

Iron-folic acid supplementation and its differentials among Nepalese women of reproductive age

Ira Shrestha,¹ Puja Paudel,² Mili Joshi,³ Shital Bhandary⁴

¹Assistant professor, ²Lecturer, Department of Physiology, School of Medicine, Patan Academy of Health Sciences, Lalitpur, Nepal
Department of Physiology, School of Medicine, Patan Academy of Health Sciences, Lalitpur, Nepal

³Assistant professor, Department of Pharmacology, ⁴Assistant professor, Department of Community Health Sciences, Patan Academy of Health Sciences, Lalitpur, Nepal

ABSTRACT

Introduction: Iron-folic acid (IFA) supplementations protect mothers and their infants against perinatal and maternal mortality. Ministry of health and population advises pregnant women and lactating mother to take IFA supplements everyday for certain period. However, not all women follow this.

Methods: 2011 Nepal Demographic and Health Survey (NDHS) data was used. Dependent variable was created using women with last child born live in the last five years and taking at least 1 tablet/syrup of IFA and women not taking any tablet/syrup during the study period. Key background variables of women and their last child born during last five years were used as independent variables. Logistic regression was used to find the association between the dependent and independent variables without controlling (bi-variate) and controlling (multi-variate) for other factors during analysis.

Results: About 60% of the women took/bought IFA supplements. Although bivariate analysis showed the effects of perceived child size and type of place of residence on maternal intake of IFA, multivariate analysis did not show this effect. However, mother's age, residence at hill region, education level and wealth index showed their effect on maternal IFA supplements intake in both bivariate and multivariate analysis.

Conclusion: The mothers from Dalit, Janjati and other marginalized group, living in hill region, with no education and higher age were less likely to take IFA supplements. Therefore, such groups should be counseled to increase the use of IFA.

Keywords: Iron-folic acid supplements, NDHS, Nepal, pregnancy, women

Correspondence

Ira Shrestha

Assistant Professor, Department of Physiology, School of Medicine

Patan Academy of Health Sciences, Lalitpur, Nepal

Email: irashrestha@pahs.edu.np

INTRODUCTION

Iron supplementation of mother during pregnancy protects her and her infant against anemia which is one of the major cause of perinatal and maternal mortality.^{1,2} Folic acid is also critically important for fetal development as it plays a vital role in DNA synthesis. It is also well known for prevention of neural tube defect.³ WHO recommends that all pregnant women in areas where anemia is prevalent should receive iron-folic acid (IFA) supplements.⁴ Anemia is prevalent in Nepal⁵ and so pregnant women are advised to take iron-folic acid tablets daily throughout their pregnancy and lactation, starting from second trimester till 45 days after delivery.⁶ The greatest mortality sparing effect was seen with early initiation and use of greater number of IFA.⁷ However, not all women take the iron-folic acid tablets as recommended and some do not take at all.⁶ Thus, this study aims to analyze the factors affecting the use of IFA supplements during last pregnancy among women of reproductive age.

METHODS

2011 Nepal Demographic and Health Survey (NDHS) data was used. Dependent variable contained women with a live

birth in the last five years and taking at least 1 tablet/syrup of IFA (coded as 1) and women not taking any tablet/syrup

during the study period (coded as 0). Key background variables of women and their child: size of child at birth, place of residence and eco-zones, mother's age, education level, ethnicity and household wealth status were used as independent variables. Logistic regression was used to find the association between the dependent and independent variables without controlling (bi-variate) and controlling (multi-variate) for other factors during analysis. SPSS software version 20.0 was used for all the analysis.

RESULTS**Univariate analysis:**

Altogether 5193 children were born five years prior to the NDHS-2011 survey. Out of them 4147 were last child and their mother's were asked IFA questions. Nearly 60% of women received or bought iron/folic acid tablets whereas about 17% of them did not receive/buy these supplements during their last pregnancy.

