Adherence to iron and folic acid supplementation and associated factors among antenatal care attendants in Northwest Ethiopia

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Article Info	ABSTRACT
	Iron and folic acid supplementation is the key approach for anemia prevention and control during pregnancy. In Ethiopia only <1% of pregnant mothers ingest the ideal number of tablets. Although, adherence is the most important challenge, literature is dearth and the predictors are undoubtedly recognized. Institution based quantitative cross sectional study design triangulated with qualitative methods was employed among 395 systematically selected pregnant mothers attending antenatal care in Debre Markos town, Ethiopia. Data were collected using interviewer administered structured questionnaire. Data were entered into Epi data and exported to SPSS software. Bivariate and multivariable Logistic regression with the 95% confidence interval was computed. P-value < 0.05 was declared as statistically significant. Eight in-depth interviews were conducted. The data were entered and analyzed using open code software. Adherence rate was 55.5% (95%CI, 50.5%-60.4%). Pregnant mothers who had; history of anemia during current pregnancy [AOR:7.9, 95%CI (4.44-14.01)], primary education (AOR:4.0, 95%CI (1.88-8.54)], secondary education and above (AOR:3.6, 95%CI (1.20-6.94)], good knowledge of iron and folic acid supplementation [AOR:2.1, 95%CI (1.24-3.56)], and early registration for antenatal care (AOR:1.8, 95%CI (1.06-3.11)] were predictors of iron and folic acid supplementation adherence. The rate of adherence was low. Getting medical advice and fear of illness if missed were the primary reasons that enforce mothers to take the tablets. Hence, improving mothers' knowledge regarding overall aspects of the tablet through better advice, community teaching and the mass media at large, would improve adherence.

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1. INTRODUCTION

Anemia refers to a condition in which the existing red blood cells are inadequate to satisfy the body's physiologic demands. It affects around one fourth of the world's population. Anemia affects more than two fifth of pregnant mothers worldwide [1]. Approximately 20% of pregnant women in developed countries and more than 50% in developing countries are affected by iron deficiency [2]. According to

the 2011 Ethiopian Demographic and health surveys, more than one fifth of pregnant women were affected by anemia [3]. Anemia in pregnancy was found to be a leading cause of morbidity and mortality, both for the mother and for the developing baby [4].

Iron is a trace element that is necessary for hemoglobin synthesis. Highly cost effective iron intervention is delivering iron together with folic acid in tablets (IFAS) to pregnant mothers. But the effectiveness of such interventions depends on the adherence to the tablets [5]. Foliate deficiency is associated with anemia and other unintended outcomes in pregnancy. Folic acid supplementation is currently among the cost effective ways recommended to control those outcomes [6].

According to WHO and Ethiopian guidelines, all pregnant mothers should take 30-60 mg iron plus 400 µg folic acid, one supplement daily starting as early as possible and taken the whole pregnancy period [7, 8]. Despite its implementation, many countries are not effective in anemia control and prevention due to poor compliance of mothers to IFAS [5, 6]. Adherence to a medicine refers to the degree to which patients take medicines/tablets as prescribed by their care givers. Adherence rates are commonly described as the proportion of the prescribed doses of the medicine/tablet truly ingested by the patient over a definite period.

One in every three women had anemia and deficiency of folic acid while about half had iron deficiency, indicating that such conditions are found to be the most important micronutrient deficiencies in Ethiopia [9]. Numerous countries (developing) are now employing iron/folic acid supplementation programs, but only a few countries had substantial progress in anemia prevention and control. Various studies from different parts of the world (Asia, Latin America and African countries) have shown low adherence of women taking daily IFAS and this takes the lions share for IFAS programs ineffectiveness. There are different factors that can affect the adherence status, which are not studied extensively [5, 10, 11].

In Ethiopia, IFAS is the key approach for anemia control and prevention. However, adherence rate persists to be very low. A study conducted in Ethiopia showed that only about one in sex pregnant mothers took the IFA supplements for three months or more [8]. In another study in Ethiopia, only less than 1% ingests the ideal number of tablets (minimum of 180 IFA tablets) [12]. More than eight out of ten women, more than one in six women and less than one in hundred women; didn't took iron tablets at all, took the tablets for less than 60 days and took the tablets for three months or more during their last pregnancy respectively [3]. Although, adherence is the most important challenge in IFAS programs, literature is dearth and the predictors are not persistent and undoubtedly recognized. Therefore, this study was aimed to assess the adherence status (IFAS) and its predictors among pregnant mothers attending ANC in Debre Markos town administration, Ethiopia.

