

Knowledge and Compliance towards Iron and Folic Acid Supplementation among Pregnant Women

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Abstract:

Iron deficiency anemia remains one of the most common nutritional deficiencies among pregnant women worldwide and is a major public health concern, particularly in developing countries. According to the World Health Organization (WHO), nearly 40% of pregnant women globally are affected by anemia, mainly due to iron deficiency. The WHO recommends daily supplementation of 30–60 mg of elemental iron and 400 µg of folic acid during pregnancy to prevent maternal anemia and adverse pregnancy outcomes. Despite the availability of iron and folic acid (IFA) supplementation programs, poor knowledge, misconceptions, side effects, and forgetfulness continue to affect compliance among pregnant women. Therefore, assessing knowledge and compliance towards IFA supplementation is essential for improving maternal and child health outcomes. Hence, a descriptive cross-sectional study was conducted to assess the knowledge and compliance towards IFA supplementation among pregnant women attending Secondary Hospital, Chumoukedima. The primary and secondary objectives of the study were to assess the level of knowledge and compliance towards IFA supplementation among pregnant women and to determine the association between knowledge and compliance towards IFA supplementation and selected demographic and clinical variables respectively. The study was conducted among 146 pregnant women using the total enumeration sampling technique. The findings showed that, majority 89 (61%) had average knowledge and 73 (50%) had low compliance towards IFA supplementation. The study also revealed a significant association between selected demographic and clinical variables and knowledge and compliance at a significance level of $P < 0.05$. The study indicated a significant need for health education and increased awareness among pregnant women regarding the importance of regular iron and folic acid intake during pregnancy to prevent anemia and related complications.

KEYWORDS: Knowledge, Compliance, Iron and Folic Acid Supplementation, Pregnant Women, Anaemia, Antenatal Care.

INTRODUCTION

Pregnancy is a vital and sensitive period in a woman's life that requires adequate nutrition to maintain

maternal health and ensure proper growth and development of the fetus. During pregnancy, the demand for nutrients increases significantly due to physiological changes such as expansion of blood volume, increased metabolic needs, and fetal development. Among the essential micronutrients, iron and folic acid play a crucial role in maintaining maternal and fetal well-being. Iron is an essential component of hemoglobin and is necessary for the transport of oxygen to maternal tissues and the fetus. Folic acid is required for DNA synthesis, cell division, and prevention of neural tube defects during early pregnancy. Deficiency of iron and folic acid during pregnancy can result in iron deficiency anemia, which is associated with adverse outcomes such as fatigue, increased risk of infections, preterm labour, low birth weight, and increased maternal morbidity and mortality. (1)

According to the World Health Organization (WHO), more than 40% of pregnant women worldwide are affected by anemia, and nearly half of these cases are due to iron deficiency. Anemia remains a major global public health problem, particularly in low- and middle-income countries, where inadequate dietary intake and poor socioeconomic conditions contribute significantly to the burden. (2)

WHO further recommends daily iron and folic acid supplementation during pregnancy as a standard strategy to prevent and treat iron deficiency anemia. Pregnant women require additional iron and folic acid to meet their own nutritional needs as well as those of the developing fetus. Despite the proven effectiveness of supplementation, its implementation in programmer settings is sometimes limited due to poor compliance, concerns about side effects, and inconsistent availability of supplements at the community level. (3)

In India, anemia among pregnant women remains a significant public health problem. The National Family Health Survey-5 (2020–21) reported that more than 50% of pregnant women in India are anemic. (4)

In Nagaland, the use of Iron-Folic Acid (IFA) tablets among pregnant women is an important but challenging component of antenatal care aimed at reducing maternal anemia. According to NFHS-5 (2019–21), although many pregnant women receive IFA tablets, compliance with consuming the full 100-day course remains relatively low.(5)

SIGNIFICANCE AND NEED OF THE STUDY

Iron deficiency anemia remains one of the most common nutritional disorders affecting pregnant women worldwide. Approximately 36–40% of pregnant women globally are affected, making it a major public health concern. (6)

