

# Compliance of Iron and Folic Acid Supplementation among Postpartum Urban Mothers of Kathmandu Valley

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## ABSTRACT

**Introduction:** Globally, iron deficiency anaemia is considered as a risk factor for maternal morbidity and mortality. It is estimated to cause 591,000 perinatal deaths and 115,000 maternal deaths annually. The World Health Organisation recommends iron supplementation to first trimester to 45 days after delivery. The Government of Nepal is supplementing Iron and Folic Acid (IFA) to pregnant and postpartum women to reduce the burden of disease and deaths, however Nepal reports low compliance and coverage. We sought to determine compliance of IFA and associated factors among postnatal mothers in Kathmandu valley.

**Methods:** A cross-sectional study was conducted with 132 mothers attending the immunisation clinic. Face to face interview was done using structured questionnaire consisting of sociodemographic information, IFA, maternal knowledge and compliance practices. Statistical analysis was done using SPSS version 23.

**Results:** We found 68.9% compliance of IFA among the respondents. The mean age of the respondents was  $27.53 \pm 4.6$  years (Mean  $\pm$  SD). Significant association was observed between the compliance of IFA with education, age, employment status of women and family type ( $p < 0.00$ ). No significant association was observed in the compliance of IFA and religion ( $p = 0.93$ ) and delivery related complications ( $p = 0.143$ ). Similarly, delivery type showed significant association with the compliance of IFA ( $p < 0.00$ ).

**Conclusions:** This study concludes that mothers from Kathmandu had better compliance and coverage of IFA was found. Private pharmacy is an important service provider for urban women.

**Key Words:** Compliance; Folic Acid; Iron; Post-partum mothers



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## INTRODUCTION

Iron deficiency anaemia (IDA) is one of the commonest types of nutritional anaemia worldwide and is considered a major public health problem in developing countries,<sup>1</sup> and one of the leading cause of maternal morbidity and mortality world-wide.<sup>2-4</sup> Globally more than 1.6 billion people suffer from anaemia and currently pregnant women are the most vulnerable population corresponding to 24.8%.<sup>5</sup> IDA is considered as a risk factor for mortality and is estimated to cause 591000 perinatal deaths and 115000 maternal deaths.<sup>6</sup> It is an important risk factor for mortality and global burden of disease.<sup>7,8</sup> Consequences related to maternal and child mortality, poor cognitive and physical development among children, and premature delivery among women are associated with IDA. Similarly, people with anaemia could have symptoms of weakness, fatigue, poor work productivity or difficulty in concentrating. The mechanisms are mainly due to a decreased maximal oxygen.<sup>9</sup> In order to prevent IDA, the Government of Nepal has been conducting the free iron distribution program to pregnant and postpartum women through government health facilities.<sup>10,11</sup>

The highest prevalence of anaemia exists in the developing world, and its causes are multifactorial.<sup>12</sup> It remains a major public health challenge with a prevalence rate of 47% among non-pregnant and 52% in pregnant women in South and Southeast Asian (SSEA) countries.<sup>13</sup> According to Nepal Demographic and Health Survey (2016), 41% women between 15 to 49 years were anaemic. Majority of these women were mildly anaemic (34%); 7% moderately and less than 1% severely anaemic. Pregnant women and breastfeeding women (46%) were more likely to be anaemic than others (39%).<sup>14</sup> Furthermore, anaemia among children is also widely reported.<sup>14,15</sup>

Iron deficiency is manifested mostly as IDA which has a prevalence of nearly 48% in six to 59 months old children in Nepal.<sup>16</sup> Despite IFA supplementation being a prioritised program in Nepal since 1980s, anaemia during pregnancy is still an existing public health problem and is above 40%.<sup>17</sup> The coverage of first-time iron distribution was high at 73% nationally with the highest

coverage in Karnali province and Province five (101% and 100% respectively), but the compliance of taking 180 tablets throughout the pregnancy (45%) and 45 days post-partum (38%) is substantially low. Province three has the lowest coverage amongst all for all three indicators.<sup>18</sup> There were only 73% of pregnant women who received IFA for the first time. Only 45 out of 100 pregnant women received 180 tablets IFA. Furthermore, only 38% of postpartum women received IFA. Out of seven provinces, province 3 has the lowest coverage consisting of the first-time receiver 48%, 180 tablet receivers 28%, and postpartum women receiver 22%.<sup>14,18</sup>

The reported evidences shows that compliance and coverage of IFA is problematic with various underlying causes. Therefore, this study aims to explore the status of coverage, compliance of IFA among postnatal women visiting the immunisation clinic of Kathmandu.

