


Adherence to prenatal iron–folic acid supplementation and associated factors among pregnant women attending antenatal care services in Dilla town, South Ethiopia

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Abstract

Background: During pregnancy, due to the physiological and hormonal change, the requirement of iron–folic acid is enhanced. Therefore, the occurrence of iron/folic acid deficiency is relatively high and it is responsible for 95% of anemia during pregnancy.

Objectives: The aim of this study was to assess adherence to prenatal iron–folic acid supplementation (IFAS) and associated factors among pregnant women attending antenatal care services at public health facilities of Dilla town.

Methods: Facility-based cross-sectional study design was employed selecting 403 pregnant women attending antenatal care services in three public health institutions of Dilla town. The women were included in the study by simple random sampling. Data were collected by interview and document review. Then it was entered into EPI Data version 3.1 and exported to SPSS version 20 for analysis. Bivariate and multivariate binary logistic regression techniques were used to identify independent predictors. A p -value <0.05 was taken as indication of statistical significance.

Results: From the total of planned 403 pregnant women, 396 participated in the study, with a response rate of 98.2%. Of these, 172 (43.4%) pregnant women were adhered to IFAS. The study also revealed that history of previous anemia (adjusted odds ratio (AOR)=1.87; 95% confidence interval (CI): (1.01–3.47); $p=0.04$), frequency of antenatal care center (ANC) visits (AOR=2.51; 95% CI: (1.17–5.37); $p=0.01$), knowledge of IFA supplement (AOR=2.28; 95% CI: (1.36–3.82); $p=0.002$), and knowledge of anemia (AOR=2.30; 95% CI: (1.40–3.77); $p=0.001$) were independent predictors of adherence to IFAS.

Conclusion: The finding of this study showed that less than half of the pregnant women were adhered to IFAS. History of previous anemia, frequency of ANC visits, knowledge of IFA supplement, and knowledge of anemia were the factors associated with adherence to IFA supplement.

Keywords

Adherence, pregnant women, iron–folic acid, Dilla

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Introduction

In a woman's life, pregnancy is a critical stage that affects the future generation. During pregnancy, due to the physiological and hormonal change, the requirement of iron–folic acid is enhanced. Therefore, the occurrence of iron/

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folic acid deficiency is relatively high.^{1,2} Pregnancy-related folic acid deficiency at conception and in early stage is associated with increased risk of congenital anomalies (e.g. neural tube defects) and other adverse pregnancy outcomes such as preeclampsia, malformations such as oro-facial clefts, fetal death, fetal growth restriction, and preterm delivery.³

Men generally have iron homeostasis even in settings where dietary iron is low, but in women, both before pregnancy because of blood loss resulting from menses and during pregnancy, the body's capacity to regulate iron absorption is often insufficient.⁴ Anemia is more prevalent in women in developing countries and usually associated with inadequate iron stores due to nutritional deficiency and intestinal helminthic infections, inadequate intake of folate, and due to malarial infection leading to chronic hemolytic states.^{5,6} Similarly, according to Ethiopian demographic and health survey of 2016, in Ethiopia, anemia prevalence among women of age 15–49 was estimated to be 24% and particularly 29% of the pregnant and lactating women were anemic. Iron deficiency anemia is the most widespread nutritional problem among pregnant women and it has also severe consequences for both their productive and reproductive roles.⁷

Iron is an essential micro nutrient, which is required for hemoglobin synthesis. The most feasible mass intervention for iron supplementation to pregnant women is giving the elemental iron parallel with folic acid in the form of tablets. But for such interventions, the effectiveness and success depend on the adherence to the iron–folic acid (IFA) tablets.⁸

Folic acid requirements are increased in pregnancy because of the rapidly dividing cells in the fetus and elevated urinary losses. Since neural tube closes by day 28 of pregnancy, it is recommended that, folic acid supplementation should be initiated as early as possible to decrease the risk of neural tube defects.⁹

