

Original research article

Utilization Pattern of Iron and Folic Acid Supplementation (IFAS) Among School Going Adolescents in North India.

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Abstract

Introduction: Iron deficiency anemia is a major public health problem among adolescents. Government is providing free IFA tablets to address the issue.

Objectives: To know the utilization pattern of Iron folic acid supplementation (IFAS) among school going adolescent (Boys and girls) in Shravasti district of Uttar Pradesh, India

Methods: This cross-sectional study has been carried out among school going adolescent girls and boys age 10-14 years who are studying in govt. schools of class sixth and seventh in a district Shravasti of Uttar Pradesh, India from December 2017 to March 2018. Six schools were selected randomly from Hariharpur Rani block. Study sample size included 220 adolescent girls. The primary outcome of the study was utilization of IFA programme.

Result: Awareness about IFA was approximately (60%) among children (58%) girls and (41%) boys reported that teachers explained about IFA in schools. Only 3 % of girls mentioned the correct reason about use of IFA. (12%) girls (6%) boys reported that IFA tablet kills the stomach worm and prevent clotting of blood. (77.2%) boys and (53.5%) girls expressed that taste of the tablet was bad. Approximately five percent boys and 17 % girls reported to have side-effects after taking tablets. Only 14 adolescents out of 220 adolescents included in this study had complete utilization of IFA. The consumption of IFA for more than 1 year in age group (10-12) was more (9%) in boys and (13%) in girls. The utilization of IFA was more in females as compared to males. IFA supplementation for more than one year, proportion of Hindus (7.19%) was more as compared to Muslims (4.48%).

Conclusion: Knowledge and utilization of IFA among school going adolescent was very low. Improving information education and communication might help increase the utilization pattern of IFA among them.

Keywords: Adolescents, Anaemia, IFA Tablet

Introduction

Anaemia is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiologic needs, which vary by age, sex, altitude, smoking, and pregnancy status. Anaemia is one of the most common and intractable nutritional problems globally, affecting both developing and developed countries with major consequences for human health as well as social and economic development. Iron deficiency

anaemia occurs at all stages of the life cycle, but is more prevalent in young children. Iron deficiency is thought to be the most common cause of anaemia globally, although other conditions, such as folate, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections, and inherited disorders can all cause anaemia. In its severe form, it is associated with fatigue, weakness, dizziness and drowsiness (1).

The World Health Organization defines adolescents as those people between 10 and 19 years of age. Adolescence is a period of transition between childhood and adulthood. The physical and physiological changes that occur in adolescents place a great demand on their nutritional requirements and make them more vulnerable to nutritional deficiencies. This is due to rapid pubertal growth with sharp increase in lean body mass, blood volume, and red cell mass, which increases iron requirements for myoglobin in muscles and Hb in the blood (3). Therefore, most of the nutrition programs are targeted on the preschool children and adolescents. Adolescent girls due to high physiological demands combined with, inadequate dietary intakes of bio available iron, and blood losses due to menstruation are more likely to be anemic as compared to the boys of the same age.

The highest prevalence of anaemia is between the ages of 12-15 years when iron requirements are at a peak. The global prevalence of iron deficiency anaemia among 5-14 years is 21.66% and among 10-24 years is 17.9% (6). According to GBD 2016, prevalence of iron deficiency anaemia in South Asia among 5-14 years and 10-24 years age group is 42.58% and 33.65% respectively. Among the adolescent girls the prevalence of anaemia is disproportionately high in developing countries, due to poverty, inadequate diet, worm infestations, and frequent attacks of malaria in presence of poor access of health services.(7) Girls are vulnerable to iron deficiency in developing countries, where they are traditionally married at an early age and exposed to a greater risk of reproductive morbidity and mortality. The study was designed with the objective to estimate the utilization pattern of Iron folic acid supplementation (IFAS) among Adolescents in district Shravasti of Uttar Pradesh, India.

Methodology

The cross sectional study was conducted in Shravasti district of Uttar Pradesh, to study the utilization pattern of the IFA supplementation received under WIFS programme. . Shravasti, is one of the newly created district in the north-eastern part of Uttar Pradesh and Bhinga town is district headquarters. Duration of the study was 4 months started from Dec 2017 to Mar 2018.

