

A Study Of Prevalence Of Anemia, Sociodemographic And Anthropometric Factors Associated With Anemia Among Pregnant Women In Chhotaudepur District, India

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Abstract

Background: Anemia in pregnancy accounts for one fifth of maternal deaths worldwide and is a major factor responsible for low birth weight. In India, 16% of maternal deaths are attributed to anemia. The association between anemia and adverse pregnancy outcome, higher incidence of preterm and low-birth weight deliveries have been demonstrated. However, high prevalence of anemia among pregnant women persists in India despite the availability of effective, low-cost interventions for prevention and treatment. A knowledge of the sociodemographic factors associated with anemia will help to formulate multipronged strategies to attack this important public health problem in pregnancy.

Aim: To study prevalence of Anemia among pregnant women due to socio-demographic factors in rural areas of Gujarat.

Setting: Radha Maternity & Surgical Hospital, Bodeli, Gujarat, India.

Study Design: Descriptive cross-sectional study.

Materials and Methods: The study was carried out from August 2020 to March 2021. A total of 380 pregnant women were selected using a systematic random sampling technique. The participants were included only after confirmation of the pregnancy.

Statistical Analysis: Chi-square test, Chi-square test for trend.

Results: Overall prevalence of anemia among the pregnant women was found to be 86.3%. Factors such as body mass index and level of education of women were found to be significantly associated with the prevalence of anemia in pregnancy ($P < 0.5$).

Conclusion: Poor nutrition and illiteracy were significantly associated with high prevalence of anemia during pregnancy in Indian women

Keywords: public; anemia; pregnancy; maternal; rural; socio-demographic; epidemiology

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I. Introduction

Anaemia, during pregnancy, is a major public health problem throughout the world, particularly the developing countries. Despite the fact that most of the anaemia's seen in pregnancy is largely preventable and easily treatable if detected in time, anaemia still continues to be a common cause of mortality and morbidity in India. Diminished intake and increased demands of iron, disturbed metabolism, prepregnant health status and excess iron demands as in multiple pregnancies, women with rapidly recurring pregnancies, blood loss during labour, heavy menstrual blood flow, inflammation and infectious diseases are important factors which lead to development of anaemia during pregnancy.^[1]

Anaemia in pregnancy is a condition in which there is a reduction in the amount of circulating haemoglobin in pregnant women. Anaemia is defined by the WHO as "a haemoglobin level of less than 11 g/dl or a packed cell volume of less than 33%."^[2] Anaemia is the most common medical disorder in pregnancy and has a varied incidence, aetiology and degree of severity in different populations. It is a well-known fact that socio-economic status and demographic factors such as age and level of formal education, do have an impact on many medical conditions. Women in the lower socio-economic groups, owing to financial constraints or lack of education, cannot afford or do not have access to good health services and are therefore more likely to suffer from the deleterious effects of poor nutrition, malaria, HIV, chronic infections and worm infestations.

Knowing the prevalence and severity of anaemia in pregnancy in the different communities will enable the judicious distribution and utilisation of the limited available medical resources needed to prevent anaemia in pregnancy.^[3] India became the first developing country to take up a National Nutritional Anemia Prophylaxis Program (NNAP) to prevent anemia among pregnant women. NNAPP was initiated in 1970 during the fourth 5-

year health plan with the aim of reducing the prevalence of anemia to 25%. The Government of India recommends a minimum dose of total 100 iron and folic acid tablets to be prescribed during pregnancy.^[4] Public health program of distribution of the iron tablets to the pregnant women (during last trimester) and preschool children is in operation in India as part of Maternal and Child Health (MCH) services. However, high prevalence of anemia among pregnant women persists despite the availability of this effective, low-cost intervention for prevention and treatment.

The present descriptive case series study is an attempt to determine the prevalence and to explore the sociodemographic & Anthropometric determinants of anaemia in pregnant women in the rural areas from Radha Surgical & Maternity Hospital, Bodeli, Chhotaudepur district, Gujarat, India

II. Methods

Research Method

A cross sectional analysis of expectant mothers from August 2020 to March 2021 in Chhotaudepur district. Face to face interviews using a survey questionnaire were conducted by the investigators who were specifically trained, medical students.

