

# Compliance to prenatal iron and folic acid supplement and associated factors among women during pregnancy in south east Ethiopia: a cross-sectional study

## Abstract

**Background:** Nutritional anemia is one of the leading causes of morbidity and mortality among pregnant women in developing country. Several studies have shown that prenatal iron and folic acid supplement for three months and more during pregnancy plays a great role in preventing maternal morbidity and mortality. The aim of this study was to assess compliance of prenatal iron and folic acid supplement and its associated factors during Antenatal Care in Goba District South East Ethiopia.

**Methods:** A community based cross-sectional study was conducted from March to May, 2014 in Goba District. A total of 405 mothers who gave birth in the last six months were selected using systematic random sampling technique. Data were collected using pretested questionnaire by interview and then entered and analyzed using SPSS version 20. Both bivariate and multivariate logistic regression were carried out to see significant association. Variables with P-value less than 0.05 were considered as significant in the multivariate analysis.

**Results:** The compliances rate to IFA supplement was found out to be 18%. Educational status of mother (AOR=0.24 (95% CI 0.63-0.97)), knowledge on anemia (AOR =0.41 (95% CI 0.20-0.84)), knowledge on benefit of iron folic acid (AOR =0.38 (95% CI 0.20-0.77)), receiving health education on IFA supplement during prenatal visit (AOR= 4.03 (95% CI 1.4-11.5)) were found to be factors associated with compliances to iron folic acid supplement

**Conclusion:** Compliance to IFA supplement was low among the study communities. Improving awareness of the community about IFA supplement during pregnancy and improving educational status of women are highly recommended.

**Keywords:** iron, folic acid, compliances to IFA, women, southeast Ethiopia

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**Abbreviations:** ANC, antenatal care; EDHS, Ethiopian demographic and health survey; IDA, iron deficiency anemia; IFA, iron/folic acid; MMR, maternal mortality rate; NIE, nutritional initiative of Ethiopia; PNC, postnatal care; SPSS, statistical package for social science; WHO, world health organization

## Background

Anemia is a global public health problem affecting two billion people worldwide. Globally, 41.8% of pregnant women and 30.2% of non-pregnant women are anaemic.<sup>1</sup> At least half of this anemia burden is assumed to be due to iron deficiency.<sup>2</sup> Many studies documented the adverse effects of maternal anemia, 12.8% and 3.7% of maternal mortality in Asia and Africa respectively is directly attributable to anemia.<sup>3</sup> In Ethiopia, anemia is the severe problem affecting 62.7% of pregnant mothers and 52.3% non-pregnant women.<sup>4,5</sup> During pregnancy anemia have negative consequence both for mother and the infant. For mother, the consequences of anemia include reduced energy and capacity for work poor pregnancy and birth outcomes including premature delivery, low birth weight, and increased prenatal mortality and increased risk of death during delivery and postpartum.

It is estimated that as many as 20% of maternal deaths are caused by anemia and that anemia may be an associated cause in as many as 50% of maternal deaths worldwide.<sup>6</sup>

As a public health measure, iron/ folic acid supplementation has been the recommended strategy for alleviating anemia in pregnant women. WHO recommended daily dose of 30–60mg of elemental iron and 400µg (0.4mg) Folic acid on daily bases throughout pregnancy.<sup>7</sup>

To combat Iron deficiency anemia, many developing countries including Ethiopia have interventions and programme during pregnancy. Provision of IFA supplement to all pregnant women free of charge is among the key interventions. The recommended dose by the Ministry of Health in Ethiopia is 60mg/day for 90days for iron and 400µg of folic acid daily.<sup>8,9</sup> And, Although National Nutrition Strategy adopted key target of increasing the proportion of mothers who get IFA for more than 90days during pregnancy and the post-partum period to 50% by 2015, there is discrepancy in the ANC coverage and the IFA intake level. The 2011 DHS documented IFA supplement of 17%. More importantly the IFA intake 90 or more tablets found to be 0.4%.<sup>10</sup> Gastrointestinal side effects, inadequate supply of tablets,

inadequate counselling, poor utilization of prenatal health-care services, lack of knowledge and patient fears about the tablets affect women's perception regarding tablet use in many countries.<sup>11-13</sup>

Even though iron folic acid (IFA) Supplementation during pregnancy is among the methods to reduce maternal mortality, in Ethiopia the coverage is very low, in addition there are limited studies conducted on this topic. Therefore, the findings of this study will give valuable information on compliances of IFA and its determinate factors for policy makers and service providers.

