ORIGINAL ARTICLE

# Dietary Pattern and Anaemia Among Female Adolescent Garment Workers in Bangladesh

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**ABSTRACT**

**Introduction:** In Bangladesh, many adolescents work in garment sector which is an important contributor to the country's economy. This study aimed to investigate the dietary pattern and haemoglobin level of the adolescent female garment workers in Bangladesh. **Methods:** This was a cross sectional study conducted in a peri-urban area in Bangladesh in 2008. The food intake pattern was assessed by food frequency questionnaire and level of haemoglobin was estimated by haemoglobin colour scale (HbCS). Anaemia was defined as the haemoglobin level of <12 g/dl.[1] **Results:** Among 108 participants, 104 (96%) were muslim, 83 (77%) were unmarried and 54 (50%) had a primary level of education. Most of their parents were illiterate. Sixty six (61%) respondents had a large family (>5 family members, mean 5.2, SD±2.1). The mean age at menarche was 12.91±1.37 years. Majority of them worked for >12 hours (55, 51%), did not watch television (77, 71%) and had just three meals with no snacks in between the meals (97, 90%) in last seven days. Fish, pulse and fruits/vegetables were consumed for >6 times in a week by 59 (55%), 56 (52%) and 68 (63%) respondents, respectively. Majority of the participants did not consume milk (65, 60%) and meat (62, 57%) in last seven days. Prevalence of anaemia was 92% (99); 54% (58) were moderately anaemic and 38% (41) were mildly anaemic. **Discussion:** Prevalence of anaemia among adolescent female garment workers is extremely high. They also consume inadequate food. Immediate steps should be taken to improve nutritional status of these girls.

**Keywords:** Anaemia, Dietary pattern, Adolescent, Garment factory, Bangladesh

## INTRODUCTION

Adolescence is a significant period of human growth and maturation. Adolescent has been defined by the world health organization as the period of life spanning the ages between 10 to 19 yrs.[2] In Bangladesh, there are more than 27 million adolescents aged 10-19 years, making up about one fifth of the total population.[3] Due to many reasons, adolescents drop out from secondary school and start working in precarious situations as day labourers, domestic servants, garment factory workers etc.[3]

Recently, garments sector has emerged as important driver for economic development in Bangladesh. In 2013-14, the garment industry represented 80 percent of the country's total export share.[4] According to BGMEA, in 2013-14, about 4 million workers were employed in about 4500 garments factories.[4] Among garments workers, majority are female[5] and 60% of them aged less than 24 years.[6] Many garment workers work hard for a long period of time in a unsafe condition.[6,7] Excessive work load and time constraint may lead to infrequent and inadequate food intake and exhaustion may lead to a reduced appetite. Lower overall intake ultimately results in lower intake of individual nutrients. All these factors make them vulnerable to undernutrition.

In Bangladesh, anaemia is a widespread public health problem,[8,9] affecting 40% of the adolescent girls.[10] Anaemia has a serious negative impact on the growth,[2] development and reproduction of adolescent girls and on economy of the country. The United Nations standing committee on nutrition has estimated that the economic costs of anaemia in Bangladesh amount to 7.9% of the country's GDP.[11] Under nutrition and anaemia of the adolescent garment workers contribute to poor physical growth and cognitive development, lowered resistance to infection,[1,2] fatigue and decreased work capacity which ultimately lead to less output of work.[12] Very little is known about the health condition and dietery pattern of the adolescent female garment workers in Bangadesh. This study aimed to investigate the dietary pattern and haemoglobin level of these girls.

## METHODS

### Study Population and Site

This was a cross sectional study, conducted in a garment factory located in Gazipur from March through June 2008. Female garment workers aged 18-19 years, working in the garment factory, were selected as participants of the study. A nonprobability sampling procedure (convenience sampling) was used to select the study sample. The garment was visited

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and the participants were interviewed and subjected to haemoglobin level testing after obtaining verbal consent. Participants were excluded from the study if they were pregnant or had chronic diseases. The study was approved by Bangladesh Medical Research Council (BMRC), Dhaka.

### Assessment of Anaemia

Using WHO recommended cut off, anaemia was defined as haemoglobin level of <12 g/dl.[1] Anaemia was further categorized as "Mild", "Moderate" and "Severe" if the haemoglobin level was 10-11.9, 7-9.9 and <7 g/dl, respectively. Heamoglobn level was measured using haemoglobin colour scale (HbCS) which was rececomended by WHO as an inexpensive method for diagnosis of anaemia at primary health care level in resource-limited settings.[13] Data suggests that HbCS may perform better than a clinical diagnosis of anaemia in certain circumstances.[13]

### Data Collection

A semi structured questionnaire was used to obtain information about respondents. In the first step, information was collected on socio-demographic status (level of education of respondents and parents, marital status, etc.), reproductive health status (age of menarche), food intake (food item intake pattern and frequency of meal/snacks) and lifestyle (working hour, duration of watching television and duration of sleep). For obtaining information related to lifestyle and food intake pattern, participants were requested to recall their activities and food intake in last seven days. A food frequency approach was followed to obtain information about the food intake pattern. Food intake pattern was recorded in terms of frequency of consumption of six food items, namely egg, milk, meat, fish, pulses, fruit/vegetable. The frequencies recorded were 'Not even once in a week', '1-3 times a week', '4-5 times a week', '6 times or more in a week'.