During normal pregnancies women need an estimated 6 mg of iron per day and about 10 mg of iron per day during the last six weeks as compared to a non-pregnant woman, which is 1.3 mg of iron per day.¹⁰ Therefore, According to the WHO guideline and Ethiopian national guideline for control and prevention of micronutrient deficiencies, all pregnant women should receive and consume a standard dose of 30–60 mg iron + 400 µg folic acid as part of antenatal and neonatal care program to improve the pregnancy outcome and prevent the adverse effects of elemental deficiency. This program is applied for all pregnant women irrespective of their hemoglobin levels. Women are said to be adhered to iron/folic acid supplement if they took 65% or more of the supplement equivalent to taking supplement at least 4 days a week.^{9,11,12}

Iron–folic acid supplementation (IFAS) is the main strategy for anemia control and prevention in Ethiopia. While many developing countries including Ethiopia are

now implementing IFA supplementation through antenatal care programs, only few countries have reported significant improvement in IFA supplementation and anemia control and prevention.^{13,14} In Ethiopia, iron/folate supplementation is the main strategy for anemia control and prevention. However, adherence rate remains very low. According to the finding from Ethiopian demographic and health survey (EDHS) 2016, more than half of the women (58%) did not take any iron tablets during their pregnancy in the preceding 5 years of the survey and only 5% took the supplement for more than 90 days. Despite there being improvement in adherence when compared to the finding of EDHS 2011 which was less than 1%, still the adherence is poor.⁷

The major problem with this elemental iron and folic acid deficiency is related to adherence status as women fail to take the dose of tablet prescribed by health providers due to varying factors.¹⁵ Even though adherence is a major problem in IFA supplementation programs, it is even worse in case of Southern Nations Nationalities and Peoples Region (SNNPR) as there is limited information on the use of prenatal iron/folic acid supplement in this study area. Limited researches have been done and to the investigators' best knowledge no study is done in the study area with this title. Since the Dilla town is the biggest town and business center between Southern Ethiopia and Northern Kenya, significant numbers of pregnant women in the town are merchants and they move between Ethiopia and Kenya and they may not have time for visiting health facilities during pregnancy and they give more attention for their business than their pregnancies. Therefore, this study was done to determine the adherence status and identify factors associated with adherence to IFAS among pregnant women attending ANC in health facilities of Dilla town administration.

Materials and methods

Study area and period

The study area was Dilla town, which is located in Southern Ethiopia at a distance of 359 km from the capital city, Addis Ababa, on the way from Addis Ababa to Moyale. The town has administratively structured to three sub-towns; Haro wolabu, Sesa, and Bedecha. Each of the sub-town had three kebeles totaled to nine kebeles for Dilla town and bordered by northern part with Sidama and west and east with Guji zone. The estimated total population of the town is 99,067 of which 52,034 (52.5%) were males and 47,033 (47.5%) were females. The total pregnant women who attended the ANC service were 3079. Regarding health service, Dilla town has 1 referral hospital, 2 government health centers, 10 private clinics, and 1 governmental and 12 private pharmacies.

The study was conducted from 26 March to 13 May 2018 in public health institutions of Dilla town.

Table 1. Sample size determination for the second objective of the study.

Factors considered	CI (%)	Power (%)	Ratio	% of exposed	% of unexposed	OR	Total sample	Ref
Age of mothers	95	80	1:1	30.0	12.9	2.9	202	16
Counseling on iron folate supplement	95	80	1:1	55.9	24.1	4.0	84	16
Knowledge of IFA supplement	95	80	1:1	34.1	12.9	3.5	142	18
Frequency of ANC visits	95	80	1:1	92.3	77.5	3.5	208	19

CI: confidence interval; OR: odds ratio; IFA: iron-folic acid; ANC: antenatal care center.

Study design

A facility-based cross-sectional study design was conducted among pregnant women during their ANC visit at public health facilities.

Target and study population

The target populations were all pregnant women who were attending ANC clinic of public health facilities in Dilla town, whereas the study populations were pregnant women who were visiting the ANC clinic of public health facilities in Dilla town for at least the second time.

Inclusion criteria

- ANC clients who took IFAS at least for a month and visited the ANC clinic during the study period.

