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Benefits and Side Effects of Iron-Folate Tablet Supplementation among the Female Adolescent Garment Workers

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Abstract **Original Research Article**

Introduction: Among adolescent girls, iron deficiency is not uncommon due to various factors. During this period, iron deficiency anemia can greatly impact various factors of daily life, and additional iron supplementation might be needed. ***Aim of the Study:*** The aim of the study was to observe the benefits and side effects of iron folate tablet supplementation in adolescent women garments workers. ***Methods:*** This cross-sectional observational and descriptive study was conducted with the female adolescent garment workers of one garment factory located in the Narayangonj district. The data collection for the study was done in a very short period of time, from the 1st week of April to the 2nd week of July 2002, which led to a small sample size of 188 adolescent female workers. ***Result:*** Among the participants, 98.40% were Muslim, over half the participants were unmarried, 46.28% had been illiterate, and 51.06% had education up to class 1-3, Among the 81 married cases, 45.68% had husbands who received education from class 1-5, 48.94% had 2- 5 family member, 46.81% had 6-9 family members, and 4.26% had 10-12 family members. The financial characteristics of the participants revealed that 35.11% had 1500-3000 monthly income, 58.51% of the participants had 3-5 earning members, and 40.96% had only 1-2 earning member's Per capita income was between 286-600 for 34.57% of participants, between 601-1000 for 53.19% participants. It was observed that in 3rd week, 43.62% had good health, 28.72% had increased work performance, and 13.83% had been free from sickness. By 4th week, 38.83% had good health, 25.00% had increased work performance and 10.11% had been free from sickness, which was true for the following weeks as well. In terms of side effects, anorexia, constipation, black stool, and vomiting were observed, with the highest frequency in 4th week of iron supplementation. ***Conclusion:*** The study observed that socio-demographic factors had no effect on the acceptance or reluctance of the tablet, as the iron folate supplementation had a high acceptance rate. The use of iron folate supplementation had high benefits compared to the side effects, and the side effects were most prevalent in the 4th week of tablet supplementation, falling down later.

Keywords: Anemia, Iron, Supplementation, Iron-Folate.

INTRODUCTION

Iron deficiency, and its consequence, iron deficiency anemia, is highly prevalent globally and is generally acknowledged to be the most common, single micronutrient deficiency in both developing and developed countries. It affects more than 3.5 billion people throughout the world. A high prevalence of iron deficiency anemia can be observed among adolescent females, even more so in the Bangladeshi population, where almost 30% of women of reproductive age suffer from iron deficiency anemia [1]. It has generally been observed that such anemia cases are more frequent among adolescent, compared to women of older age. The primary reason behind this might be the regular menstrual blood loss, as well as the expansion of blood volumes and muscle mass [2]. This affects a large proportion of Bangladesh's adolescent female population. And, because the readymade garment (RMG) business is one of Bangladesh's most important industries, accounting for 81 percent of total export revenues while directly employing nearly 3 million women, it has a large proportion of anemic young women [3]. This could be due to a combination of factors such as poor salary rates, insecure employment conditions, a lack of safety, and a lack of respect for

female workers' rights. Because of the low minimum pay, garment workers are unable to afford basic and acceptable food, clothing, housing, transportation costs, and medical expenses [4]. According to a recent survey, 77- 80 percent of female Bangladeshi RMG workers are anemic [5]. Anemia is caused mostly by iron deficiency, although it can also be caused by other micronutrient deficiencies such as vitamins A, B2, folate, and B12, and minerals such as selenium and copper, as well as a variety of non-nutritional factors [6, 7]. It is estimated that iron deficiency anemia causes 26% of all anemia in women of reproductive age in Southeast Asia [8]. Iron deficiency anemia causes lower physical labor and earning ability in adults of both sexes, as well as diminished resistance to tiredness [9]. The ramifications for underdeveloped countries' health and economies, in particular, are astounding. Iron deficiency has been projected to cause $5 billion in economic losses in South Asia alone [10]. Iron deficiency anemia is seen as a major nutritional issue in Bangladesh, impacting a considerable proportion of the population. Malnutrition and undernutrition are serious public health concerns in teenage women, manifesting themselves in a variety of ways, including anemia. The physical body requires more nutrients than usual throughout the adolescent era, particularly iron, as the body experiences growth spurts and menstruation. It is nearly impossible for those working in clothing to support their family for a minimal wage to acquire sufficient medication and nourishment from their usual lifestyle. As a result, many Bangladeshi garment factories supply supplementary supplements to their adolescent female workers to meet the body's need for iron. Iron folate is one of the most used iron supplementation methods. However, because garment workers do not fully comprehend the medical benefits and negative effects of such iron supplements, the current study was carried out to throw some light on the consequences of these sorts of tablets in adolescent non-pregnant girls.

OBJECTIVE

General Objective

- To observe the benefits of iron folate tablet supplementation in adolescent women garments workers.
- To observe the side effects of iron folate tablet supplementation in adolescent women garments workers.

