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Factors Affecting Adherence to Iron-Folic Acid Supplementation During Pregnancy in Rawalpindi

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ABSTRACT

Objectives: To determine frequency of adherence to Iron Folic Acid supplementation (IFAS) and to identify determinants of adherence to IFAS in pregnant women of Rawalpindi.

Study Design: Cross-sectional study.

Place and Duration of Study: Department of Gynecology and Obstetrics, Fauji Foundation Hospital, Rawalpindi, Pakistan, from Oct 2021 to Mar 2022.

Methodology: Three hundred and ninety-nine pregnant women in their second and third trimesters of pregnancy meeting our inclusion criteria were recruited. A pre-validated, open-access questionnaire, including informed consent, demographic information, and items related to IFAS adherence, including reasons for non-adherence, counselling by healthcare provider, polypharmacy, family support, and whether or not the pregnancy was planned, was administered.

Results: Forgetfulness (23.7%), abdominal pain (13.4%), nausea (14.4%), and unpleasant taste (11.3%) were main reasons reported for non-adherence. There was a significant association between education (p=0.001), monthly income (p=0.03), area of residence (p=0.001), planned pregnancy (p=0.001), husband's support (p< 0.001), counseling by healthcare provider regarding the importance of IFAS (p=0.003), availability (p< 0.001), accessibility (p< 0.001) and affordability (p< 0.001) of IFAS supplements and adherence.

Conclusion: The majority of women reported adherence to the prescribed IFAS supplementation. Higher education, planned pregnancy, urban residence, husband's support, counselling by healthcare provider, affordability, availability and accessibility were associated with adherence. For those who reported non-adherence, forgetfulness and side effects were main reasons reported for non-adherence. Training of healthcare professionals to provide better counseling to women and their husbands during Antenatal care is recommended.

Keywords: Folic Acid, Iron-deficiency Anemia, Medication Adherence, Pregnancy.

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INTRODUCTION

The impact of a woman's health during pregnancy on her and her baby's well-being is indisputable. During the gestational period, there is an increased need for elements such as iron and folic acid because of the modifications occurring in the pregnant woman's physiology and the rapid growth and development of the fetus.[1] It is during this time that deficiencies of these vital micronutrients can develop.[2] Iron deficiency anemia in pregnancy is a noteworthy issue in developing countries, with 41.8% of pregnant women being diagnosed with this condition at one point or another during their pregnancy.[3]

Literature suggests that the deficiency of iron as well as folic acid during pregnancy can cause life-threatening congenital fetal anomalies, including hemorrhagic newborn disease, neural tube defects, craniofacial deformities, as well as cognitive dysfunction.[4] To obviate these effects, the World Health Organization recommends adherence to Iron-Folic-Acid supplementation as advised by healthcare providers.[5] However, non-adherence to Iron Folic Acid supplementation remains a problem in developing countries.[6]

Local studies show that lack of awareness about the benefits of Iron Folic Acid supplementation, poor affordability and non-availability of supplementation all contribute to iron deficiency anemia in pregnant as well as non-pregnant women of reproductive age (WRAs) in Pakistan[7,8] whereas international studies cite reasons such as polypharmacy, forgetfulness, lack of social and family support and fear of side effects for

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not taking the medication as prescribed by the health care providers.[9]

The study was conducted to evaluate the frequency of adherence to IFAS during pregnancy, as well as to evaluate factors leading to both adherence and non-adherence, based on which recommendations can be made as to how non-adherence can be addressed, and adherence encouraged.

METHODOLOGY

This cross-sectional study took place at the Department of Obstetrics and Gynecology at Fauji Foundation Hospital, Rawalpindi, Pakistan, from October 2021 to March 2022, after approval from the Institutional Ethical Review Committee (Letter no. FF/FUMC-215-122/Phy/21).

Inclusion Criteria: Pregnant women in their second and third trimester of pregnancy, coming to the Gynecology and Obstetrics OPD at Fauji Foundation Hospital Rawalpindi for their second or more antenatal visit were included.

Exclusion Criteria: Pregnant women in first trimester, women diagnosed with diseases that can lead to anemia, even in the absence of Iron deficiency, including aplastic anemia, bone marrow suppression, chronic kidney disease, pernicious anemia, hemolytic anemia, and sickle cell anemia were excluded.

Using the WHO online calculator, taking a 95% Confidence Interval and a 5% Margin of Error, and a previous prevalence of non-adherence being 67.3%,[10] our sample size came to 340. To accommodate for possible non-response or incomplete forms, we recruited 399 participants. Participants were recruited using non-probability consecutive sampling, after obtaining written informed consent. Data was collected through a pre-validated questionnaire from a similar, open-access study that permitted unrestricted use and reproduction in any medium.[11] A pilot study was conducted to determine its reliability. The Cronbach's alpha was found to be 0.83.

