

**RESEARCH ARTICLE****ASSESSMENT OF SEVERITY OF IRON DEFICIENCY AND  
ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN**

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**ABSTRACT**

**Introduction:** Iron deficiency (ID) is a common problem in pregnant women. The primary drivers of anemia in pregnancy are ID, aplastic anemia, a lack of vitamin B12, and vitamin B9. ID is the most widely recognized and can lead to unfavorable pregnancy outcomes. Both ID and iron deficiency anemia (IDA) are normal clinical illnesses in pregnant women. Anemia can cause a compromised immune system during pregnancy, leading to negative outcomes including premature birth and premature rupture of membranes. **Objective:** The objectives of this research are to determine the severity of ID among pregnant women and to check the associated risk factors for ID. **Methodology:** It is a cross-sectional study in government hospitals in Lahore. The data was collected through a self-administered questionnaire. Simple random sampling techniques are used, and SPSS is used for data analysis. **Results:** According to this study, the prevalence of IDA is high. Out of 385 women, 96 are normal, 102 are mild, 129 are moderate, and 58 are anemic. All associated risk factors—level of education, trimester, gravidity, family planning, and animal source food values—were significantly positive. **Conclusion:** The iron deficiency anemia (IDA) prevalence is high, and risk factors are high among pregnant women: living in rural areas, high gravidity, no family planning, and poor food from animal sources.

**Keywords:** Iron deficiency anemia, Risk factors, Pregnancy, Hemoglobin.

## INTRODUCTION

Anemia during pregnancy is thought to affect Worldwide, one third population globally is suffering from anemia and 50% prevalence is during pregnancy (1). While some pregnant women develop anemia gradually, others have anemia from the moment of conception (2). Iron-deficient diets, gestation periods and digestive issues that restrict absorption are risk factors for inadequate iron absorption or IDA in pregnant women (3). Women who are expecting may have shortness of breath, weakness, pallor, tiredness, and tachycardia if they have clinically severe iron deficiency or IDA (iron deficiency anemia). Average pregnancy iron needs for mothers are 1000 mg throughout their pregnancy (4). Pregnant women who are not anemic, physiological changes of the mother and the rising needs of the growing baby cause iron needs rise during pregnancy. Increased red blood cell mass and development in blood volume during the third trimester are significant maternal hematological alterations (5).

The mother and baby are thus more likely to experience iron deficiency anemia (IDA), which can cause difficulties during pregnancy and increase maternal and newborn morbidity and mortality (6). Currently, the most common micronutrient deficit in the world is iron deficiency anemia. Millions of women and children are affected, which has an influence on poor cognitive development, an increase in maternal mortality, and reduced job capability (7), (8). However, this type of micronutrient deficiency can be controlled with the right public health measures. These recommendations are provided as a crucial part of programs to control anemia due to iron deficiency (9).

Risk factors that are associated with iron deficiency anemia includes poor dietary intake, lack of awareness and less intake of dairy products (10). To counter these risk factors awareness should be given to masses about dietary intake and antenatal care (11).

## METHODOLOGY

A cross-sectional study was conducted to determine the prevalence and severity of iron deficiency and contributing risk factors for iron deficiency anemia among pregnant women in different government hospitals of Lahore.

Sample size of study was 385 pregnant women, convenient sample techniques was used and data was collected from General hospital, services hospital, Farooq hospital, Mayo hospital, Indus hospital, Superior hospital and Evercare hospital Lahore. The study was completed in 6 months after taking ethical approval from ethical committee of university of south Asia. Pregnant females of 1<sup>st</sup> and 2<sup>nd</sup> trimester and who had done their Hb level test were included in the study, whereas pregnant women who received blood transfusions and of third trimester were excluded from the study.

Data was collected by using a self-administered questionnaire through interview techniques. The questionnaire includes questions regarding socio-demographic data, economic status, dietary practices, and diversity. The data scores will be computed according to FAO guidelines. The data was stored and analyzed in SPSS version 22. The alpha level for statistical significance was set at  $p < 0.05$ . The general characteristics of pregnant women were analyzed through descriptive statistics. General frequencies and percentages were calculated for categorical variables. Factors associated with the severity of iron deficiency among pregnant women using the chi-square and correlation tests.

## RESULTS

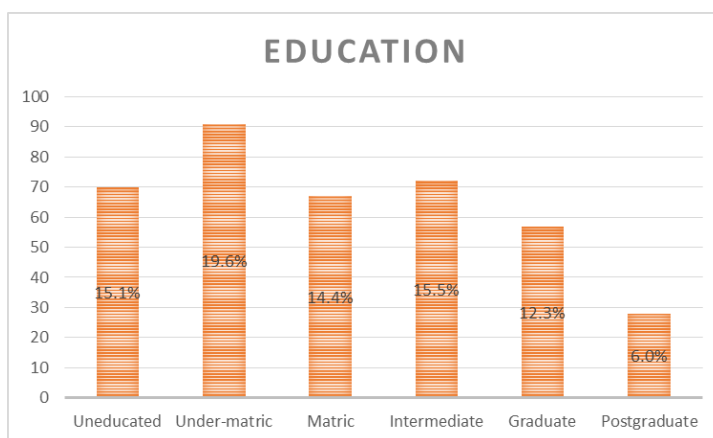
Out of 385 sample of pregnant women most of the participants belong to 25-43 years of age. (Table 1). The education status of the sample under study is as follows: uneducated 15.1%, under matric 19.6%, Matric 14.4%, intermediate 15.5, graduate 12.3%, and postgraduate is 6.0% (Figure 1). Hemoglobin levels of the women participated in the study are Normal 20%, Mild 22%, Moderate 27.8%, Severe 12.5% (Figure 2). Associated risk factors with severity of iron deficiency among pregnant women showed; out of 385 sample of pregnant women, 96 are normal, 102 are mild, 129 are moderate and 58 are severe iron deficient. Associated risk factors include level of awareness, education, trimester, dietary intake and family planning (Table 2). Out of 385 sample of pregnant women, 96 are normal, 102 are mild, 129 are moderate and 58 are severe iron deficient. Trimester 1st and 2nd