Maternal anemia increases the risk of preterm birth by nearly 1.5 times and contributes significantly to low birth weight and maternal complications.(7)

Despite routine iron and folic acid (IFA) supplementation as a standard antenatal intervention, the burden remains high. Although IFA tablets are widely distributed through antenatal care services, adherence rates in many low- and middle-income settings remain below 60%, limiting programme effectiveness. (8)

In India, anemia continues to be highly prevalent among pregnant women. As per the National Family Health Survey (NFHS-5, 2019–21), 52.2% of pregnant women are anemic. Despite national initiatives such as Anemia Mukh Bharat and routine distribution of IFA tablets during antenatal visits, compliance remains inconsistent across regions.(9)

METHODOLOGY

Research design: A descriptive cross-sectional research design was adopted for the study.

Setting of the study: The setting of the study was conducted in the selected area of secondary hospital, Chumoukedima, Nagaland

Population and sample: The study population included the pregnant women attending OBG OPD and Labour ward of tertiary hospital, Nagaland, India.

Sample size: The sample size is calculated using the formula: $n = (t^2 \times p \times q) / d^2$

Calculating based on compliance using prevalence of 81.74% from a previous study conducted in Meghalaya on knowledge and compliance on IFA among pregnant mother.

$p = 0.8174$, $z = 1.96$, $q = 1 - p$. the sample size calculated was 157. However during the data collection, the researchers could gather only 146.

Sampling technique: Total enumeration sampling technique was used to select the participants.

Inclusion Criteria:

- Pregnant women who are available at the time of data collection and whose consent has been taken.
- Pregnant women who have received Iron-Folic-acid (IFA) tablets for at least 2 weeks or more.

Exclusion Criteria

- Pregnant women who are seriously ill.
- Pregnant women who have taken only folic acid.

Data collection instrument:

TOOL 1: Demographic Variables: Age, religion, educational qualification, type of family, family income, resident, occupation.

TOOL 2: Clinical Variables: Gravida, parity, haemoglobin level, no of ANC visit, history of IFA intake

TOOL 3: A self-structured knowledge questionnaire consisted of 13 questionnaire using multiple choice questions. A score of “1” is given to each correct answer and “0” for wrong answer. The score was interpreted as:

<50% - inadequate knowledge

50-75% - moderately adequate knowledge

>75%- adequate knowledge.

TOOL 4: Compliance questionnaire containing 8 questions adopted from the standardized Morisky Medication Adherence Scale (MMAS-8). The scoring was interpreted as:

MMAS-8 Score	Level of Compliance
8	High compliance
6 to <8	Moderate compliance
<6	Low compliance

Validity and reliability: Content validity was done by 4 experts in the field of Obstetrics and Gynaecology. Four rating scale i.e. very relevant, relevant, needs modification and not-relevant for knowledge questionnaires. The total CVI for knowledge questionnaires was 0.94. Reliability for knowledge questionnaire was calculated using Cronbach’s alpha. The value was 0.6, which indicates moderate level of reliability.

Data collection procedure: Data were collected over a period of 2 weeks, from 27th April to 9th May 2026.

