

## RELATIONSHIP BETWEEN EDUCATION LEVEL AND HEMOGLOBIN STATUS OF PREGNANT WOMEN?

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*Received: 28/02/2019*

*Revised: 21/03/2019*

*Accepted: 29/03/2019*

### ABSTRACT

**Background:** Anaemia is a global public health problem affecting both developing and developed countries. Iron deficiency anaemia accounts for 2.4% of the total global DALYs and 4.05% losses in Gross Domestic Product per annum, thereby stalling social and economic development. In the World Health Organization (WHO)/World Bank rankings, Iron Deficiency Anaemia (IDA) is the third leading cause of Disability-Adjusted Life Years lost for females aged 15–44 years. **Material & Methods:** The present prospective study was conducted at department of obstetrics and gynecology of our tertiary care hospital. The study duration was of one year. A sample size was calculated at 95% confidence interval at 10% acceptable margin of error. The data were collected by predesigned, multiple response type of questionnaire from each pregnant woman (above 18 years of age and beyond 12 weeks of amenorrhea) after taking the written consent. **Results:** Among primary education group 18 (78.3%) females had moderate anemia and 5 (21.7%) females had severe anemia. Among middle education group 8 (12.1%) females had no anemia, 27 (40.9%) of pregnant women had mild anemia, 29 (43.9%) of pregnant women had moderate anemia and 2 (3.1%) of pregnant women had severe anemia. Among the group of secondary or senior secondary education, 26 (36.6%) females had no anemia, 31 (43.7%) of pregnant women had mild anemia, 14 (19.7%) of pregnant women had moderate anemia and none of pregnant women had severe anemia. Among the group of graduates or post graduate level education, 25 (62.5%) females had no anemia, 15 (37.5%) of pregnant women had mild anemia and none of pregnant women had moderate and severe anemia. These differences in burden of anemia was statistically highly significant ( $p$  value  $< 0.001$ ). **Conclusions:** We concluded from the present study that the literacy level has a significant association with hemoglobin level of pregnant women. Higher education status reported to have less severity of anaemia and this correlation was statistically highly significant.

**Key words:** Anemia, Pregnancy, literacy level, education status.

### INTRODUCTION

Anaemia is a global public health problem affecting both developing and developed countries. Iron deficiency anaemia accounts for 2.4% of the total global DALYs and 4.05% losses in Gross Domestic

Product per annum, thereby stalling social and economic development. In the World Health Organization (WHO)/World Bank rankings, Iron Deficiency Anaemia (IDA) is the third leading cause

of Disability-Adjusted Life Years lost for females aged 15–44 years (1).

WHO has estimated that prevalence of anaemia in developed and developing countries in pregnant women is 14% and 51% respectively and 65–75 % in India. About one third of the global population (over 2 billion) is anaemic. In India five major surveys, National Family Health Survey (NFHS-2) and (NFHS-3), District Level Household Survey 3 (DLHS), Indian (2). Council of Medical Research (ICMR) Micronutrient Survey and Micronutrient Survey conducted by National Nutrition Monitoring Bureau (NNMB) were undertaken to estimate prevalence of anaemia in the country (3). All these showed that over 70 per cent of pregnant women and adolescent girls in the country were anaemic (4). Regarding this context of combating anaemia during pregnancy, with far reaching benefits in terms of safe motherhood and healthier future generations, an attempt has been made to know the magnitude of anaemia among urban and rural pregnant women along with to study the relationship between anaemia and contributory factor of birth interval to meet the challenge of protecting maternal and neonatal health.

## MATERIAL & METHODS

The present prospective study was conducted at department of obstetrics and gynecology of our tertiary care hospital. The study duration was of one year. A sample size of 200 was calculated at 95% confidence interval at 10% acceptable margin of error. Pregnant women were enrolled from outdoor, antenatal clinic and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant.

The data were collected by predesigned, multiple response type of questionnaire from each pregnant woman (above 18 years of age and beyond 12 weeks of amenorrhea) after taking the written consent. The questionnaire was address on the topics of anaemia and our study variables educational status and geographical living areas. Data analysis was carried out using SPSS v22. All tests were done at alpha (level

significance) of 5%; means a significant association present if p value was less than 0.05.

