ADHERENCE TO IRON–FOLIC ACID SUPPLEMENTATION AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN AT FELEGE HIWOT COMPRESSIVE SPECIALIZED HOSPITAL, BAHIR DAR, ETHIOPIA

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ABSTRACT

BACKGROUND: Iron deficiency is the most significant contributor to the onset of anemia, accounting for 75% of anemia cases that occur during pregnancy worldwide. Adherence to iron and folic acid supplementation is one of the determinant factors to prevent anemia during pregnancy. Thus, this study aimed to assess the magnitude and associated factors for adherence of iron-folic acid supplementation among pregnant women.

METHOD: Cross-sectional study was conducted at Felege Hiwot Compressive Specialized Hospital from April 1 to August 30, 2019. Data was collected from 390 pregnant women who attended antenatal care follow-up using an interviewer-administered structured questionnaire and from clients' registry book. Descriptive analysis was done on socio-demographic, obstetric, and medical-related characteristics. Binary and multivariate logistic regression analysis was done to identify factors associated with adherence of iron-folic acid supplementation.

Results: 67.4% of pregnant women were adherent to iron-folic acid supplementation. Being counseled about IFAS (AOR=2.30; 95% CI: 1.21-4.34), having good knowledge about IFAS (AOR= 4.22; 95% CI: 2.43-7.31), more than 3 antenatal care visits (AOR=3.50; 95% CI: 1.55-7.92), having previous ANC follow up in tertiary hospital (AOR=2.61; 95% CI: 1.30-5.27), and having no history of hypertension (AOR=3.07; 95% CI: 1.37-6.89) were significantly associated with IFAS adherence. Lack of adequate counseling about anemia and IFAS mainly contributes to non-adherence.

CONCLUSION: In this study, counseling and knowledge about iron-folic acid supplementation, frequency of antenatal care visit and previous antenatal care follow-up center were significantly associated with adherence of iron-folic acid supplementation.

KEYWORDS: Adherence, Folic Acid, Iron, Pregnant Women.

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INTRODUCTION

Anemia is a global public health problem affecting nearly 2 billion people worldwide[1]. About 41.8% of pregnant women and 30.2% of non-pregnant women are anemic worldwide[2]. The greatest burden of anemia in pregnant women is found in Africa, accounting for about 57.1% of the global anemic pregnant women[3]. The prevalence of anemia among pregnant women in Ethiopia is 22%, which makes it a moderate public health problem[2]. Iron deficiency is the most significant contributor to the onset of anemia, accounting for 50% of anemia cases worldwide and 75% of anemia cases occurring during pregnancy[1].

Anemia has significant adverse health consequences, as well as adverse impacts on social and economic development[4]. Low hemoglobin concentrations indicative of moderate or severe anemia during pregnancy has been associated with an increased risk of premature delivery, low birth weight, maternal and child mortality, and infectious diseases. It also affects growth and development both in utero and in the long term[5].

It is well established that women are at higher risk of iron deficiency and iron-deficiency anemia during pregnancy and they are often unable to meet the increased iron requirements of pregnancy from dietary sources alone. According to the WHO guidelines for control and prevention of micronutrient deficiencies, all pregnant women should take a standard dose of 60mg iron and 400μg folic acid daily for 6 months starting from the first month of pregnancy or at the time of their first antenatal visit. If the prevalence of anemia in pregnant women is high (40% or more), supplementation should continue for three months in the postpartum period[6].

Though many developing countries implemented iron-folic acid supplementation (IFAS) through antenatal care programs, only a few countries have reported significant improvement in preventing anemia[3]. Adherence to iron and folic acid supplementation is one of the determinant factors to preventing anemia during pregnancy[7]. Interventions to improve the adherence rate of iron during pregnancy including the use of directly observed therapy (DOT) and gastric delivery system (GDS) were found to be effective in improving adherence for iron during pregnancy [8, 9]. Poor adherence arises not only because of patient behavior, but also from factors out of the patient's control. Hence, this study aimed to assess the adherence level of pregnant women for IFAS and factors contributing to non-adherence.

SUBJECTS AND METHODS

Study area and period: This study was conducted at Felege Hiwot Comprehensive Specialized Hospital, Bahir Dar, Ethiopia from April 1 to August 30, 2019.

