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Knowledge and Adherence to Weekly Iron and Folic Acid Supplementation Among Adolescent Girls of Selected Government Schools

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Abstract

Anaemia is a global public health problem and is the common cause of morbidity and mortality in adolescent girls. World Health Organization recommends weekly iron-folic acid supplementation to reduce anaemia in adolescent girls. The significance of this work is to find out knowledge and adherence to weekly iron and folic acid supplementation among adolescent girls of selected government schools. A descriptive cross-sectional research design was used to conduct the study among 324 adolescent girls studying in grades eight to ten of selected government schools in Kathmandu. Probability, cluster sampling technique was used, and data was collected by using a structured self-administered questionnaire and analyzed by using descriptive statistics as frequency, percentage, mean, and standard deviation and inferential statistics as chi-square test. The study reveals that less than half of the respondents (47.8%) had adequate adherence to weekly iron and folic acid supplementation among adolescent girls. Similarly, less than half of the respondents (44.1%) had an adequate level of knowledge on anaemia. There was a statistically significant association between adherence status to weekly iron and folic acid supplementation and both mothers (p=0.004) and fathers' (p=0.002) educational status and mothers' occupation (p=0.024) respectively which shows that the adherence status to weekly iron and folic acid supplementation and level of knowledge on anaemia is inadequate. Thus, a more awareness programme on anaemia and the importance of iron and folic acid supplementation, better parental involvement in education sessions and close monitoring by concerned authorities is needed.

Keywords: *Adherence; Adolescent girls; Anaemia; Knowledge; Weekly Iron and Folic Acid Supplementation*

INTRODUCTION

According to the World Health Organization (WHO), adolescence spans the age group of 10 to 19 years and anaemia affects more than 2 billion people worldwide. It is a serious public health concern in developing countries and its prevalence is quite high among female adolescents (Teni, Shiferaw & Asefa, 2017). Iron deficiency anaemia is estimated to be the single largest cause globally of morbidity and mortality in adolescent girls; it is expressed as disability-adjusted life years (WHO, 2017). Consequences of iron deficiency anaemia include reduced academic potential; decreased well-being and productivity at home or in the community; and increased maternal and infant morbidity and mortality for adolescents who become pregnant. The World Health Organization recommends weekly iron-folic acid supplementation (WIFAS) to reduce anaemia in adolescents aged 10-19 years in regions where anaemia is a public health concern, affecting >20% of females (WHO, 2011). The prevalence of anaemia in adolescent girls reported by various studies showed that in Thailand 17%, Indonesia 30%, Srilanka 40%, Bangladesh 40%, Myanmar 45.2%, Nepal 46%, Maldives 50% and India 90% (WHO, 2011).

The National Nutrition Programme is a priority programme of the government of Nepal. The most efficient way of improving iron status among adolescents is by providing weekly Iron and folic acid tablets to all adolescent girls. From Fiscal Year 2072/073, the School Health and Nutrition Program has initiated Weekly Iron Folic Acid (IFA) supplementation to adolescent girls aged 10-19 years aiming to prevent and control the high burden of Iron deficiency anaemia among this group of population. This activity was piloted in eight district and scaled up to 77 districts in 076/077. Under this program, all the adolescent girls aged 10-19 years are supplemented with weekly Iron Folic Acid (IFA) biannually in Shrawan (Shrawan-Asoj) and Magh (Magh-Chaitra) rounds. In each round, they are provided with one IFA tablet every week for 13 weeks. So, each adolescent girl should get a total of 26 IFA tablets in a year (DOHS, 2077/078). Weekly supplementation of IFA tablet among adolescent girl is cost-effective method for reducing the prevalence of anaemia where it is a public health concern (Nutrition International, 2019). Creating awareness regarding importance of IFA supplementation and careful program implementation including a regular supply of IFA tablets should be considered to make the WIFS programme successful (Priya et al., 2016). Though the implementation of a Weekly Iron and Folic acid (WIFA) supplementation programme has been launched in most of developing countries including Nepal to combat iron deficiency anaemia among adolescent girls, the improvement of iron status is only maintained when adequate adherence to IFA is achieved by all the adolescent girls who consumed IFA tablets. Since no data related to adherence to IFA tablets in Nepal was found till date, a study has been conducted to find out the

association between knowledge and adherence to weekly iron and folic acid supplementation among adolescent girls.