Study Population

Study population was school going adolescent girls and boys age 10-13 years who were studying in govt. schools of class 6th to and 7th.

Sample Size

Sample size was calculated using Open EPI. The minimum required sample size for the study was 192. Considering 10 percent as non-response rate, study sample included 220 adolescent girls and boys between 10 -13 years.

Sampling Technique:

Multi stage sampling techniques was used to select sample population. District Shravasti from Uttar Pradesh was selected in consultation with IHAT (India Health Action trust, UP-TSU Uttar Pradesh Technical Support Unit). Out of five blocks, one block (Hariharpur Rani) was selected purposively to conduct the study based on the prevalence of anaemia. Six schools were selected in that block. All the students with age between 10-13 years from the 6th and 7th class of each school were selected for the study. Adolescent girls and boys who

were medically ill or suffering from chronic diseases were not taken into account. Informed consent of the principals of government schools was taken and assent from the selected adolescents was also obtained, before initiation of the study.

Data collection

For this study pre designed, quantitative questionnaire was used to collect data from study participants. The questionnaire which was previously validated on a sample size of ten adolescents before the beginning of the study. According to the NHM|WIFS 2014 guidelines for the school teacher, distribution of IFA through the platform of school children from 6th to 12th standard, in rural and urban regions was to reach through this program. Each school should designate two teachers as the WIFS nodal teachers. So, this study also involved a section in which few questions were asked from two nodal teacher from each of six schools to know how the program is managed in schools. The time taken for interview was approximately 15 to 20 minutes per participant.

Table 1: Summary of the schools and participants

Schools	Boys	%	Girls	%	No of study participants
School No. 1	11	39.2 %	17	60.7 %	28
School No. 2	41	47.1 %	46	52.8 %	87
School No. 3	0	0 %	21	100 %	21
School No. 4	12	40 %	18	60 %	30
School No. 5	11	52.3 %	10	47.6 %	21
School No. 6	6	18.1 %	27	81.8 %	33
Total	81		139		220

Study Outcomes

Primary Outcome

Utilization pattern was the primary outcome of the study. Utilization pattern of IFA received under WIFS programme was defined as an adolescent receiving and consuming IFA tablets for 52 weeks (up to one year). The amount of IFA tablet required as per the program document was to calculate 60 tablets for every eligible student (one tablet every week for 52 weeks and considering 8 tablets as wastage/extra). If the utilization for less than 52 weeks it was considered as underutilization.

Secondary Outcome

Exploring the challenges related with consumption of IFA tablets among adolescent in district Shravasti of Uttar Pradesh, India.

Ethical Considerations

Approval for the study was taken from Institutional Ethics Committee of Indian Institute of Public Health, Delhi (ECR/124/Inst/HR/2014). The privacy and confidentiality of the personal information has been protected and was not being shared to any one not involved in this project.

Data Storage and management:

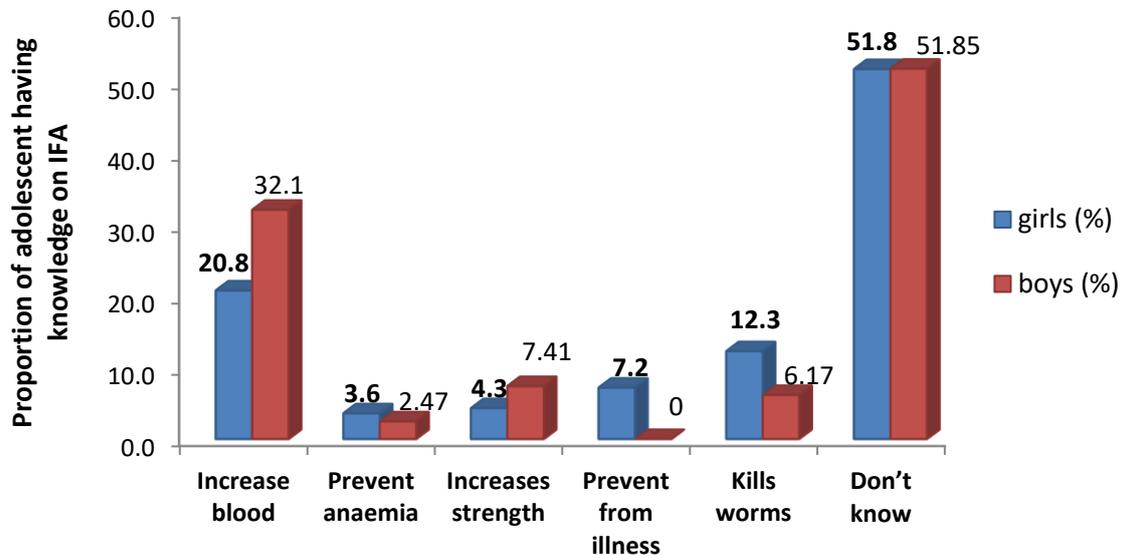
The data collected using questionnaire was stored safely. Data has been coded before analysis. The data has been entered in Microsoft excel and analyzed in STATA 14.2, and Appropriate statistical test like Chi square test was done whenever necessary.

