5% overweight; underweight was 50.0% in pregnant adolescent's vs 29.4% in non-pregnant married adolescents (p = 0.048). In the Mridha et al. pregnancy cohort, 36% had low BMI (reported as low BMI prevalence among pregnant adolescents) [8]. The BDHS trend analysis indicates a national decline in adolescent underweight from ~39.5% (earlier surveys) toward ~23.6% by 2017, while overweight rose from ~6% to >20% in some subgroups [1]. Our overall underweight (40.3%) is similar to the higher earlier estimates and slightly above Mridha's 36% (pregnant adolescents), while our overweight (12.5%) is below the national (urban-influenced) rises - consistent with a predominantly rural, younger sample. Overall anaemia in our study was 56.9% (65.8% pregnant, 47.1% non-pregnant). A national community study by Mistry et al. reported an anaemia prevalence of 51.6% among adolescent girls (10–19 years) [9]. A 2023 meta-analysis found a pooled anaemia prevalence among Bangladeshi children and adolescents ≈ 46.8% [10]. Mridha et al. reported 28% anaemia in their pregnant-adolescent cohort (different Hb cutoffs and population), but community studies commonly report 50%+ prevalence [4,8]. Compared with these, our overall 56.9% is higher than the pooled and national averages (46.8–51.6%), and our pregnant-adolescent figure (65.8%) is notably elevated - indicating substantial haemoglobin deficit in this sample. We found universal cereal intake but low consumption of dairy (29.2%), fruit (38.9%) and animal-source foods (45.8%). Akter et al. reported that 73–88% of women of reproductive age in rural Bangladesh had inadequate intakes of calcium, vitamin A, folate and B12, and that adolescents had lower mean adequacy ratios than adult women (MAR ≈ 0.49 vs 0.51) [4]. Our low consumption rates for nutrient-dense food groups reflect the poor micronutrient adequacy documented by Akter et al. and explain the high anaemia and underweight rates observed here. Underweight fell from 57.7% (married ≤15 years) to 18.8% (married ≥18 years), while overweight rose from 3.8% to 43.7% (p = 0.036). The pattern -worse undernutrition with earlier marriage and improved (or transitioning to overnutrition) status with later marriage- mirrors published associations linking early marriage/early childbearing with lower BMI and higher risk of chronic energy deficiency [1]. Although absolute percentages vary across studies, the direction and magnitude of the gradient in our data are consistent with the literature showing early marriage as a strong marker of nutritional disadvantage.

## CONCLUSION

This study revealed that early marriage and teenage pregnancy significantly impact the nutritional status of adolescent girls in rural and semi-urban areas of Bangladesh. A considerable proportion of participants were undernourished, with low BMI, anaemia, and inadequate dietary intake.

## LIMITATIONS

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community

## RECOMMENDATION

Based on the study findings, it is recommended that community-based awareness programs be strengthened to discourage early marriage and teenage pregnancy in rural and semi-urban areas. Nutritional education and supplementation programs targeting adolescent girls should be integrated into school and community health services.

## FUNDING

No funding sources

## CONFLICT OF INTEREST

None declared

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