Study design: Hospital-based cross-sectional study was applied.

Study participants: All pregnant women who started ANC follow-up at Felege Hiwot Comprehensive Specialized Hospital and started taking IFAS during the study period.

Exclusion criteria: Pregnant women who started taking IFAS not more than a month prior to the survey were excluded from the study (since they should take IFAS at least for a month prior to the survey to determine whether they were adherent or not).

Sample size determination: The desired sample size was calculated using single population proportion formula:

Where:
$$n = \frac{z^2\, p(1-p)}{d^2}$$

n = total sample size

Z = 1.96 for 95% confidence level

p = proportion of pregnant women adherent to IFAS

d = 0.05 for 5% margin of error

Based on the literature [10], the value of p = 44%. Therefore, inserting all the above values into the equation and with a non-response rate of 10%, the total sample size was 416.

Sampling procedure: The study participants were selected using systematic random sampling. Data obtained from the ANC registry book showed that four months before the study period, around 846 clients visited Felege Hiwot Comprehensive Specialized Hospital for ANC services. Considering four months of data collection, a total population of 846 was used to calculate the sampling interval. Thus, by dividing the total population by the sample size, the sampling interval was found to be 2. After random selection of the first sample, every 2nd unit was included in the study.

Data collection: The data were collected using a structured, interviewer administered questionnaire and from the clients' registry book. The data was collected by midwives working at the ANC clinic and the completeness of the data was consistently checked by the principal investigators.

Data processing and analysis: The data were coded and entered into EPI-Info 7 and then exported into SPSS version 23 for analysis. Knowledge of anemia and IFAS was computed by adding 8 relevant knowledge questions (items on cause, complication, prevention, and others). A correct answer for each question was scored as "1" and an incorrect answer was scored as "0". Questions were summed up and the median was calculated. Descriptive statistics were computed to characterize sociodemographic characteristics and obstetric and medical conditions of the study participants. Binary and multivariate logistic regression analyses were done to identify factors associated with compliance with iron and folate supplementation. A level of $p < 0.05$ was considered statistically significant.

Ethical consideration: The research proposal was approved by the institutional review board of the College of Medicine and Health Sciences, Bahir Dar University, and permission to collect data was obtained from the medical director at FHCSH. Participants were provided with clear information and asked if they were willing to participate in the study. Data collection started after verbal informed consent was obtained from those who were willing to participate. Confidentiality of response was maintained throughout the study.

Operational definition

Adherence to IFAS: Pregnant women were considered as adherent to IFAS if they were able to take at least 4 IFAS tablets per week in the previous 1 month preceding the survey, otherwise; they were considered as non-adherent.

Knowledge about anemia and IFAS: Respondents were asked questions related to the cause, signs and symptoms, method of prevention, risk factors and consequences of anemia, and the benefits of IFAS. Accordingly, pregnant women who scored greater than or equal to the median value of correct responses were considered as having good knowledge about anemia and IFAS, otherwise, they were considered as having poor knowledge.

RESULTS

Socio-demographic characteristics of the study participants

A total of 390 pregnant womenparticipated in the study, a response rate of 93.3%. The mean age of the study participants was 27.4 ± 5.1. Most of the study participants (82.1%, n=320) were in the age range of 20-34 years. About 95.1% (n=371) of the study participants were married and 63.3% (n=247) of them were housewives (Table 1).

Table 1: Socio-demographic characteristics of the study participants, Felege Hiwot Comprehensive Specialized Hospital, Bahir Dar, Ethiopia, 2019.

Variables	Categories	Frequency	Percentage
Age (years)	< 20	23	5.9
	20-34	320	82.1
	≥ 35	47	12.0
Marital status	Married	371	95.1
	Single	19	4.9
Residence	Urban	207	53.1
	Rural	183	46.9
Religion	Orthodox	348	89.2
	Muslim	36	9.2
	Protestant	6	1.6
Educational status	Can't read and write	117	30.0
	Can read and write	66	16.9
	Primary school complete	60	15.4
	High school complete	70	18.0
	College and above	77	19.7
Occupation	Housewife	247	63.3
	Government employee	61	15.6
	Merchant	32	8.2
	Other	50	12.9

Obstetric and medical history of the study participants

About 36.4% (n=142) of the study participants were in their first pregnancy and 64.4% (n=251) of them were in the third trimester of their pregnancy. About 50.7% (n=198) of the study participants had three or more prior ANC visits and most of them (81.5%, n=318) were counseled about the importance of iron and folic acid supplementation during pregnancy. About 10.8% (n=42) and 6.7% (n=26) of the respondents had a history of anemia and hypertension respectively (Table 2).