Results

Profile of the students

This study included total of 220 adolescents. Adolescents included in the study were from 10 to 14 age group studying in class sixth and seventh. In school one, total 28 participants were taken in which 11 boys and 17 girls were there, in school 2 total 87 were included among them 41 boys and 46 girls, School three was girl's school total 21 girls included in this study. From school four total 30 participants were taken 12 boys and 18 girls. 21 participants selected from school five in which 11 boys and 10 girls taken in this study. Total 33 students taken from school six in which 6 boys and 27 girls were selected.

Knowledge about IFA among adolescents



Knowledge about IFA among adolescents

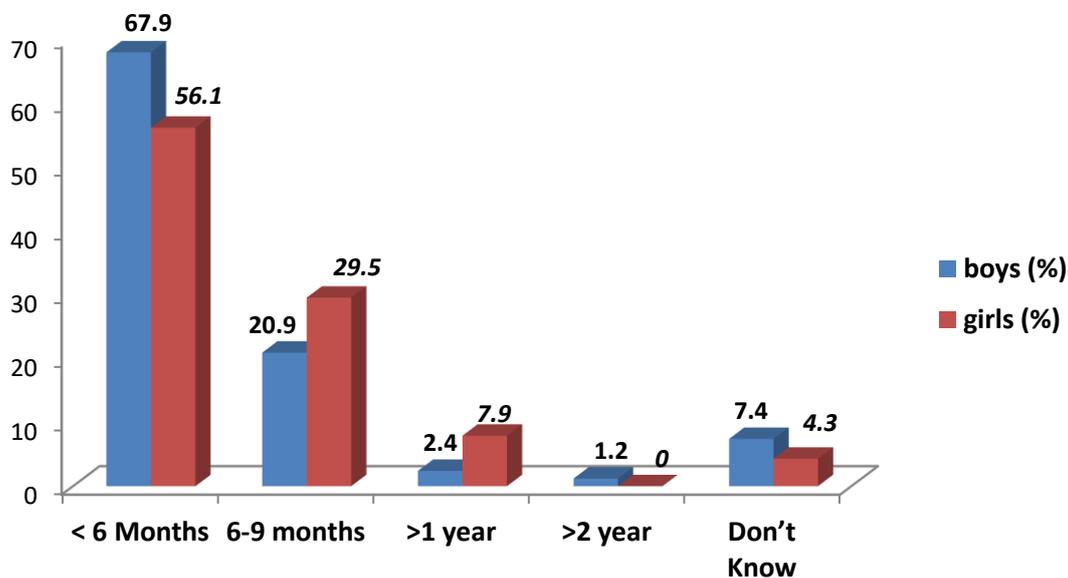
Table no. 6 approximately 60% of both boys and girls have heard about IFA. 58 % girls and 41 % boys told that teachers have explained about IFA in schools in which approximately 3% of girls mentioned the correct reason about use of IFA. Figure no. 3 half of the participants did not know about the importance of IFA. Around 20% girls and 32% depicted IFA as tablets to increase blood. Major concern was the lack of knowledge among students about benefits of IFA Tablets consumption. Approximately 12% girls and 6% boys was having incomplete or incorrect knowledge about IFA that IFA tablets kills the stomach worm and prevents clotting of blood. Apart from that only some participants answered IFA helps in increasing strength, prevent from illness and boost immunity.