METHODS

This cross-sectional observational and descriptive study was conducted with the female adolescent garment worker population of one garment factory located in the Narayangonj district. Prior to the commencement of the study, the garment authorities were consulted regarding the topics and goals of the study from the National Institute of Preventive and Social Medicine, Dhaka, Bangladesh. A purposive sampling technique was used to select all-female adolescent workers, excluding any floor supervisors and pregnant women. The data collection for the study was done in a very short period of time, from the 1st week of April to the 2nd week of July 2002, which led to a small sample size of 188 adolescent female workers. Data was collected by a face-to-face interview with each participant, whose informed verbal consent was also obtained for the study, and a pre-tested semi-structured questionnaire was used for the interview. All collected data was inputted manually into an SPSS database, and analysis of the collected data was done on SPSS software.

Inclusion Criteria

- Only female adolescent garment workers.
- Workers who did not have any adverse diseases preventing them from taking iron folate tablets

Exclusion Criteria

- Pregnant adolescent workers.
- Supervisors or above-level workers.
- Unable to answer the criteria question.
- Exclude those affected with other chronic diseases.

RESULTS

Table 1: Distribution of the participants by socio-demographic characteristics (n=188)

Characteristics	Frequency	Percentage
Religion		
Muslim	185	98.40%
Hindu	3	1.60%
Marital Status		
Married	81	43.09%
Unmarried	107	56.91%
Education		
None	87	46.28%
Class 1-3	96	51.06%
class 4-6	5	2.66%
Husband's Education [n=81]		
Class 1-5	37	45.68%

Characteristics	Frequency	Percentage
Class 6-10	21	25.93%
Up to SSC	8	9.88%
Family Members		
2-5	92	48.94%
6-9	88	46.81%
10-12	8	4.26%
Residence Condition		
Kacha	78	41.49%
Pakka	42	22.34%
Tin Shade	68	36.17%

The socio-demographic factors of the participants revealed that 98.40% were Muslim, and 1.60% was Hindus. Over half the participants were unmarried, with 43.09% married participants. 46.28% had been illiterate, 51.06% had education up to class 1-3, while 2.66% had received education up to class 4-6. Among the 81 married cases, 45.68% had husbands who received education from classes 1-5, while 25.93% had a husband who received education up to classes 6-10, and 9.88% had husbands who had education up to SSC levels. 48.94% had 2-5 family members, 46.81% had 6-9 family members, and 4.26% had 10-12 family members. 41.29% had been living in Kacha houses, 22.34% had been living in pakka or cement-build houses, and 36.17% had been living in tin-shade houses.

Table 2: Distribution of the participants by financial status (n=188)

Characteristics	Frequency	Percentage
Monthly Income		
1500-3000	66	35.11%
3001-4500	56	29.79%
4501-8000	66	35.11%
Number of Earning Members		
1-2	77	40.96%
3-5	110	58.51%
6	1	0.53%
Per Capita Income		
286-600	65	34.57%
601-1000	100	53.19%
1001-1750	23	12.23%

The financial characteristics of the participants revealed that 35.11% had 1500-3000 monthly income, while 29.79% had a monthly income of 300-4500 taka, and the remaining 35.11% earned between 4501 to 8000 taka. 58.51% of the participants had 3-5 earning members, while 40.96% had only 1-2 earning members, and 1 participant had 6 earning family members. Per capita income was between 286-600 for 34.57% of participants, between 601-1000 for 53.19% of participants and between 1001-1750 for 12.23% of participants.

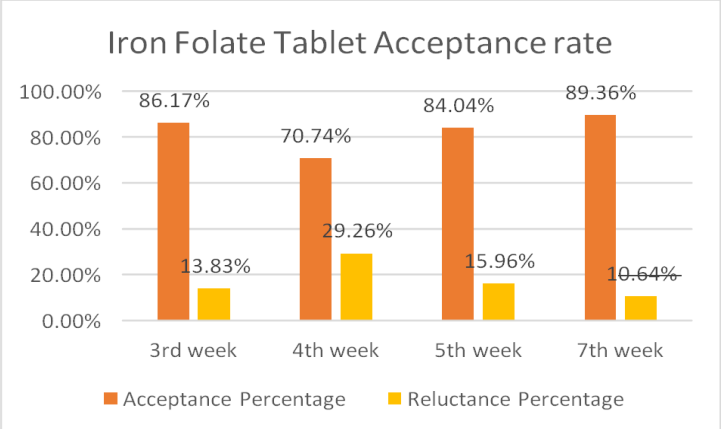

Figure 1: Percentage of acceptance and reluctance rate of iron folate tablets at different weeks (n=188)

Acceptance of the iron folate tablet was 86.17% by the 3rd week of initiation, 70.74% by the 4th week, 84.04% by the 5th week, and 89.36% at the 7th-week mark.

