

# Evaluation of Weekly Iron and Folic Acid Supplementation Programme for adolescents in rural schools of Kannur, North Kerala, India: A Cross-sectional Study

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## Abstract

**Background:** Iron deficiency is the major cause for anemia and widespread nutritional deficiency disorder in India. In 2013, Ministry of Health and Family Welfare has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Programme to reduce the prevalence and severity of nutritional anemia in adolescent population. Since it is a relatively new program, we conducted this survey to evaluate current status of the program implementation in the schools, Kannur, India.

**Objective:** To evaluate the current status of WIFS Programme implementation in the schools of Kannur, north Kerala, India.

**Materials and Methods:** It was a cross-sectional study carried out in schools under the rural field practice area of Community Medicine Department, Kannur Medical College, Kannur. Two schools were selected randomly for the data collection and a sample of 524 students and 39 teachers were studied for a period of 1 month. A pretested, semi-structured, self-administered questionnaire was administered and descriptive statistics and associations were analyzed.

**Results:** Out of the 524 students, 50.4% were males and 49.6% females, 77.3% of them had not consumed iron and folic acid (IFA) tablets regularly—main reasons were feeling healthy and parent's resistance. Awareness about anemia and its symptoms was good but significant difference existed between the schools. Twenty-three percent had side effects after IFA tablets intake and common side effect was stomach pain. All 39 teachers opined WIFS Programme was useful and 90% teachers counseled the students. Fifty percent teachers told they faced resistance from parents.

**Conclusion:** Awareness about anemia was good but WIFS implementation in schools was not regular. There is a need to strengthen the program by giving proper training to the teachers and by giving health education to the parents and students about the benefits of WIFS.

**KEY WORDS:** Adolescents, weekly iron and folic acid supplementation, anemia, evaluation

## Introduction

In developing countries, anemia is a major public health problem, which is due to poor dietary intake of iron and

undernourishment. It is not only a problem of pregnant women or children but also the problem of adolescents.

Adolescence is a transitional period from childhood to adulthood and characterized by rapid physical, hormonal, and biological changes that result in psychosocial, behavioral, and sexual transformations in an individual. There is a significant increase in nutritional requirements for both boys and girls during this stage because of growth spurt.<sup>[1]</sup>

Iron deficiency is the major cause for anemia in India and is the most widespread nutritional deficiency disorder in the country today. According to National Family Health Survey 3 (NFHS-3), about 56% and 30% of adolescent girls and boys (15–19 years) are anemic, respectively.<sup>[2]</sup> Adolescent

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girls are more vulnerable to anemia due to loss blood during menstruation and rapid growth of the body. In India, the highest prevalence of anemia is reported between the ages 12 and 13 years, which also coincides with the average age of menarche.<sup>[1]</sup>

Efficiency of weekly iron supplementation in the control of nutritional anemia has been found in various studies conducted in India, abroad, and by World Health Organization (WHO).<sup>[3–8]</sup>

In 2013, Ministry of Health and Family Welfare, Government of India, has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Programme to reduce the prevalence and severity of nutritional anemia in adolescent population (10–19 years) in convergence with key stakeholder ministries—The Ministry of Women and Child Development and Ministry of Human Resource Development.<sup>[1]</sup> The program is implemented across the country both in rural and urban areas for school-going adolescent girls and boys and for out-of-school adolescent girls. The Kerala Government has launched WIFS Programme since March 2013 for government and private aided school children of class VI to class XII. These adolescents are given weekly supplementation with iron and folic acid (100 and 0.5 mg, respectively) tablets on a fixed day in a week (Monday) by their teacher for the 52 weeks in a year. Deworming with albendazole (500 mg) is done every 6 months. In each school, two teachers will be named as nodal teachers—assigned the duty of distribution of the tablets to students.<sup>[1]</sup> Since it is a relatively new program and only few studies have been done on the evaluation of WIFS Programme in India, we conducted this survey with the objective to evaluate the current status of WIFS Programme implementation in the schools of Kannur, north Kerala, India.