## RESULT

In the present study the we enrolled 200 pregnant women who were classified in two major groups according to the residential area. We classified pregnant women among four major groups on the basis of education. There were 23 females in the group of primary education, 66 females in the middle level education group, 71 females were in the group of up to secondary level and 40 females in the group of graduates or post graduate level education. Among primary education group 18 (78.3%) females had moderate anemia and 5 (21.7%) females had severe anemia. Among middle education group 8 (12.1%) females had no anemia, 27 (40.9%) of pregnant women had mild anemia, 29 (43.9%) of pregnant women had moderate anemia and 2 (3.1%) of pregnant women had severe anemia. Among the group of secondary or senior secondary education, 26 (36.6%) females had no anemia, 31 (43.7%) of pregnant women had mild anemia, 14 (19.7%) of pregnant women had moderate anemia and none of pregnant women had severe anemia. Among the group of graduates or post graduate level education, 25 (62.5%) females had no anemia, 15 (37.5%) of pregnant women had mild anemia and none of pregnant women had moderate and severe anemia. These differences in burden of anemia was statistically highly significant (p value < 0.001). [Table 1]

In the present study, among primary education group 18 (78.3%) females had moderate anemia 2 were from urban area and 16 from rural area and 5 (21.7%) females had severe anemia 1 was from urban area and 4 from rural area. Among middle education group 8 (12.1%) females had no anemia 4 were from urban area and 4 from rural area, 27 (40.9%) of pregnant women had mild anemia 10 were from urban area and 17 from rural area, 29 (43.9%) of pregnant women had moderate anemia 15 were from urban area and 14 from rural area and 2 (3.1%) of pregnant women had severe anemia both of them from rural area. Among the group of secondary or senior secondary education, 26 (36.6%) females had no anemia 15 were from urban area and 11 from rural area, 31 (43.7%) of

pregnant women had mild anemia 14 were from urban area and 17 from rural area, 14 (19.7%) of pregnant women had moderate anemia 10 were from urban area and 04 from rural area. Among the group of graduates or post graduate level education, 25 (62.5%) females

had no anemia 18 were from urban area and 7 from rural area, 15 (37.5%) of pregnant women had mild anemia 11 were from urban area and 4 from rural area. These differences in burden of anemia was statistically highly significant (p value < 0.001). [Table 2]

**Table 1: Relationship between literacy level and severity of anaemia**

Literacy level	Severity				
	No anaemia	Mild	Moderate	Severe	Total
Primary	0 (0%)	0 (0%)	18 (78.3%)	5 (21.7%)	23 (100%)
Middle	8 (12.1%)	27 (40.9%)	29 (43.9%)	2 (3.1%)	66 (100%)
Secondary/ senior secondary	26 (36.6%)	31 (43.7%)	14 (19.7%)	0 (0%)	71(100%)
Graduate/post- graduate	25 (62.5%)	15 (37.5%)	0 (0%)	0 (0%)	40 (100%)

$\chi^2 = 101.087$

df= 9

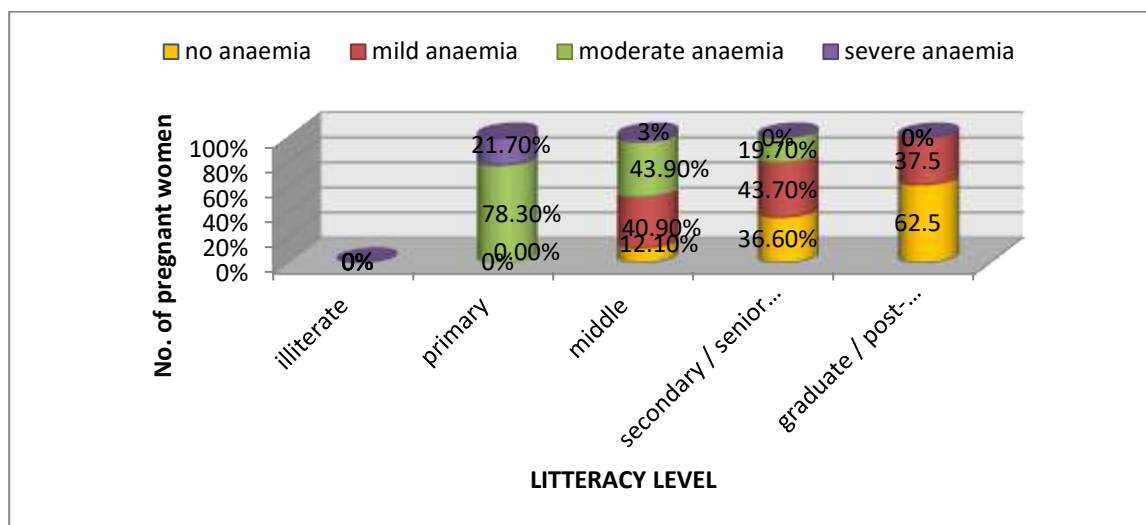
p< 0.001

**Table 2: Relationship between literacy level and severity of anaemia between urban and rural pregnant women**

Literacy level	Severity of anaemia								Total
	No anaemia		Mild anaemia		Moderate anaemia		Severe anaemia		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Primary	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (66.7%)	16 (80%)	1 (33.3%)	4 (20%)	23 (100%)
Middle	4 (13.8%)	4 (10.8%)	10 (34.5%)	17 (45.9%)	15 (51.7%)	14 (37.8%)	0 (0%)	2 (5.4%)	66 (100%)
Secondary / senior secondary	15 (38.5%)	11 (34.3%)	14 (35.9%)	17 (53.1%)	10 (25.6%)	4 (12.5%)	0 (0%)	0 (0%)	71 (100%)
Graduate / post- graduate	18 (62.1%)	7 (63.6%)	11 (37.9%)	4 (36.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	40 (100%)