Utilization pattern of IFA tablets in adolescents

Exposure Variable	Total no. of adolescents	Utilization for less than 52 weeks Proportion (%)	Utilization for more than 52 weeks Proportion (%)	P(r)
Gender				
Male	81	78 (96.30)	3 (3.70)	0.217
Female	139	128 (92.09)	11 (7.91)	
Age				
10 to 12	144	131 (90.97)	13 (9.03)	0.026
13 to 14	76	75 (98.68)	1 (1.32)	
Religion				
Hindu	153	142 (92.81)	11 (7.19)	0.448
Muslim	67	64 (95.52)	3 (4.48)	

Utilization Pattern of IFA tablets in adolescents

Utilization of IFA among adolescents was considered as the dependent variable and recoded as a binary variable with categories as utilization of IFA for more than one year and less than one year. Variable such as gender (male and female), age (10-12, 13-14) and religion (Hindu and Muslim) were taken as possible determinants of IFA utilization and recoded into a categorical variable. Only 14 adolescents out of 220 participants included in the study were consuming the IFA tablets for more than a year. The utilization of IFA was found to be poor but females tend to consume more (7.91%) as compared to males (3.70) for more than 1 year. The consumption of IFA for more than 1 year in age group (10-12) was more and (9 %) and (13-14) one percent respectively. The result shows significant association between age and utilization pattern of IFA. Among adolescents who were utilizing IFA supplements for more than one year, proportion of Hindus (7.19%) as compared to Muslims (4.48%).

Utilization pattern of IFA tablets in adolescents

Results of the study presented in figure 4 shows that that (67.9 % boys and 56.1% girls) of the govt. school were consuming IFA tablets less than 6 months showing underutilization of the programme. More than 90% participants included in the study were consuming the IFA tablets for less than a year. 7.4% boys and 4.3% girls reported that they don't know or forget, since when they are consuming IFA tablets.

Challenges faced by adolescents related to consumption of IFA tablets

The maximum students (77.22 percent boys and 53.54 percent girls) expressed that taste of the tablet was bad. The result shows significant association between gender and non-compliance of IFA. Due to lack of information given by teachers on IFA supplements and its benefits, one- fifth of the students believed that it was as not necessary to take IFA. Approximately five percent boys and 17 percent girls reported to have side-effects after taking tablets.

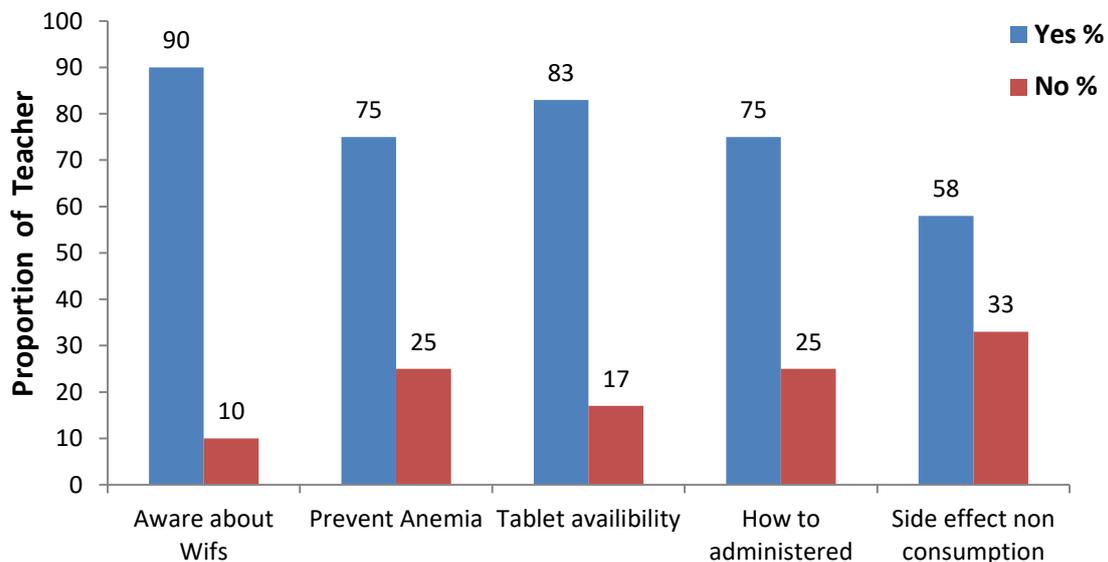
Maintenance of IFA consumption record among adolescents in school