Table 1: Use of iron-folic acid supplements by women of reproductive age according to socio-demographic variables, 2011 NDHS

Background Variables	Number (N)	Percentage (%)	Background Variables	Number (N)	Percentage (%)
Demographic					
Size of last child at birth			Highest educational level		
Very large	83	2.0	No education	1822	43.9
Larger than average	694	16.7	Primary	835	20.1
Average	2716	65.5	Secondary	1228	29.6
Smaller than average	511	12.3	Higher	263	6.3
Very small	136	3.3	Ethnicity		
Don't Know	6	.2	Hill Brahmin	456	11.0
Mother's age (years) at birth of the child			Hill Chhetri	794	19.2
15-19	332	8.0	Terai Brahmin/ Chhetri	33	.8
20-24	1329	32.0	Other Terai caste	414	10.0
25-29	1310	31.6	Hill Dalit	448	10.8
30-34	670	16.2	Terai Dalit	235	5.7
35-39	317	7.6	Newar	127	3.1
40-44	140	3.4	Hill Janajati	999	24.1
45-49	50	1.2	Terai Janajati	396	9.5
Socioeconomic			Muslim	236	5.7
Region of residence			Other	10	.3
Mountain	306	7.4	Wealth index		
Hill	1669	40.2	Poorest	979	23.6
Terai	2173	52.4	Poorer	899	21.7
Type of place of residence			Middle	871	21.0
Urban	418	10.1	Richer	748	18.0
Rural	3729	89.9	Richest	649	15.7
Total (in each category)	4147	100.0			

Nearly 7 out of 10 children born were average in size, about 2 out of 10 larger than average and 1 out of 10 smaller than average. Nearly one third mothers were between 20-30

years and between 25-29 years. Approximately 5 out of 10 women lived in terai region, while 4 out of 10 were from hill region. Majority of women, about 9 out of 10, were from

Table 2: Bivariate and Multivariate analysis of intake of IFA supplements by women of reproductive age using multiple logistic regression, 2011 NDHS

Background Variable	Unadjusted				Adjusted			
	OR	95% CI of OR		p-value	OR	95% CI of OR		p-value
Size of the last child at birth	Reference category							
Very small	Reference category							
Very large	1.412	.748	2.663	0.287	1.300	.643	2.628	.465
Larger than average	1.561	1.032	2.362	0.035	1.492	.935	2.381	.093
Average	1.608	1.097	2.357	0.015	1.529	.991	2.359	.055
Smaller than average	1.134	.745	1.725	.558	1.219	.760	1.957	.411
Mother's age (years)at birth of the child	Reference category							
45-49	Reference category							
15-19	11.528	5.953	22.324	.000	5.238	2.589	10.596	.000
20-24	9.725	5.324	17.763	.000	4.315	2.274	8.186	.000
25-29	8.878	4.864	16.202	.000	3.968	2.097	7.508	.000
30-34	5.560	3.021	10.231	.000	2.536	1.329	4.840	.005
35-39	.000	3.705	1.975	6.952	2.504	1.289	4.863	.007
40-44	.334	1.394	.710	2.734	1.041	.512	2.113	.912
Region of residence	Reference category							
Terai	Reference category							
Mountain	.000	.532	.404	.699	.788	.548	1.133	.198
Hill	.000	.590	.505	.690	.735	.567	.954	.021
Type and place of residence	Reference category							
Rural	Reference category							
Urban	2.121	1.564	2.876	.000	0.939	.660	1.337	.728
Highest educational level	Reference category							
No education	Reference category							
Primary	1.686	1.394	2.040	.000	1.312	1.055	1.632	.015
Secondary	5.064	4.058	6.321	.000	2.506	1.908	3.293	.000
Higher	19.335	8.759	42.678	.000	6.157	2.667	14.215	.000
Ethnicity	Reference category							
Hill Brahmin	Reference category							
Hill Chhetri	.339	.228	.504	.000	.800	.518	1.236	.315
Terai Brahmin/Chhetri	.426	.155	1.171	.098	.495	.166	1.478	.208
Other terai caste	.241	.159	.367	.000	.396	.240	.652	.000
Hill Dalit	.235	.155	.355	.000	.692	.438	1.095	.116
Terai Dalit	.226	.143	.359	.000	.511	.296	.883	.016
Newar	.921	.440	1.925	.826	1.029	.473	2.242	.942
Hill Janjati	.179	.123	.262	.000	.399	.264	.604	.000
TeraiJanjati	.393	.252	.611	.000	.732	.437	1.225	.235
Muslim	.286	.178	.458	.000	.615	.355	1.066	.083
Others	.631	.088	4.536	.647	.434	.057	3.318	.421
Wealth index	Reference category							
Poorest	Reference category							
Poorer	2.123	1.737	2.594	.000	1.677	1.340	2.100	.000
Middle	2.680	2.170	3.309	.000	1.638	1.270	2.112	.000
Richer	4.815	3.728	6.219	.000	2.317	1.694	3.169	.000
Richest	11.456	7.955	16.499	.000	4.283	2.748	6.675	.000