## METHODS

We conducted an institution based descriptive cross-sectional study among mothers with children less than one-year age who visited immunisation clinic for vaccination of their baby at the Chhetrapati Family Welfare Centre (CFWC) Kathmandu, Nepal. It is a unique model of public-private partnership and provides family planning services, immunisation services, ANC checkup, postnatal checkup and other health services. The centre serves around of 65 clients per day for routine health services. Total sample size was 132, non-probability purposive sampling technique was used for data collection from the mothers who had completed their 45 days of delivery and had child <1 years of age. We interviewed the participants till we reached the desired sample size. The data collection for the present study was conducted from February 4<sup>th</sup> to 22<sup>nd</sup> 2020.

A structured, interview schedule was developed consisting of 27 questions. The interview schedule included demographic information (14 questions), maternal knowledge (Six questions) and current practices and compliance towards IFA (Seven questions). Pretesting of tool was performed at Family Planning Association (FPAN) Jadibuti

branch of Kathmandu district and needful modification was done prior to field work. In order to minimise bias, participants were given adequate time to think and provide the correct answer. We collected data by face to face interview. Data were checked for consistency and completeness, and then descriptive and analytic statistics were carried out. Chi-square test was performed to check the relationship between dependent variable and independent variables. Variables with  $p < 0.05$  were considered statistically significant. Statistical Package for Social Science (SPSS) version 23 was used to perform the analysis.

Permission was obtained from the Asian College for Advance Studies and Chhetrapati family welfare centre prior to study. Informed verbal consent was obtained from the study participant after counselling them regarding the purpose of the study, benefits and harms of participating in the study. We followed World Medical Association (WMA) declaration of Helsinki on ethical principles for medical research involving human subjects. Respondents were ensured for voluntary participation and confidentiality of provided information.

## RESULTS

Table 1 shows the sociodemographic information of the respondents. Mean age of the respondents was  $27.73 \pm 4.6$  (Mean $\pm$ SD) as in foot note of table 1. Most of the (71%) respondents were in the age group 23 to 33 years and were the highest age group among all. Nine out of 10 (92.4%) respondents followed Hindu religion.

Table 2 shows more than half (65.9%) of the women delivered at the Government health facility and very few respondents also had home delivery which accounted for 2.3% of total delivery. Most of the respondents did not have complications during childbirth. Most of the them (85%) had normal delivery and rest of them had Cesarean sections.

Nearly seventy nine percent reported IFA should be started at four months of pregnancy (Table 3). Most of the respondents replied that IFA should be taken once a day and should be continued from fourth month of pregnancy to 45 days after delivery.

**Table 1.** Distribution of socio-demographic

Characteristics	Number	%
<b>Age (Years)</b>		
< 22	26	19.7
23 - 33	94	71.2
> = 34	12	9.1
<b>Education</b>		
Literate	28	21.2
Primary	26	19.7
Secondary	38	28.8
Higher	40	30.3
<b>Occupation</b>		
Housewife	95	72.0
Agriculture	2	1.5
Business	20	15.2
Service	15	11.4
<b>Family type</b>		
Joint	51	38.6
Nuclear	81	61.4
<b>Religion</b>		
Hindu	122	92.4
Muslim	8	6.1
Christen	2	1.5
<b>Number of Child</b>		
1	81	61.4
2 and More	51	38.6
<b>Age at first childbirth (Years)</b>		
< 20	26	19.7
> = 20	106	80.3
<b>Ethnic group wise distribution of respondents</b>		
Brahmin / Chhetri	55	42
Janajati	50	38
Dalit	13	10
Madhouse	7	5
Muslim	7	5

*Mean age Mean  $\pm$  SD (27.53  $\pm$  4.6)*

Nearly all (97.7%) reported they had ANC visits during the pregnancy period and 83.3% had four or more visits during the ANC period.