## Materials and methods

A community based cross-sectional study using quantitative methods of data collection was conducted in Goba District, South East Ethiopia from March to May 2014. Those postnatal mothers who gave birth 6months before the survey were included in the study. The sample size for this study was determined using a single population proportion formula estimation, with the assumptions of; an expected compliances to IFA 50%, a 95% confidence level, a 5% margin of error and a none response rate of 10%. The final calculated sample size was 422.

Goba district is divided into 2 urban and 24 rural kebeles (the smallest administrative unit in Ethiopia). From the district's 24 rural kebeles 4 was selected randomly and from the 2 urban kebeles 1 is selected randomly. In selected kebeles, preliminary survey was conducted to identify households with mothers who have child birth within 06months prior to the study and sampling frame was developed. After the total sample size was allotted proportionally to the selected kebeles based on the total number of deliveries in the past 06months, respondents were selected using systematic random sampling technique.

Data was collected using semi-structured, interviewer administered, pretested questionnaire after obtaining informed consent. The completed questionnaire were given codes, checked for completeness and consistencies then entered into EPI-info version 3.5.3 statistical software and then transferred to SPSS version 20 statistical package for further analysis. Data cleaning were performed to check for accuracy and consistencies, missed values and variables were also checked and corrected. The results were presented in the form of tables, figures, and text.

In this study, women were categorized as compliant to IFA supplement if they took 90 or more IFA tablets on daily base during her pregnancy.<sup>14</sup> Mother's knowledge of anemia was assessed using 20 questions. The questionnaire were composed of cause, health consequence, risk group and method of prevention in anemia, mothers who score mean value and above were considered as having good knowledge of anemia.

To assess mother's knowledge of IFA, 12 questions were employed, mothers who score mean value and above were considered as having good knowledge of IFA. Both bivariate and multivariate logistic regressions were used to identify factors associated with compliances to IFA. Odds ratio with 95% confidence interval was used to identify the presence and strength of association between variables.

Ethical clearance was obtained from the Institutional Ethical Review Board of Institute of Public Health, College of Medicine and Health Sciences, University of Gondar. Correspondingly written letters were offered from Bale Zone Health Department. Finally

informed consent was obtained from each mother before the start of the interview.

## Results

### Socio-demographic characteristics

A total of 405 PNC mothers who give birth 6months before data collection were included in the study with a response rate of 95.9%. The mean age of the respondents was 26.3 ( $\pm 5.1$ ) years. Around 35.6% of respondent were in age group of 21-25years and about 28% were in age group of 36-40years.

Majority of the women interviewed were married (98.1%) and rural dwellers (83.2%). About (32.1%) of the respondents were unable to read and write, (27.4%) can only read and write, (13%) had primary school level and (19.5%) had secondary school level. Regarding occupation majority of the respondents were house wives (72.6%) (Table1).

### Pregnancy and obstetric related characteristic of respondent

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

### Respondent's knowledge about anemia and benefit of IFA supplement

Two third (62.5%) of respondents had good knowledge on cause, consequence, risk group, and method of prevention in anemia, while 60.7% of the respondents had good knowledge on benefits of IFA (Table 3).

### Service related characteristics

About 78.9% were provided with health education and 21.2% were not provided health education on iron/folic acid supplements during their IFA collection. Regarding dispensing of supplement; majority of the respondents (87%) collected 30 tablets whereas 12.8% were collected more than 30 tablets per visit (Table 4).

### Compliances to iron/ folic acid supplement

It was found out that only 18% of the respondents were compliant to iron/folic acid supplement (Figure 1).

### Factors associated with adherence

Bivariate analysis for compliances to IFA revealed that place of residence, educational status of mother, education level of the husband, mothers knowledge of anemia, mothers knowledge on benefits of iron folic acid and receiving health education at the time of supplement collection have significant association with compliance to IFA at  $p$  value  $\leq 0.02$ .

Multivariable logistic regression was done to control potential confounders and educational status of mother, knowledge on anemia, knowledge on benefits of iron folic acid and receiving health education at the time of supplement collection have significant association with compliances to IFA at  $p$  value  $\leq 0.05$  (Table 5).