From the register, it was found that in school 3 (girls school), there was a record of 55 girls (class 6th and 7th) out of which only 21 girls was present on the day of data collection, among which all were having the consumption and in school 6 there was a record of 80 boys and girls (6th and 7th) out of which only 33 students were present on the data collection day,

among which 29 were having the consumption. On matching the record and answer given by adolescents, it was found that the IFA tablets consumption as recorded in the IFA register for school 3 was same, on the other hand in school 6 there was 30 students where 27 girls and 3 boys who answered the same that they are taking the IFA tablets as recorded in the IFA register maintained by the two schools.

It was found that out of 6 schools taken, only two schools (school no. 3 and 6) were maintaining the IFA (WIFS) record register for consumption and rest schools surveyed (school no. 1,2,4 and 5) were not maintaining any record for adolescents consumption of IFA. The results show that reporting about consumption of IFA tablets among adolescents maintained by teacher/headmaster in the IFA register was good. They use to put tick mark in front of the student's name who is consuming IFA tablets in front of them and cross mark who was absent that day.

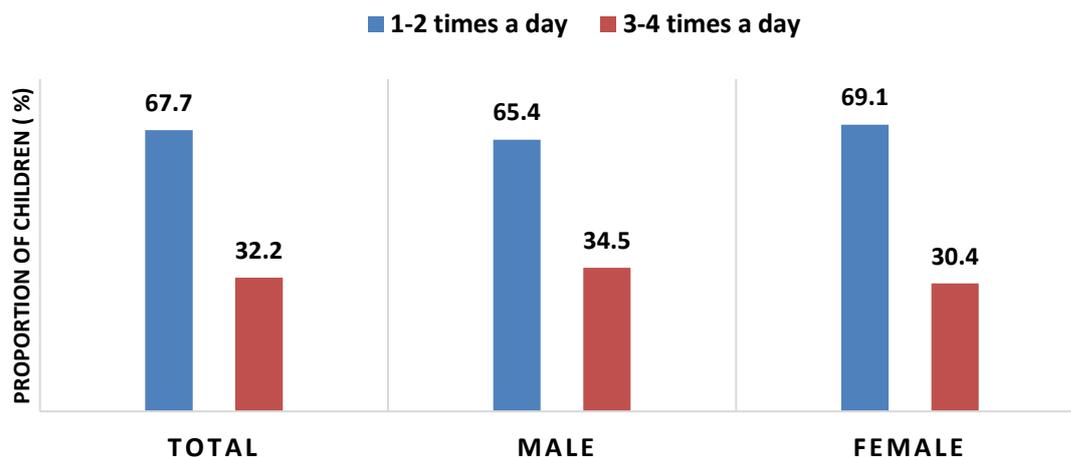
Information obtained from school nodal teachers about IFA management



Information obtained from school nodal teachers about IFA management

Most (90%) of the teachers of all 6 schools were aware about ongoing WIFS program, only 10 % were not aware. 75% of them were having correct knowledge about the reason of IFA (prevents anemia) and Albendazole (deworming) administration among school going adolescent. (83%) of teachers reported that IFA is available throughout the month, while (17%) said that stock of IFA was not available in school since two weeks. (75%) of them ensured that IFA tablet must be consumed after meal as according to guideline but rest (25%) of them were not sure when to give it to students. Two schools has the provision of providing the tablets to the students after lunch or mid-day meal in front of them, they don't give IFA for home so there is no chance that student might not be consuming or throwing it so it is sure that all the students were consuming the IFA tablets. The major reason for non – consumption of IFA among schools going adolescents was found to be school dropouts which was reported by (58%) of teachers, while (33%) of them mentioned side effects of IFA to be another cause, and (8%) of teachers mentioned that students didn't take IFA because of the reason that it is not necessary. Moreover, some teachers also revealed that, on the whole they were not comfortable with this programme because the programme is time-consuming, pressured by government, overloaded with extra work such as maintaining and issuing the IFA tablets.