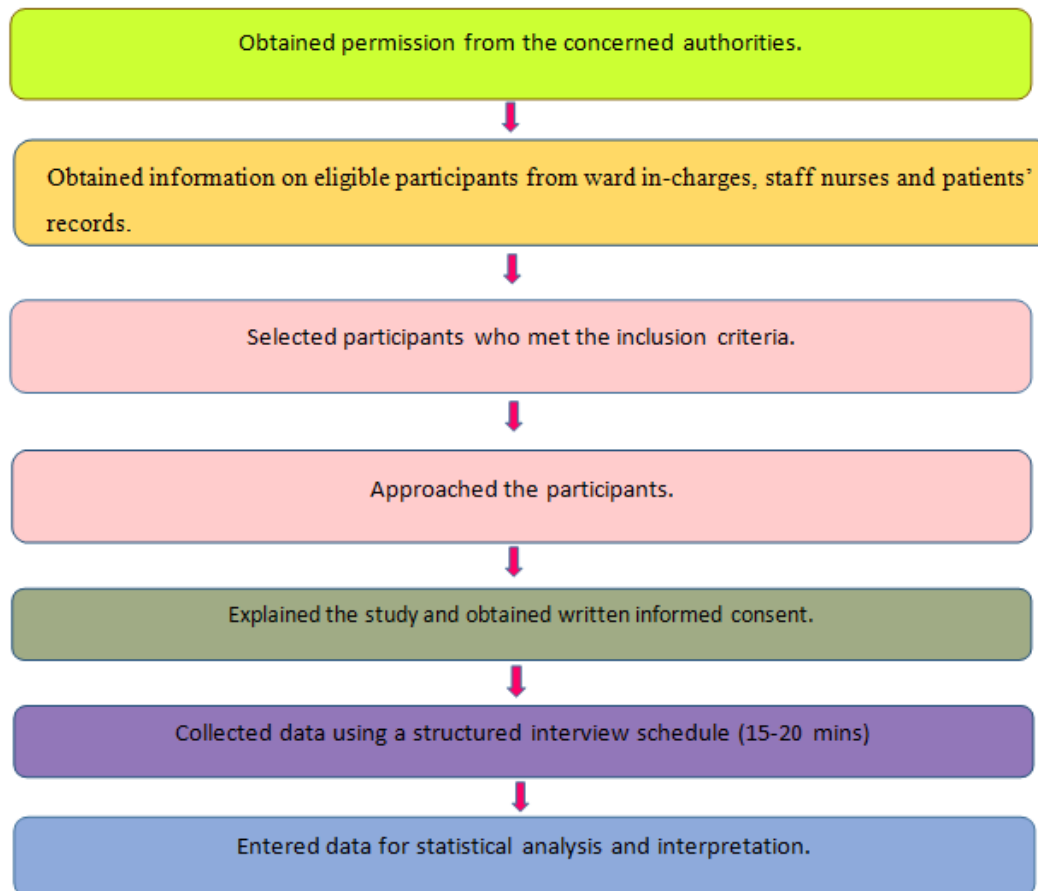


Figure 1: Data collection procedure.

Ethical consideration: The study was conducted after obtaining approval and ethical clearance from the Research Committee of the College of Nursing. Formal written permission to conduct the study was secured from the Medical Superintendent and Nursing Superintendent. Informed written consent was obtained from the participating staff nurses after explaining the purpose of the study, the voluntary nature of participation, potential benefits, and their right to withdraw at any stage. Confidentiality and anonymity of the participants were strictly maintained throughout the data collection process.

Data analysis: Demographic and clinical variables of the pregnant mothers was represented using frequencies and percentages.

Fishers' Exact Test was used to determine the association between knowledge and compliance with the demographic and clinical variables.

RESULT AND DISCUSSION:

The results are presented as follows:

Table 1: Demographic variables of pregnant women attending OBG OPD and labour ward in secondary hospital, Chumoukedima (n=146)

SL.NO	VARIABLES	CATEGORIES	NO.OF PARTICIPANTS	PERCENTAGE(%)
1	Age	17-19 years	4	3%
		20-29 years	50	34%
		30-39 years	89	61%
		40-45 years	3	2%
2	Religion	Muslim	13	9%
		Christian	109	75%
		Hindu	24	16%
3	Educational Qualification	Illiterate	2	1%
		Up to class 12	91	62%
		Graduate and above	53	36%
4	Type of family	Nuclear	101	69%
		Joint	45	31%
		Extended	0	0
5	Family Income	Less than 10,000	26	18%
		Less than 20,000	43	29%
		More than 20,000	77	53%
6	Resident	Rural	60	41%
		Urban	86	59%
7	Occupation	Government	20	14%
		Private	36	25%
		Housewife	90	62%

INFERENCE: The above table shows the demographic variable of the pregnant women, majority 89(61%) belongs to the age group 30-39 years and Christian religion 109(75%),91(62%) were up to class 12 passed, 101(69%) are from nuclear family,77(53%) participants have more than Rs20,000 income, 86(59%) are from urban residents and 90(62%) are housewife.