**Table 1** Socio-demographic and economic characteristics of respondent of pregnant and PNC mothers, Goba Woreda, South East Ethiopia, 2014 (n=405)

Variable	Category	Frequency	Percent
Age	16-20	51	12.6
	21-25	144	35.6
	26-30	132	32.6
	31-35	50	12.3
	36-40	28	6.9
Marital Status	Single	15	3.7
	Married	370	91.3
	Divorced	4	1
Religion	Widowed	16	4
	Orthodox	174	43
	Catholic	6	1.5
	Muslim	213	52.5
Residence	Protestant	12	3
	Rural	337	83.2
Family Size	Urban	68	16.8
	< 4 Family	71	17.5
	4-7 Family	253	62.5
Educational Level	>7 Family	81	20
	Can't read and write	122	30.1
	Can read and write	117	28.9
	Primary	53	13.1
	Secondary	84	20.7
Occupation of Mother	Above Secondary	29	7.2
	House Wife	294	72.6
	Governmental Employee	41	10.1
	Private Employee	18	4.4
	Daily Labourer	11	2.7
Educational Level of Husband	Merchant	24	5.9
	Farmer	17	4.3
	Can T Read and Write	80	19.8
	Can Read and Write	116	28.6
	Primary	59	14.6
Occupation of Husband	Secondary	117	28.9
	Above Secondary	33	8.1
	Governmental Employee	58	14.3
	Private Employee	47	11.6
	Daily Labourer	12	3
	Merchant	27	6.7
	Farmer	261	64.4

**Table 2** Pregnancy and obstetric related characteristic of respondent Goba woreda, Oromia region, South East Ethiopia, 2014 (n=405)

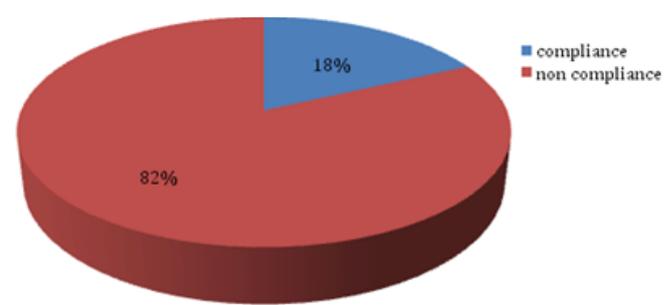
Variable	Frequency	Percent
Gravidity	<3	302 74.6
	≥3	103 52.4
Still Birth	Yes	12 3
	No	393 97
Abortion	Yes	47 11.6
	No	358 88.4
No of ANC	>3	199 49.1
	≤3	206 50.9
Time of Start of ANC	<12 Week	88 21.7
	12-24 Week	209 51.6
	>24 Week	108 26.7
Place of ANC	Health Post	73 18
	Health Centre	277 68.4
	Hospital	55 13.6

**Table 3** Respondents knowledge about anaemia and benefit of IFA supplement Goba District, South East Ethiopia, 2014 (n=405)

Variable	Frequency	Percent
Knowledge on Anaemia	Good Knowledge	253 62.5
	Poor Knowledge	152 37.5
Knowledge on Benefits of IFA	Good Knowledge	246 60.7
	Poor Knowledge	159 39.3

**Table 4** Service related characteristics Goba District, South East Ethiopia, 2014 (n=405)

Variable	Category	Frequency	Percent
Health Education	Yes	319	78.8
	No	86	21.2
Waiting Time	< 30minute	354	87.4
	>30minute	51	12.6
Problem Faced	Yes	93	23
	No	312	77
Number of Tab Supplemented Per Visit	30 tab	353	87.2
	>30 tab	52	12.8



**Figure 1** Adherence level of mothers to IFA Goba District South East Ethiopia, 2014.

**Table 5** Factor associated with compliance to IFA at Goba District, South East Ethiopia, 2014 (n=405)

Factors	Category	Compliance status of respondent		COR (95 % CI)	AOR (95 % CI)
		Compliance	Non-compliance		
Place of Residence	Rural	54	283	0.49 (0.26, 0.90)	0.69 (0.31, 1.5)
	Urban	19	49		
Educational Status of Mother	Can t Read and Write	9	113	.20 (0.7, 0.60)	0.11(0.026, 0.47)
	Can Read and Write	20	97	.54 (.21, 1.39)	0.23 (0.064, 0.87)
	Primary Education	8	45	0.46 (0.15-1.4)	0.24 (0.63, 0.97)
	Secondary Education	28	56	1.31(0.51, 3.33)	0.97(0.32, 2.8)
	Above Secondary	8	21		

Table continued...

