

Adherence to Iron-Folic Acid among Pregnant Women Attending Antenatal Care at Wolaita Zone Public Primary Hospitals in Southern Ethiopia, 2022

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ABSTRACT

Background: Among the micronutrient deficiencies, iron and folic acid are the most common and frequently occur in pregnant women. So, the objective of this study was to assess the adherence to iron and folic acid among pregnant women booking antenatal services in the study area.

Materials and methods: A facility based cross-sectional study design was employed from January-April 2022. A structured questionnaire was used for data collection using systematic sampling techniques to approach 327 pregnant women. Data was entered and analyzed using SPSS version 20 software. Descriptive analysis was performed. Adjusted odd ratios, along with corresponding 95% confidence intervals, were used and the level of statistical significance was declared at a p-value of <0.05 with a corresponding 95% CI.

Result: In this study, 339 (99%) pregnant women participated. The respondents' average age was 28.04 SD 5.3 years. The prevalence of adherence to iron and folic acid supplementation among pregnant women was 68.1% (95% CI: 63.1-72.9). Mothers whose age less than 19 (AOR=0.025; CI 95% (0.003, 0.218)), daily laborers (AOR=0.127; CI 95%(0.028, 0.568)), and who had no history of abortion (AOR=0.276; CI 95% (0.086, 0.891)) were associated with adherence to iron-folic acid supplementation.

Conclusion: In this study, adherence to IFA supplementation among pregnant women in the study area is relatively high. Appropriate counseling and health education should be given to pregnant women to enhance their adherence.

Keywords: Pregnant women; Health; Education; Deficiencies; Maternal anemia

Abbreviations: ANC: Antenatal Care; AOR: Adjusted Odd Ratio; CI: Confidence Interval; IFA: Iron Folic Acid; PH: Primary Hospital; WHO: World Health Organization

INTRODUCTION

Deficiencies in micronutrients negatively impair the health of mothers by affecting the outcomes of pregnancy and growth and development of their children [1]. Among those micronutrients, deficiencies of Iron and Folic Acid (IFA) are the most common that affect the mother's health. Deficiency of iron adversely impairs productivity and cognition in the general population, and is the most common cause of anemia during the pregnancy period [2,3]. On the other hand, deficiency of folic acid causes neural tube defects in the fetus and negatively affects the outcome of pregnancy. Thus, supplementation of both micronutrients for pregnant women is the key strategy to prevent

health impacts on women and their offspring related to its deficiency.

According to the World Health Organization (WHO), early and appropriate folic acid (400 g) and iron (30-60 mg) supplementation during antenatal care can reduce perinatal, neonatal, and maternal mortality by preventing low birth weight, maternal anemia, spinal bifida, and encephalitis [4]. The WHO estimates that around 58% and 50% of maternal mortality is related to anemia in developing and developed countries respectively. To tackle these problems, ministries of health in different countries, including Ethiopia, designed the policy to

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Received: 25-Jan-2023, Manuscript No. CPOA-23-21543; **Editor assigned:** 27-Jan-2023, PreQC No. CPOA-23-21543 (PQ); **Reviewed:** 10-Feb-2023, QC No. CPOA-23-21543; **Revised:** 20-Jul-2023, Manuscript No. CPOA-23-21543 (R); **Published:** 27-Jul-2023, DOI: 10.35248/2572-0775.23.8.241

Citation: Geta T, Ashiko A, Tilahun C (2023) Adherence to Iron-Folic Acid among Pregnant Women Attending Antenatal Care at Wolaita Zone Public Primary Hospitals in Southern Ethiopia, 2022. Clin Pediatr. 8:241.

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give IFA to pregnant women in a single or combined form as a tablet [5].

Only provision of these micronutrients for women cannot end up with successful outcomes, but the effectiveness and success of this intervention always relies on the adherence of women with the iron and folic acid tablets provided by health care professionals. In a medical context, compliance refers to a degree to which a client/patient appropriately follows medical information provided by health care providers. Evidences suggest that non-compliance with iron can significantly impact the success and supplementation of national program in different countries.

