



Assessment of knowledge and practice towards iron and folic supplementation among antenatal mothers in selected hospital of Bhubaneswar

Sephali Moharana^{1*}, Sushri Bani Bandana Mohakul¹, Saraswati Panda², Sruti Bhowmick²,
Amrita Jena³

^{1*} Assistant Professor, Department of mental health nursing, SUM Nursing College, Siksha 'O' Anushandhan University, Bhubaneswar, Odisha, ORCID ID: 0009-0009-3150-9188, Mail Id: sephalimoharana@soa.ac.in,
Phn no- 8763021112

¹ Nursing Officer, Department of Mental Health Nursing, Bhadrak, Odisha, ORCID ID: 0009-0001-2617-2797

² Educator, Department of Mental Health Nursing, Siksha 'O' Anushandhan University, Bhubaneswar, Odisha, ORCID ID: 0009-0004-8937-7919

² Msc Tutor, Department of Mental Health Nursing, Siksha 'O' Anushandhan University, Bhubaneswar, Odisha, ORCID ID: 0009-0003-6951-3373

¹ Nursing Officer, Hindustan Shipyard Limited, Visakhapatnam, India

Corresponding Author

Sephali Moharana

Assistant Professor, Department of mental health nursing, SUM Nursing College, Siksha 'O' Anushandhan University, Bhubaneswar, Odisha, ORCID ID: 0009-0009-3150-9188, Mail Id: sephalimoharana@soa.ac.in,
Phn no- 8763021112

ABSTRACT

Background: Iron and folic acid (IFA) supplementation is a crucial component of antenatal care to prevent anemia and neural tube defects.

Aim: This study aimed to assess the level of knowledge and practice regarding IFA supplementation among antenatal mothers and to determine the association between these levels and selected socio-demographic variables.

Methodology: A descriptive survey was conducted among 70 antenatal mothers attending the Gynecology OPD of a selected hospital in Bhubaneswar. Data were collected using structured questionnaires.

Result: Results showed that 60% of mothers had average knowledge, while 74.3% demonstrated excellent practice. A significant association was observed between occupational status and knowledge ($p < 0.05$), and between body weight and practice ($p < 0.05$).

Conclusion: The study concludes the need for targeted educational interventions to improve antenatal IFA supplementation adherence.

Keywords: Antenatal mothers, Iron and folic acid supplement

Introduction

Daily oral iron and folic acid supplementation is recommended for antenatal care. It helps in reduce low birth weight, preterm birth, maternal anaemia at term and maternal iron deficiency at term. All women of reproductive age should get 400 micrograms of folic acid each day in addition to consuming food with folate from a varied diet to help prevent neural tube defect (NTD). NTDs are major birth defects of the baby brain and spine. ⁽¹⁾

Approximately 41.8% of pregnant women globally suffer from anaemia, with iron deficiency accounting for nearly half of these cases. The impact is greatest in developing nations. Maternal folate deficiency is one of the maternal risk factors for neural tube defects and pre-conception folate deficiency contributes to about 300000 new cases of NTDs each year globally resulting in about 41000 deaths. ⁽²⁾

It is estimated that more than 40% of pregnant women worldwide are anaemic. As last half of this anaemia burden is assumed tube due to iron deficiency. Pregnant women require additional iron and folic acid to meet their own nutritional needs as well as those of the developing fetus. Deficiency in iron and folic acid during pregnancy can potentially negatively impact the health of the mother, her pregnancy as well as fetal development. ⁽³⁾

HalaAbdullahi, Gasim, Ahmed Saeed, Abdulmutalab M I mam, and IshagAdam (2014) conducted a study on antenatal iron and folic acid supplementation consumed during pregnancy by antenatal mothers in Khartoum Sudan. A study involving 856 women found that 788 (92.1%) consumed iron- folic acid supplements. A total of 65.4% reported using folic acid in the course of their pregnancy. The research examined the prevalence and influencing factors of iron- folic acid supplementation, as well as its impact on maternal anaemia and low birth weight. The findings indicated that supplementation was associated with healthier birth outcomes. ⁽⁴⁾

A study was carried out by P Mithara, B Unnikrishnan, T Rekha, et al (2014) to find out the importance of IFA in pregnancy. The study involved 190 expectant mothers attending antenatal care at tertiary centers in Mangalore, South India. Data were collected via interviews after ethical approval. Missing two or more consecutive IFA doses was considered non- compliance. The mean age was 25.8 years, with most participants on a mixed diet and 72.1% from socioeconomically deprived groups. IFA compliance was 64.7% improving with age, birth order, and single daily dosing. Forgetfulness and side effects were main reasons for non- compliance. Social and demographic factors significantly influenced adherence. ⁽⁵⁾