Regarding IFA compliance, nearly all (94.7%) mothers had started from fourth month of ANC and about eighty five percent consumed up to 45 days of post-delivery (Table 4). More than half (50.8%) had purchased from private outlets and the rest of

**Table 2.** Distribution of obstetrical Information of the respondents (n = 132)

Characteristics	Number	%
<b>Place of delivery</b>		
Home	3	2.3
Private Hospital	42	31.8
Government Hospital	87	65.9
<b>Complication during childbirth</b>		
Yes	20	15.2
No	112	84.8
<b>Type of delivery</b>		
Normal delivery	113	85.6
Caesarean section	19	14.4

the respondents from Government health centres. About 68.9% of the mother had consumed 225 tablets during and after ANC.

Table 5 shows there is significant relationship with compliance of IFA, education, employment, age of respondents and family types ( $P < 0.05$ ). No significant association was observed in between the compliance of IFA and religion of the women ( $p = 0.93$ ) and delivery related complications ( $p = 0.143$ ). Similarly, delivery type showed significant association with the compliance of IFA ( $p < 0.00$ ) was found.

## DISCUSSION

In this study, we found that mothers aged 23 to 33 years were visiting the immunisation clinic. Government health facility was reported as first choice for delivery among them. We found that seven out of ten to have compliance as per protocol.

Worldwide socio-demographic characteristics are said to be an influencing factor for IFA compliance among pregnant.<sup>19,20</sup> The compliance level is directly influenced by the age, socioeconomic status, cost of IFA tablets and birth order. Perceived side effects, lack of clarity on importance of IFA during pregnancy decreased the overall compliance.<sup>21</sup> Study from South India shows the average age of mothers to be 25.8 years and most of them were from lower socio-demographic class. The compliance was 64.7% whereas in our study we found compliance to be 68.9%. The compliance

**Table 3.** Respondent's knowledge on initiation, consumption and duration of Iron and Folic Acid (IFA) (n = 132)

Characteristics	Number	%
<b>Start to take IFA</b>		
Before conception	11	8.3
Immediately after conception	29	22.0
Four months of pregnancy	91	68.9
<b>Consumption IFA / Day</b>		
Once	126	95.5
Twice	5	3.8
<b>IFA consumption duration</b>		
4th month of pregnancy to 45 days after delivery	99	75.0
4th months of pregnancy to delivery	32	24.2
<b>Antenatal visit</b>		
Yes	129	97.7
No	3	2.3
<b>First antenatal visit (Month) (n = 129)</b>		
2nd	55	41.7
3rd	24	18.2
4th	50	37.9
<b>First antenatal visit (Month) (n = 129)</b>		
<4 Visit	19	14.7
>=4 Visit	110	85.3

**Table 4.** Distribution of compliance of Iron and Folic Acid (IFA) supplementation by respondents (n=132)

Characteristics	Frequency	%
<b>Starting time of IFA consumption of Pregnancy (Months) (n = 131)</b>		
4 <sup>th</sup>	125	94.7
5 <sup>th</sup>	2	1.5
After delivery	4	3.0
<b>Source for IFA (n = 131)</b>		
Government Health centre	64	48.5
Private pharmacy	67	50.8
<b>Compliance of IFA</b>		
Consumed 225 tablets	91	68.9
Consumed < 224 tablets	40	30.3
<b>Days for consumption of IFA after delivery (n = 110)</b>		
45 days after delivery	93	85
First two weeks of delivery	9	8
One month after delivery	8	7

**Table 5.** Association between compliance of IFA and selected socio-demographic and obstetric information (n = 132)

Characteristics	Compliance	No Compliance	Chi Square ( $\chi^2$ )	P-Value
<b>Education Level</b>				
Primary Level	29 (53.7%)	25 (46.3%)	9.906	0.002*
Secondary and above	62 (79.5%)	16 (20.5%)		
<b>Age</b>				
< 20 years	8 (33.33%)	16 (66.66%)	17.73	< 0.00*
> 20 years	83(23.14%)	25 (76.85%)		
<b>Working Status</b>				
Working	45 (19.29%)	30 (70.71%)	6.4819	< 0.00*
Not Working	46 (19.29%)	11 (70.71%)		
<b>Family Types</b>				
Joint	30 (52.28%)	33 (47.61%)	25.58	< 0.00*
Nuclear	61 (11.14%)	8 (88.86%)		
<b>Religion</b>				
Hindu	84 (31.14%)	38 (68.85%)	0.0057	0.93
Others	7 (30.0%)	3 (70.0%)		
<b>Number of children</b>				
Single	60 (25.92%)	21(74.07%)	2.581	0.108
2 and more	31 (39.21%)	20 (60.78%)		
<b>Complication during delivery</b>				
Yes	11 (45.00%)	9 (55.0%)	2.138	0.143
No	80 (28.57%)	32 (71.43%)		
<b>Delivery Type</b>				
Normal	83 (26.54%)	30 (74.45%)	7.463	<0.00*
CS	8 (57.89%)	11 (42.11%)		

