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Research Article

Determinants

Socio-demographic determinants of Iron and folic acid (IFA) consumption by females during their antenatal period delivering in a tertiary care hospital of Haryana

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Introduction: In India, the major causes of maternal mortality are hemorrhage (26%) and anemia (19%). According to NFHS -4 data, 53% of women are anemic, this situation further worsens when these anemic women come into the antenatal phase, as there is haemodilution during pregnancy. **Aim and objectives:** To find out the socio-demographic factors affecting Iron and Folic acid consumption among recently delivered women. **Material and methods:** A cross-sectional study was carried out from April 2017- April 2018 among 500 pregnant females who recently delivered at PGIMS Rohtak. A simple random sampling technique was followed. An interview schedule was used for data collection and data were analyzed using SPSS. **Results:** Out of 500 study subjects, the majority (70.4%) belonged to rural area.97.4% of them were Hindus, 81.4% were literate, 77.2% were unemployed, only 26.4% belonged to below poverty line. 80% of subjects were anemic and only 38.2% of study subjects consumed 100 or more IFA tablets. A significant ($p \leq 0.05$) association was found between IFA consumption and age, education, and occupation. **Conclusion:** Women and their family members need to be educated regarding the consumption of IFA tablets and their role in pregnancy.

Keywords: IFA, Anaemia, Pregnant, Socio-demographic determinants

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Introduction

Globally 0.294 million maternal death occurred during the year 2017 [1]. About 20% of maternal deaths are directly related to anemia, and another 50% of maternal mortality is associated indirectly with anemia [2]. At present global maternal mortality ratio is 211 women per one lakh live birth [1] which is very far from the target of the sustainable development goal of achieving MMR of 70 by all the countries by 2030. In India, the current MMR is 122 [3], which is also far away from the SDG target. In India prevalence of anemia in pregnant women is 50%, which is a major contributor to maternal mortality [4]. In India, every year 4.3 lakhs live birth takes place, of which 525 maternal deaths reported [3]. The majority of maternal deaths are due to maternal factors. The major complications that account for 80% of all maternal deaths are severe bleeding/hemorrhage (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (preeclampsia and eclampsia) and unsafe abortion, etc. The remaining maternal deaths are caused by or associated with diseases such as malaria and AIDS during pregnancy [5]. The major causes of maternal mortality are hemorrhage (26%) and anemia (19%). Major proportion of this could be reduced if the hemoglobin level of antenatal women is normal. In India, according to NFHS -4 data53%, women are anemic, this situation further worsens when these anemic women come into the antenatal phase, as there is haemodilution during pregnancy. Consumption of iron and folic acid (IFA) tablets during pregnancy can remarkably solve this problem. A study in Haryana has supported this fact by showing that IFA supplementation has reduced the burden of anemia from 92.9% to 79.9% in pregnant women included in the study [6]. As per guidelines of ministry of health and family welfare, the government of India under 'Intensified National iron plus initiative program', one IFA tablet containing 60 mg elemental iron and 0.5 mg folic acid for non-anemic women and two IFA tablets daily for anemic women for 180 days is recommended during pregnancy [7]. Different studies have shown that consumption of IFA tablets is far below recommended. According to NFHS-4 data for Haryana, only 32.5% of mothers had taken 100 IFA tablets during her pregnancy (India – 30.3%). IFA tablets are being provided free of cost during antenatal visits and checkups but even then its consumption is low. Poor compliance with IFA Tablets consumption is responsible for the prevalence of anemia in pregnant women despite supplementation [8-10]. The study was planned to find out the determinants related to IFA consumption during pregnancy.

Aim and objectives

01. To find out the consumption of IFA tablets among recently delivered women.
02. To study the socio-demographic factors affecting IFA consumption.

Material and methods

A cross-sectional hospital-based observational study was carried out among pregnant women who delivered at Pt. B. D. Sharma PGIMS, Rohtak, Haryana in the Department of Obstetrics and Gynaecology. The study was conducted over a period of one year from April 2017 to April 2018.

Sample size: According to NFHS-4 data for Haryana, 32.5% of mothers had taken 100 IFA tablets during their pregnancy. Considering the prevalence as 32.5%, confidence interval 95 % and allowable error of 15%, the sample size was calculated using the formula

$$N = \frac{(Z1\text{-}a/2)2 \times p \times q}{D2}$$

Where,

Z=standard normal variate

Z1-a/2 = value of two tailed alpha error; this is 1.96 at 5%

P = expected prevalence in fraction

Q = 1 – p

D = allowable error (taken as 15%)

Minimum sample size came out to be 371. A total of 500 subjects were included in the study.