The data collection tool comprised of the following sections: (i) Informed consent, (ii) information sheet, which comprised of information about the research and respondent's signature, demographic information which included age, level of education, area of residence, family structure, monthly household income, employment status, number of existing children, and number of family members, (iii) information obtained from antenatal card which included previous and current hemoglobin, gestational age, gravidity, past medical history, history of disease during the current pregnancy, history of miscarriage or stillbirth, dosage and salt of prescribed IFA supplement, and drug history, which may indicate polypharmacy, and (iv) factors influencing compliance to iron-folic acid supplementation, which included information about prescribed IFA supplementation, moreover husband's support in taking prescribed IFA supplementation, and counseling by a healthcare professional regarding and knowledge about the benefits of IFA supplementation.

Further information about the availability, accessibility, and affordability of prescribed IFA supplementation and possible reasons for non-adherence, including forgetfulness, unpleasant taste, and perceived side effects, among others, all of which are independent variables, was asked in the questionnaire. Adherence was defined as the pregnant woman following the prescribed supplementation as explained by her healthcare provider. Husband's support included the pregnant woman's husband being agreeable to and providing necessary assistance in accessing, acquiring, and consuming the IFA supplement as prescribed. A planned pregnancy was defined as one that the couple intended to occur.

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics were presented as frequencies and percentages (age groups, areas of residence, income groups, adherence to IFAS supplementation), and mean and standard deviation (age, hemoglobin levels). For inferential statistics, Chi-Square test of analysis was used to assess the association between dependent and independent variables. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

Three hundred and ninety-nine women meeting our inclusion criteria were included in the study, with no participants being lost to incomplete forms or non-response. The mean age of the participants was 30±5.19 years. Demographic details of participants are given in Table-I.

Out of 399 participants, 302(75.7%) participants adhered to IFA supplementation, whereas 97(24.3%) participants showed non-adherence to prescribed supplements (Table-II).

Table-I: Demographic Details of Participants (n=399)

Variables		Frequency n(%)
Age (years)	Under 18	4(1.0)
	18 to 23	40(10.59)
	24 to 29	158(39.0)
	30 to 34	131(32.94)
	35 to 39	43(10.59)
	40 and above	23(5.88)
Education	Matric or under	153(38.24)
	Fa/FSc.	101(25.29)
	BA/BSc.	84(21.18)
	MA/MSc. or above	61(15.29)
Variables		**n(%)**
Employment status	Employed	148(37.05)
	Unemployed	251(62.95)
Family Type	Nuclear	178(44.71)
	Joint	221(55.29)
Area of Residence	Urban	248(62.06)
	Rural	151(37.94)

Table-II: Frequency of Adherence to IFA Supplementation in Study Participants (n=399)

Variables		n(%)
Adherence to IFA supplementation	Yes	302(75.7)
	No	97(24.3)

** IFA: Iron Folic Acid*

The 24.3% respondents who answered "No" to the question on whether or not they took the prescribed Iron Folic Acid supplement as prescribed were then asked to give the reason for their non-adherence. These mainly included forgetfulness (27.7%), unpleasant taste (11.3%) and abdominal pain (13.5%). These reasons can be seen in Table-III.

There was a significant association between level of education (p=0.001), respondents' monthly income (p=0.03), and their area of residence (p=0.001) and adherence to the prescribed IFAS. There was a statistically significant association between age and adherence, with the highest adherence being observed in the 24-29 (31.82%) and 30-34(23.05%) year age groups (p=0.04). Employment status was not significantly associated with adherence to the prescribed supplement (p=0.47)

It was also found that a statistically significant association was found between the current pregnancy being planned and adherence to the prescribed Iron Folic Acid supplement, with 84.04% of women with planned pregnancies reporting medication compliance (p=0.001).

Counseling by a healthcare provider regarding the importance of IFA supplementation during pregnancy was also significantly associated with adherence to the prescribed supplement (p= 0.003), with over 65% (n=261) of women who were adherent reporting to have been counselled by their healthcare provider on the importance of these supplements during pregnancy.

Awareness of the benefits of the prescribed IFA supplementation to the mother (p=0.000) and baby (p=0.000), during pregnancy was significantly associated with adherence to the prescribed IFA supplements with nearly 63%(251) who reported adherence were aware of the benefits of IFA supplementation during pregnancy for the mother, and 61.15%(244) of women reporting adherence to their prescribed supplement, being aware of the benefits of IFA supplementation to the unborn baby.

Husband's support (p< 0.001), affordability (p< 0.001), availability (p< 0.001), and accessibility (p< 0.001), of prescribed IFA supplement were also found to have a positive association with adherence, as seen in Table-IV.

Table-III: Reasons for Non-Adherence in Pregnant Women (n=97)

Reasons	n(%)
Forgetfulness	27(27.7)
Unpleasant Taste	11(11.3)
Abdominal Pain	13(13.5)
Constipation	8(8.2)
Nausea	14(14.5)
Fear of Side Effects to Mother	7(7.2)
Fear of Side Effects to Fetus	7(7.2)
Lack of Counseling on How to Use Supplement	5(5.2)
Other	5(5.2)

DISCUSSION

The findings of this study showed that the parameters associated with high adherence to IFA were affordability, availability, and husband's support. The 244(61.15%) women reported adherence to their prescribed supplement, as they were well aware of the benefits of IFA supplementation to the unborn baby. For 27.7% of respondents, highlighted forgetfulness was the vital reason for non-adherence.