Exclusion criteria

- This study excluded those pregnant women who were seriously ill, and mothers who were unable to respond because of physical or psychological disabilities.

Sample size determination

For the first specific objective of this study, sample size was calculated based on single population proportion formula using the following assumptions: $P=39.2\%$ (the proportion of pregnant women adherent to iron-folate supplement),¹⁶ with 95% confidence level and 5% level of precision. Accordingly, $n=366$.

For the second specific objective, various factors significantly associated with the dependent variable are considered and calculated using Epi Info 7 (Table 1).

Finally, the required sample size for this study was decided by taking the maximum from the first objective ($n=366$). And by adding 10% for non-response rate, the final sample size became 403.

Sampling techniques

All public health facilities providing ANC service in Dilla town were included in this study (Dilla University Referral

Hospital, Haroresa Health Center, and Oddaya'a Health Center). By using the previous months of ANC flow of pregnant women as a baseline, there were a total of 758 pregnant women in those public health facilities, who fulfill the eligibility criteria during the study period. Using this information, the total number of clients that were interviewed for each health facility was calculated based on proportionate allocation to size. And then by assuming that pregnant mothers will come to the health facility randomly, eligible mothers were taken consecutively till the sample size reaches in each facility.

Data collection tools and procedures

Data were collected using structured questionnaires adapted and modified after reviewing different literatures as appropriate to address the study objectives. To ensure reliability, the questionnaire was pre-tested on 5% of the sample size (20 pregnant women) in Wonago Health Center, which is located in one of the neighboring Districts of Gedeo Zone, and then the necessary modification was made to it. To ensure the internal validity of the questionnaire, senior scholars in the school of public health have looked into it and made comments and corrections on it. The main contents of the questionnaire were socio-economic and demographic, obstetric and medical history, health service-related issues, mother's knowledge status on anemia and IFA supplement, and benefits of IFA tablets. The adopted and modified questionnaire was initially prepared in English and then it was translated to Gede'uffa and Amharic. To check for consistency, the questionnaire was further translated from the Gede'uffa and Amharic to English. Then it was collected through face to face exit interview. The charts of the clients were also reviewed as a secondary data.

Operational definition

Adhered to IFAS: pregnant women who were said to be adhered to IFA supplement were women that took the supplement at least 4 days per week in the preceding 1 month of the survey.¹⁷

IFA supplement: a tablet containing iron and folic acid compound that was prescribed to pregnant women.¹⁷

Good knowledge about anemia: those pregnant mothers who are capable of answering \geq mean score of computed knowledge-related questions on anemia.

Poor knowledge about anemia: those pregnant mothers who are capable of answering $<$ mean score of computed knowledge-related questions on anemia.

Good knowledge about IFAS: those pregnant mothers who are capable of answering \geq mean score of computed knowledge-related questions on IFAS.

Poor knowledge about IFAS: those pregnant mothers who are capable of answering $<$ mean score of computed knowledge-related questions on IFAS.

Data processing and analysis

Following accomplishment of data collection activities, the data were coded and entered using EPI DATA version 3.1 statistical software and exported to SPSS version 20 statistical software for analysis. Binary logistic regression was used to determine a dependent variable on the basis of continuous and/or categorical independent variables and variables with $p \leq 0.25$ in bivariate analysis were candidates for multivariate analysis and variables with $p < 0.05$ in final model were statistically significant. The degree of association between dependent and independent variables was assessed using adjusted odds ratio (AOR) at 95% confidence interval (CI).

Ethical consideration

Ethical clearance was obtained from Institutional Review Board of College of Health and Medical Sciences, Dilla University (Reference No: 008/2018). A formal letter was given to each of the public health institutions in Dilla town. In addition, verbal informed consent was obtained from study participants to confirm willingness for participation after explaining the objective of the study. Since, there are no procedures carried out on study participants, we only take verbal consent after explaining the research protocol to them. And the respondents were notified that they have the right to refuse or terminate at any point of the interview. To keep the confidentiality of the study participants, the anonymity was kept by using only codes; and to keep the privacy, each of the pregnant women were interviewed separately in a quiet room prepared for this purpose.