Adherence to iron and folic acid is an important approach to enhance the implementation of the national program and prevent neonatal birth defects and pregnancy related anemia [6]. Adherence to micronutrients (IFA) is referred to as the intake of tablets reported at each antenatal care visit by the clients [7]. The overall adherence status deals with a woman contacting an antenatal care clinic and taking IFA tablets for greater than or equal to four days per week for the last one month preceding the survey or for more than or equal to ninety days in the 3rd trimester [8]. IFA supplementation is the main strategy to prevent and control IFA deficiency related health impacts, and its effectiveness depends on the adequate adherence status of women to the folic and iron tablets offered.

Literature showed that overall adherence status to IFA varied from country to country: 38% in Pakistan, 51.14% in Iran, 51% in Senegal, 65% in Sudan, and 41.4% of pregnant women in Ethiopia adhered to IFA [9-13]. This indicates that across the world there is a great challenge related to an adequate adherence to IFA. Assessing the adherence status of pregnant women to IFA supplementation and its associated factors is mandatory for all responsible bodies. In Ethiopia, overall adherence status remains very low, below fifty percent, and varies from region to region. In addition, no previous study was conducted in the current study area. So, the study was aimed to assess the adherence to IFA among pregnant women booking antenatal services in the study area.

LITERATURE REVIEW

Study area, design and period

A cross-sectional study was conducted in Wolaita zone public primary hospitals from January-April 2022. Wolaita zone is one of the South nation nationality people regions. The zone is 356 km distant from Addis Ababa, the capital city of Ethiopia. Based on the 2020 Central Statistical Agency (CSA) report, the population of the Wolaita zone was projected to be 5,385,782. From these, 2,687,021 populations are accounted for by males and 2,698,261 populations are females [14]. The zone has 8 primary public hospitals, such as Tebela Primary Hospitals (PH), Bodit PH, Bombe PH, Halale PH, Bitana PH, Gasuba PH, Bale PH, and Gasuba PH. All institutions were included in the study. These public hospitals have been providing health service for all the Wolaita zone population and for other surrounding zones.

Population and eligibility criteria

Selected pregnant women who were taking IFA supplementation during data collection in all institutions were the study population and all pregnant women who had used IFA tablets for at least three months were included in the study. Those women who were unable to speak/hear, critically ill, and refused to participate in the study were excluded from the study.

Sample size determination and its procedures

A total of 342 sample sizes was calculated and used by considering the 71.8% adherence rate in the previous study, 95% significant level, 5% margin of error, and 10% non-response rate. For each hospital, the average monthly patient flow to delivery service for the 1st and 2nd quarters of 2021 was determined. Then the final sample size is proportional allocated to these service centers by considering their monthly client flows. Eventually, the subject was taken by systematic random sampling, and every other client who came to each hospital was recruited as a study unit till the total sample size for the study was obtained.

Operational definition

Adherence to IFA: IFA adherence requires that pregnant women take 4 IFA tablets at least once per week in the previous month of IFA supplementation.

Non-adherence: A pregnant women takes less than 4 IFA tablets per week in the previous month of IFA supplementation.

Good knowledge: Pregnant women who scored the mean value and above in knowledge related questions were considered to have good knowledge about IFA.

Poor knowledge: Pregnant women who scored less than mean value on knowledge related questions were considered to have good knowledge about IFA.

Data collection and its analysis

A structured questionnaire was adapted from the previous studies, which consists of socio-demographic factors of the respondents, obstetric related factors, and health system related factors. Data was collected through face to face interviews. Based on communication skills with the client, 8 BSc nurses were selected for data collection. Health officers were recruited as supervisors. 1 day of training was provided to the data collector and supervisor regarding the objective, data collection tool, procedure, and interview methods that were supposed to be applied during the collection period. The selected participants were informed by the data collectors. From the selected participants, consent was obtained and the data was collected.