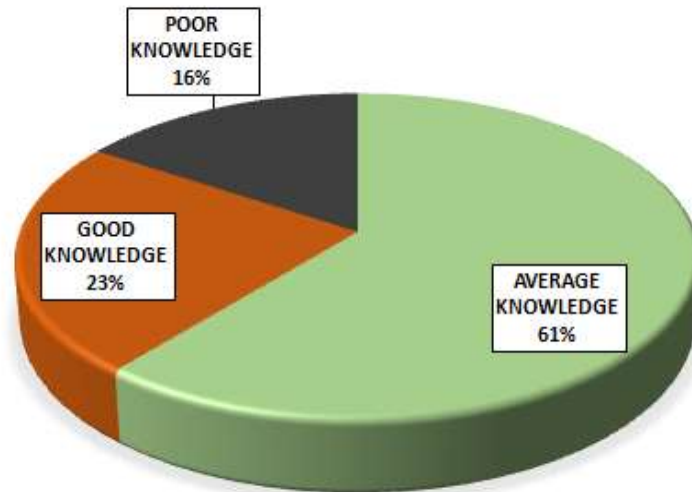
Table 2: Clinical variables of pregnant women attending OBG OPD and labour ward in secondary hospital, Chumoukedima (n=146)

SL.NO	VARIABLES	CATEGORIES	NO.OF PARTICIPANTS	PERCENTAGE(%)
1	Gravida	Primigravida	3	2%
		Multigravida	71	49%
		Grand Multigravida	72	49%
2	Parity	No previous birth	72	49%
		One birth	41	28%
		Two or more birth	33	23%
3	Haemoglobin Level	Less than 7g/dl	0	0
		7-10.9g/dl	30	21%
		11g/dl or more	114	79%
4	No.of ANC visits	Less than 4 visits	64	44%
		4-7 visits	77	53%
		8 or more visits	5	3%
5	History of IFA intake	Yes regularly	117	80%
		Yes but irregularly	28	19%
		No	0	0

INFERENCE: The above table shows the clinical variable of the pregnant women, majority of them 72(49%) are grand multigravida and 71(49%) are multigravida.; 72 (49%) are nulliparous,114(79%)

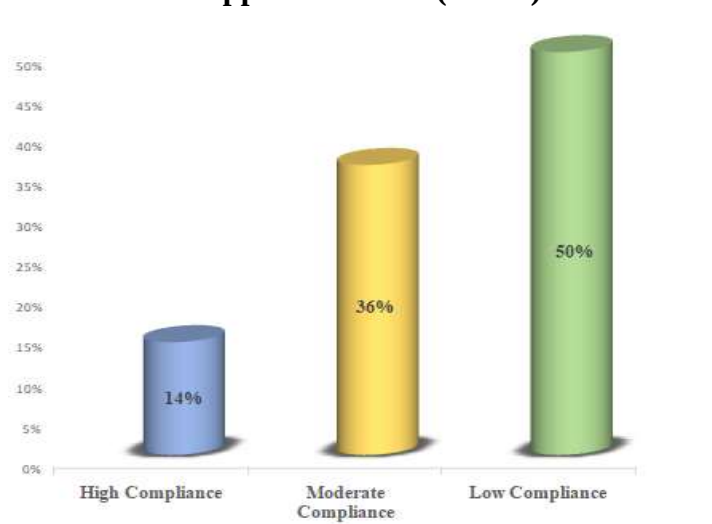
participant's haemoglobin level was 11g/dl or more, 64(44%) went for less than 4 ANC visits, 117(80%) participants take IFA regularly.

FIGURE 2: Assessment of knowledge of pregnant women regarding iron and folic acid supplementation. (n=146)



INFERENCE: The above figure shows that the majority of the pregnant women, 89(61%) showed average knowledge, 34(23%) showed good knowledge and 23(16%) showed poor knowledge regarding iron and folic acid supplementation.