Results

Socio-demographic and economic characteristics of pregnant women

From a total of 403 pregnant women, 396 were participated in the study, with a response rate of 98.2%. The mean age

was 27.5 (SD= ± 5.1) years and most participants, 233 (58.8%), were between 25 and 34 years of age. Of the study participants, 320 (82.1%) were married. About 285 (72.0%) of the study participants reside in urban areas and 185 (46.7%) of the participants were Protestants by religion followed by Orthodox followers. About 153 (38.6%) of the study participants were primary educated and 169 (42.2%) of the respondents' husband has attended secondary and above.

About 182 (46.0%) of the participants were government employees. Regarding their monthly income as told by the participants, about 193 (48.7%) of the participants had monthly income of ≥ 1000 birr (Table 2).

Table 2. Socio-demographic and economic characteristics of participants in public health facilities of Dilla town, South Ethiopia (N= 396).

Variables	Frequency	Percentage
Age (years)		
15–24	120	30.3
25–34	233	58.8
≥ 35	43	10.9
Marital status		
Single	48	12.5
Married	325	82.1
Others ^a	23	5.8
Residence		
Urban	285	72.0
Rural	111	28.0
Religion		
Protestant	185	46.7
Orthodox	166	41.9
Muslim	30	7.6
Others	15	3.8
Educational status of woman		
Cannot read and write	116	29.3
Primary education (1–8)	153	38.6
Secondary and above	127	32.1
Educational status of husband		
Cannot read and write	110	27.8
Primary education (1–8)	119	30.1
Secondary and above	167	42.2
Occupation		
Housewife	97	24.5
Daily laborer	31	7.8
Merchant	86	21.7
Government employee	182	46.0
Monthly income		
< 500 ETB	87	22.0
500–1000 ETB	149	37.6
> 1000 ETB	160	40.4

ETB: Ethiopian birr.

^aOthers include divorced and widowed.

Obstetric and health service-related characteristics of pregnant women

The mean \pm SD gestational age of the study participants was 24.0 ± 5.6 weeks. Half of the participants, 194 (49.0%), were in their second trimester. About 264 (66.5%) of the study participants were primigravida. Majority, 337 (85.1%), of the participants visited the ANC clinic in their second trimester. About 320 (80.8%) of the study participants had less than four ANC visits. Majority, 335 (84.5%), of the study participants had no history of previous anemia and about 238 (60.1%) of the study participants were not anemic during data collection time. More than half of the participants 209 (52.8%) live near the health centers and reach the health centers within 30 min and more than three-fourth 318 (80.3%) of the participants have the service within 1 h. About 302 (76.3%) of the study participants obtained adequate IFA tablets during their ANC visits. Majority of the participants, 325 (82.1%), got medical advice about IFAS (Table 3).

Knowledge of the pregnant mother

Comprehensive knowledge of anemia. Knowledge of anemia was evaluated using seven relevant knowledge items on sign and symptoms, cause, prevention, complication, and others where a score of 1 was given for correct responses and 0 for incorrect answers/do not know responses. The mean was 3. Those pregnant women who score above the mean were considered as having a good knowledge on anemia. But, those pregnant women who scored less than the mean score were labeled as having a poor knowledge on anemia. Accordingly, about 251 (63.4%) of the participants had a poor knowledge of anemia and 145 (36.6%) had a good knowledge of anemia.

Comprehensive knowledge of IFAS

Knowledge of iron folate supplement was also evaluated by seven relevant knowledge items on the importance of IFAS, when to take it, consequences if not taken, and importance of taking it regularly; where a score of 1 was given for correct responses and 0 for incorrect answers/do not know responses. The mean score was 4. Those pregnant women who scored above the mean score were considered as having a good knowledge on IFAS and those who scored less than the mean score were labeled as having a poor knowledge on IFAS. Accordingly, about 221 (55.8%) of the participants had a good knowledge of IFAS and 171 (44.2%) of the participants had a poor knowledge of IFAS.