The questionnaire was prepared in English and then translated into the Amharic language by experts and again translated back to English to increase consistency. To maintain completeness and consistency, data collectors were closely supervised before and during the data collection process. The supervisors followed the correct implementation of the procedure and checked the completeness and logical consistency after data collection.

The completeness and consistency of the data was checked. Then, it was coded and entered onto Epi Data 3.1. For further analysis, data was exported to SPSS 25.0. Descriptive statistics of different variables were presented by frequency and percentage using tables and pie charts. A binary logistic regression test was used to compute COR with its 95% interval to test the associations between dependent and independent variables. The variables found to be $P < 0.25$ in the bivariate analysis were taken as a candidate for multivariate analysis. Finally, multivariate analysis with AOR was used to control possible confounders and to determine predictors of adherence status to IFA supplementation among the study participants. A p-value of < 0.05 was considered as the criterion for statistical significance.

RESULTS

Socio-demographic characteristics

A total of 339 (99%) of study participants fully responded to the interview. The mean age of the respondents was 28.04 with a standard deviation of 5.3 years and the majority of mothers were within the age range of 25-39 years. 99 (29.2%), 324 (95.6%), and 94 (27.7%) of respondents were government employees, married, and educate diploma and above, respectively (Table 1). Majority of study participants were Wolaita in ethnic group. Regarding family size, 165 (48.7%) of participants have one up to three alive children.

Table 1: Socio-demographic characteristic of the respondents in Wolaita zone public primary hospitals, 2022 (n=339).

Variables	Categories	Frequency	Percentage
Age in years	<=19	15	4.4
	20-24	55	16.2
	25-29	157	46.3
	30-34	80	23.6
	>=35	32	9.4
	Total	339	100
Marital status	Married	324	95.6
	Single	7	2.1
	Others ^a	8	2.4
Monthly income	<=3934	204	60.2
	3935-9055	129	38.1
	>=9056	6	1.8
Educational status of mothers	No formal education	23	6.8
	Primary (1-8)	72	21.2
	Secondary (9-12)	150	44.2
	Diploma and above	94	27.7
Occupation status of mothers	Gov't employee	99	29.2
	Non-governmental	12	3.5
	Self-employed	53	15.6

	Merchant	70	20.6
	House wife	75	22.1
	Others ^b	30	8.8
Husband education	No formal education	22	6.5
	Primary (1-8)	43	12.7
	Secondary (9-12)	137	40.4
Variables	Categories	Frequency	Percentage
	Diploma and above	137	40.4
Husband occupation	Gov't employee	124	36.6
	NGO employee	13	3.8
	Self-employed	34	10
	Merchant	113	33.3
	Others ^b	55	16.2
Religion	Protestant	162	47.8
	Orthodox	125	36.9
	Muslim	36	10.6
	Catholic	16	4.7
Ethnicity	Wolaita	177	52.2
	Oromo	42	12.4
	Kembata	53	15.6
	Amara	39	11.5
	Others ^c	28	8.3
Family size	1-3	165	48.7
	4 and above	174	51.3

a-divorced, widowed; b-student, daily laborer, car driver farmer; c-sidama, gurage, hadiya

Obstetric related factors of the respondents

In this study, 132 (38.9%), 213 (62.8%), 207 (61.1%), and 263 (77.6%) of study participants were multiparas, skipped IFA,

attended Antenatal Care (ANC) two times, and had planned last pregnancy (Table 2).

Table 2: Obstetric health related factors among respondents in Wolaita zone public primary hospitals, 2022 (n=339).

