

# Factors Associated with Adherence to Iron-Folic Acid Supplementation among Pregnant Women Attending ANC Clinic North Shewa Health Institution, Ethiopia 2016

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**Abstract** Background:- Anemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children. Iron deficiency anemia (IDA) was considered to be among the most important contributing factors to the global burden of disease and folic acid deficiency is also the major contributing factor for congenital anomalies. Objective:-To assess the factors associated with adherence to iron-folic acid supplementation among pregnant women attending ANC clinic in selected governmental health institution, North shewa, Ethiopia 2016. Methodology: - Institutional based cross sectional study design was employed. On this study 693 respondents was participated. Data was collected using interview pre-tested and semi structured questionnaire of Amharic version. The data was cleaned, coded and entered into EPI info versions 3.1 and transferred to SPSS version 21 windows for analyses. Both Bivariate and multivariate logistic regression analysis was carried out to see significant association. Result: - It was intended to distribute 702 targeted sample questionnaires of this 693 were completed and returned with a response rate of (98.7%). Pregnant women who had less than 30 min waiting time were 5.93 times more likely to be adhered to IFAS than who take greater than 30 min in health facility (AOR=5.93, 95% CI: 3.4-10.1). Pregnant women who take health education were 6.25(2.5-15.4) times more likely to be adhered to IFAS than who didn't take health education (AOR=6.25, 95% CI: 2.5-15.4). Conclusion: - This study show that only 25% of the pregnant women were adhered to iron folic acid supplementation. Recommendation: - Sensitization of pregnant women by health providers is very important to continue supplements of iron and folate throughout pregnancy. Provision of health education on anemia and importance of FANC are necessary.

**Keywords** Maternal Anemia, Adherence, Iron/folate Supplement, Pregnant women

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## 1. Introduction

### Back ground

Anemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children. It is considered to be among the most important contributing factors to the global burden of disease [12].

Low iron during pregnancy can cause fatigue, reduced work capacity, cardio vascular stress, lower resistance to infection, and iron deficiency which leads to premature delivery, low birth weight, infant mortality, placental previa, premature rupture of membrane, cardiac arrest, hemorrhage, and poor cognitive development [13].

According to EDHS 2011 result in Ethiopia 17% of women at the age of 15-49 are anemic, with 13 percent having mild anemia, 3 percent having moderate anemia, and 1 percent having severe anemia. A higher proportion of pregnant women are anemic (22 percent) than women who are breastfeeding (19 percent) and women who are neither pregnant nor breastfeeding 15 percent [9].

The other major problem related to folic deficiency is neural tube defects (NTDs), serious birth defects of the brain and spine, are a major, preventable public health burden. Globally, it is estimated that approximately 300,000 babies

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are born each year with it [15].

According to the WHO and Ethiopia's national guidelines for control and prevention of micronutrient deficiencies, all pregnant women should receive and consume a standard dose of 60mg iron + 400 µg folic acid daily for 6 months starting from the first month of pregnancy or at the time of their first antenatal visit. Currently, iron-folic acid supplementation (IFA) is the main strategy for anemia control and prevention in Ethiopia [16]. But overall national data suggests that from all pregnant women supplemented with IFA tablets only 0.4% consumed > 90 tablets during their pregnancy time [17]. This indicates that identification of the factors associated with adherence to IFA supplement is an important step to improve the IFA tablets use among pregnant women.

## 2. Methodology

### Study design

A cross-sectional descriptive institutional based study was conducted to assess the adherence rate and factors affecting to iron/folate supplements among pregnant women at selected public health institution, in North shewa Ethiopia 2016.

### Study period

The duration of the project was conducted from November to January, 2016.

### Source population

All pregnant women attending ANC At selected public hospital, in north shewa Ethiopia 2016.

### Sample size and sampling technique

The sample size was determined by using 37.2% of the adherence rate of pregnant women in North Western Zone of Tigray, Ethiopia (1). And using the following assumption: 37.2% of mothers had adherence with 5% marginal error and 95%CI and a non response rate of 10%. Based on this assumption, the actual sample size for the study was determined using the formula for single population proportion.