MATERIALS AND METHODS

A descriptive, cross-sectional research design was used to find out the knowledge and adherence to weekly iron and folic acid supplementation among adolescent girls studying in grades 8 to 10 at government schools of the Nagarjun Municipality, Kathmandu where the Iron and Folic acid supplementation programme was launched. The sample size was calculated using the following formula:

Sample size (n) = Z^2pq/d^2 (Cochran, 1977)

Z= 1.96 in 95% of Confidence interval

n = desired sample size

Level of Significance = 5%

p=15% = 0.15 (Vijayan & Shefaly, 2017)

q= 1-0.15= 0.85

d= 5% = 0.05 (allowable error)

Sample size (n) = Z^2pq/d^2

= $(1.96)^2 \times 0.15 \times 0.85/ (0.05)^2$

= 195.92

= 196

Since the cluster sampling technique was adopted, the design effect has to be considered, so the sample size was 196×1.5=294

The total sample size was 324 (by adding 10% of the estimated sample size as a response error).

Probability Cluster sampling technique was used in this study. In Nagarjun municipality, there were a total ten government Secondary schools. Each secondary school was considered as one cluster. Among ten schools, five schools were selected randomly by using the lottery method. All the adolescent girls, age group between 10-19 years, who were studying in grades 8 to 10, willing to participate, available at the time of data collection and whose parents gave consent to participate in the study were included in the study. A structured self-administered questionnaire related to knowledge and adherence to weekly iron and folic acid supplementation among adolescent girls was developed by the researcher herself after extensively reviewing the related literature.

The instrument was divided into three parts: Part I**:** Questions related to Socio-demographic Characteristics, Part II**:** Questions related to knowledge on anaemia among adolescent girls and Part III: Questions related to adherence to WIFA supplementation. The adherence status was calculated based on the total consumption as well as missing of IFA tablets and divided into two categories:

Adequate adherence: the girl who consumed iron and folic acid tablets≥ 75% as per protocol within the last three months of data collection. It included the respondents who never missed the IFA tablets plus the respondents who missed IFA tablets 1 to 3 times within the last three months of data collection.

Inadequate adherence**:** the girl who consumed iron and folic acid tablets <75% as per protocol within the last three months of data collection. It included the respondents who missed the IFA tablets more than four times within the last three months of data collection. (Kuril et al., 2016)

The level of knowledge was measured on the basis of the total score of knowledge on anaemia-related questions and was converted to percentages and then classified into two categories.

Adequate knowledge (Good knowledge) score: ≥ 50%

Inadequate knowledge (Poor knowledge) score :< 50%

(Mengistu, Muluken & Hordofa, 2019)

The content validity of the research instrument was maintained by consultation with the research advisor, research expert, subject matter expert and peers. The instrument was pretested in 33 (10% of 324) samples in Shree Halchowk secondary school, Halchowk, Kathmandu. Some modifications were made based on responses from the respondents.

The data was collected after obtaining approval of the research proposal from the research committee of Maharajgunj Nursing Campus and ethical approval from the Institutional Review Committee (IRC) of Tribhuvan University, Institute of Medicine. Administrative approval for data collection was taken from the Nagarjun municipality and the principal of the related school after explaining the purpose of the research study and by submitting the written request letter from the Maharajgunj Nursing Campus. Written informed consent was obtained from the parents of each respondent before data collection by sending a consent form in the home with coordination to the school administration. Assent was taken from each respondent before data collection by explaining the purpose of the study. Every precaution was taken to safeguard the rights of the respondents. Anonymity was maintained throughout the study by keeping the code number instead of the respondent's name. Confidentiality was maintained by not disclosing the information as well as it was used only for the research purpose. The respondent was not forced, and they were given freedom to withdraw their participation from the study. Data was collected by using a structured self-administered questionnaire from 1st September 2019 to 27th September 2019. The collected data were checked for completeness, then coded and entered in Statistical Package for Social Sciences (SPSS) version 16. Data was analyzed using descriptive statistics as frequency, Percentage, Mean and Standard Deviation and inferential statistics as chi-square test. Findings are presented in tables.