## Material and Methods:

### Study Design

It was a cross-sectional study.

### Study Setting and Sampling

Study was conducted in the government and private aided schools of rural field practice area of the Department of community Medicine, Kannur Medical College. The rural field practice area consists of total four schools—two government, one private aided, and one private. By simple random method, Vadakumbad higher secondary school (government) and Anjarakandy high school area (private aided) were selected—both have students from 8th–12th standard. After random selection of schools, all the students (except 10th standard) who were present on the day of interview were selected for the study.

### Sample Size

Considering the compliance of adolescents to IFA tablets as 50%, precision at 5%, alpha 5% with design effect 1, the sample size derived was 384—calculated using the

OpenEpi (Version 3.03). Considering the non-response rate and absentees at 35%, sample of 524 students was collected. Thirty-nine teachers of these schools were also interviewed for the evaluation of WIFS Programme.

### Study Duration

1 Month (February 2016).

### Data Collection

The ethical clearance from the Institutional Ethics Committee, Kannur Medical College, was taken. Permission was also taken from the respective school's principals and prior appointment was taken from the class teachers for the survey. After taking informed assent from students and informed consent from the teachers, pretested, semi-structured, self-administered questionnaire was administered for those who were willing to participate in the study. The filled-in questionnaires were checked for their completeness at the time of their collection.

### Data Analysis

Data entered in Microsoft Excel sheet and descriptive statistics and associations were analyzed using EpiData Analysis V2.2.2.182.

## Results

### Students

#### *Basic Details of the Students:*

A total of 524 students were involved in the study—225 (42.9%) were from Vadakumbad Government Higher Secondary School and 299 (57.1%) from Anjarakandy Higher Secondary School. There were 264 (50.4%) males and 260 (49.6%) females and their mean age was  $14.5 \pm 1.8$  years. A total of 121 (23.1%), 178 (34%), 186 (35.5%), and 39 (7.4%) students were from 8th, 9th, 11th, and 12th standard, respectively.

#### *Awareness about WIFS Programme*

Among the 524 students assessed, 64 (12.2%) were not aware of the existence of WIFS Programme in their school and only 119 (22.7%) consumed the weekly IFA tablets and 405 (77.3%) of them not consumed the same. The main reason given for not consuming the weekly IFA tablets was “Not necessary, I am Healthy” and other reasons are shown in Tables 1 and 2 based on gender distribution and school type of the students.

#### *Awareness about Anemia*

The awareness about the definition and symptoms of anemia was good among the study population and there was no much significant difference of awareness between the genders (Table 3). Compared to Vadakumbad School, Anjarakandy School students were having better awareness about definition and symptoms of anemia and albendazole use (Table 4).

**Table 1:** Reasons quoted for not consuming the weekly iron and folic acid tablets by the students based on the gender distribution

Reasons	Gender		Total n (%)	P Value
	Male n (%)	Female n (%)		
• Not necessary because I am healthy	102 (63.4)	59 (36.6)	161(39.8)	1
• Not good for health, can cause serious problems	44 (56.4)	34 (43.6)	78 (19.2)	0.3
• Resistance from parents	28 (32.6)	58 (67.4)	86 (21.2)	0.001
• Reports from media about side effects	26 (44.1)	33 (55.9)	59 (14.5)	0.01
• No reasons mentioned	21 (100)	0 (0)	21 (5.1)	<0.001*
<b>Total</b>	<b>221</b>	<b>184</b>	<b>405</b>	

\*Fischer's exact test is used.