Since the average total study population in the study area is about 2804 pregnant mothers who have attended ANC in the selected governmental health institution which is below 10,000. So reduction formula was employed as follows= Margin of error tolerated is 5%.

Since multi-stage sampling technique will be used by considering the design Effect 2 the total sample size became 702.

### Data quality assurance

A copy of the questionnaire was submitted to the expert to examine whether the number and type of items in the questionnaire measured the concept or construct of interest.

The data collection tool was translated in to local language [Amharic]. The second version of the tool was retranslated in to the English to evaluate its consistency and

before the actual data collection the questionnaires was pre-tested on the same source population in 04 health center which is not selected for the study with 5% of the total sample size. Based on the findings of the pre -test some modification and developments of the tool was done. Training was given for data collectors and coordinator. Data collectors was instructed to check the Completeness of each questionnaire whether each and every question was completely answered and also the coordinator was rechecked the completeness of the questionnaire immediately after Submission.

### Data analysis procedures

The questionnaires were checked for completeness by the principal investigator. Unfilled and Partially filled questionnaire was excluded. The remaining was coded, cleaned and entered in to EPI data version 3.1 statistical software package. Then the data was transfer & analyzed by statistical package for social sciences software package (SPSS) version 21.

The descriptive analysis such as frequency distribution and percentages was used. Odd ratio with 95% confidence interval was used to ascertain the association between dependent and independent variable as appropriate. Bivariate and multivariate analysis was used to identify independent predictor of adherence of iron folic acid. Confidence interval of (95%) was used to see precision of the study and level of significance was taken at  $\alpha = <0.05$ .

### Data presentation

The data was presented by using frequency, table, text, by measurement of central tendency and graphs.

### Ethical consideration

Ethical clearance was obtained from IRB (institution review board) of Debre Birhan University (DBU), college of health science, institute of health science and medicine. Then formal letter of cooperation was written to north shewa health Bureau, and for each health institution from north shewa health Bureau. Each study participant was adequately inform about the purpose, method, anticipated benefit of the study and their full right to discontinued or refused to participate in the study by their data collector and asked if they are willing to participate or not. Written Informed consent was obtained from student who was participate in the study. Not asking the name of the participant to keep Confidentiality and cultural norms was respected properly.

## 3. Result

### Socio-demographic characteristics of the respondents

It was proposed to distribute 702 targeted sample questionnaires from this 693 were completed and returned with a response rate of (98.7%). The mean age of the respondents was 26.3 ( $\pm 5.1$ ) years. Around 35.6% of respondent were in age group of 21-25 years and about

6.9% were in age group of 36-40 years. Majority of the women interviewed were married (85.1%). About (37.8%) of the respondents were unable to read and write, (28.9%) can read and write, (13%) had primary school level and (9.3%) had secondary school level, the percentage of pregnant women who had college and university level were (24.3%). Regarding occupation majority of the respondent were house wives (60%). Concerning residence 360 (51.9%) were in rural and 333 (48.1%) were in urban. By religion majority of respondent were Orthodox which constitute 554 (79.9%) and the remaining small proportion Muslim and Protestant were 127 (18.3%) and 9 (1.2%) respectively. Majority 590(85.1%) were married (Table 1).

**Table 1.** Distribution of socio demographic characteristics of pregnant women in selected north Shewa zone in governmental hospital, Ethiopia, 2017 (n=693)