Table-IV: Analysis of Factors Affecting Adherence to IFA Supplementation (n=399)

Parameters	Adherence		*p*-Value
	Yes	No	
Counselling by healthcare provider n (%)	261(65.41) 68(17.04)	44(11.06) 26(6.49)	=0.003
Awareness of benefits of IFA to the mother n (%)	251(62.90) 39(9.77)	54(13.53) 55(13.80)	< 0.001
Awareness of benefits of IFA to the baby n (%)	244(61.15) 36(9.02)	61(15.28) 58(14.55)	< 0.001
Husband's support n (%)	271(61.15) 47(9.02)	34(15.28) 47(14.03)	< 0.001
Accessibility to IFAS n (%)	254(63.67) 50(12.53)	50(12.53) 45(11.27)	< 0.001
Affordability to IFAS n (%)	274(68.67)) 59(14.78)	31(7.78) 35(8.77)	< 0.001
Availability to IFAS n (%)	274(68.67) 61(15.28)	30(7.53) 34(8.52)	< 0.001

The associations between educational level, area of residence, and monthly household income and non-adherence to prescribed Iron Folic Acid supplements were found to be statistically significant. This is consistent with a study from West Bengal, India, where low monthly income, rural areas of residence, and lower education levels were also significantly associated (p=0.05) with lower adherence to the prescribed IFA supplement.[12] Additionally, regional studies have highlighted forgetfulness as the biggest reason for medical non-adherence, where the majority of non-adherent patients cited forgetfulness as the reason for not taking their medication as prescribed by their healthcare provider, and in the United States of America, where 57% of non-adherent women cited forgetfulness.[13,14] 14.4% of respondents described fear of side effects to both the mother and the unborn child as a reason for non-adherence to the prescribed Iron Folic Acid supplement. This is consistent with international studies, where 5% to 34% of patients avoided taking their prescribed medicines due to fear of side effects.[15,16]

The study found a significant association (p=0.001) between the current pregnancy being a planned one and adherence to the prescribed IFA supplement. This is consistent with a meta-analysis from the United States of America, where it was found that 94% of women with planned pregnancies were adherent to their prescribed medication, as opposed to women with unplanned pregnancies, out of whom nearly 40% were non-adherent.[17]

According to a study from Kiambu County, Kenya, counseling is a predictor of better understanding of the benefits, use, and side effects of Iron Folic Acid supplementation, which in turn is a key factor in adherence to the supplement.[18]

A lack of counseling on the benefits of Iron Folic Acid supplements during pregnancy and the mother's awareness regarding the advantages of IFA supplementation for both her and the unborn baby were found to be significantly associated with non-adherence to these supplements. This aligns with international studies showing poor adherence in mothers who had not been counseled by their healthcare providers about the benefits of Iron Folic Acid, as well as in mothers who were unaware of these supplements' benefits for themselves and their unborn babies, with non-adherence reported as high as 59.1% in women who have "low" knowledge of IFA supplementation during pregnancy.[19]

The study also showed that husbands' support was significantly associated with adherence to prescribed IFA supplementation. This is consistent with several international studies that report better medical adherence in people with support from their family members.[20,21] This study also showed that affordability, availability, and accessibility were found to have a statistically significant association with adherence to the prescribed Iron Folic Acid supplement. This is in line with an Ethiopian study, which shows that poor availability, accessibility, and affordability of a drug led to rates of adherence as high as 72%.[22]

Based on our findings, we recommend regular counseling by healthcare providers for married couples, including both husband and wife, during antenatal sessions. Healthcare providers must reinforce the benefits of prescribed supplementation for both the mother and the baby while addressing the couple's concerns about possible side effects for the mother and her unborn child. To this end, healthcare providers must be trained in the necessary counseling skills and techniques for the most effective communication.

LIMITATIONS OF STUDY

The limitations of our study may be that the participants' adherence to their prescribed Iron Folic Acid supplementation was established by recording their self-

reported response, which may be subject to bias or error. Additionally, data taken from only one hospital may not be generalizable to the entire population of Rawalpindi.

CONCLUSION

The majority of women reported adherence to the prescribed IFAS supplementation. Higher education, planned pregnancy, urban residence, husband's support, counselling by healthcare provider, affordability, availability, and accessibility were associated with adherence. For those who reported non-adherence, forgetfulness and fear of side effects were the main reasons reported for non-adherence. Training of healthcare professionals to provide better counseling to women and their husbands during Antenatal care is recommended.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

FARM & NA: Data acquisition, data analysis, critical review, approval of the final version to be published.

RA & NUSK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MR: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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