Table 2: Obstetric and medical history of the study participants, Felege Hiwot Comprehensive Specialized Hospital, Bahir Dar, Ethiopia, 2019.

Variables	Categories	Frequency	Percentage
Gravidity	I	142	36.4
	II-IV	201	51.5
	≥V	47	12.1
Parity	0	147	37.7
	I-IV	223	57.2
	≥V	20	5.1
Type of gestation	Singleton	377	96.7
	Twin	13	3.3
Gestational age	First trimester	9	2.3
	Second trimester	130	33.3
	Third trimester	251	64.4
Previous ANC follow-up center	Tertiary hospital	171	43.9
	Primary hospital	52	13.3
	Health center	167	42.8
Prior number of ANC visits	1	42	10.8
	2	150	38.5
	≥ 3	198	50.7
Counseled on the importance of IFAS	Yes	318	81.5
	No	72	18.5
History of anemia	Yes	42	10.8
	No	348	89.2
History of hypertension	Yes	26	6.7
	No	364	93.3
Hemoglobin level during time of interview (g/dl)	7-10.9	46	11.8
	≥ 11	344	88.2

Knowledge about anemia and IFAS and adherence to IFAS related characteristics

Out of the 8 relevant knowledge questions, the median knowledge of the study participants about anemia and IFAS was found to be 5. About 67.9% (n=265) of the respondents had good knowledge of anemia and IFAS and 32.1% (n=125) of the respondents had poor knowledge of anemia and IFAS.

About 32.6% (n=127) of the study participants were non-adherent for IFAS (took less than 4 IFAS per week). The three most commonly cited reasons for non-adherence were fear of side effects of the tablet (45.7%, n=58), not being counseled on the importance of IFAS (19.7%, n=25), and fear of raised blood pressure if they took the tablets (18.9%, n=24) (Table 3).

Table 3: Reasons for non-compliance to IFAS among the study participants, Felege Hiwot Comprehensive Specialized Hospital, Bahir Dar, Ethiopia, 2019.

Reasons for non-compliance	Frequency (n=127	Percentage
Fear of side effects	58	45.7
Lack of counseling on IFAS importance	25	19.7
Fear of raised blood pressure	24	18.9
Forgetfulness	16	12.6
Fear of having a macrosomic baby	13	10.2
Family influence	6	4.7
Fear of harm for the baby and the mother from taking too many tablets	5	3.9

a = multiple responses is possible

Factors associated with adherence to Iron-folic acid Supplements

Table 4 evaluates factors associated with compliance to iron/folate supplementation. Among the risk factors assessed in the study participants, previous ANC follow up in a tertiary hospital (aOR=2.61; 95%CI: 1.52-4.51), being counseled on the importance of IFAS (aOR=2.30; 95%CI: 1.21-4.34), having no previous history of hypertension (aOR=3.34; 95%CI: 1.26-8.86) and having good knowledge about IFAS and anemia (aOR=4.22; 95%CI: 2.43-7.31) were significantly associated with adherence to IFAS than those who had ANC follow up at a health center, who weren't counseled about IFAS and having poor knowledge about IFAS and anemia, respectively.

In addition, having prior ANC visit of 2 times (aOR=2.93; 95% CI: 1.28-6.72) and 3 and more times (aOR=3.50; 95% CI: 1.55-7.92) were more likely to adhere to IFAS than those who had only one ANC visit.

Table 4: Factors associated with adherence to IFAS in the study participants, Felege Hiwot Comprehensive Specialized Hospital, Bahir Dar, Ethiopia, 2019.