FIGURE 3: Assessment of compliance of pregnant women towards iron and folic acid supplementation. (n=146)



INFERENCE: The above figure shows that the majority of the pregnant women, 73(50%) had low compliance, 53(36%) had moderate compliance, and 20(14%) had high compliance towards iron and folic acid supplementation.

Table 3: Association between demographic variables and knowledge of pregnant women regarding iron and folic acid supplementation using fisher's exact test. (n = 146)

VARIABLES	CATEGORIES	PK*	AK**	GK***	FET VALUE	P VALUE	LEVEL OF SIGNIFICANCE (P<0.05)
Age	17-19 Years	1	3	0	35.5	0.008	Significant
	20 -29 Years	11	33	6			
	30-39 Years	11	52	26			
	40-45 Years	0	1	2			
Religion	Muslim	3	8	2	20.98	0.137	Not Significant
	Christian	17	64	28			
	Hindu	3	17	4			
Educational Qualification	Illiterate		2		48.58	0.001	Significant
	Up to class 12	16	62	13			
	Graduate and above	7	25	21			
Type of family	Nuclear	18	60	23	17.48	0.046	Significant
	Joint	5	29	11			
	Extended	0	0	0			
Family Income	Less than 10,000	7	19	0	50.73	0.002	Significant
	Less than 20,000	7	28	8			
	More than 20,000	9	42	26			
Resident	Rural	11	39	10	19.67	0.015	Significant
	Urban	12	50	24			
Occupation	Government	3	10	7	26.31	0.011	Significant
	Private	3	20	13			
	Housewife	17	59	14			

*=Poor knowledge **=Adequate knowledge ***=Good knowledge

INFERENCE: From the above table, using Fisher's Exact Test, it was found that there was a significant association between the demographic variables age, educational qualification, type of family, family income, residence, and occupation and the knowledge of pregnant women regarding Iron and Folic Acid supplementation ($p < 0.05$).

Table 4 : Association between clinical variables and knowledge of pregnant women regarding iron and folic acid supplementation using fisher's exact test. (n = 146)

VARIABLES	CATEGORIES	PK*	AK**	GK***	FET VALUE	P VALUE	LEVEL OF SIGNIFICANCE (P<0.05)
Gravida	Prim gravida	13	47	12	32.51	0.07	Not Significant
	Multigravida	10	40	21			
	Grand Multigravida	0	2	1			
Parity	No. of previous birth	13	47	12	21.27	0.074	Not Significant
	One birth	5	23	13			
	Two or more birth	5	19	9			
Haemoglobin Level	Less than 7g/dl	0	0	0	42.18	0.005	Significant
	7-10.9g/dl	5	19	6			
	11g/dl or more	18	68	28			
No. of ANC visits	Less than 4 visits	11	42	11	24.10	0.044	Significant
	4-7 visits	11	45	21			
	8 or more visits	1	2	2			
History of IFA intake	Yes regularly	17	72	29	48.06	0.139	Not Significant
	Yes but irregularly	6	17	5			
	No	0	0	0			

*=Poor knowledge **=Adequate knowledge ***=Good knowledge

INFERENCE: The above table shows that there is significant association between clinical variables (hemoglobin level, history of IFA intake) and knowledge with a significant P value <0.05.

Table 5: Association between demographic variables and compliance of pregnant women regarding iron and folic acid supplementation using fisher's exact test. (n = 146)

VARIABLES	CATEGORIES	LC*	MC**	HC***	FET VALUE	PVALUE	LEVEL OF SIGNIFICANCE (P<0.05)
Age	17-19 years	3	1	0	20.87	0.082	Not Significant
	20-29 years	22	22	6			
	30-39 years	47	29	13			
	40-45 years	1	1	1			
Religion	Muslim	3	7	3	28.14	0.00	Significant
	Christian	64	32	13			
	Hindu	6	14	4			
Educational Qualification	Illiterate	1	1	0	32.14	0.005	Significant
	Up to class 12	52	31	8			
	Graduate and above	20	21	12			
Type of family	Nuclear	49	35	17	15.63	0.012	Significant
	Joint	24	18	3			
	Extended	0	0	0			
Family Income	Less than 10,000	16	8	2	31.33	0.041	Significant
	Less than 20,000	25	14	4			
	More than 20,000	32	31	14			
Resident	Rural	25	26	9	15.75	0.01	Significant
	Urban	48	27	11			
Occupation	Government	7	9	4	15.95	0.079	Not Significant
	Private	19	13	4			
	Housewife	47	31	12			