2.   RESEARCH METHOD
2.1. Study setting

The study was conducted in Debre Markos town Administration, Northwest Ethiopia from March 03-23/2016. The town is located about 300 kilometres Northwest from Addis Ababa, Ethiopia. The town has a total of eight kebeles, and bordered by Gozamen District. The estimated total population of the town is 68,960 of which male populations constitute 33, 291(48.2%) and female accounts for 35, 669 (51.8%). Regarding health services, the town administration has one referral hospital, three health centres, eight health posts, four small and six medium private clinics, two private drug vendors and four private drug stores. Institution based quantitative cross sectional study design triangulated with qualitative methods was employed among 395 systematically selected pregnant mothers from the selected health facilities. All pregnant women who took IFAS at least for a month and visited the ANC clinic during the study period were the source populations.

2.2. Sample size determination

The final sample size was determined after calculating and comparing the sample size for the two specific objectives; accordingly the maximum sample size was obtained by using single population proportion estimation formula (Normal deviant at the portion of 95% confidence interval two tailed test = 1.96; margin of error acceptable is taken as 5%) and taking the rate of adherence to IFAS among pregnant mothers as 37.2% from a study done in a similar set up [13]. After adding 10% non-response rate, finally the total sample size was 395. In the qualitative study six pregnant mothers and two key informants (heads of ANC clinics) participated in in-depth interviews.

In Debre Markos Town Administration, there are three public health centers and one referral hospital. Namely, Hedasie health center, Debre Markos health center, Wuseta health center and Debre Markos referral hospital. In all health institutions there were pregnant women attending ANC clinic. All of those institutions were involved in the study. By using the flow of pregnant mothers

visiting ANC clinic in the previous months as a baseline there were a total of 792 pregnant women in those public health facilities, who fulfill the eligibility criteria during the study period. Considering the total number of pregnant mothers (N=792), and the sample size (n=395), an interval of k =N/n = 792/395 = 2, was used to select the study subjects. The sample size was proportionally allocated to each health facility and the participants were selected using systematic random sampling technique.

2.3. Data collection tools and data collectors

Data were collected using translated structured questionnaire adapted from Dinga et al., and further developed by using different peer reviewed published literatures. The questionnaire addressed the participant's socio-demographic factors; Obstetric and health related characteristics, Health service related factors; Client related factors (knowledge) and others. The questionnaire was modified further after a pre-test was conducted. Separate eight in-depth interview guide was prepared in English language for both pregnant women and key informants from previous literatures. Then it was translated into local Amharic language. The in-depth interview guide included general information about the respondents and other open ended questions that focus on reasons for adherence/non adherence to IFAS. Four grade ten completed girls were recruited to participate in data collection. The data collectors were selected from Debre Markos town administration, who were fluent in local language. One Public Health officer was recruited for supervision. In order to collect the qualitative data, the principal investigator conducted in-depth interviews on six pregnant women and two key informants. Open ended questions with multiple probing were used to get adequate information. The interviews were recorded via tape recorder.

2.3.1. Variables of the study

The dependent variable was IFAS adherence. The independent variables were socio demographic and economic factors, obstetric characteristics, knowledge related factors and others.

2.3.2. Data quality control

The data collectors had taken two days training. The questionnaire was translated into the local language of the respondents (Amharic language) and used for the data collection. Pre test was done and necessary amendments were made in the tool. During the actual data collection, close supervision was made and accordingly, data were checked for its consistency and completeness. Double entry was made to cross check the data for completeness before analysis. For the qualitative data, the already conducted interviews were analysed before the next interview for avoidance of unnecessary data collection and possible amendment of the tool.

2.3.3. Data processing and analysis

After checking the collected data visually, data were coded, entered and cleaned using Epi-Data version 3.3.1 software. The data entered was exported to SPSS version 23 software for analysis. Frequency and percentages were calculated to describe the different characteristics of the study subjects. Bivariate logistic regression was performed for each independent variable with outcome variable. A variable whose bivariate test had a p-value < 0.2 was a candidate for multivariable model together with all other variables. The Hosmer and Lemeshow's goodness-of-fit test model coefficient was considered to assess whether the necessary assumptions for the application of multiple logistic regression were fulfilled. Multivariable logistic regression was performed to identify the predictors of IFAS adherence. Multicollinearity was checked and all non collinear variables were taken to the model. Crude and adjusted odds ratios were calculated; all tests were two-sided and P value < 0.05 was considered statistically significant. For the qualitative data analysis Open code software was used. First the tape recorded audio data was transcribed to paper in Amharic language and further translated to English. Then it was entered to computer in word document. Thereafter it was exported to open code software for descriptive content analysis.