Variables	Categories	IFAS Adherence Yes	No	OR (95% CI)	aOR (95% CI)
Previous ANC follow-up center	Health center	88	79	1.00	1.00
	Primary hospital	38	14	2.43 (0.99, 4.57)	1.59 (0.68, 3.70)
	Tertiary hospital	137	34	3.62 (2.23, 5.86)	2.61 (1.52, 4.51)
Prior number of ANC visits	1	17	25	1.00	1.00
	2	96	54	2.61 (1.30, 5.27)	2.93 (1.28, 6.72)
	≥ 3	150	48	4.60 (2.29, 9.22)	3.50 (1.55, 7.92)
Counselled about IFAS	Yes	233	85	3.84 (1.37, 6.89)	2.30 (1.21, 4.34)
	No	30	42	1.00	1.00
History of hypertension	Yes	11	15	1.00	1.00
	No	252	112	3.07 (1.37, 6.89)	3.34 (1.26, 8.86)
Knowledge about IFAS and anemia	Good	208	57	4.64 (2.94, 7.35)	4.22 (2.43, 7.31)
	Poor	55	70	1.00	1.00

DISCUSSION

In our study, the overall adherence rate of pregnant women to iron and folic acid supplementation was 67.4% which is comparable with the study done in South India (64.7%), Nepal (73%), and Northern Ethiopia in Eritrean refugee camps (64.7%) [11-13]. However; it is higher than the study done in Debre Tabor General Hospital (44%), Mecha district, Northwest Ethiopia (20.4%), North-Western zone of Tigray, Ethiopia (37.2%), and Southeast Ethiopia (18%) [10, 14-16]. The higher proportion of IFAS adherence in our study might be attributed to the study site being at a tertiary hospital, as opposed to primary hospital and community-based study, which likely increases the provision of counseling about the importance of IFAS for most clients and results in better adherence.

Studies reported that knowledge about IFAS coupled with understanding of anemia and its relationship with IFAS is associated with improved adherence for IFAS [10-11, 17]. Our study also revealed that pregnant women who had good knowledge of anemia and IFAS were more likely to be adherent to IFAS. This might be because of having good knowledge of anemia and its association with IFAS drives their health seeking behavior.

Our study also showed that advising pregnant women about the benefits of IFAS significantly increased their adherence status. Our result is similar to the study done in Kiambu County, Kenya, at Mulago National Referral Hospital, Uganda, at Misha district, South Ethiopia, and in Mizan-Aman Town, Bench Maji Zone, Ethiopia [17-20]. This might be because advising pregnant women about IFAS increase their level of knowledge, and hence their adherence to IFAS.

Pregnant women who had frequent ANC attendance were reported to be more adherent to their iron supplements than their counterparts [18]. Our study indicated that those pregnant women who had more than one ANC attendance were more adherent to IFAS than those who had a single ANC visit. This might be due to the reason that those mothers who had repeated ANC visits could get better counseling and knowledge about the importance of IFAS which leads to a better adherence.

Our finding showed that pregnant women who had ANC follow-ups at a tertiary hospital were more adherent than those who had at a health center. This might be because ANC service providers at a tertiary hospital more likely have higher qualification and equipped with the necessary knowledge and provide better counseling to their clients which contribute to better adherence.

Pregnant women who had a history of hypertension were found less likely to be adherent to IFAS. As identified in this study, fear of increased blood pressure was one of the reasons for IFAS non-adherence. Clients likely misinterpreted the concept of IFAS increases blood cell synthesis as it increases blood pressure.

In our study, fear of side effects and not being advised on the importance of IFAS during pregnancy were among the common reasons for non-adherence. Our result is consistent with other studies [11, 14, 21-24]. As evidenced from these studies, health care provider's inadequate counseling about IFAS and anemia during pregnancy might lead to non-adherence.

CONCLUSION AND RECOMMENDATIONS

In this study, those pregnant women who were counseled about IFAS, who had more than one ANC attendance, previous ANC follow-up in a tertiary hospital, and having good knowledge about anemia and its association with IFAS were more adherent to IFAS than their counterparts. There is a need to ensure adequate and satisfactory counseling about the significance of IFAS and its relationship with anemia, as well as managing side effects of IFAS to improve their adherence.

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