A study was done by Meseret Belete Fite, Kedir Teji Roba, Lemessa Oljira, et al (2021) to find out pregnant women's adherence to IFAS and the determinants affecting it in Sub-Saharan Africa. Twenty-three studies, which encompassed 24272 pregnant women, were chosen for the analysis. The overall prevalence of adherence to Iron and Folic Supplementation (IFAS) during pregnancy in Sub- Saharan Africa (SSA) was found to be 39.2%. The meta- analysis results indicated that women who received counselling on IFAS during pregnancy were 1.96 times more likely to comply with supplementation compared to those who did not receive counselling. Additionally, women with knowledge of IFAS were 2.71 times more likely to adhere, while those aware of anaemia were 5.42 times more likely to comply than those lacking such knowledge. The analysis also revealed that women who attended four antenatal care (ANC) visits were 1.54 times more likely to follow IFAS recommendations compared to those who had fewer or no visits. Overall, the results from this meta- analysis and systematic review indicate poor compliance with IFAS among pregnant women in SSA. ⁽⁶⁾

A cross-sectional study was done by Dibley Michael J, Titaley Christiana R, et al (2012) to find if iron and folic acid supplementation in pregnancy improves child survival in Indonesia. The study assessed whether children under five born to mothers who took iron- folic acid supplements during pregnancy had a lower risk of mortality. Using Cox regression analysis to adjust for 19 potential confounding variables, the study examined survival outcomes of 52,917 singleton live births and 1,525 deaths of children under five. Results showed that children under five had a 34% lower risk of death if their mothers had taken iron- folic acid and supplementation in developing countries can significantly reduce child mortality, particularly within the first year of life.⁽⁷⁾

A study was done by Monica Steffi Thomas, Anahit Demirchyan, Vahe Khachadourian et al (2020) to find how effective iron supplementation is during pregnancy and childhood in reducing anaemia among 6-59 months old children in India. A total of 145,904 last- born children aged 6 to 59 months were included in the analysis. Among them, 39.9% had normal haemoglobin levels (≥ 11 g/dL), 27.8% were mildly anaemic (10–10.9 g/dL), 30.7% were moderately anaemic (7–9.9 g/dL), and 1.6% were severely anaemic (< 7 g/dL). There is a need to evaluate the National Iron plus Initiative for child iron supplementation to identify the factors behind its limited success in reducing anaemia prevalence.⁽⁸⁾

A survey was done by Nisha Malhotra, Ravi Prakash Upadhyay, Timothy Green et al (2014) to find the impact of maternal nutrition and iron- folic acid supplements in Influencing Birth Weight. Infants born to women who regularly consumed milk, curd and fruits were more likely to give birth to babies with normal weight. Regular intake of pulses and beans was associated with higher odds of avoiding low birth weight, whereas weekly fish consumption was linked to reduced odds. Iron- folic acid supplementation during pregnancy contributed to an average increase of 6.46 grams in birth weight per month. Enhancing the consumption of nutrient dense foods can positively influence birth weight.⁽⁹⁾

A cross sectional study was done by Abjyot WolieAsres, Tamene WolieAzene et al (2022) to the community based cross- sectional study conducted in Dangila, Northern Ethiopia explored the adherence to iron- folic acid supplementation and the influencing factors among pregnant women. A total of 589 pregnant women participated in the study, with a response rate of 91.2%. The mean age of the participants was 30.90 ± 5.93 years. On average, they consumed 5.3 iron- folic acid tablets per week, and the overall compliance rate was 76.9%. Higher compliance with iron- folic acid supplementation was linked to having four or fewer living children, living within 30 minutes of a health facility, being employed in the government sector, attending antenatal care sessions, and initiating supplementation during the first trimester. Despite these associations, overall compliance remained suboptimal. Early initiation in the first trimester and participation in antenatal care training were significant factors influencing adherence.⁽¹⁰⁾

Methods & materials

Research Approach and Design

A quantitative research approach was adopted for the study, utilizing a descriptive survey design to assess the knowledge and practice level of antenatal mothers regarding iron and folic acid supplementation.

Setting and Population

The study took place in a selected hospital of Bhubaneswar, Odisha. The target population included antenatal mothers in their 2nd and 3rd trimesters who attend the antenatal outpatient department (OPD) during the data collection period.

Sample size and sampling technique

A total of 70 antenatal mothers were selected for the study using a purposive sampling technique. This method was chosen based on inclusion criteria relevant to the study objectives.