Demographic characteristics	Frequency	Percentage
<b>Age in year</b>		
15-20	67	9.7
21-25	219	31.6
26-30	272	39.3
31-35	81	11.7
36-40	44	6.4
41-45	9	1.22
45-50	1	0.1
<b>Marital status</b>		
Single	73	10.5
Married	587	85.1
Divorced	20	2.9
Widowed	10	1.4
<b>Religion</b>		
Orthodox	554	79.9
Muslim	127	18.3
Catholic	3	4
Protestant	9	1.3
<b>Other</b>		
<b>Place of residence</b>		
Urban	333	48
Rural	360	52
<b>Educational level of mother</b>		
Illiterate	262	37.8
Primary	197	28.4
Secondary	65	9.4
College/university	169	24.4
<b>Other</b>		
<b>Educational level of husband</b>		
Illiterate	158	22.8
Primary	306	44.2
Secondary	65	9.4
College/university	164	23.6
<b>Other</b>		
<b>Marital status</b>		
Single	73	10.5
Married	588	84.8
Divorced	20	2.9
Widowed	12	1.4
<b>Other</b>		

<b>Family size</b>		
<4	489	70.7
4-7	180	25.7
>7	25	3.6
<b>Occupation of mother</b>		
House wife	416	60
Private work	85	12.3
Employ	171	24.7
Other	21	2.9
<b>Occupation of husband</b>		
Unemployed	14	2
Private work	308	44.4
Employ	208	30
Other	163	23.6

### Pregnancy and Obstetric related characteristic of respondent

Half of the respondents had less than three times ANC visit. Around 11.6% percent of the respondents have history of abortion and 3% have history of still birth. Among the respondents 21.7% have started ANC while their pregnancy is less than 12weeks gestation, and 26.7% have started after 24 week of gestation (Table 2).

**Table 2.** Pregnancy and obstetric related characteristic of respondent at selected public health institutions, in north Shewa, Ethiopia 2017(n=693)

Variable	Frequency	Percentage
<b>Gravidity</b>		
<3	491	70.9
>3	202	29.1
<b>Number of delivery</b>		
<3	584	84.3
>3	109	15.7
<b>Number of still birth</b>		
Yes	44	6.3
No	649	93.7
<b>Number of abortion</b>		
Yes	54	54
No	639	92.2
<b>Number of ANC</b>		
<3	544	78.7
>3	147	21.3
<b>Time of first ANC</b>		
<12	683	98.8
12-24	7	0.7
>24	3	0.4
<b>Place of ANC</b>		
Health post	44	5.9
Health center	465	67.1
Hospital	181	26.1
Other	6	0.8
<b>Presence of disease in this pregnancy</b>		
Yes	93	13.4
No	600	86.6

**Respondent’s knowledge of anemia and benefit of Iron and folate supplement**

Majority of the respondents (62.6%) had Good knowledge on cause, consequence, risk group, and method of prevention on anemia, while (55.4%) of respondents had Good knowledge on benefits of Iron and folate supplementation (Table 3).

**Table 3.** Respondents knowledge about anemia and benefit of Iron and folate supplement at selected north Shewa wereda, Ethiopia 2016 (N=693)

Variable	Frequency	Percent (%)
<b>Knowledge on anemia</b>		
Poor	258	37.2
Good	435	62.6
<b>Knowledge of IFAS</b>		
Poor	307	44.3
Good	385	55.4

**Service related characteristics at selected public**

About 77.9% of pregnant women were provided Health education towards iron with folic acid supplementation and 22.1 were not provided. Regarding health care provider communication majority of respondent 83.5% pregnant women said there is poor communication with health care provider. In addition to this around 22.7% of pregnant women said there is shortage of supplementation, when you come to source of information about anemia 68.8%, 12.6,6.9%, 6.3 health care provider, school, media and friend respectively (Table 4).