Sampling technique: 30-40 deliveries occur per day in the department of Obstetrics and Gynaecology PGIMS, Rohtak. So, on each day of the visit, a list of women who delivered on the previous day was prepared from the labor room register. From this list, 8-10 delivered women were selected using a simple random sampling technique using the lottery method.

Consent: Each study subject was explained about the study and informed written consent in vernacular language was taken from each of them before conducting the study. The confidentiality of the data collected was assured.

Inclusion criteria

01. Women who delivered at PGIMS Rohtak.
02. Women who delivered after completion of 28 weeks of gestation, irrespective of the outcome.
03. Stillbirths were also included in the study.

Exclusion criteria

01. Women did not give consent for the study.
02. Women who left against medical advice (LAMA) after delivery.
03. Women who had psychiatric illness and were severely ill.

Methodology

On the day of the visit, 8-10 delivered women were selected using a simple random sampling technique and the selected women were briefed about the nature and purpose of the study and interviewed one by one after taking their consent. A pre-designed, pre-tested, semi-structured interview schedule, which consisted of questions regarding socio-demographic profile, obstetric history, medical history, pregnancy outcome, and ANC services utilization including IFA tablets consumption, was used for recording their responses. The confidentiality of the information was maintained. For the socioeconomic status of the subjects, the revised B.G. Prasad Scale for the Year 2017 was used. The details about the utilization of antenatal care services by the subjects were enquired mainly focusing on the IFA tablet's availability and its consumption during the pregnancy.

Definitions:

Anemia during pregnancy: Refers to women with a hemoglobin level below 11 gm/dl during pregnancy

Degree of anemia:

Mild: hemoglobin level 10-10.9 gm/dl.

Moderate: haemoglobin level 7-9.9gm/dl.

Severe: hemoglobin level below 7gm/dl.

Data analysis: Collected data were compiled, coded appropriately, and entered in the MS EXCEL Spreadsheet and were cleaned for any possible typographical error. The analysis was carried out using SPSS Vs 20.0 (Statistical Package for Social Sciences) and appropriate statistical tests were applied wherever applicable.

Results

Table-1: Distribution of study subjects according to their socio-demographic characteristics (n=500).

Variable	Category	Frequency	Percentage
Age in years	18-21	111	22.2
	22-25	254	50.8
	26-29	66	13.2
	>30	69	13.8
Area of residence	Urban	148	29.6
	Rural	352	70.4
Religion	Hindu	487	97.4
	Muslim	7	1.4
	Christian	1	0.2
	Sikh	5	1
Caste	General	149	29.8
	OBC	157	31.4
	SC	188	37.6
	ST	6	1.2
Family type	Joint	281	56.2
	Nuclear	219	43.8

Table-2: Distribution of study subjects according to their socioeconomic characteristics (n=500).

Variable	Category	Frequency	Percentage
Education	Illiterate	93	18.6
	Primary	17	3.4
	Middle	120	24
	Secondary	178	35.6
	Graduate and above	92	18.4
Occupation	Unemployed	436	87.2
	Unskilled	37	7.4
	Semiskilled	8	1.6
	Skilled	9	1.8
	Semi-professional	9	1.8
	Professional	1	0.2
BPL card holder	Yes	132	26.4
	No	368	73.4
Socioeconomic class	V	14	2.8
	IV	174	34.8
	III	160	32
	II	115	23
	I	37	7.4

Out of 500 study subjects, the majority (50.8%)

Belonged to the age group 22 to 25 years, followed by 18 to 21 years (22.2%), more than 30 years (13.8%), and 26 to 29 years (13.2%). The majority (70.4%) of the study population resided in urban areas while 29.6% resided in rural areas. The majority (97.4%) of subjects were Hindus followed by Muslims (1.4%), Sikhs (1%), and Christians (0.2%). The majority (37.6%) of study subjects belonged to the SC category followed by OBC (31.4%), General (29.8%), and ST category (1.2%). The majority (56.2%) of study subjects belonged to the joint family.

The majority (35.6%) of study subjects were educated up to secondary level followed by middle (24%), illiterate (18.6%), graduate and above (18.4%), and primary school level (3.4%). The majority (87.2%) of study subjects were unemployed followed by unskilled workers (7.4%), skilled and semi-professionals (1.8% each), semi-skilled (1.6%), and professionals (0.2%). The majority (34.8%) of study subjects belonged to class IV followed by class III (32%), class II (23%), class I (7.4%), and only 2.8% belonged to class V. 26.4% study subjects had BPL card.