2.4. Ethical considerations

Officially written approval letter from Haramaya University Institutional Health Research Ethics Review Committee (IHRERC) was obtained prior to the data collection. Before informed consent obtained, the clear description of the study title, procedure and duration, possible risks and benefits of the study were explained for the study subjects. and the responses of interviewee`s were kept confidential.

3. RESULTS AND DISCUSSION

About 384 pregnant mothers were participated yielding response rate of 97.2%. About 233 (60.7%) study participants were age ≥25 years. Three hundred twenty five (84.6%) of study participants resided in urban. The vast majority, 351(91.4%) were Orthodox Christian followers and 365(95.1%) of the participants were married. About 186(48.4%) of the study participants were house wife followed by government employee 78(20.3%), and 243(63.3%) of respondents had family size of at most three. Frequency of Socio-economic and demographic characteristics of respondents in Debre Markos town, Northwest Ethiopia, March 2016, (N=384) shown in Table 1.

Table 1. Frequency of Socio-economic and demographic characteristics of respondents

Variable	Category	Frequency	Percent
Age	< 25 years	151	39.3
	≥25 years	233	60.7
Religion	Orthodox	351	91.4
	Others*	33	8.6
Residence	Urban	325	84.6
	Rural	59	15.4
Educational status	Cannot read and write	131	34.1
	Can read and write	67	16.4
	Primary education	64	17.7
	Secondary and above	122	31.8
Occupational status	Government employee	78	20.3
	Daily laborer	30	7.8
	Merchant	70	18.2
	House wife	186	48.4
	Others**	20	5.2
Marital Status	Married	365	95.1
	Others***	15	4.9
Husband Educational status	Cannot read and write	103	27.8
	Can read and write	58	15.7
	Primary education	42	11.4
	Secondary and above	167	45.1
Family size	1-3	243	63.3
	4-6	121	31.5
	>6	20	5.2
Family income	<500 birr	59	15.4
	500-1000birr	98	25.5
	>1000 birr	227	59.1

*=Muslim and Protestant   **=Student and Farmer   ***=Unmarried, Widowed and Divorced

The mean (± SD) gestational age of the respondents' was 27.6±7.6 weeks. About 225(58.6%) of the respondents were primigravidas and only 143(37.2%) were Multiparous. More than half 207(53.9%) of the participants were in their third trimester. About 260(67.7%) of the respondents had ANC follow up within their 16weeks of gestation. More than ninety percent (354) of the respondents had at most four ANC visits. About 223(58.1%) of the participants spent more than half an hour (by foot) to reach the health facility and 365(94.5%) of the participants got medical advice about IFAS. More than one fifth (21.6%) and more than one third (37.5%) of the participants had history of previous anemia and history of anemia during current pregnancy respectively Table 2.

Table 2. Frequency of Obstetric and health facility related characteristics of respondents

Variable	Category	Frequency	Percent	Variable	Category	Frequency	Percent
Gravidity	Primigravida	159	41.4	Number of Visits	≤4	354	92.2
	Multigravida	225	58.6		>4	30	7.8
Parity	Nulliparous	168	43.8	Distance from health facility	≤30 minutes	161	41.9
	Primiparous	73	19.0		>30 minutes	223	58.1
	Multiparous	143	37.2				
Trimester	First	39	10.2	Get Medical advice about IFAS	Yes	363	94.5
	Second	138	35.9		No	21	5.5
	Third	207	53.9	History of previous anemia	Yes	83	21.6
Time of registration	<16 weeks (Early)	260	67.7		No	301	78.4
				History of anemia during current pregnancy	Yes	144	37.5
					No	240	62.5

Adherence assessment was made based on participants self-report of taking average number of IFA tablets (per week) during the previous one month preceding the survey. Two hundred thirteen [55.5% (95%CI, 50.5%-60.4%)] of participants were adhered to IFAS (took ≥4 tablets per week) and 171[44.5% (95%CI, 39.6-49.5)] were non-adhered to IFAS (took < 4 tablets per week). The leading reason for adherence was getting medical advice (352, 94.1%) followed by fear of illness if missed (177, 47.3%) and getting family support (68, 18.2%). From those who got medical advice, (345, 95.3%), (324, 89.5%) and (54, 14.9%) were advised about the importance of the supplement, how it is taken and side effect of the supplement respectively. Findings from the qualitative part of the study also shown that most pregnant mothers' leading motive of consuming the tablets was getting medical advice from health care providers.