Table 3: Distribution of participants by recorded benefits at different weeks (n=188)

Weeks		3rd week	4th week	5th week	7th week
Good Health	Frequency	82	73	89	94
	Percentage	43.62%	38.83%	47.34%	50.00%
creased Working Performance	Frequency	54	47	53	61
	Percentage	28.72%	25.00%	28.19%	32.45%
Free from Sickness	Frequency	26	19	19	19
	Percentage	13.83%	10.11%	10.11%	10.11%

3 primary benefits were observed among the participants, which were good health, increased working performance, and being free from sickness. It was observed that in 3rd week, 43.62% had good health, 28.72% had increased work performance, and 13.83% had been free from sickness. By 4th week, 38.83% had good health, 25.00% had increased work performance and 10.11% had been free from sickness, which was true for the following weeks as well. In the 5th week, 47.34% had good health and 28.19% had increased work performance, while in the 7th week, 50% had good health and 32.45% had increased working performance.

Table 4: Distribution of participants by recorded side effects at different weeks (n=188)

Weeks		3rd week	4th week	5th week	7th week
Anorexia	Frequency	11	16	13	7
	Percentage	5.85%	8.51%	6.91%	3.72%
Constipation	Frequency	8	12	8	3
	Percentage	4.26%	6.38%	4.26%	1.60%
Black Stool	Frequency	3	9	3	0
	Percentage	1.60%	4.79%	1.60%	0.00%
Vomiting	Frequency	7	11	6	7
	Percentage	3.72%	5.85%	3.19%	3.72%

The primary side effects of the iron folate supplementation were anorexia, constipation, black stool, and vomiting. In 3rd week, 5.85% had anorexia, 4.26% had constipation, 1.60% had black stool and 3.72% had vomiting. In 4th week, these risk factors were observed in 8.51%, 6.38%, 4.79%, and 5.85% respectively. In the 5th week, it was 6.91%, 4.26%, 1.60%, and 3.19% respectively, and in the 7th week, the side effects were observed in 3.72%, 1.60%, 0%, and 3.72% respectively.

DISCUSSION

In this study, it was found that 98.4% of the respondents were Muslim, which was understandable as Islam is the largest religion in Bangladesh. Among the participants, about 53.7% were literate, which was higher than the national literacy rate of Bangladesh in 2002, which was 49.6% [11]. It was observed that almost half the participants were married, with only 56.91% being unmarried, despite the specific selection of adolescent workers in this study. This represents a part of the social situation of the study period, where child marriages were not that uncommon, especially in low-income families, which comprised almost all the participants of the study [12, 13]. Among the present study participants, none of the respondents crossed the high school level, but for 9.88% of the married participants, their husbands passed high school. Among the participants, 48.9% had been part of a family consisting of 2-5 family members, while 4.26% had 10-12 family members. Per capita, the monthly income of Bangladeshi people was around Tk. 1500 in 2002, and among the study participants, 53.19% had per-capita income between Tk. 601-1000. This was lower than the average per-capita income at the time. Acceptance of the iron folate tablet was 86.17% by the 3rd week of initiation, 70.74% by the 4th week, 84.04% by the 5th week, and 89.36% at the 7th-week mark. Among the observable benefits of the participants, good health was the most common benefit at all follow-up weeks, with 43.62%, 38.83%, 47.34%, and 50% in the 3rd, 4th, 5th, and 7th weeks of follow-up. Iron folate tablet is often used among anemic pregnant women to decrease their iron deficiency and provide them with good health, and long-term weekly usage of iron folate tablets have shown established hemoglobin and iron increase in the blood as well [14-16]. Another one of the benefits of iron folate supplementation was increased working performance, which was observed among 28.72% in the 3rd week, and increased to 32.45% by the 7th week. The increase in the working performance was of direct benefit to both the participants and the garments, as a better working performance meant an increase in productivity for the garments and an increase in income for the participants. Another one of the observable benefits was that participants were less sick compared to before iron folate supplementation was done. This

was most prominently observed in the 3rd week of supplementation, where 13.83% of the participants were free from sickness. In the following weeks, this percentage dropped down and stayed at 10.11% for the following weeks. Workers getting less sick are also of great benefit to the worker's mentality and financial state, as well as to the garments in terms of productivity. Iron supplementation has been proven to decrease the incidence of general sickness in other studies, both among pregnant and non-pregnant women [17, 18]. But, in cases where the body has adequate iron, additional supplementation can cause too much iron in the body, causing side effects. Some side effects of too much iron are nausea, abdominal pain, and vomiting. Iron folate supplementation can also cause black stool and constipation. Among the present study participants, anorexia, black stool, constipation, and vomiting were the only observed side effects. Anorexia had the highest prevalence of 8.51% in the 4th week while decreasing in the following weeks. Similarly, constipation, black stool, and vomiting each had the highest prevalence in the 4th week, at 6.38%, 4.79%, and 5.85% respectively. Similar to anorexia, they also fell in prevalence in the following weeks.

Limitations of the Study

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

CONCLUSION

The study observed that socio-demographic factors had no effect on the acceptance or reluctance of the tablet, as the iron folate supplementation had high acceptance rate. The use of iron folate supplementation had higher benefits compared to the side effects, and the side effects were most prevalent at the 4th week of tablet supplementation, falling down later.

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Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethical Committee.

RECOMMENDATION

Continuous nutritional education and motivation are needed to ensure iron-folate supplementation among female adolescent garment workers. Duration of iron-folate supplementation for the prevention and control of anemia needs to be determined.

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