**Table 2:** Reasons quoted for not consuming the weekly iron and folic acid tablets by the students based on the school distribution

Reasons	School		Total n (%)	P Value
	Anjarakandy n (%)	Vadakambad n (%)		
• Not necessary because I am healthy	56 (36.6)	105 (65.2)	161(39.8)	1
• Not good for health, can cause serious problems	52 (66.7)	26 (33.3)	78 (19.2)	<0.001
• Resistance from parents	50 (58.1)	36 (41.9)	86 (21.2)	<0.001
• Reports from media about side effects	6 (10.2)	53 (89.8)	59 (14.5)	0.01
• No reasons mentioned	20 (95.2)	1 (4.8)	21 (5.1)	<0.001*
<b>Total</b>	<b>184</b>	<b>221</b>	<b>405</b>	

\*Fischer's exact test is used.

**Table 3:** Awareness about definition and symptoms of anemia and albendazole use and frequency of usage among the students based on gender distribution

Reasons	Gender		Total n = 524 n (%)	P Value
	Male n = 264 n (%)	Female n = 260 n (%)		
<b>Awareness</b>				
• Anemia means low hemoglobin	224 (84.8)	250 (96.1)	474 (90.5)	<0.001
• Requirement of iron and folic acid is more for adolescents	200 (75.6)	223 (85.8)	423 (80.7)	0.004
<b>Symptoms of anemia<sup>#</sup></b>				
• Feeling tired	204 (50.5)	200 (49.5)	404 (77.1)	0.924
• Loss of concentration in studies	101 (58.7)	71 (41.3)	172 (32.8)	0.007
• Loss of appetite	69 (59.5)	47 (40.5)	116 (22.1)	0.02
• Irregular and increase in menstrual blood loss for girls	66 (37.7)	109 (62.3)	175 (33.4)	<0.001
<b>Albendazole tablet awareness</b>				
• Given to treat worm infestation	203 (47.7)	223 (52.3)	426 (81.2)	0.009
• Every six months once albendazole have to consume	63 (43.8)	81 (56.2)	144 (27.5)	0.06

<sup>#</sup>Multiple responses were allowed.*Sources of IFA-Rich Foods*

About 49% (257) and 31% (162) of the students named at least two iron-rich foods and two folic acid-rich foods, respectively.

*Physical Examination and Side Effects Reporting*

Only about 33% (173) of the students said that physical examination for pallor was done by teachers regularly. A total of 23.3% (122) students said that they experienced side

**Table 4:** Awareness about definition and symptoms of anemia and albendazole use and frequency of usage among the students based on school distribution

Reasons	School		Total n = 524 n (%)	P value
	Anjarakandy n=299 n (%)	Vadakambad n=225 n (%)		
<b>Awareness</b>				
• Anemia means low hemoglobin	284 (95.0)	190 (84.4)	474 (90.5)	<0.001
• Requirement of iron and folic acid is more for adolescents	267 (89.3)	156 (69.3)	423 (80.7)	0.004
<b>Symptoms of anemia<sup>#</sup></b>				
• Feeling tired	247 (82.6)	157 (69.8)	404 (77.1)	<0.001
• Loss of concentration in studies	121 (40.5)	51 (22.7)	172 (32.8)	<0.001
• Loss of appetite	88 (29.4)	28 (12.4)	116 (22.1)	<0.001
• Irregular and increase in menstrual blood loss for girls	91 (30.4)	84 (37.3)	175 (33.4)	0.09
<b>Albendazole tablet awareness</b>				
• Given to treat worm infestation	265 (88.6)	161 (71.6)	426 (81.3)	<0.001
• Every six months once albendazole have to consume	104 (34.8)	40 (17.8)	144 (27.5)	<0.001

<sup>#</sup>Multiple responses were allowed.

effects after consuming IFA tablets. Major side effect reported was stomach pain (55%) followed by vomiting (15%). Only 17% (21) of students who had side effects had reported to teacher or consulted a doctor and 14% (17) have said that they have stopped taking tablets. About 98% responded that they were not given IFA tablets during holidays of the schools.

## Teachers

### Basic Details of the Teachers

Teachers of both schools were also surveyed. A total of 39 teachers were surveyed—14 and 25 were from Vadakumbad and Anjarakandy schools, respectively. Four of them were nodal teachers—consolidate all the information from the reporting formats of all the classes on the monthly school-reporting format and submit it to the headmaster/mistress, and all the teachers were involved in the WIFS Programme and all of them were females.