RESULTS AND DISCUSSIONS

More than half (60.5%) of the respondents were between the age group of 15 to 19 years with mean age and standard deviation of 14.82±1.115. Regarding the students' grade, more than one-third of the respondents (36.4%) were studying in grade nine. More than half of them (59.6%) belonged to Janajati and (72.2%) were of

Hindu religion. Likewise, more than two-third of respondents (70.4%) lived in a nuclear family. More than half of the respondents' mothers (59.9%) were able to read and write. Among them, 47.2% had received basic level education. Similarly, most of the respondents' fathers (83%) were able to read and write and 54.6% had attained a basic level of education. More than one-third of respondents' mothers (36.1%) were homemakers. Similarly, concerning the occupation of the father, 39.8% were private employees. Table 1 reveals that less than half of the respondents (41.4%) correctly answered the meaning of anaemia. More than half of the respondents (60.5%) stated that adolescents are the risk group for anaemia where as more than two-third (69.1%) causes anaemia due to iron poor diet.

Table 1: Respondents' knowledge on meaning, risk group and causes of anaemia n=324

Variables	Number	Percentage
Meaning of Anaemia		
Decreased hemoglobin level #	134	41.4
Increased red blood cells	115	35.4
Increased hemoglobin level	10	3.1
Don't know	65	20.1
Risk Group*		
Adolescent	196	60.5
Pregnant women	175	54.0
Children	67	20.7
Infant	58	17.9
Causes *		
Lack of iron-containing diet	224	69.1
Excessive bleeding during menstruation	160	49.3
High demand due to growth spurt	97	29.9
worm infestation	65	20.1

*Multiple Response # correct response

Table 2 shows that 71.6% of respondents stated weakness to sign and symptom of anaemia. Most of the respondents (80.9%) showed consuming iron-rich food was the preventive measure of anaemia.

Table 2: Respondents' knowledge on sign and symptoms and preventive measures of anaemia=324

Variables	Number	Percentage
Sign and Symptoms *		
Weakness	232	71.6
Irregular menstrual cycle	197	60.8
Decreased appetite	154	47.5
Decreased concentration	110	34.0
Shortness of breath	96	29.6
Preventive Measures *		
Consuming iron rich food	262	80.9
Taking iron folic acid tablets	151	46.6
Taking anti helminthic medicine every six monthly	148	45.7
Maintain personal hygiene	116	35.8

*Multiple Responses

Table 3 depicts that all the respondents (100%) had consumed IFA tablets at school. Regarding the missing of IFA tablets, most of them (80.2%) had missed the dose of IFA tablets and only 3.7 % of respondent's parents were involved in IFA supplementation education sessions. Likewise, less than half of the respondents (48.3%) had received counselling before consuming IFA tablets.

Table 3: Parental involvement in education sessions and counselling before consuming IFA tablets

Variables	Number	Percentage
Place of taking IFA tablets		
At School	324	100.0
Missing IFA tablets		
Yes	260	80.2
Frequency of Missing (within last three months)		
1 to 3 times	91	35
4 to 5 times	86	33.1
6 to 7 times	83	31.9
Reasons for Missing (n=260) *		
Holidays	139	42.9
Illness	88	27.2
Parents not consented	48	14.8
Lack of supply of IFA tablets	35	10.8
No faith in tablets	35	10.8
Fear of side effects	28	8.6
Bad taste	2	0.6
Forget to take	1	0.3
Parental Involvement in IFA Supplementation Education Session		
Yes	12	3.7
Counseling before Consuming IFA tablets		
Yes	156	48.3

Table 4 interprets that less than half of the respondents (47.8%) had adequate adherence to weekly iron and folic acid supplementation.

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Table 4: Respondents' adherence status to weekly iron and folic acid supplementation

Adherence Status	Number	Percentage
Adequate adherence (≥75%)	155	47.8
Inadequate adherence (<75%)	169	52.2
Total	324	100.0

Likewise, Table 5 presents that less than half of the respondents (44.1%) had adequate knowledge on anaemia

Table 5: Respondents' level of knowledge on anaemia

Level of Knowledge	Number	Percentage
Adequate knowledge (≥50%)	181	44.1
Inadequate knowledge (<50%)	143	55.9
Total	324	100.0

Table 6 shows that there was a statistically significant association between adherence status to weekly iron and folic acid supplementation and educational status of both mothers (p=0.004) and father (p=0.002) and occupation of the mother (p=0.024) respectively.