Sampling Criteria

Antenatal mothers in their second and third trimesters and willing to participate in the study was under inclusion criteria. Exclusion criteria of the study was non- pregnant women and adolescent girls and those unwilling to participate.

Development and description of tools

Three self-structured tools were developed:

Socio-demographic Questionnaire: Included 11 items to collect information on age, education, religion, family type, food habits, occupation, income, body weight, pregnancy order, haemoglobin level, and gestational week.

Knowledge Assessment Questionnaire: Contained 13 multiple-choice questions, each carrying one mark. Scoring was categorized as:

- Poor Knowledge: 5–7
- Average Knowledge: 8–10
- Good Knowledge: 11–13

Practice Assessment Scale: A 3-point Likert scale (Never = 3, Sometimes = 2, All the time = 1) consisting of 7 items. Scoring was categorized as:

- Good Practice: 14–16
- Excellent Practice: 17–19

Validity and Reliability

The tools were validated by five experts in Community Health Nursing and Obstetrics and Gynaecological Nursing. The reliability of the structured questionnaires was established using Cronbach's alpha formula to ensure internal consistency.

Pilot Study

A pilot study was conducted in a separate hospital setting in Bhubaneswar over three days. Ten percent of the sample size (n=7) was used to test the feasibility and clarity of the tool, and no major changes were required.

Data Collection Procedure

Formal administrative permission was obtained from the concerned hospital authority. Written informed consent was secured from participants. Data collection was carried out through structured interviews using the validated tools.

Ethical Considerations

Approval for the study was granted by the Institutional Ethics Committee. Informed consent was secured from all participants. Anonymity and confidentiality of the participants were strictly maintained.

Data Analysis

Collected data were analyzed using SPSS version 20.0. Descriptive statistics (frequency, percentage) were used to describe socio-demographic variables, knowledge, and practice levels. The association between knowledge/ practice and selected demographic variables was evaluated using inferential statistics specifically the Chi- square test. A P- value less than 0.05 were regarded as statistically significant.

Result

The above table-1 revealed that frequency (F) and percentage (%) distribution of participants according to 58.6% of the samples age was 22-25 years. 68.6%of the samples were educated at primary level. 77.0 % samples were Hinduism. 48.6% samples were nuclear family. 60.0% of pregnant women were non-vegetarian. 63.0%of the samples were housewife. 45.7% of pregnant women families were 20001-25000 per capita monthly family income. 60.0% pregnant women were 55-63 kg of body weight. 64.0% samples were 1st pregnancy. 61.4% samples were Hb levels in between 11.3-12.2. 50.0% of samples were gestation week of 18-21.

Table- 1: Frequency (f), Percentage (%) distribution of samples according to the level of knowledge.
N= 70

LEVEL OF KNOWLEDGE	FREQUENCY (f)	PERCENTAGE (%)
POOR KNOWLEDGE (SCORE 5-7)	23	32.9
AVERAGE KNOWLEDGE (SCORE 8-10)	42	60.0
GOOD KNOWLEDGE (SCORE 11-13)	5	7.1

The above table shows that 7.1% antenatal mothers had good knowledge (score 11-13) and 60.0% had average knowledge (score 8-10) and 32.9% antenatal mothers had poor knowledge (score 5-7).

Table-2: Frequency (f), Percentage (%) distribution of samples according to the level of practice.**N= 70**

LEVEL OF PRACTICE	FREQUENCY (f)	PERCENTAGE (%)
GOODPRACTICE (14-16)	18	25.7
EXCELLENTPRACTICE (17-19)	52	74.3

The table above indicates that, above table 2 shows that, 25.7% antenatal mothers had good practice (score 14-16) and 74.3% had excellent practice (score 17-19).

Table- 3: Association between knowledge and demographic variables were assessed by using Chi-Square test. The results summary of Chi-Square test is tabulated below**N= 70**

Variable	Chi square value	df	p value
Age	1.116	4	0.892
Educational status	8.673	6	0.193
Occupational status	10.852	4	0.028*
Body weight	7.269	4	0.122
Hb level	1.704	2	0.427
Gestational week	7.585	6	0.270

$P \leq 0.05^* = \text{Significant}$

Above table shows that the P value of age of occupational status is smaller than 0.05, which was found to have statistically significant association with level of knowledge. And rest have no significant association with the level of knowledge.

Table-4: Association between practiceand demographic variables were assessed by using Chi-Square test. The results summary of Chi-Square test is tabulated below:**N=70**

Variable	Chi square value	df	P value
Age	1.628	2	0.443
Educational status	0.721	2	0.697
Body weight	6.860	2	0.032*
Order of pregnancy	3.540	1	0.060

Hb level	0.867	1	0.352
Gestational week	3.795	3	0.284

$P \leq 0.05^* = \text{Significant}$

Above table shows that, the P value of body weight is less than 0.05, which was found to have statistically significant association with level of practice. And rests have no significant association with the level of practice.