\*= statistically significant

is said to be increased with age, birth order and single daily dose.<sup>22</sup> Another study from Nepal demonstrated that the role of influence of education status, ANC visits, delivery place and PNC visits influenced the compliance.<sup>23</sup> Another study from Ethiopia conducted on pregnant women at their ANC visits showed that IFA supplementation was 52.9%.<sup>24</sup> In our study, we found that ninety five percent starts IFA supplementation at fourth months of pregnancy. Mother's education has been consistently reported as a significant determinant of maternal health and increased health service utilisation.<sup>25</sup> Education also enables mothers to understand and use the health information effectively, to comply with the advice, and to take an informed choice for themselves. Several previous studies have reported the effect of education on higher utilisation of services which were also reported in our study.<sup>24,26</sup>

We still found that women been delivering at home. It is obvious to have complications during childbirth at home however we did not find many mothers with complications. Being of urban women, the mother might have good access to maternal and child health services.<sup>27</sup> Nearly seven among 10 were aware about initiation time for IFA and reported that they started IFA from the 4th months of pregnancy. Majority were aware that IFA should be taken once a day from the fourth month of childbearing to 45 days of delivery. Almost all women visited nearest health facilities for ANC among them more than 83% visited as per protocol in Nepal.<sup>14</sup> Private outlets were one of the famous destinations for purchasing IFA. Seven out of 10 consumed IFA as per protocol.<sup>18</sup>

Education status of the mother plays a significant role in IFA compliance.<sup>23</sup> Similar evidence was also



generated from study in Ethiopia. Those mothers attending secondary school are three times more likely to have IFA compliance. Similarly, the study also demonstrated the strong role of ANC visits, knowledge and anaemia history for IFA compliance.<sup>24</sup> In our study also, we found a positive role of ANC visits towards better IFA compliance. Another study from Ethiopia also showed the influences of education status, knowledge on anaemia and knowledge on benefits of IFA for better compliance. Both the Ethiopian studies reported lower compliance than present study. Another study from the Terai region of Nepal reported about 58% IFA compliance.<sup>17</sup> Nationally representative study NDHS 2011 shows that 20.7% consumed IFA throughout 45 days of PNC which is lower than the present status as explored through this study.<sup>28</sup> Studies concluded that the compliance of IFA is worse in lower socio-economic communities.<sup>22</sup> However, we could not explore the economic status of the current respondents to segregate their economic status.

There are reported evidences that IFA reduces the child mortality in Nepal. The positive effects of IFA have been also reported by another study from Terai of Nepal. IFA supplementation to mothers been significantly contributed to reduction in childhood stunting.<sup>29</sup> IFA supplementation status of mothers, consumption of additional food during ANC period is also said to be responsible for LBW in Nepal.<sup>17</sup> Though, we were limited only on mother's compliance and therefore we are unable to comment on child survival status, impact of IFA consumptions and its economic as well as health impacts. Due to lower sample size and involving only urban women the study findings could not be generalised for wider country context and robust statistical analysis could not perform to explore the factors for IFA. However, it provides crucial

information about IFA status in urban communities. In our study, we interviewed the mothers who were aware about the health of their babies, importance of vaccination and attending the immunisation clinic. So, only those mothers might have been there who are were health conscious. Therefore, the study findings might have come from these respondents who were more conscious about health of own and babies. Also, we did not explore about the weight of babies at birth. Thus, there might have some information bias about their IFA history, and we did not get enough evidence to compare the weight of child as per their compliance status. We would like to recommend another study with larger sample size and focused on IFA compliance in urban areas of Nepal where still the IFA compliance can be another unseen programmatic hurdle to improve the maternal and child health.

## CONCLUSIONS

Compliance of IFA in Urban area of Kathmandu had found better. Private service provider were identified as major source of service provider in Urban area. Role of socio-demographic and health service-related variable were observed. Still, there is need to intervene to those with low IFA compliance. Intervention should be designed based on improved technology and addressing the socio-demographic and health service-related characteristics.

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