…"I took the tablets because the health care providers (both at health facility and home) told me it prevents you from anemia and your fetus from diseases".

(Pregnant women, age 38)

Another qualitative finding showed that fear of illness (if tablets are missed) was the second major reason to taking the tablets.

…"I am forced to take the tablets because I fear the illness that would happen to me and to my fetus, if I missed the doses of tablets"

(Pregnant women, age 27)

Another reason for taking tablets raised by in-depth interview participants was getting family support.

…"I never missed the tablet, because my husband reminds me to take it".

(Pregnant women, age 38)

The primary reason for mothers who didn't ingest the tables, was forgetfulness (248, 67.8%) followed by fear of side effect (190, 51.9%). In addition, belief that taking tablets leads to too big baby (133, 36.3%) and taking a lot of tablets would injure the mother and infant (38, 10.4%) were reasons for missing the doses of tablets.

Findings from the qualitative component also revealed that forgetfulness was the major reason of missing tablets.

…"Since I forgot, I missed more than half of the tablets. Tablets are taken at night time, I spent all the day with work…when I returned back to home … I will be so exhausted … then I will forget them".

(Pregnant mother, age 32)

…"Pregnant mothers' first reason for missing the doses of tablets was forgetfulness, not side effect … since we gave them counseling about side effects"

(ANC head, age 25)

Knowledge of anemia was calculated by adding 19 relevant knowledge questions (items on sign and symptom, cause, complication, prevention and others). A correct answer for each question was recorded as "1" and incorrect answer was recorded as "0". Questions were add up and then converted to 100%. Hence, the median was 47.4%. About 167 (43.5%) of the respondents had good knowledge of anemia (scored median and above) and 217 (56.5%) of the respondents had poor knowledge of anemia (scored below the median). Similarly, knowledge of IFAS was computed by adding 7 relevant knowledge questions [14]. The median was 71.4%. One hundred eighty one (47.1%) of the respondents had good knowledge of IFAS and about 203 (52.9%) of the respondents had poor knowledge of IFAS.

To determine the predictor variables, both bivariate and multivariable analysis were done. In the bivariate analysis, 14 variables: maternal educational status, partner educational status, occupational status, marital status, monthly family income, gravidity, trimester, time of ANC registration, number of ANC visit, history of previous anemia, history of anemia during current pregnancy, medical advice about IFAS, knowledge of anemia and knowledge of IFAS showed an association with IFAS at p value < 0.2 and they were a candidate for the final model. Accordingly, maternal educational status, time of ANC registration, history of anemia during current pregnancy and knowledge of IFAS were found to be the predictor variables. The comparison of pregnant women those who adhered to IFAS and those who do not, revealed that; Pregnant mothers who had primary education were 4 times more likely to be adhered to IFAS compared to those who cannot read and write (AOR=4.0, 95% CI=1.88 - 8.54). Pregnant women who were secondary education and above were 3.6 times more likely to be adhered to IFAS than those who cannot read and write (AOR=3.6, 95% CI=1.20 – 6.94). Pregnant mothers who had early registration (≤16weeks) for ANC were 1.8 times more likely to be adhered to IFAS than those who had late registration (>16weeks) (AOR= 1.8, 95% CI=1.06-3.11). Pregnant mothers who had good knowledge of IFAS were 2.1 times more likely to be adhered to IFAS than those who had poor knowledge of IFAS (AOR= 2.1, 95% CI= 1.24-3.56). Pregnant mothers who had history of anemia during current pregnancy were 7.9 times more likely to be adhered to IFAS than those who hadn't (AOR = 7.9, 95% CI= 4.44-14.01) Table 3.

Table 3. Multivariable logistic regression that shows predictors of IFAS adherence among pregnant mothers attending ANC clinics