Dietary Patterns among adolescents



Discussion

Utilization of IFA was found to be poor among both males and females, as majority of students were consuming IFA tablets for less than one year. The association between age of the students and utilization of IFA was found significant where pre-adolescents (10-12 years) tend to consume more than adolescents age group (13-14 years) for more than one year. The association of utilization of IFA was non-significant with gender and religion. Only two schools were maintaining registers for IFA consumption among adolescents and were making students eat tablet in front of them. And students of that two schools reported receiving IFA every week. The IFA distribution in the rest of the schools was regular but registers were not maintained in these schools.

Knowledge about IFA and its importance among adolescents was poor. Students were getting confused between albandazole and IFA and were depicting the importance of IFA as killing worms. Girls had better knowledge about consumption of IFA benefits which was supported by one of the study (19). Bad taste was expressed as the major barrier for the consumption of IFA tablets by adolescents. Other barriers of IFA tablet consumption were side effects of IFA and believe that it's not necessary to take it.

This finding is consistent with the study done by (18) which shows significant association between side-effects and non-compliance to IFA.

The findings of the study for utilization of IFA tablets were found significant with age, where the student of age group (10-12) was having good consumption as compared to age group (13-14) this could be perhaps due to the fact they are enthusiastic to take tablets as they are new to it. However, as programme progresses eventually they after that drop out. Though gender is a biological plausible variable, but the association between gender and utilization was found non-significant. It may be because of sample variability between girls and boys. Majority of the teachers ensured that IFA tablet must be consumed after meal as according to guidelines which was also found significant with one of the study (18).

Dietary pattern of adolescents was found to be mainly irregular and more than 60 percent were having meals one to two times a day. The result of the study also shows that majority of adolescents have one to two meals per day in which there were more females as compared to males corresponds to the similar finding in one of the study (22).

The study sensed an element of resistance and repulsion among teachers for IFA distribution and supervision. Though the teachers play an integral part in the WIFS programme but the knowledge about IFA importance was inconsonant which results in poor counseling to the students and subsequently less consumption of IFA. Hence, awareness should be recognized

in its broadest sense and correctional measures should not be restricted to beneficiaries but to the immediate providers as well.

Strength of the Study

This is the study that has been conducted to find out the utilization pattern of IFA among boys and girls in government schools in district Shravasti, one of the high burden district of Uttar Pradesh.

Limitation of the study

The study selected participants from the class who were present on the day of data collection. This may not be the representative sample for all adolescent girls and boys in district Shravasti. Moreover, the study was school based and the result of this study are representative of school going Adolescent girls and boys. Out of schools girls and boys in this age group in the study area may have different characteristics. Hence, the external validity of the study is limited. Reasons for non-consumption were only explored from students and teachers not from parents.

Conclusion

In this high burden district of Uttar Pradesh, utilization of IFA among adolescent girls and boys were extremely poor. Perceived side-effects, lack of clarity on importance of IFA and misconception regarding the tablets decrease the overall compliance. Adolescents ability to adhere to IFA supplements is influenced by side effects, lack of awareness and irregular supply of tablets. Proper dietary practices should be prioritized along with IFA supplementation. Iron fortification of foods and/or changing composition of iron preparation to avoid side effects may also be considered in future. Inadequate counseling results in poor awareness and subsequently low consumption of IFA. School dropouts remain a major challenge to the optimum utilization of IFA among adolescents.

Recommendations

At Government level

- Inter-sectoral convergence needs to be strengthened.
- Strict administrative regulation for proper delivery and consumption of IFA should be ensured at school and block level.

At school level

- Improvement of IFA record at class level.
- Supervision and compliance for IFA should be ensured.
- Logistics of IEC and timely supply of IFA should be maintained.
- Improve counselling for IFA tablets for utilization.
- Screening of students who are anaemic and there referral.

At block level

- Monthly reporting of IFA from school nodal teacher to District Programme Officer responsible for the programme.
- Programme monitoring and monthly review meetings.

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