Variables	Categories	Frequency	Percentage
Current visit trimester	2 nd trimester	168	49.6
	Third trimester	171	50.4
Planned pregnancy	No	76	22.4
	Yes	263	77.6
Previous Place of ANC follow up	Hospital	259	76.4
	Health center	71	20.9
	Privet clinic	9	2.7
The first registration for ANC	<=4month	265	78.2
	>=5 month	74	21.8
Number of ANC visits	Two times	207	61.1
	Three times	96	28.3
	>=4 times	36	10.6
Skipped IFAS	No	126	37.2
	Yes	213	62.8
Reason of skip	Forgetfulness	73	34.3
	Travel	9	4.2
	Constipation	16	7.5
	Gastritis	93	43.7
	Vomiting	16	4.7
	Absence in health facility	6	2.8
Gravidity	Primi-gravida	99	29.2
	Multigravida	240	70.8
Parity	Nulliparous	105	31
	Primiparas	102	30.1
	Multipara	132	38.9
History of abortion	No	280	82.6
History of still birth	Yes	59	17.4
	No	329	97.1
	Yes	10	2.9

Health system related factors

249 (73.5%), 219 (64.6%), 212 (62.5%), 213 (62.8%), and 196 (57.8%) of women of the respondents spent 30 minutes and above waiting to get service, counseled on the benefit of IFAS,

were not counseled how long to take IFAS, were not counseled on managing side effects, and were counseled about anemia respectively (Table 3).

Table 3: Health system related conditions of respondents in in Wolaita zone public primary hospitals, 2022 (n=339).

Variables	Categories	Frequency	Percentage
Facility distance	<30 minute	148	43.7
	>=30 minute	191	56.3
Waiting time	< 30 minute	90	26.5
	>=30 minute	249	73.5
Shortage of IFA	No	262	77.3
	Yes	77	22.7
Counselled on benefit of IFAS	No	120	35.4
	Yes	219	64.6
Counselled how often to take IFAS	No	187	55.2
	Yes	152	44.8
Counselled how long to take IFAS	No	212	62.5
	Yes	127	37.5
Counselled possible side effects	No	210	61.9
	Yes	129	38.1
Counselled on managing side effects	No	213	62.8
	Yes	126	37.2
Counselled about anemia	No	143	42.2
	Yes	196	57.8

Respondents' knowledge on IFAS

More than half, 189 (55.8%) had good knowledge on anemia and IFAS and 150 (44.2%) had poor knowledge on anemia and IFAS.

Prevalence of adherence to IFAS

From a total of 339 participants included in this study, 68.1% of the participants adhered to iron-folic acid supplementation and 31.9% of them non-adhered to IFA.

Factors associated with IFA adherence

The variables which significantly predict adherence to folic acid supplementation include the age, occupation of a mother, knowledge on IFA, and history of abortion. In multivariate

logistic regression analysis, those whose age <19 (AOR=0.025; CI 95% (0.003, 0.218) p=0.001); pregnant women daily laborer (AOR=0.127; CI 95% (0.028, 0.568) p=0.007); history of abortion (AOR=0.276; CI 95% (0.086, 0.891) p=0.031), and knowledge on IFA (AOR=5.56, CI 95% (1.23-8.34) p=0.020) were identified as associated factors.

DISCUSSION

Findings from this study revealed that the overall prevalence of adherence to IFA among study participants in the study area was 68.1%. This finding was in line with studies done in different parts of Ethiopia, such as Dire Dawa (71.8%), Tikur anbesa (63.6%), and Sidama (67.6%) [15,16]. The possible reason for this agreement might be similarity in socio-economic status, similar study setting, and designs. However, this finding was

lower than studies conducted in Mozambique (79%), and northern Ethiopia (76.9%) [17]. This discrepancy could be rooted in the geographical location, time interval of the study, sample size, and perception of the women.

Being a daily labourer negatively and significantly affects the adherence to IFA. This study revealed that mothers who were daily labourer were 87.3% less likely to adhere to IFA supplementation compared to the other group. The possible reason might be that daily labourer have a low probability of getting adequate information, are mostly less educated, and have low economic status, which inhibits them from visiting health facilities easily.

Having adequate knowledge about IFA supplementation would positively and significantly affect the adherence status among women [18-20]. Those mothers who had good knowledge about IFA were 5.56 times more likely to adhere to IFA compared to their counterparts. This might be related with a mother who had adequate knowledge and could comply with the health care providers' recommendation adheres to IFA supplementation.