Self-reported rate of adherence to IFAS

All participants (100%) used IFA tablet in the previous month and 172 (43.4%) of pregnant women were adhered

Table 3. Obstetric and health service-related characteristics of pregnant mothers in public health facilities of Dilla town, South Ethiopia (N = 396).

Variables	Frequency	Percentage
Gravidity		
Primigravida	264	66.7
Multigravida	132	33.3
Parity		
Nulliparous	126	31.8
Primiparous	141	35.6
Multiparous	129	32.6
Gestational age		
First trimester	8	2.0
Second trimester	337	85.1
Third trimester	51	12.9
Previous history of anemia		
No	335	84.5
Yes	61	15.5
Current anemia		
No	238	60.1
Yes	158	39.9
Time of registration		
≥ 16 weeks (late)	224	56.6
< 16 weeks (early)	172	43.4
Number of ANC visit		
< 4 visits	320	80.8
≥ 4 visits	76	19.2
Waiting time in health facility		
0–60 min	318	80.3
> 60 min	78	19.7
Time spent from health facility (by foot)		
≤ 30 min	209	52.8
> 30 min	187	47.2
Obtain adequate IFAS		
No	94	23.7
Yes	302	76.3
Got medical advice about IFAS		
No	71	17.9
Yes	325	82.1

ANC: antenatal care center; IFAS: iron-folic acid supplementation.

to IFAS (took ≥ 4 tablets per week in the previous 1 month preceding the survey) and 224 (56.6%) were not adhered to IFAS (took < 4 tablets per week in the previous 1 month preceding the survey). The main reason for adherence to IFAS were getting medical advice (168, 97.6%) followed by fear of illness (123, 71.5%) and getting family support (46, 26.7%). From those pregnant women who got medical advice, (268, 82.4%), (215, 66.1%), and (117, 36.0%) were advised about the importance of the supplement, how and for how long it is taken, and the possible side effects of the supplement, respectively.

In this study, for 200 (89.2%) of the pregnant women who missed the dose of tablet, the reason was forgetfulness. The other reason of missing the dose of the tablet was due to side effects for 168 (75.0%) pregnant women, and

the perception that the tablet would harm the mother and her fetus for 103 (46.0%) pregnant women.

Factors associated with adherence to IFAS

Both bivariate and multivariate analyses were used to investigate the association of predictors with IFA supplement. Variables that showed an association with IFA supplement at p -values less than 0.25 levels were entered into multivariate logistic Regression.

Out of all variables, age of the mother, educational status of mothers, occupation of the mothers, monthly family income, number of pregnancy, gestational age, time of registration at ANC, frequency of ANC, distance from health facility, waiting time in the health facility, availability, counseling about IFAS, knowledge of mothers about anemia, knowledge of mother about IFAS, previous history of anemia, current status of anemia were candidate variables for multivariate logistic regression analysis.

Finally, after adjusting for potential confounders using multivariate binary logistic regression model, previous history of anemia, frequency of ANC visits, knowledge of IFA supplement, and knowledge of anemia were found to be statistically significant predictors for adherence to IFA supplement.

Adherence to IFA supplement has increased with previous history of anemia in the women. Pregnant women who had previous history of anemia were 1.8 times (AOR=1.87, 95% CI (1.01, 3.47), $p=0.04$) more likely to be adhered to IFA supplement than those pregnant women who had no history of anemia.

Moreover, frequency of ANC visit has also been an important predictor of adherence to IFA supplement. Pregnant women who visited ANC four times and above were 2.5 times (AOR=2.51, 95% CI (1.17, 5.37), $p=0.01$) more likely to be adhered to IFAS compared to those pregnant women who visited ANC less than four times.

Pregnant women who had a good knowledge of iron folate supplement were 2.2 times (AOR=2.28, 95% CI (1.38, 3.82), $p=0.002$) more likely to be adhered to IFAS than those pregnant women who had poor knowledge of IFAS. Similarly, pregnant women who had a good knowledge of anemia were 2.3 times (AOR=2.30, 95% CI (1.40, 3.77), $p=0.001$) more likely to be adhered to IFAS compared to those who had poor knowledge of anemia (Table 4).