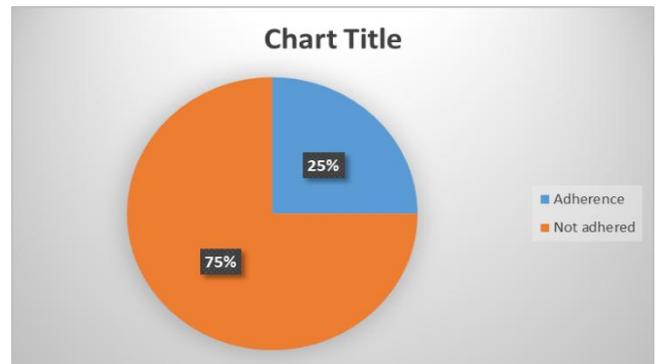
**Table 4.** Service related characteristics\*, at selected public health institutions, in north Shewa selected wereda, 2016. (N=693)

Variable	Frequency	Percent (%)
<b>Health education</b>		
Yes	538	77.9
No	155	22.1
<b>Waiting time</b>		
<30	222	32.7
>30	471	67.3
<b>Problem faced</b>		
Yes	433	62.3
No	260	37.7
<b>Poor health care provider communication</b>		
Yes	114	16.5
No	579	83.5
<b>Shortage of supplement</b>		
Yes	157	22.7
No	536	77.3
<b>Distance from house to health facility</b>		
Yes<30	350	51
No >30	346	49

**Adherence of iron folic acid**

The prevalence of adherence of iron folic acid

supplementation is only 25% and most of their source of information was health care provider that is 85.4% and the rest 8.5%, 6.9% and 6.8% were media, friends and school respectively (figure 1).



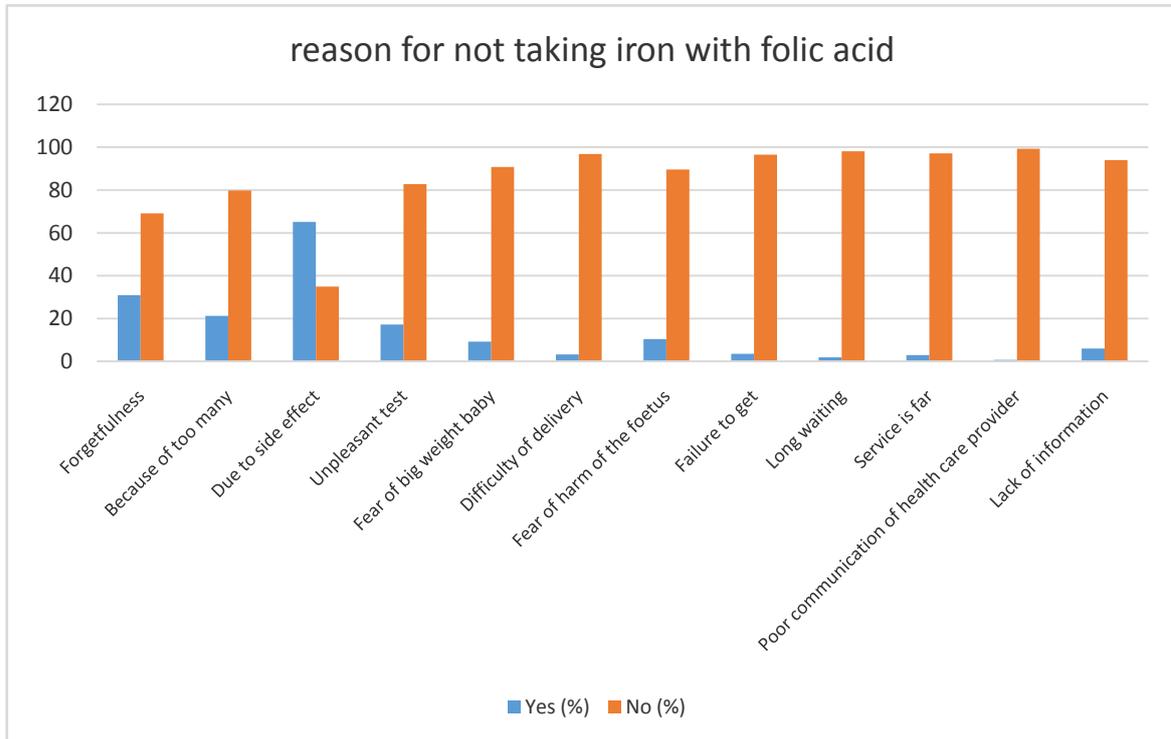
**Figure 1.** Prevalence of adherence of iron folic acid

**Reasons for not taking iron folic acid supplement**

The study Shows that the reasons for poor adherence to IFA supplement includes due to side effect (65.1%), forgetfulness (30.9%), because of too many pills (21.2%), unpleasant test (17.2%), and due to fear of big weight (9.2%) (figure 2).