In the next step, haemoglobin percentage was estimated using HbCS. Initially, haemoglobin was recorded as a percentage, which was later transferred to a haemoglobin level as gm/dl by using the following formula: X%= X. 16/100 gm/dl.

### Data Analysis

Data processing and analysis was done using statistical software SPSS Windows version 11.5. Descriptive analysis was performed to summarize data. In order to find an association between haemoglobin level and socio-demographic and other variables of interest, Chi square or Fisher's exact tests were performed, as appropriate.

## RESULTS

### Characteristics of the Respondents

During the study period, a total of 108 respondents was included in the study. Sixty five percent (n=70) of respondent's age was 18 years and the rest of them (n=38, 35%) were 19 yrs old. Most of the respondents (n=104, 96.3%) were Muslim. The majority of the respondents (n=83, 77%) were unmarried and only 23% (n=25) were married. Half (n=54, 50%) of the respondents had a primary level of education. Only 2% (n=2) respondents had a secondary level of education and 6% (n=6) were illiterate. Although only 29% (n=31) and 38% (n=41) of the respondents lived in paka and semi-paka houses, majorty of them (n=97, 90%) used hygienic (sanitary) latrine. Nearly two third of the respondents experienced menarche at 12 (n=40, 37%) and 13 (35, 32%) years of age (Figure 1). The mean age at menarche was 12.91 (SD ±1.37, range 10-15) years.

Majority (n=66, 61%) of the respondents had a large family (>5 family members). Mean size of the respondent's family was 5.2 (SD ± 2.1, Range 1-12). Sixty three percent (n=68) of the respondent's father were illiterate, followed by 19% (n=21) had some primary education. Only 18% (19) of them had an education level of primary and above. A similar level of education was observed among mothers of the respondents; 64% (n= 69) were illiterate, followed by 21% (n=23) had some primary and 15% (n=15) had a primary level of education and above. One third (n=36, 33%) of the respondent's father were farmer followed by 21% (n=23) day labourers and 17% (n=18) petty businessman. Most of the respondent's mothers (78%) were housewife, and 13% were in low paid jobs.

### Lifestyle

In the last seven days, most of the respondents (n=105, 97%) worked for more than 8 hours per day (Figure 2). The mean daily working hour was 11 (SD ± 1, range 8-12). Majority of the respondents (n=95, 88%) used to sleep for >6 hours. Seventy one percent (n=77) of the respondents did not watch television and only 20% (n=22) of them watched television for 1 hour per day.

### Dietary Pattern

Based on participants' recall of food intake in the last seven days, 90% (n=97) of the respondents had three meals per day with no snacks in between meals. Only 9.3% (n=10) of them had snacks once in a day in between meals. More than half of the respondents did not drink milk or eat meat in the previous week; 60% (n=65) and 57% (n=62), respectively (Table 1). A good number of the respondents consumed fish (n=59, 55%), pulse (n=56, 52%) and fruit/vegetables (n=68, 63%) >6 times in the last seven days.

### Haemoglobin Level

The study found that 92% (n=58) of the respondents had a haemoglobin level of <12 g/dl, hence were anaemic (Table 2). However, none of them had a haemoglobin level of <7 g/dl. A significant association between anaemia and characteristics of the participants was not found, except for