Table- 3: Distribution of study subjects according to anemia (n=500).

Anemia	Frequency	Percentage
No anemia	60	12
Mild	105	21
Moderate	312	62.4
Severe	23	4.6
Total	500	100

Table -3 shows that the majority (62.4%) of study subjects suffered from moderate anemia followed by mild anemia (21%) and no anemia (12%), whereas, 4.6% had severe anemia. Hemoglobin values were available for all the study subjects as it is done in routine for all antenatal mothers.

Table- 4: Distribution of study subjects according to the consumption of IFA tablets (n=500).

IFA tablets	Frequency	Percentage
None	105	21.0
< 50	99	19.8
50- 100	105	21.0
>100	191	38.2
Total	500	100.0

Table 4 shows that only 38.2% of the study subjects consumed 100 or more IFA tablets. 21% of females consumed 50 -100 tablets and 19.8% of females Consumed less than 50 tablets. 21% of females did not consume any IFA tablet.

Table-5: IFA consumption and its association with the profile of study subjects (n=500).

Variable	Category	IFA consumption No. (%)		Total	Test value
		Yes	No		
Age in years	18-21	62 (55.9)	49 (44.1)	111	χ2=11.162, p-value-0.011
	22-25	137 (53.9)	117 (46.1)	254	
	26-29	50 (75.8)	16 (24.2)	254	
	>30	36 (52.2)	33 (47.8)	66	
	Total	285 (57)	215 (43)	500 (100)	
Caste	General	96 (64.4)	53 (35.6)	149	χ2=4.790, p-value-0.091
	OBC	85 (54.1)	72 (45.9)	157	
	SC/ST	104 (53.6)	90 (46.4)	194	
Education	Illiterate	39 (41.9)	54 (58.1)	93	χ2=12.301, p-value-0.015
	Primary	11 (64.7)	6 (35.3)	17	
	Middle	67 (55.8)	53 (44.2)	120	
	Secondary	109 (61.2)	69 (38.8)	178	
	Graduate and above	59 (64.1)	33 (35.9)	92	
Occupation	unemployed	243 (55.7)	193 (44.3)	436	χ2=11.854, p-value-0.037
	Unskilled	20 (54.1)	17 (45.9)	37	
	Semiskilled	8 (100)	0	8	
	Skilled	6 (66.7)	3 (33.3)	9	
	Semi professional	8 (88.9)	1 (11.1)	9	
	Professional	0	1 (100)	1	
Family type	Joint	164 (58.4)	117 (41.6)	281	χ2=0.486, p-value-0.486
	Nuclear	121 (55.3)	98 (44.75)	219	
Socio-economic class	I	6 (42.9)	8 (57.1)	14	χ2=4.428, p-value-0.351
	II	92 (52.9)	82 (47.1)	174	
	III	92 (57.5)	68 (42.5)	160	
	IV	73 (63.5)	42 (36.5)	115	
	V	22 (59.5)	15 (40.5)	37	
Religion	Hindu	279 (57.3)	208 (42.7)	487	χ2=1.932, p-value-0.587
	Muslim	3 (42.9)	4 (57.1)	7	
	Sikh	2 (40)	3 (60)	5	
	Christian	1 (100)	0	1	

Table 5 shows the association of women who consumed and did not consume IFA tablets with their demographic profile. A significant difference was observed in terms of age, education, and

Occupation of study subjects. Out of 500 study subjects, a higher proportion (75.8% and 55.9%) of IFA consumption was observed among women in the age group 26-29 and 18-21 years respectively and the results were statistically significant ($p<0.05$). Similarly, a higher proportion (64.7% and 64.1%) of study subjects who were educated up-to primary and graduate and above respectively showed more IFA consumption as compared to those having education up to secondary level, middle level and those who were illiterate (61.2%,55.8%and 41.9%) and the results were statistically significant($p<0.05$). Similarly, a higher proportion (100% and 88.9%) of study subjects who were semiskilled, and semi-professionals showed more IFA consumption as compared to skilled, unemployed and unskilled (66.7%, 55.7%, and 54.1%) and the results were statistically significant($p<0.05$). The influence of caste, family type, socio-economic status, and religion was not statistically significant ($p>0.05$).