rural area. Similarly about 4 out of 10 women had no education and only about 1 out of 10 had higher education. Nearly one fourth women were hill janjati. About 2 out of 10 women were in the poorest wealth index and nearly 2 of 10 women were in richest wealth index.

Bivariate Analysis

The odds of taking iron-folic acid (IFA) supplements were 1.56 times and 1.60 times higher among women who had larger than average size child and women who had average size child respectively as compared to women with very small size child. The 95% odds ratio intervals of these groups were 103%-236% and 110%-236% respectively.

The probability of taking IFA supplements was 11.53 times greater among women of 15-19 years than women of 45-49 years. The odds of taking IFA supplement were 9.7 and 8.9 times greater among women of 20-24 and 25-29 years respectively than women of 45-49 years. Similarly, the odds of taking IFA supplements among women of 30-34 and 35-39 years were 5.6 and 3.7 times greater respectively than women of 45-49 years. The 95% odds ratio intervals of these age groups were 596%-2232%, 532%-1776%, 486%-1620%, 302%-1023%, and 198%-695% respectively.

The chances of taking IFA supplements among women of mountain and hill region were 47% and 41% less as compared to women of terai region and the 95% odds ratio interval were 30%-60% and 31%-49% respectively.

The odds ratio of taking IFA supplements among urban women was 2.1 times greater than rural women. The 95% odds ratio interval ranged from 156%-287%.

The chances of taking IFA supplements among women with primary, secondary and higher education were 1.69, 5.1 and 19.3 times higher than women with no education. The 95% odds ratio intervals were 139%-204%, 406%-632% and 876%-4268% respectively.

The probability of taking IFA supplements among hill Chhetri women was 66% less as compared to hill Brahmin women. Similarly the odds ratio of taking IFA was about 76% less among both other caste terai women and hill Dalit. Similarly the odds ratio of taking IFA was about 77% less among terai Dalit women as compared to hill Brahmin women. In addition, the odds of taking IFA among hill, terai Janjati and Muslim women were 82%, 61% and 71% less as compared to hill Brahmin women. The 95% odds ratio intervals of these groups were 50%-77%, 63%-84%, 64%-84%, 64%-86%, 74%-88%, 39%-75% and 54%-82% respectively.

The chances of taking IFA supplements were 2 and 2.7 times higher respectively among women with poorer and middle wealth index compared to women with poorest wealth index. Similarly, women with richer and richest wealth index had 4.8 times and 11.3 times respectively higher odds of

taking IFA as compared to women with poorest wealth index. The 95% odds ratio intervals of these groups were 173%-259%, 217%-330%, 372%-622%, and 796%-1650% respectively.

Multivariate analysis:

Multivariate analysis gave adjusted odds ratios. This study found the age, region of residence, education, ethnicity and wealth index of women affected the intake of iron/folic acid supplements after controlling the effect of other variables. The size of the child did not make any significant difference in the chances of taking IFA supplements among the women.