History of abortion was identified as an explanatory variable significantly related with adherence to iron folic acid supplementation. The probability of adherence to IFAs was 73% likely lower among study participants who had no history of abortion compared with their opposite group. This finding was supported by a systematic review conducted in Ethiopia [19]. This might be because pregnant women who have a history of abortion may have a high perceived fear that abortion could happen again. As a result, this may encourage them to give emphasis to their ANC and adherence to IFA supplementation.

Age of respondents significantly associated with adherence to IFA. Those pregnant mothers whose age less than 19 were 99.5% less likely to adhere to IFAS compared with those whose age greater than 35. This finding was supported by a study finding in India and Pakistan. The possible reason for this would be the increasing age of mothers becoming pregnant, more than ones where there are ANC visits for each pregnancy, which will increase awareness on IFAS.

CONCLUSION

In this study, adherence to IFA supplementation among pregnant women in the study area was relatively high. Age, occupation of the mother, knowledge on Iron and folic acid and history of abortion were associated with adherence to iron folic acid supplementation. So, we recommend that appropriate counseling and health education should be given to pregnant women to enhance their adherence. In addition, health care providers and the top hospital managers should focus on the factors identified.

LIMITATION OF THE STUDY

- Cross-sectional study, which could not assess cause-effect effect.
- There might be recalling bias, which might affect validity of the study.

ETHICAL APPROVAL

Wolaita Sodo university, college of health science institutional review board approved all experimental protocols and issued ethical clearance with reference the number of WSU/IRB/1280/2022. Informed consent was obtained from all participants after the nature of the study was fully explained to them in their local languages. A thumbprint or signature was used on the consent form. Only those who signed written consent participated in the study and confidentiality of response was maintained throughout the research process by giving codes for the participants. The entire study participants were informed that data was kept private and confidential and used only for research purposes. The participants were assured that they have the right to refuse or withdraw if they are not comfortable at any time. All methods throughout a study were carried out in accordance with relevant guidelines and regulations.

CONSENT FOR PUBLICATION

Is not applicable.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated and/or analyzed during the current study are not publicly available to prevent any kinds of misuse by the public before publication but are available from the corresponding author upon reasonable request.

COMPETING INTEREST

The authors declare they have no competing interests.

FUNDING

No funding was received.

AUTHOR'S CONTRIBUTIONS

TG: Conceive data and designed the study, supervised the data collection, performed the analysis and interpretation of data, drafted the manuscript, and finally approved the revision for publication. TG had full access to all of the data in the study and takes responsibility for the integrity of data and the accuracy of data analysis. AA and CT assisted in designing the study and data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

ACKNOWLEDGMENT

We would like to express our appreciation to Wolaita Sodo university, college of medicine and health sciences, and school of nursing for continued support and follow.

REFERENCES

1. Tegegne A, Ademasu E, Demewozu H. Parent to young communication on sexual and reproductive health and associated factors among parents living with young in Dera Woreda, North West Ethiopia 2018. *J Community Med Health Educ*. 2019;9(655):2.