Urban ( $\chi^2 = 29.422$ , p = 0.001); Rural ( $\chi^2 = 65.565$ , p < 0.001)

**Fig 1: Relationship between literacy level and severity of anemia**



## DISCUSSION

The present prospective study was conducted at the field practicing areas under department of obstetrics and gynecology of our tertiary care hospital. The aim of present study was assessing the magnitude and burden of anaemia along in the correlation to the literacy level of pregnant female. In the present study we enrolled 200 pregnant women from different urban and rural areas and further subdivided them into four subgroups of no anemia, mild anemia, moderate anemia and severe anemia.

In the present study the age of enrolled pregnant women was ranged from 21 to 39 years. The mean age of the enrolled pregnant women was 25.13 ±5.14 years. There were no pregnant women in the present study who aged less than 18 years of age. In the present study the overall burden of anaemia was found to be 65% which was comparatively more among rural areas (69%) in comparison to the urban areas (61%) and difference in the burden of anaemia was statically significant ( $p < 0.05$ ). The odds of anaemia were 1.3 times higher among rural areas than urban pregnant mothers. The results of present study were comparable and nearly similar to the results of surveys of India conducted by National Family Health Survey (NFHS-3) and another survey conducted by District Level Household Survey (DLHS-3).(5)(6) The results of present study were comparable and nearly similar to the study conducted by Toral M. Goswami et al among

pregnant women in 2014 on anaemia status during pregnancy and effects of anemia on perinatal outcome.(7)

In the present study the we enrolled 200 pregnant women who were classified in two major groups according to the residential area. We classified pregnant women among four major groups on the basis of education. There were 23 females in the group of primary education, 66 females in the middle level education group, 71 females were in the group of up to secondary level and 40 females in the group of graduates or post graduate level education. Among primary education group 18 (78.3%) females had moderate anemia and 5 (21.7%) females had severe anemia. Among middle education group 8 (12.1%) females had no anemia, 27 (40.9%) of pregnant women had mild anemia, 29 (43.9%) of pregnant women had moderate anemia and 2 (3.1%) of pregnant women had severe anemia. Among the group of secondary or senior secondary education, 26 (36.6%) females had no anemia, 31 (43.7%) of pregnant women had mild anemia, 14 (19.7%) of pregnant women had moderate anemia and none of pregnant women had severe anemia. Among the group of graduates or post graduate level education, 25 (62.5%) females had no anemia, 15 (37.5%) of pregnant women had mild anemia and none of pregnant women had moderate and severe anemia. These differences in

burden of anemia was statistically highly significant ( $p$  value  $< 0.001$ ). A study by Abbasi RM et al showed found similar results with anemia and birth interval.(8)

In the present study, among primary education group 18 (78.3%) females had moderate anemia 2 were from urban area and 16 from rural area and 5 (21.7%) females had severe anemia 1 was from urban area and 5 from rural area. Among middle education group 8 (12.1%) females had no anemia 4 were from urban area and 4 from rural area, 27 (40.9%) of pregnant women had mild anemia 10 were from urban area and 17 from rural area, 29 (43.9%) of pregnant women had moderate anemia 15 were from urban area and 14 from rural area and 2 (3.1%) of pregnant women had severe anemia both of them from rural area. Among the group of secondary or senior secondary education, 26 (36.6%) females had no anemia 15 were from urban area and 11 from rural area, 31 (43.7%) of pregnant women had mild anemia 14 were from urban area and 17 from rural area, 14 (19.7%) of pregnant women had moderate anemia 10 were from urban area and 04 from rural area. Among the group of graduates or post graduate level education, 25 (62.5%) females had no anemia 18 were from urban area and 7 from rural area, 15 (37.5%) of pregnant women had mild anemia 11 were from urban area and 4 from rural area. These differences in burden of anemia was statistically highly significant ( $p$  value  $< 0.001$ ). Similar results were reported in a study by Vijay Kumar et al on s anaemia in pregnant women and found significant association of anaemia ( $p < 0.05$ ) was found with birth interval.(9)

## CONCLUSION

We concluded from the present study that the literacy level has a significant association with hemoglobin level of pregnant women. Higher education status reported to have less severity of anaemia and this correlation was statistically highly significant. However, the magnitude and burden of anemia was very high and the population living among rural areas were at high risk of developing anemia.

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**How to cite this article:** Dabholkar KM, Relationship between education level and hemoglobin status of pregnant women?. *Int.J.Med.Sci.Educ* 2019;6(1):98-102