Factors	Category	Compliance status of respondent		COR (95 % CI)	AOR (95 % CI)
		Compliance	Non-compliance		
Educational Status of Husband	Can't Read and Write	10	70	0.38 (0.13, 1.04)	1.31 (0.34, 4.9)
	Can Read and Write	16	100	0.42 (0.16, 1.08)	1.30 (0.37, 4.4)
	Primary Education	13	46	0.75 (0.28, 2.75)	3.3 (0.90, 12.3)
	Secondary Education	25	92	0.72 (0.29, 1.75)	0.85 (0.30, 2.3)
	Above Secondary	9	24	1	1
History of Abortion	Yes	15	32	2.4 (1.23, 4.7)	3.79 (1.68, 8.55)
	No	58	300	1	1
Knowledge on Anemia	Good	58	195	1	1
	Poor	137	15	0.36 (0.20, 0.67)	0.41 (0.20, 0.84)
Knowledge on Benefits of Iron Folic Acid	Good	56	190	1	1
	Poor	17	142	0.40 (0.22, 0.72)	0.38 (0.20, 0.77)
Health Education at the Time of Supplement Collection	Yes	68	251	4.3 (1.71, 11.2)	4.03 (1.4, 11.5)
	No	5	81	1	1

## Discussion

This study revealed that only 18% of the studied subjects were compliant to IFA supplement. The compliance rate of this study is lower than a study conducted in Kenya (24.5%),<sup>15</sup> study conducted in Cambodia (47%)<sup>16</sup> and study conducted in India (35.5%).<sup>17</sup> This could be due to differences in socioeconomic status of the study population. But the finding of this study is higher than EDHS 2011 which was 0.4%. This could be because of the present study has been conducted among ANC follower and the time gap between the present study and EDHS 2011.<sup>18</sup>

Educational status of mother was an important socio demographic factor which showed significant association. The compliance rate of IFA supplement was significantly increases with educational status of mother. Mothers who can't read and write were 91%, mothers who can read and write were 77% and mothers who had primary education were 76% less likely to adhere to IFA when compared with those who had above secondary education. This might be because, when women are educated, they might have accessible to information and advices from different sources about IFA and threats of anemia.

Another important variable that showed a significant association is knowledge of cause, consequences, risk group and method of prevention of anemia. The rate of compliance to IFA was 59% times less likely among women with poor knowledge.

This finding was similar with the study done in Nepal which identifies high proportion of compliances among pregnant mothers with good knowledge.<sup>19</sup> This could be due to reason that knowledge of pregnant women about anemia related to causes, consequence and method of prevention affect their compliance of IFA. In addition good level of knowledge about anemia was a factor which could promote

individuals in preventing iron deficiency anemia and following recommendation.

It was found out that there was a significant association between respondent's knowledge on benefit of IFA and compliance to IFA. Women with poor knowledge on benefit of IFA were 62% times less likely to adhere than women's with good knowledge on benefit of IFA. This could be due to the fact that good levels of knowledge promote mothers to take the supplements based on the recommendation. Receiving health education during prenatal visit was also an important predictor of compliance to iron folate supplements. This study showed that mothers who were provided with health education at the time of receiving supplements have about 4.03 (AOR 4.03 (95% CI 1.4-11.5) times more likely to adhere to IFA supplement than those who were not provided. This could be due to the fact that health education at the time of supplement provides important information of IFA supplement.

## Conclusion

Compliance to IFA supplements was low among pregnant women attending ANC in the study communities. Increase awareness of the community about anemia and IFA supplement during pregnancy, improving educational status of women, providing alternative community based delivery mechanisms and sustainable supply of IFA is highly recommended.

## Authors' contributions

MT made substantial contributions in conception, design, and acquisition of data, analysis and interpretation of data and has been involved in drafting the manuscript. AB Participated in the design of the study, writing of results and discussion and has been involved

in drafting the manuscript. MA Approved the proposal with some revisions: All authors read and approved the final manuscript. MT wrote the paper.

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## Conflict of interest

The author declares no conflict of interest.

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