### WIFS Programme Implementation

Around 90% of the teachers said they have counseled the students for weekly IFA tablet consumption, 49% of teachers consumed the tablet in front of students and 36% of teachers told that, they have physically examined the students for anemia.

### Regular Supply, Storage of IFA Tablets and Record Maintenance

About 92% teachers told that they are getting regular supply of tablets from the government and 82% were storing tablets in the health room of the school. About 75% of them told that they are maintaining the records at class levels properly.

### Orientation Class

All the teachers opined that WIFS Programme is very useful for students; 82% teachers told that they have got an orientation program about the importance of IFA tablets and 77% of the teachers said that they have been explained about the need of IFA tablet in regular government meetings.

### Consumption of Tablets

There was no resistance from the students themselves in taking the tablet, but about 21% (8) teachers said that 50%–90% of their students were not taking the tablets at all in their class and 28% teachers said that about 50% of the students take IFA tablets irregularly because of the resistance from parents (19 teachers). Very few (2) teachers have told that there was 100% regular consumption of tablets by students. All the teachers said that tablets were administered 1 h after meals. Only 20% teachers told they were giving IFA tablets during holidays and only 8% of the teachers checked the compliance of intake of tablets. About 44% teachers had given specific answers about the benefits of WIFS Programme.

## Discussion

In this study, almost three-fourth of the students were not consuming the weekly IFA tablets regularly and the reasons quoted were they are healthy, not good for health, and resistance from parents. Our findings are very contrasting to the study done by Dhikale et al. in Pondicherry, India,<sup>[9]</sup> which shows 86% of students reported taking IFA tablets regularly and the reasons for noncompliance were absenteeism and side effects.

Most of the students (91%) were aware about anemia and about 77% students were aware of its main symptoms. This is similar to the study done by Dhikale et al. in Pondicherry, India.<sup>[9]</sup> There was no much significant difference between awareness and the gender but there was much difference between awareness and the school studied. The students of Anjarakandy School were having better awareness (Table 4).

About half of the students were aware about iron-rich foods and awareness is very less compared to the study by Dhikale et al. (91%).<sup>[9]</sup> About one-third of the students were aware about folic acid-rich foods in our study. Most of the students were aware that albendazole is used to treat worm infestation. Only 33% have reported of physical examination by teachers. About quarter of the students had side effects after consuming IFA tablets, most common side effect reported was stomach pain and in majority (77%) of the cases no action was taken for side effects or not reported.

In our study, all teachers have opined that WIFS Programme is useful but only one-third of the teachers had examined the students for anemia and half of them consumed tablets in front of the students to give confidence to the students. Majority of the teachers said they have counseled the students for weekly IFA tablet consumption. The storage of IFA tablets was good but only two-third said that they were maintaining records at class levels. There was no resistance in taking tablets from students, but almost half of the teachers told about the resistance from parents. Majority of the students and teachers told that weekly IFA tablets were not administered during holidays.

In our study, there awareness about anemia and WIFS Programme is good among students and teachers but there are so many misbeliefs about IFA tablet consumption and resistance from parents.

The strength of the study was that it included both government and private aided schools, involving both the students and teachers for the survey. Limitations of the study was that it did not cover the program implemented through anganwadi centers for non-school adolescent girls, and the physical verification of the records maintained by the schools were not verified.

## Conclusion

By this study, we can conclude that the awareness about anemia among students is good but WIFS implementation in schools of the study area was not regular and it is not reaching the beneficiaries completely. There is a need to strengthen the program by giving proper training to the teachers to address the issue with the resistant parents and by giving health education to the parents and students about the benefits of the WIFS Programme. For the successful implementation, local community leaders and religious leaders could be involved in WIFS implementation—to motivate the parents and students to take IFA regularly and to address the benefits of IFA.

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