The odds of taking IFA supplements were 5.2 times, 4.3 times and 4 times higher among women of 15-19, 20-24 and 25-29 years respectively as compared to women of 45-49 years. Similarly the chance of taking IFA among women of both group of 30-34 years and 35-39 years were 2.5 times higher than women of 45-49 years. The 95% odds ratio intervals of these groups were 258%-1059%, 227%-818%, 209%-750%, 132%-484% and 128%-486% respectively.

The chances of taking IFA supplements among women of hill region was 26% less than women of terai region and the 95% odds ratio interval was from 5%-43%. The type of place of residence (rural or urban) did not make any difference in chances of taking IFA among women. The probability of taking IFA supplements was 1.3 times, 2.5 times and 6.2 times higher among women with primary, secondary and higher education respectively than women with no education. The 95% odds ratio intervals in these groups were 105%-163%, 191%-329% and 267%-1421% respectively. The chances of taking IFA supplements were 60% less among both other terai caste and hill janjati women as compared to hill brahmin women. Similarly, the chances of taking IFA supplements was 49% less among terai dalit women than hill Brahmin women. The 95% odds ratio intervals in these groups were 35%-76%, 40%-74% and 12%-70% respectively.

The odds of taking IFA supplements among women with poorer and middle wealth index were 1.7 times and 1.6 times higher respectively as compared to women with poorest wealth index. Women with richer and richest wealth index had 2.3 times and 4.3 times respectively higher chances of taking IFA than women with poorest wealth index. The 95% odds ratio intervals in these groups were 134%-210%, 127%-211%, 169%-317% and 275%-668% respectively.

DISCUSSION

The factors that affected iron/folic acid (IFA) supplement intake were age, region of residence, level of education, ethnicity and wealth index of the women when analyzed separately.

This study showed that mothers with larger infants took more IFA supplements as compared to mothers with very

small infants, although it was not statistically significant. However, in other studies significant findings were present between size of the infant and intake of IFA^{8, 9}. Younger mothers were more likely to take greater number of IFA supplements than the older mothers. However, this was in contrary to findings of other studies^{10, 11} where older mother were more likely to take IFA supplements. Women of hill region were less likely to take IFA than women of terai region. This might be due to limited availability and access to health care services in these regions, as found in a study from Indonesia. The place of residence did not make any difference in the chances of taking IFA in our study. However in another study women from rural areas were less likely to use IFA supplements.¹²

The chance of taking IFA was greater in women with higher education. This finding was similar to other findings^{13, 14} but contrary to finding in Sudan.¹¹ The probability of taking IFA supplements were less in some Dalit, Janjati and few terai caste which are said to be marginalized group. They may have low socioeconomic condition which may be a reason for not taking the supplements as mothers with better wealth index were more likely to take IFA in our study. This finding was similar to other findings.^{12, 14, 15} The mothers with low socioeconomic status might lack proper knowledge about maternal health. They might perceive pregnancy as a normal event not requiring any special attention until emergency arises. This perception would have contributed to late attendance at antenatal care services, and eventually late and lesser utilization of IFA supplements.¹⁶ Therefore, health promotion programs should be targeted to this population group to increase the awareness and intake of IFA supplements. A study from India reported that a continuous counseling session could improve the compliance with taking iron/folic acid supplements amongst pregnant women.¹⁷

LIMITATIONS

The main limitation of this study was to ask the questions for the last child only instead of all the children born the last five years before the NDHS Survey. The other limitation was to include all the women taking even less than recommended doses of IFA supplements as the positive category of the dependent variable.

CONCLUSION

The mothers from Dalit, Janjati and other marginalized group, living in hill region and with no education were less likely to take IFA supplements. However, young mothers were more likely to use IFA supplements than old mothers. This suggests that antenatal care and counseling should be focused more on these targeted groups to increase the intake of IFA supplements so that the rate of neonatal and maternal mortality can be reduced.

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