*=Low compliance **=Moderate compliance ***=High compliance

INFERENCE: From the above table using the Fishers Exact Test, it shows that there is significant association between the demographic variables (religion, educational qualification, type of family, family income and resident) and compliance towards iron and folic acid supplementation with a significant P value <0.05.

Table 6: Association between clinical variables and compliance of pregnant women regarding iron and folic acid supplementation using fisher's exact test. (n = 146)

VARIABLES	CATEGORIES	LC*	MC**	HC***	FET VALUE	P VALUE	LEVEL OF SIGNIFICANCE (P<0.05)
Gravida	Primigravida	36	26	10	22.34	0.066	Not Significant
	Multigravida	34	27	10			
	Grand Multigravida	3	0	0			
Parity	Noprevious birth	35	26	11	22.75	0.004	Significant
	One birth	15	21	5			
	Two or more births	23	6	4			
Haemoglobin Level	Less than 7g/dl	0	0	0	25.45	0.062	Not Significant
	7-10.9g/dl	17	11	2			
	11g/dl or more	56	41	17			
No. of ANC visits	Less than 4 visits	33	19	12	20.22	0.013	Significant
	4-7 visits	39	30	8			
	8 or more visits	1	4	0			
History of IFA intake	Yes regularly	46	52	20	68.20	0.00	Significant
	Yesbut irregularly	27	1	0			
	No	0	0	0			

*=Low compliance **=Moderate compliance ***=High compliance

INFERENCE: From the above table using the Fisher's Exact Test, showed that there is significant association between the clinical variables (parity, No of ANC visits, history of IFA intake) and compliance towards iron and folic acid supplementation with a significant P value <0.05.

According to a similar study conducted by Asmamaw Demis Bizuneh, Getnet Gedefaw Azeze (2022) Maternal education status (AOR = 2.19, 95% CI 1.32–3.64), good knowledge of iron–folic acid (AOR = 5.85, 95% CI 3.60–9.50) and residence (AOR = 5.43, 95% CI 2.36–12.51) were statistically associated with pregnant mothers' knowledge on anemia. Obtained counselling on the benefit of iron–folic acid (AOR = 2.04, 95% CI 1.11–3.75), having four or more antenatal care visit (AOR = 3.12, 95% CI 1.38–7.07) and good knowledge of anemia (AOR = 5.88, 95% CI 3.63–9.50) was statistically associated with pregnant mothers' knowledge on the benefit of iron–folic acid.

IMPLICATIONS OF THE STUDY:

The study highlights the vital role of nurses in improving the use of iron and folic acid (IFA) supplementation during pregnancy. Nurses can empower mothers through effective antenatal counselling, regular follow-up, and practical health education on the benefits and correct use of IFA tablets. Nursing education should prepare student nurses with strong knowledge and counselling skills

related to maternal nutrition and anaemia prevention. Nurse administrators should ensure uninterrupted availability of IFA tablets and strengthen awareness programmes and supervision. Nursing research should encourage innovative educational interventions and further studies in different settings to identify effective strategies for improving knowledge, compliance, and maternal health outcomes.

CONCLUSION:

The findings of the study demonstrate that a considerable proportion of pregnant women had only average knowledge and low compliance regarding IFA supplementation. The significant associations identified between selected demographic and clinical variables and knowledge and compliance emphasize the importance of individualized health education, regular antenatal counselling, and appropriate follow-up. Strengthening counselling regarding the benefits of IFA supplementation, addressing common barriers such as side effects and forgetfulness, and encouraging regular ANC attendance may help improve knowledge and compliance among pregnant women.

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