Discussion

This study revealed that 43.4% of pregnant women were adherent to IFA supplement (took ≥ 4 tablets per week in the previous 1 month preceding the survey). This implies that substantial proportion of pregnant women do not take the prescribed dose of tablets. Proportion of women who were adherent to IFA supplement in this study was

comparable with a study conducted in Egypt (41.1%) and Philippines (40.1%).^{1,18} In addition, the result is consistent with a study conducted in Bahir Dar, Northwest Ethiopia (41.5%).¹⁹

The adherence level in this study is lower compared to the studies conducted in Sudan, South India, and Nepal, which was 64.7%, 55.7%, and 92.1%, respectively.^{8,14,20} The variation may be due to the difference in lifestyle and the given low attention for adherence issue due to lack of awareness. Similarly, the adherence level was also much lower than the study conducted in Hossana town, which was 69.6%.²¹ The possible reason would be the differences in awareness of pregnant women about IFAS and educational status. But this result is higher when compared to the findings of the studies conducted in North Western Zone of Tigray (37.2% in urban and 28.9% in rural), Assaita district (22.9%), and Mecha district (20.4%).^{12,22,23} The probable reason might be the difference in geographic locations and time gap between the studies.

This study revealed that pregnant women who had previous history of anemia are 1.8 times more likely to be adherent to IFAS than those pregnant women who had no history of anemia. This finding was supported by the studies done in North Western Zone of Tigray, Nepal, and Western Iran.^{12,14,24} The possible reason would be pregnant women who had history of anemia had better experience in the prevention and treatment of iron-deficiency anemia.

In this study, pregnant women who had visited ANC service for four and more times are 2.5 times more likely to be adherent to IFAS than those pregnant women who visited ANC service less than four times. This finding is consistent with the findings of the studies in Misha district, Philippines, Urban Islam, and Eritrean refugee camps (Northern Ethiopia).^{16,18,25,26} The possible reason of this would be the health providers will advise the pregnant woman during their ANC visits where there are frequent ANC visits which will increase awareness on IFAS.

This study showed that pregnant women who had a good knowledge of anemia are 2.3 times more likely to be adherent to IFAS than those women who had a poor knowledge of anemia. This finding is consistent with the findings of the studies carried out in Misha district, Amhara region, and Nigeria.^{15,16,23}

The other factor significantly associated with adherence of IFAS was knowledge of IFAS. Mothers who had a good knowledge of IFAS are two times more likely to be adhered to IFAS than those mothers who had a poor knowledge of IFAS. This finding is consistent with the findings of the studies done in South India, Amhara region, Nigeria, Pakistan, and eight rural districts of Ethiopia.^{8,15,23,27,28} The possible reason is that those pregnant women who had a good knowledge on anemia and IFAS had better perception of IFAS and are aware of the benefits, side effects, and the complications, if missed.

Table 4. Multivariate analysis of factors associated with adherence status of the mothers at Dilla town, South Ethiopia, 2018.