Discussion

The present study was assessing the level of knowledge and practice towards iron and folic supplementation among antenatal mothers in selected hospitals of BBSR. The study involved non- experimental descriptive survey research design among 70 samples according to inclusion and exclusion criteria. The structure questionnaire for socio demographic data, structured knowledge questionnaire for knowledge and structured practice questionnaire for practice were used for the data collection. The majority of the mother had average knowledge 60% and 70% having good practice. The occupational status was found to have statistically significant association with level of knowledge. Similarly, body weight was found to have statistically significant association with level of practice.

A study was carried by SkMasumBillah, NaziaBinte Ali, Farhana Karim et al (2022) to find out maternal importance of iron and folic acid supplementation in pregnancy in Bangladesh. They assessed the quantity of iron- folic acid (IFA) doses received and actually taken during pregnancy and explored the factors affecting IFA intake. The study shows that there is a linear relationship between the occupational status and the quantity of iron- folic acid tablets taken body weight, receiving free IFA and counselling on its use were linked to increased IFA intake. ⁽¹¹⁾

Nursing Implication

Integrate IFA awareness in community nursing curriculum. Nurses should educate pregnant women about the timing, dosage, and benefits of IFA.

Conclusion

Most antenatal mothers demonstrated average knowledge and good to excellent practice regarding iron and folic acid supplementation. Socio-demographic factors like occupation and body weight significantly impacted these levels. This indicates the need for enhanced education and reinforcement during antenatal visits.

Funding

No Funding

Conflicts of interest

There are no conflicts of interest for the writers.

Acknowledgements

The authors sincerely appreciate all the participants who willingly dedicated their time and thoughtfully provided sincere and well- considered responses.

Ethics Approval

Approval of research problem & objectives by the research committee. Approval for conducting study from Institutional Ethics Committee of Institute of Medical Sciences. Participants were not to be harmed physically, psychologically emotionally. Information of participants was confidential. Participant's right, of autonomy was maintained.

Reference

1. <https://www.who.int/data/nutrition/nlis/info/antenatal-iron-supplementation>
2. <https://www.who.int/tools/elena/interventions/daily-iron-pregnancy>
3. <https://www.ncbi.nlm.nih.gov/books/NBK258737/>
4. Abdullahi H, Gasim GI, Saeed A, Imam AM, Adam I. Antenatal iron and folic acid supplementation use by pregnant women in Khartoum, Sudan. BMC research notes. 2014 Dec;7:1-4.
5. Mithra P, Unnikrishnan B, Rekha T, Nithin K, Mohan K, Kulkarni V, Holla R, Agarwal D. Compliance with iron-folic acid (IFA) therapy among pregnant women in an urban area of south India. African health sciences. 2014 Mar 12;14(1):255-60.
6. Fite MB, Roba KT, Oljira L, Tura AK, Yadeta TA. Compliance with Iron and Folic Acid Supplementation (IFAS) and associated factors among pregnant women in Sub-Saharan Africa: A systematic review and meta-analysis. PLoS One. 2021 Apr 14;16(4):e0249789.
7. Titaley CR, Dibley MJ. Antenatal iron/folic acid supplements, but not postnatal care, prevents neonatal deaths in Indonesia: analysis of Indonesia Demographic and Health Surveys 2002/2003–2007 (a retrospective cohort study). BMJ open. 2012 Jan 1;2(6):e001399
8. Thomas MS, Demirchyan A, Khachadourian V. How effective is iron supplementation during pregnancy and childhood in reducing anemia among 6–59 months old children in India?. Frontiers in Public Health. 2020 Jul 7;8:234.
9. Malhotra N, Upadhyay RP, Bhilwar M, Choy N, Green T. The role of maternal diet and iron-folic acid supplements in influencing birth weight: evidence from India's National Family Health Survey. Journal of tropical pediatrics. 2014 Dec 1;60(6):454-60.
10. 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 Medicine. 2022 Aug;10:20503121221118989.
11. Billah SM, Raynes-Greenow C, Ali NB, Karim F, Lotus SU, Azad R, Sari M, Mustaphi P, Maniruzzaman M, Rahman SM, Dibley MJ. Iron and folic acid supplementation in pregnancy: findings from the baseline assessment of a maternal nutrition service programme in Bangladesh. Nutrients. 2022 Jul 28;14(15):3114