Variables	Adherence status		COR(95%CI)	AOR(95%CI)
	Adhered No (%)	Non adhered No (%)		
Educational status				
Cannot read and write	44(20.7)	87(50.9		1
Can read and write	42(19.7)	25(14.6)	3.3 (1.80,6.14)	2.0 (0.97,4.13)
Primary education	43(20.2)	21(12.3)	4.0 (2.15,7.64)	4.0 (1.88,8.54)*
Secondary and above	84(39.4)	38(22.2)	4.4 (2.58,7.14)	3.6 (1.20,6.94)*
Monthly family income				
< 500	21(9.9)	38(22.2)	1	
500 – 1000	44(20.7)	54(31.6)	1.5 (0.76,2.87)	2.0 (0.87,4.77)
> 1000	148(69.5)	79(46.2)	3.4 (1.86,6.17)	2.0 (0.90,4.55)
Gravidity				
Primigravida	82(38.5)	77(45.0)	1	1
Multigravida	131(61.5)	94(55.0)	1.3 (0.87,1.97)	1.3 (0.79,2.27)
Trimester				
First	17(8.0)	22(12.9)	1	1
Second	80(37.6)	58(33.9)	1.8 (0.87,3.66)	2.2 (0.90,5.45)
Third	116(54.5)	91(53.2)	1.7 (0.83,3.29)	2.5 (0.98,6.21)
Time of registration				
Early(≤16weeks)	170(79.8)	90(52.6)	3.6 (2.27,5.58)	1.8 (1.06,3.11)**
Late(>16weeks)	43(20.2)	81(47.4)	1	1
History of anemia current pregnancy				
Yes	117(54.9)	27(15.8)	6.5 (3.98,10.6)	7.9(4.44,14.01)*
No	96(45.1)	144(84.2)	1	1
Knowledge of Anemia				
Poor	102(47.9)	115(67.3)	1	1
Good	111(52.1)	56(32.7)	2.2 (1.47,3.39)	1.4 (0.80,2.48)
Knowledge of IFAS				
Poor	98(46.0)	105(61.4)	1	1
Good	115(54.0)	66(38.6)	1.9 (1.24,2.81)	2.1 (1.24,3.56)**

AOR = Adjusted Odd Ratio   CI = Confidence Interval,   COR = Crude Odd Ratio
*= significant at P-value <0.001   **= significant at P-value <0.005

Iron deficiency anemia greatly affects pregnant mothers. To prevent and mitigate such deficiencies, IFA supplementation is the realistic and practicable way. However adherence to IFAS is below the standard in most African countries including Ethiopia. The result revealed that 55.5% of pregnant women were adhered to Iron and folic acid supplementation (IFAS) which is consistent with the study done in Northwest Ethiopia (55.3%) [14], West dembecha district, Ethiopia (52.9%) [15] and in Indonesia (53.7%) [16] However; it is higher than the study done in Mecha district, Northwest Ethiopia (20.4%) [6], Tigray, Ethiopia (37.2%) [13], Armachiho, Northwest Ethiopia (28.7%) [17], Hawassa, South Ethiopia (38.3%) [18], Adwa, Tigray Ethiopia (40.9%) [19], Kenya (24.5%) [20], Kiambu County, Kenya (32.7%) [21]. The possible reason may be improved knowledge of mothers about anemia and IFAS, majority of the respondents being urban residents and the time gap between studies. The other possible rationale as told by qualitative study participants was; overestimation of taking tablets, since they did not exactly remind how much of the tablets were taken and how much were missed. The key informants also told that pregnant women favour overestimation of taking tablets because the health care providers ask them why if they miss the tablets, so in order not to be criticized by the providers', women tend to overestimate.

The study showed that women educational status was one of the predictor variables for IFAS adherence. Pregnant women who were having primary education were 4 times more likely to be adhered to IFAS compared to those who cannot read and write. The possible reason as told by the key informants was those who had primary education were eager to accept the counseling about IFAS. The finding is similar with other studies done in Northwest Ethiopia [6] Pakistan [22], Camboidia [23], and Indonesia [24]. However, this finding is inconsistent with other studies done in Kenya [20] and Sudan [25]. The variation may be due to geographical, and socio cultural (societal belief about IFAS) difference. On the other hand, pregnant mothers who were secondary education and above were 3.6 times more likely to be adhered to IFAS compared to those who were cannot read and write. This indicates that those women who had primary education were more likely to be adhered to IFAS than those who were secondary and above. The possible rationale as told by the qualitative study participants (key informants) were those who were secondary and above were prone to forgetfulness since most spent their time outside home with work: they did not want to suffer from side effects: think that they can get it (iron) just from diet and were reluctant to accept the counseling given by the health care provides, compared to those who had primary education.

In this study history of anemia during current pregnancy had shown a significant association with IFAS adherence. Women who had history of anemia during current pregnancy were 7.9 times more likely to be adhered to IFAS than those who had not. The qualitative finding also revealed that, women were strict in taking the tablets if they had anemia because they need to be free from the illness due to fear of anemia complications both on them and their infant. The finding is consistent with other studies conducted in Mecha district, Northwest Ethiopia [6], Tigray, Ethiopia [13], Kenya [20] Tanzania [26], Debre tabor, Ethiopia [27].