Discussion

The majority (62.4%) of the present study subjects suffered from moderate anemia followed by mild anemia (21%). 12% of females did not have anemia at al, whereas 4.6% suffered from severe anemia. Similar results were found by Bora Ret al [11] who found that anemia (Hb < 11 gm/dl) was present in 89.6% mothers with 8.3% having severe anemia (Hb < 7 gm/dl). Almost similar results were found by Mishra S et al [12] who showed that the overall prevalence of anemia was 73.1%. Of these, the moderate anemia was 47.6%, mild was 43.6% and severe was 8.8%, whereas, Ahankari A et al [13] conducted a study that showed that anemia (Hb<11g/dl) was prevalent in 91% of women studied.

Devineni K et al [14] found that 45% of their subjects had medical disorders complicating pregnancy, of which severe anemia was found in 17 % of females which was a bit higher as found in the present study (4.6%). Only 38.2% of the present study subjects consumed 100 or more IFA tablets. 21% of females consumed 50 -100 tablets and 19.8% of females consumed less than 50 tablets. 21% of females did not take any IFA tablets. Iyengar S et al [15] conducted a survey that showed that iron and folic acid (IFA) tablets reached 58% of women. However, only 13% consumed IFA tablets for 90 days or more. Malik et al [16] conducted a similar study which showed that 97.4% Received 100 tablets of IFA, however, less than half of them consumed all the tablets. Abdullahi H et al [17] conducted a study on antenatal iron and folic acid supplementation use by pregnant women in Khartoum Sudan. They found that out of 856 women, 92.1% used iron-folic acid supplementation during pregnancy and 65.4% used folic acid. In the present study socio-demographic factors affecting IFA tablets consumption came out to be middle age group, educational status, and employment status. The influence of caste, family type, socio-economic status, and religion was not statistically significant.In the present study out of 500 study subjects higher proportion (75.8%) of IFA consumption was observed among women in the age group 26-29 years and the results were statistically significant ($p<0.05$). Similar results were shown by Mithra P et al [18] where compliance of IFA consumption was higher (72.5%) among women aged >25 years as compared to women age <25yrs.

A study by Knudsen et al[19] al also reported the same results where compliance was higher in women aged > 20 years. In the present study IFA consumption increased significantly with the increase in literacy level, it was 41.9% in illiterates and 64.1% among graduates and above. Similar findings were reported by Wendt A et al [20] in their study where IFA consumption was higher (64.9%) among women who had an education of >9 years. Similar results were shown by Knudsen et al [19] and Begum S et al [21] al who reported that consumption was higher among women with higher educational levels. In the present study IFA consumption was significantly higher among working women as compared to unemployed women. It was 55.7% among unemployed and 65.7% among working women. In a study by Chaurasia et al [22], it was seen that IFA consumption was better among non-working women. It was 18.9% among non-working and 13.4% among working women. This difference in results may be because the current study is done in one State whereas a study done by Chaurasia et al was conducted taking data from NFHS-3 of high focus states.

Limitations

The current study is a cross-sectional study so there are chances of recall bias while reporting the consumption of tablets. Also, since the study is a tertiary care setting-based study, so results cannot

Be generalized for community settings.

Conclusion

A significant association was observed between age, education, and occupation of study subjects with IFA consumption. Since a higher proportion of IFA consumption was observed among women in the age group 26-29 so young and elderly pregnant women need to be focused on IFA consumption. IFA consumption was least among illiterates so women should be empowered by educating them right at the beginning by educating each and every girl child. As consumption was less among unemployed and unskilled subjects which might be due to their education status and less awareness due to less interaction with other aware people, so there should be interactive sessions/health education for them.

What does the study add to the existing knowledge

The current study showed that the education level of mother and employment status of the mother is positively related to the consumption of IFA tablets, this shows that Socioeconomic factors need to be looked upon for making policies regarding programs related to anemia in pregnancy.

Author's contributions

Dr. B. M Vashisht: The whole concept of the study selecting a topic, the whole layout of the study, finalizing the methodology, and final proofreading of the manuscript.

Dr. Himanshu Bhardwaj: reviewed all the literature, collected, analyzed, and interpreted the data for final results.

Dr. Meenakshi: Selections of the subjects from Obstetrics and Gynecology and guidance in manuscript writing.

Dr. Anvesha: Data collection, analysis of results, final manuscript writing, and editing.

Dr. Jai Prakash: Sorting the data

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