2. Gebre A, Mulugeta A, Etana B. Assessment of factors associated with adherence to iron-folic acid supplementation among urban and rural pregnant women in North Western zone of Tigray, Ethiopia: Comparative Study. *Int J Food Sci Nutr.* 2012;4(2):161.
3. Maina-Gathigi L, Omolo J, Wanzala P, Lindan C, Makokha A. Utilization of folic acid and iron supplementation services by pregnant women attending an antenatal clinic at a regional referral hospital in Kenya. *Matern Child Health J.* 2013;17(7):1236-1242.
4. Mithra PUB, Rekha T, Nithin K, Mohan K, Kulkarni V, Kulkarni V, et al. Compliance with Iron-Folic Acid (IFA) therapy among pregnant women in an urban area of South India. *Afr Health Sci.* 2013;14(1):255-260.
5. Nwaru BI, Salome G, Abacassamo F, Augusto O, Cliff J, Sousa C, et al. Adherence in a pragmatic randomized controlled trial on prophylactic iron supplementation during pregnancy in Maputo, Mozambique. *Public Health Nutr.* 2015;18(6):1127-1134.
6. Demis A, Geda B, Alemayehu T, Abebe H. Iron and folic acid supplementation adherence among pregnant women attending antenatal care in North Wollo zone Northern Ethiopia: Institution based cross-sectional study. *BMC Res Notes.* 2019;12(1):107.
7. Kassa ZY, Awwaris T, Daba AK, Tenaw Z. Compliance with iron folic acid and associated factors among pregnant women through pill count in Hawassa city, South Ethiopia: A community based cross-sectional study. *Reprod Health.* 2019;16(1):14.
8. Nisar YB, Dibley MJ, Mir AM. Factors associated with non-use of antenatal iron and folic acid supplements among Pakistani women: A cross sectional household survey. *BMC Pregnancy Childbirth.* 2014;14(1):305.
9. Abdul-Rahman AM. Adherence to folic acid supplements during PeriConceptional period. *Int J Curr Microbiol App Sci.* 2015;4(7): 215-523.
10. Niang K, Faye A, Tine JAD, Diongue FB, Ndiaye B, Ndiaye MB, et al. Determinants of iron consumption among pregnant women in Southern Senegal. *Open J Obstet Gynecol.* 2016;7(1):41-50.
11. Abdullahi H, Gasim GI, Saeed A, Imam AM, Adam I. Antenatal iron and folic acid supplementation use by pregnant women in Khartoum, Sudan. *BMC Res Notes.* 2014;7(1):498.
12. Sendeku FW, Azeze GG, Fenta SL. Adherence to iron-folic acid supplementation among pregnant women in Ethiopia: A systematic review and meta-analysis. *BMC Pregnancy Childbirth.* 2020;20:1-9.
13. Solomon Y, Sema A, Menberu T. Adherence and associated factors to iron and folic acid supplementation among pregnant women attending antenatal care in public hospitals of Dire Dawa, Eastern Ethiopia. *Eur J Midwifery.* 2021;5:35.
14. Nasir BB, Fentie AM, Adisu MK. Adherence to iron and folic acid supplementation and prevalence of anemia among pregnant women attending antenatal care clinic at Tikur Anbessa specialized hospital, Ethiopia. *PLoS One.* 2020;15(5):e0232625.
15. Mekonnen A, Alemnew W, Abebe Z, Demissie GD. Adherence to iron with folic acid supplementation among pregnant women attending antenatal care in public health centers in Simada district, Northwest Ethiopia: Using health belief model perspective. *Patient Prefer Adherence.* 2021:843-851.
16. Asres AW, Hunegnaw WA, Ferede AG, Azene TW. Compliance level and factors associated with iron-folic acid supplementation among pregnant women in Dangila, Northern Ethiopia: A cross-sectional study. *SAGE Open Med.* 2022;10:20503121221118989.
17. Molla T, Guadu T, Muhammad EA, Hunegnaw MT. Factors associated with adherence to iron folate supplementation among pregnant women in West Dembia district, Northwest Ethiopia: A cross sectional study. *BMC Res Notes.* 2019;12(1):1-6.
18. Assefa H, Abebe SM, Sisay M. Magnitude and factors associated with adherence to Iron and folic acid supplementation among pregnant women in Aykel town, Northwest Ethiopia. *BMC Pregnancy Childbirth.* 2019;19(1):1-8.
19. Bizuneh AD, Azeze GG. Knowledge on anaemia and benefit of iron-folic acid supplementation among pregnant mothers attending antenatal care in Woldia town, Northeastern Ethiopia: A facility based cross-sectional study. *J Health Popul Nutr.* 2022;41(1):1-8.
20. Gebremichael TG, Welesamuel TG. Adherence to iron-folic acid supplement and associated factors among antenatal care attending pregnant mothers in governmental health institutions of Adwa town, Tigray, Ethiopia: Cross-sectional study. *PLoS One.* 2020;15(1):e0227090.