**Association of socio demographic factors and other variable with IFAS**

To know the association of predictor variable with IFAS both bivariate and multivariable analysis were done. In bivariate analysis nine variable: residence, husband education, still birth, income, anemia, waiting time, health education, distance and current anemia showed an association with iron folic acid adherence at  $p < 0.2$  and there were candidate for multi variable logistic regression analysis. Among the variable entered in to multi variable logistic regression, husband education, still birth, income, anemia, waiting time, health education and distance were significantly associated with iron folic acid adherence. The comparison of pregnant women those who adhered to AFAS and those who do not revealed that; pregnant women who had illiterate, primary and secondary educated husband were 0.4 time less likely to be adhered to IFAS than those pregnant women who had higher educated husband (AOR=0.48, 95% CI: 0.24-0.9). Pregnant women who come from early residence (<30min) were 7.03 times more likely to be adhered to IFAS than who came from far distance (AOR=7.03, 95% CI: 3.9-12.6). Pregnant women who had poor knowledge of anemia were 0.46 times less likely to be adhered to IFAS than those who had good knowledge (AOR=0.46, 95% CI: 0.23-0.9). Pregnant women who had short waiting time (<30 min) were 5.93 times more likely to be adhered to IFAS than who take long time in health facility (AOR=5.93, 95% CI: 3.4-10.1). Pregnant women who take health education were 6.25(2.5-15.4) times more likely to be adhered to IFAS than who didn't take health education (AOR=6.25, 95% CI: 2.5-15.4). (Table 5)



**Figure 2.** Reason for not taking iron with folic acid

**Table 5.** Binary logistic regression that show factor associated with adherence to IFAS among pregnant women attending ANC clinics in north Shewa selected wereda 2017(N=693)

Factors		Adherence status of respondent		COR at 95 % CI	AOR at 95 % CI
		Adhered	Not adhered		
Place of residence	Rural	296	61	0.42(0.293-0.60)	1.291(0.70-2.35)
	Urban	222	109	1	1
Income	1-500	6	40	0.219(0.087-0.549)	0.23(0.06-0.8)**
	500-2500	64	247	0.378(0.246-0.581)	0.38(0.19-0.7)**
	2500-5000	41	144	0.415(0.257-0.671)	0.34(0.18-0.6)**
	5000-20000	59	86	1	1
Educational status of the husband	Illiterate	31	124	0.354(0.213-0.587)	0.629(0.26-1.48)
	Primary	49	257	0.270(0.174-0.419)	0.48(0.24-0.9)**
	Secondary	24	39	0.871(0.478-1.586)	1.07(0.48-2.36)
	College/university	65	92	1	1
History of still birth	Yes	5	39	0.372(0.144-0.960)	0.23(0.06-0.8)**
	No	165	479	1	1
Knowledge on anemia	Good	129	303	0.448(0.303-0.663)	0.46(0.23-0.9)**
	Poor	41	215	1	1
Waiting time	<30	91	131	3.377(2.354-4.844)	5.93(3.4-10.1)**
	>30	79	380	1	1
Current anemia	Yes	41	159	0.565(0.373-0.854)	0.662(0.40-1.09)
	No	105	230	1	1
Health education	Yes	162	374	7.793(3.737-16.26)	6.25(2.5-15.4)**
	No	8	144	1	1
Distance	<30	142	207	7.521(4.835-11.70)	7.03(3.9-12.6)**
	>30	28	307	1	1

## 4. Discussion

Iron/folic acid deficiency is the major contributing factor for both maternal and neonatal morbidity and mortality. Pregnant women are among the most vulnerable group of iron deficiency anemia. But overall national report suggests that majority of pregnant women not take the drug as recommended. This indicates identification of the factor associated with adherence of iron folic acid supplementation is the important point to identify the problem and to take an intervention because Iron and folic acid supplementation is among the most feasible way to prevent anemia folic acid deficiency.