Adherence rate was better seen in those mothers who were early registered for ANC services than those who were late registered. Pregnant mothers who were early registered were 1.8 times more likely to be adhered to IFAS than those who were late registered. The reason may be those who had early registration would had better attention for their prenatal period and had more ANC follow ups which will have effect for getting counseling and ultimately improved knowledge about anemia and IFAS. The qualitative finding also revealed that, the early pregnant women visit the ANC clinic, the more they get adequate counsiling, and the better to adhere to the supplementation. The result is supported by the studies in India [11] and Ethiopia [12, 13]

Knowledge of IFAS was also another predictor; those women who had good knowledge IFAS were 2.1 times more likely to be adhered compared to those who had poor knowledge of IFAS. The likely justification may be, those who had good knowledge were having better opportunity about tablets benefit, side effects, when it has to be taken, and complication if missed. Findings from the qualitative component also showed that, women were encouraged to ingest the tablets if they have good knowledge about the tablets especially the benefits and side effects of the tablets and knowledge about IFAS can be increased by giving adequate counseling during medical advice and through health extension workers during home visit and community meetings. The finding is supported by studies done in Ethiopia [15, 19, 28].

There were different reasons for adherence and non-adherence to IFAS. Getting medical advice, and fear of illness if missed were the major reasons for mothers to be adhered to IFAS. This could be due to increased knowledge of both anemia (including pregnancy complications) and iron and folic acid supplementation that resulted from proper counseling through medical advice from health care providers. Qualitative study participants also told that they were willing to take the tablets if the health care providers were able to give medical advice about the tablets appropriately. Key informants also told that, even though medical advice is given, participants may not take the tablets because the quality of medical advice matters women to take the tablets. Therefore trainings should be given for the health care providers in order to deliver adequate counseling about IFAS. The finding is consistent with the study in Kenya [20]. The other reason of pregnant women for adherence was getting family support. The justification behind is that when pregnant women get family support, they will have an opportunity not to forget the tablets and great concern for adherence. Findings from the qualitative component also revealed that, family support especially husband support, play a great role for IFAS adherence because husbands consider the tablet as medication and think as it should be taken fully without missing, therefore they remind women to take the tablets. The finding is consistent with the study in Pakistan [22].

Forgetfulness was the primary reason of mothers for non-adherence to IFAS. A possible explanation for forgetfulness as a major reason is that the timing that the tablet is taken. Findings from the qualitative study revealed that since the tablet is taken at night, pregnant women were forced to forget the tablet since they the day time is loaded with various tasks and at night time they become tired. Lack of concern for adherence might also lead pregnant women to forget the tablets. The finding is consistent with other studies done in Ethiopia [12], Misha district, and South Ethiopia [29].

Following forgetfulness, fear of side effect was the prominent reason for non-adherence. Findings from the qualitative part also revealed that (as told by the key informants), women were prone to forget the tablets because they did not give emphasis for the tablets that resulted from reluctance of accepting advices, considering they can get the tablets benefit from diet and being busy with work. Fear of side effect is probably resulted from getting inadequate counseling during medical advice from health care providers and women decreased knowledge of anemia and IFAS. Through better counseling about the overall aspect of tablets, non-adherence due to fear of side effects could be decreased. The finding is consistent with studies done in Kenya [20], Pakistan [22] and Ethiopia [28, 29]. Taking the tablets will lead to too big baby and the tablets would harm the mother and the infant were the other reasons of pregnant women for missing the tablets. This could be due to health care provider's inadequate counseling about the tablets and pregnant women decreased knowledge of iron and folic acid supplementation and anemia. This finding is supported by other studies in Ethiopia [6, 12], and Pakistan [22]. Since evidence on adherence status was from mothers' individual report of supplement intake, recall bias is one of the most important limitations of this study.

4.   CONCLUSION

The rate of adherence was found to be low. Maternal educational status, early registration for ANC, history of anemia during current pregnancy and knowledge of mothers about IFAS were predictors of adherence to IFAS. Getting medical advice followed by fear of illness if missed were the primary reasons that enforce mothers to take the tablets. On the other hand, forgetfulness and fear of side effects were among the prominent reasons for missing the doses of tablets. Hence, improving mothers' knowledge regarding overall aspects of the tablet through better advice, community teaching and the mass media at large, would improve adherence.

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