(R-value 0.81), gravidity (R value 0.79), family planning (R-value 0.72), animal source food intake (R-value 0.94) and dietary diversity score (R-value 0.86) showed statistically significant

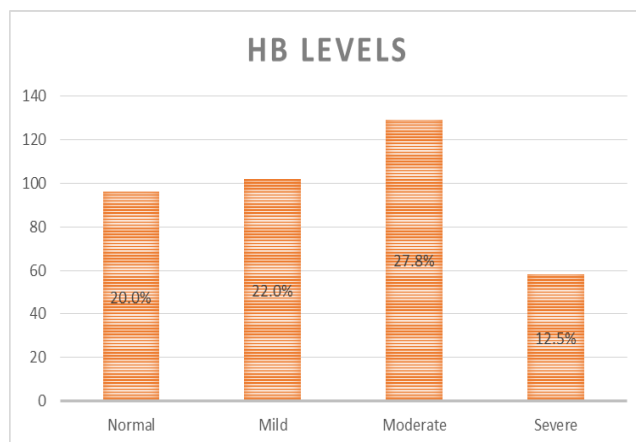
association ( $p < 0.05$ ) with anemia among pregnant women.

**Table 1. Age distribution of participants**

Age	Frequency	Percentage
16-24 years	112	28.6
25-43 years	216	56.6
44-55 years	57	14.8
<b>Total</b>	<b>385</b>	<b>100</b>



**Figure 1. Education level of the participants**



**Figure 2. Hemoglobin levels of the participants**

**Table 2. Risk factors of the iron deficiency anemia and its severity**

Variables	Severity of Iron Deficiency				P Value	R Value
	Normal (12-16mg/dl)	Mild (10-10.9mg/dl)	Moderate (7.9-9mg/dl)	Severe (<7mg/dl)		
	n=96	n=102	n=129	n=58		
<b>Level of Education</b>					0.04	0.67
Educated	80	85	106	44		
Illiterate	16	17	23	14		
<b>Trimester</b>					0.00	0.81
1 <sup>st</sup>	62	67	67	27		
2 <sup>nd</sup>	34	35	62	31		
<b>Gravidity</b>					0.00	0.79
<3	66	75	85	32		
3-5	27	25	37	15		
>6	3	2	7	11		
<b>Family Planning</b>					0.03	0.72
Yes	50	44	66	26		
No	46	58	63	32		
<b>DDS</b>					0.00	0.86
High	47	31	30	12		
Medium	22	27	40	22		
Low	27	44	59	24		
<b>Animal source food</b>					0.00	0.94
Yes	40	48	60	17		
No	56	54	69	41		

## DISCUSSION

The WHO categorized the prevalence of anemia among pregnant women in this study as a moderate public health concern (12). The prevalence determined by this study was close to that seen in previous Ethiopian studies as well as the national prevalence, which indicated 21% and 22%, respectively (13).

These regional variances in anemia prevalence might be brought about by differences in socioeconomic conditions, cultural practices, and dietary habits (14), according to a study conducted in 2022, anemia is one of the most often encountered problems during pregnancy. Due to typical physiological changes, the concentration of hemoglobin (Hb) falls throughout pregnancy, either proportionately or totally. A modest to severe iron deficiency does not appear to have a substantial impact on the concentration of embryonic hemoglobin(15).

Anemia in pregnant women was substantially correlated with gravidity. Out of 385, the women with <3 children, 75 were moderately anemic, meanwhile the women with 3-5 children 37 were moderately anemic. A study Women with gravidities of 6 or more are twice as likely to develop anemia as women with gravidities of 1-3 (16).

The other variable significantly association with IDA among pregnant women was family planning. Out of 385, 32 were severely anemic, 63 were moderately anemic and 58 were mildly anemic. According to NNS was conducted in Pakistan in 2011-2012, IDA affected 18.1% of people(17). In the multivariate regression analysis, Significant predictors of the outcome were the adjusted odds ratio (AOR) (95% CI) 1.31 (1.05, 1.64), a history of four or more pregnancies (AOR (95% CI) 1.30 (1.04, 1.60), and a birth interval of less than 24 months (AOR (95% CI) 1.27 (1.06, 1.71) (18).

## CONCLUSION

The IDA prevalence is high and risk factors are high among pregnant women; however, a sizeable proportion of gravidas were moderately anemic. Pregnant women who live in rural areas are more likely to have IDA. The women with high gravidity, no family planning, low DDS, and poor animal sources had a high risk of IDA. Improving

nutritional habits, supplementing iron, and encouraging family planning and iron-rich sources among pregnant women in this community.

## ACKNOWLEDGEMENT

None

## DECLARATIONS

### Authors' Contributions

FK contributed to the study concept; MA, MM, and SAS contributed to the study design and data collection. MAR and FK contributed to the data analysis and interpretation. FK and MM did the literature review and critically reviewed the manuscript. All the authors read and approved the final manuscript.

### Ethical Approval

Ethical approval was obtained from Research Ethics committee of University of South Asia, Pakistan (Ref No: 0115/IRC/BMR).

### Conflict of Interest

The authors declared no conflict of interest among them.

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