The study also show that only 25% of the pregnant women had adhered to Iron and folate supplement. This figure is lower than the study conducted in debre markos town which is 55.5%, Tigray, North Ethiopia (37.2), Misha district, south Ethiopia (39.2), but other study that conducted in Eritrean refugee camp is only 7% the possible reason may be related with different in geographic location, life style, inaccessibility of health care service and there may be related with poor information regarding iron folic acid supplementation.

Educational status of partner was important socio demographic factor which showed significant association with adherence to iron folic acid supplementation. Pregnant women who were having educated husband more likely to be adhered to iron with folic acid supplementation compared with those husband who were can not read and write. This finding also supported by other study done...the possible reason is educated husband have good knowledge about anemia and iron folic acid supplementation and give emphasis for adherence to iron folic acid supplementation.

Adherence was better seen in those pregnant women who were less waiting time in the health facility 5.93 times more likely to be adhered to iron folic acid supplementation and those who were wait long time. This also consistent with the study done in goba the reason may be pregnant women who had short waiting time probably had better concern for their Pregnancy and good communication with health care provider.

Knowledge of anemia is one of the grate factor to adherence of iron folic acid supplementation. In this study was women who had poor knowledge of iron folic acid supplementation were 0.46 times less likely adhered than who had good knowledge of iron and folic acid supplementation. The finding also supported by the study done in eight district in Ethiopia, study done in markose town and goba town.

The possible reason is that those pregnant women who had good knowledge iron and folic acid supplementation were aware of the tablet importance, frequency of taking and side effect of the drug.

There were different reason for adherence and non-adhered of pregnant women to iron and folic acid supplementation. Among the reason that make the pregnant women to be not adhered to iron and folic acid

supplementation distance between home and health facility, forgetfulness, poor communication with health care provider, fear of side effect and long waiting time in the health facility, were the major reason. This also supported by another study in Kenya and debre markose. The possible reason for this it may be related with poor communication with health care provider and poor counseling during medical advice

## 5. Conclusions

This study reviled that only one fourth of the pregnant women were adhered to iron folic acid supplementation. Educational status of the husband, waiting time, distance from health facility and health education were significantly associated with pregnant women adhered to iron folic acid supplementation. On the other hand half of the respondent had good knowledge on anemia and iron folic acid supplementation.

## List of Abbreviations

<b>AA</b>	Addis Ababa,
<b>ANC</b>	Antenatal care,
<b>DBU</b>	Debre Berhan University
<b>ETB</b>	Ethiopian Birr,
<b>EDHS</b>	Ethiopian Demographic Health Survey
<b>HC</b>	Health Center,
<b>HGB</b>	Hemoglobin,
<b>IFA</b>	Iron Folic Acid
<b>IDA</b>	Iron Deficiency Anemia,
<b>IRB</b>	Institution Review Board
<b>MDG</b>	Millennium Development Goal,
<b>NTD</b>	Neural Tube Defect
<b>SPSS</b>	Statistical Package for Social Science,
<b>SRS</b>	Simple Random Sampling
<b>WHO</b>	World Health Organization

## Declaration

### Ethical Considerations

Ethical clearance obtained from IRB (institutional review board) of formal letter of cooperation and written to selected organizations. Informed consent was obtain from each study participants after adequately providing information about the purpose, method, anticipated benefit of the study. Confidentiality was maintained by anonymous coding.

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**Funding** – Debre Birhan University College of medicine and health science department of midwifery Availability of data and materials- the raw data would not be provided so as to protect client anonymity.

## Availability of Data and Material

All data supporting the findings are contained in the manuscript. Anyway, datasets are available from the corresponding author on reasonable request.

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