Variables	Adherence status		Crude adjusted	
	Not adhered (%)	Adhered (%)	OR (95% CI)	OR (95% CI)
Age				
15–24	74 (61.7)	46 (38.3)	1	1
25–34	126 (54.1)	107 (45.9)	1.36 (0.87–2.14)	0.85 (0.50–1.46)
≥35	24 (55.8)	19 (44.2)	1.27 (0.62–2.59)	1.13 (0.49–2.59)
Mother education				
Cannot read and write	60 (51.7)	56 (48.4)	1	1
Primary (1–8)	86 (56.2)	67 (43.8)	0.83 (0.51–1.35)	1.04 (0.51–2.13)
Secondary and above	78 (61.4)	49 (38.6)	0.67 (0.40–1.12)	0.89 (0.44–1.81)
Occupation of mother				
Housewife	54 (55.7)	43 (44.3)	1	1
Daily labor	21 (67.7)	10 (32.3)	0.59 (0.25–1.40)	0.47 (0.18–1.23)
Merchant	53 (61.6)	33 (38.4)	0.78 (0.43–1.41)	0.77 (0.39–1.51)
Government employee	96 (52.7)	86 (47.3)	1.12 (0.68–1.84)	0.82 (0.46–1.47)
Frequency of ANC				
<4 visit	54 (71.1)	22 (28.9)	1	1
≥4 visit	170 (53.1)	150 (46.9)	2.16 (1.25–3.72)	2.51 (1.17–5.37)*
Gravida				
Primigravida	143 (54.2)	121 (45.8)	1	1
Multigravida	81 (61.4)	51 (38.6)	0.74 (0.48–1.13)	0.990 (0.58–1.68)
Gestational age				
First trimester	3 (37.5)	5 (62.5)	1	1
Second trimester	187 (55.5)	150 (44.5)	0.48 (0.11–2.04)	0.44 (0.79–2.44)
Third trimester	34 (66.7)	17 (33.3)	0.30 (0.06–1.40)	0.25 (0.42–1.54)
Time of registration				
≥16 weeks (late)	127 (59.6)	86 (40.4)	1	1
<16 weeks (early)	97 (53.0)	86 (47.0)	1.30 (0.87–1.95)	1.37 (0.84–2.22)
Counseling on IFAS				
No	46 (64.8)	25 (35.2)	1	1
Yes	178 (54.8)	147 (45.2)	1.52 (0.89–2.59)	0.98 (0.52–1.82)
Previous history of anemia				
No	198 (59.1)	137 (40.9)	1	1
Yes	26 (42.6)	35 (57.4)	1.94 (1.12–3.38)	1.87 (1.01–3.47)*
Current anemia				
No	142 (59.7)	96 (40.3)	1	1
Yes	82 (51.9)	76 (48.1)	1.37 (0.91–2.05)	0.98 (0.59–1.65)
Waiting time in the health facility				
0–60 min	187 (58.8)	131 (41.2%)	1	1
>60 min	37 (47.4%)	41 (52.6%)	1.58 (0.96–2.60)	1.02 (0.48–2.16)
Obtain adequate IFA tablets				
No	60 (63.8%)	34 (36.2%)	1	1
Yes	164 (54.3)	138 (45.7%)	1.48 (0.92–2.39)	0.72 (0.40–2.31)
Distance from health facility				
≤30 min	131 (62.7)	78 (37.3)	1	1
>30 min	93 (49.7)	94 (50.3)	1.69 (1.13–2.53)	1.12 (0.66–1.90)
Knowledge of anemia				
Poor	164 (65.3)	87 (34.7)	1	1
Good	60 (41.4)	85 (58.6)	2.67 (1.75–4.06)	2.30 (1.40–3.77)**
Knowledge of iron				
Poor	121 (69.1)	54 (30.9)	1	1
Good	103 (46.6)	118 (53.4)	2.56 (1.69–3.89)	2.28 (1.36–3.82)**

(Continued)

Table 4. (Continued)

Variables	Adherence status		Crude adjusted	
	Not adhered (%)	Adhered (%)	OR (95% CI)	OR (95% CI)
Monthly income				
<500	39 (44.8)	48 (55.2)	1	1
500–1000	94 (63.1)	55 (36.9)	0.47 (0.27–2.74)	0.60 (0.31–1.14)
>1000	91 (56.9)	69 (43.1)	0.61 (0.36–1.04)	0.89 (0.44–1.81)

OR: odds ratio; CI: confidence interval; IFAS: iron–folic acid supplementation; 1: reference variable.

Bold values indicate significant association in multiple logistic regressions.

* $p < 0.05$, ** $p < 0.01$.

Conclusion

The finding of this study showed that less than half of the pregnant women were adherent to IFAS. And frequency of ANC visits, previous history of anemia, knowledge of anemia, and knowledge of IFAS were found to be significantly associated with adherence to IFAS.

Limitations of the study

As both dependent and independent variables were determined at one point in time, it is impossible to indicate which comes first.

Declaration of conflicting interests

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