Table 6: Association between respondents' adherence status to weekly iron folic acid supplementation and selected variables

Variables	Adherence Status		χ^2	p-value
	Adequate No. (%)	Inadequate No. (%)		
Mothers' Educational Status				
Can read and write	80(41.2)	114(58.8)	8.447	0.004*
Cannot read and write	75 (57.7)	55 (42.3)		
Fathers' Educational Status				
Can read and write	118 (43.9)	151 (56.1)	10.026	0.002*
Mother's Occupation				
Home maker	60 (51.3)	57 (48.7)	12.906	0.024 *
Business	32(48.5)	34(51.5)		
Farmer	27(39.7)	41(60.3)		
Private employee	22 (55.0)	18 (45.0)		
Government employee	12 (66.7)	6 (33.3)		
Others (Labourer, Employee in Abroad)	2 (13.3)	13 (86.7)		

**Significant* *Significance level at < 0.05* χ^2 =Chi-square

Regarding the meaning of anaemia, less than half of the respondents (41.4%) had known about decreased haemoglobin levels. This finding is inconsistent with the finding of Singh *et al*. (2019) where the majority of respondents (76.6%) had known the meaning of anaemia. More than half of the respondents (60.5%) had known that adolescence are at the risk age group for anaemia. This finding is similar to the finding of Singh *et al*. (2019) where 69% of the respondents knew that adolescents are at risk for anaemia. In relation to causes of anaemia, more than two-third of the respondents (69.1%) stated a lack of an iron-containing diet. This finding is similar to the finding of Singh *et al*. (2019) where decreased dietary iron intake was 63.3%. Regarding the signs and symptoms of anaemia, more than two-thirds of them (71.6%) had knowledge about weakness followed by irregular menstrual cycle, decreased appetite, decreased concentration and shortness of breath as 60.8%, 47.5%, 34% and 29.6% as respectively. Among them, decreased appetite and shortness of breath is in accordance with the findings of Singh *et al*. (2019) as 33.3%, and 30% as respectively. This finding is also similar to the findings of other studies where the overall knowledge of signs and symptoms is 42% and 45.4% respectively (Mingistu *et al*.,2019; Chauhan *et al*., 2016). Regarding preventive measures of anaemia, most of the respondents (80.9%) had answered consuming iron-rich food and more than one-third of them (35.8%) answered maintaining personal hygiene. This finding is in accordance with the study of Singh *et al.* (2019) as increasing dietary iron intake (76.4%) and maintaining personal hygiene (36.7%) as respectively and also nearly consistent with the finding of Johnson *et al*. (2016) where the overall knowledge on preventive measure of anaemia is 64.5%. In the present study, cent percent of the respondents (100%) were consuming IFA tablets. Regarding the missing of IFA tablets, most of the respondents (80.2%) had missed the IFA tablets. Focusing on the reason of missing, less than half of them (42.9%) had stated holidays followed by illness, parents not consented, lack of supply of IFA tablets, no faith in tablets, fear of side effects, bad taste and forgetting to take as 27.2%, 14.8%, 10.8%, 10.8%, 0.6%

and 0.3% as respectively. According to national protocol, IFA supplementation is given biannually that is from July to September and January to March, and most of the schools were closed after finishing the final examination in the month of March, so the highest percentage of respondents had missed the IFA tablets because of holidays. Some of the reasons for missing IFA are similar to other studies as absenteeism, parents not consented and no faith in tablets as 55.1%, 7.1% and 1.2% as respectively (Dhikale *et al*.,2015; Vijayan and Shefaly 2017). In the present study, more than one-third of the respondents (35%) had missed the IFA tablets 1 to 3 times followed by 4 to 5 times and 6 to 7 times as 33.1% and 31.9% as respectively. In the current study, the least percentage of parents (3.7%) was involved in the IFA supplementation education session. This is inconsistent with the findings of Chakma et al. (2012), where all the teachers, village elders, local leaders and parents participated in the IFA supplementation meetings before beginning the programme so that there was high compliance (89%) to weekly IFA supplementation. In the present study, less than half of the respondents (47.8%) had adequate adherence status to weekly iron and folic acid supplementation. This finding is nearly consistent with other studies where adherence status as 60.6%, 47.2% and 67.7% as respectively (Selvraj et al., 2017; Priya et al., 2016; Sau, 2016).

CONCLUSION

Based on the findings of the study, it has been concluded that the adherence status to weekly iron and folic acid supplementation and knowledge level on anaemia among adolescent girls is inadequate. There is a statistically significant association between adherence status and educational status of the mother, father and occupation of the mother respectively. Thus, a more awareness programme on anaemia and the importance of iron and folic acid supplementation is needed to enhance parental involvement by concerned authorities.

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