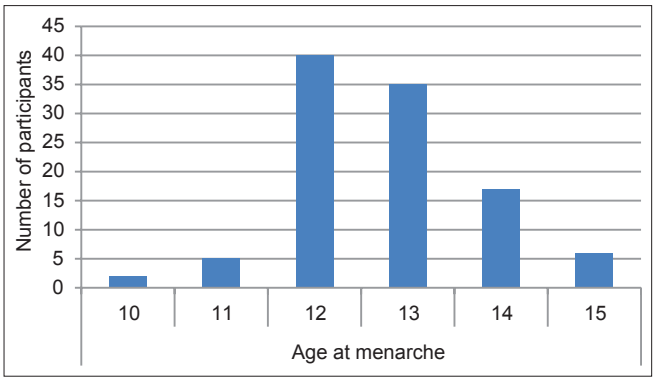


**Figure 1:** Distribution of respondents by their age at menarche

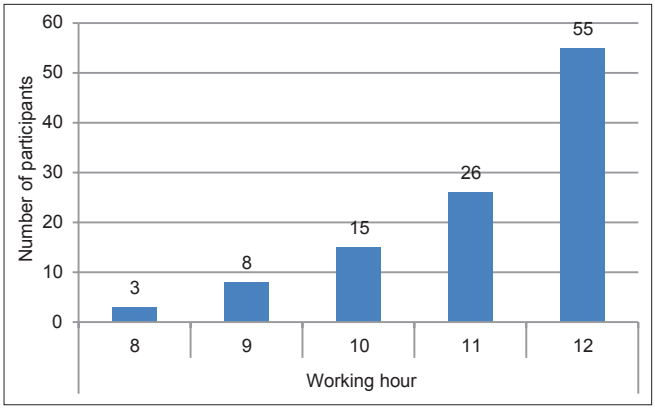


**Figure 2:** Distribution of participants by their working hour

**Table 1: Pattern of consumption of selected food items by the adolescent female garment workers**

| Food items | Frequency of weekly consumption | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Never | | 1-3 times | | 4-5 times | | ≥6 times | |
| | N | % | N | % | N | % | N | % |
| Egg | 37 | 34 | 53 | 49 | 12 | 11 | 6 | 6 |
| Milk | 65 | 60 | 31 | 29 | 6 | 6 | 6 | 6 |
| Fish | 7 | 7 | 30 | 29 | 12 | 11 | 59 | 55 |
| Meat | 62 | 57 | 46 | 43 | 0 | 0 | 0 | 0 |
| Pulses | 16 | 15 | 20 | 18 | 16 | 15 | 56 | 52 |
| Fruits/vegetables | 8 | 7 | 21 | 19 | 11 | 10 | 68 | 63 |

**Table 2: Distribution of the respondents by the haemoglobin level (n=108)**

| Haemoglobin Level | Frequency | Percent |
|---|---|---|
| Moderate anaemia | 58 | 54 |
| Mild anaemia | 41 | 38 |
| Normal haemoglobin level | 9 | 8 |
| Total | 108 | 100 |

age at menarche. Age at menarche was significantly higher (p=0. 016) for anaemic girls.

## DISCUSSION

The study revealed that majority of the adolescent female garment workers had a lower level of education and a large family. In the last seven days, most of them worked for long hours, had just three meals with no snacks in between the meals. Fish and pulse were frequently consumed by the respondents. Although, meat and fish were consumed less frequently, the consumption of fruits and vegetables were satisfactory. The prevalence of anaemia was high, although, none of them had severe anaemia. Anaemic girls had a history of delayed menarche.

In spite of improvement of dietery habit in Bangladesh over time,[14] data suggest that the current practice of food intake remains inadequate. Similar to the previuos stdies, large proportion of adolescents did not eat egg, milk and meat.[15–17] Proportion of adolescents consumed fruits and vegetables varied in different studies.[15,17,18]

The results of this study were consistent with previous studies and indicate that anaemia is a public health problem for female adolescents in Bagladesh.[10,16,18–21] As a previous study reported, this is mainly attributable to mild and moderate anaemia.[19] Although data on nutritional status of adolescent female garment workers are limited, an old study study reported a lower prevalence of anaemia among adolescent female garment workers.[16] A lower prevalence of anaemia was also reported by some studies.[18,22] This could be explained by the fact that partcipants of theose studies were adolescent school and college gilrs who were not as vulnerable as garment workers. Despite of evidence that socio-demographic status influences nutritional status of the adolescents,[19,22] this study did not find such association between selected socio-demographic status and anaemia. This is probably because the study participants were homogeneous in terms of socio-demographic characteristics and working environment. However, menarche was delayed in anaemic girls.

The study provides new information about long working hour and recreation of the adolescent female garment workers, in addition to the updated information on dietary intake and anaemia. The study also had several limitations. First, the study participants were selected purposively, rather than randomly, which might challenge generalizability of the study results. Second, the study was conducted among a small number of adolescent female garment workers. However, despite of small sample size, the study result might be useful in addressing health issues of the adolescent female garment workers.

In conclusion, the data showed that the prevalence of anaemia is extremely high among Bangladeshi female adolescent garment workers. They work for long hours and consume inadequate food. In order to have a healthy nation and a strong economy, policy makers as well as associations of garment factory owners should

take immediate steps to implement a comprehensive intervention programme targeted to this special population. The intervention programme may include iron and folic acid supplementation, periodic deworming, food at subsidized cost and health education. Further studies are required after intervention in order to monitor the health status of the female adolescent garment workers in Bangladesh.

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