Hemoglobin level was estimated by Cell Counter & Haematological Analyzer. According to World Health Organization (WHO), hemoglobin level below 11 g/dL is labeled as anemia during pregnancy and classified as mild (10.0–10.99 g/dL), moderate (7.0–9.9 g/dL), and severe (<7.0 g/dL) anemia^[5, 10, 11]. The same criteria were used for diagnosing anemia in pregnancy. Individual discussion with each mother about anemia, importance of regular treatment with iron/folic acid tablets and correction of faulty dietary practices was conducted.

Population & Sample

Participants were those pregnant women who want to get examined in obstetrics clinic .

In 400 target interviews, 20 participants declined to answer any questions, and the preliminary response rate was thus 95% (380/400).

Among 380 respondents, the final analysis sample included all the 380 persons who answered all questions.

Face Validation & Content Validity

The questionnaires were analysed by a panel of six experts (3 Obstetricians, 1 Dietician & 2 Intern Doctors).

Sociodemographic Variables

Demographic data included Age, Religion (Hindu, Muslim & Others), BMI (Underweight, Normal, Overweight & Obese according to WHO criteria), Diet (Vegetarian/Non Vegetarian), Education (Illiterate, Lower Primary School, Upper Primary School, High School, Higher Secondary & Graduate according to the education system in India)

Data Analysis

The data was carefully reviewed prior to entry into the database using OpenOffice Spreadsheet. Data analysis was performed using statistical software (R-Studios & MedCalc) after careful data sorting and cleaning. The characteristics of the participants were summarized using either means and standard deviations or frequencies and percentages, and were presented using descriptive analysis (means, standard deviations, and percentages). Chi-square tests were employed for comparisons when appropriate.

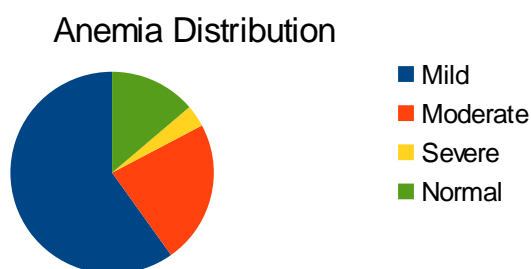
III. Results

In the present study, the mean duration of active married life of pregnant women was 4.87 years. Mean value for parity was 0.64. Mean height and weight of the study subjects were 151 cm and 49.5 kg, respectively. The general profile of study subjects is shown in Table 1 and the demographic characteristics of the study subjects are summarized in Table 2. The majority of the subjects were between ages 20 to 24 years with an average age of 24.34 years. It was observed that the maximum number of the study subjects were 371 (97.64%) Hindus.

	Minimum	Maximum	Mean	SD
Age	18	35	24.35	3.51
Weight	24	91	49.5	8.6
Height	1.15	1.75	1.51	0.06
BMI	14.6	35.5	21.55	3.51
AML	0.5	20	4.87	3.49
HB	4.2	13.5	9.61	1.31

TABLE 1

As shown in Figure 1, the overall prevalence of anemia among pregnant women was found to be 86.3%. The prevalence of mild, moderate, severe anemia were observed as 59.8%, 22.9%, and 3.5%, respectively. Thus the prevalence of mild anemia was high in comparison to the other degrees of anemia.



Demographic Characteristics		
Parameter (n = 380)	Number	Percentage
AGE GROUP		
<20	56	15.1
20 – 24	159	42.9
25 – 29	119	32.1
>30	37	10
EDUCATION LEVEL		
Illiterate	22	5.78
Lower Primary	13	4.64
Higher Primary	48	12.63
High School	145	38.15
Higher Secondary	109	28.68
Graduate	43	11.31
Religion		
Hindu	371	97.64
Muslim	9	2.36
Diet		
Vegeterian	368	97.84
Non-vegetarian	12	3.16

Table 2

Table 3 shows that the proportion of pregnant women suffering from anaemia is higher amongst the illiterate and the graduate subject groups as compared to the other educational classes, which were 95.5% and 88.4% respectively while other groups constitute 85% collectively. Hence, it can be observed that the educational status of the pregnant women did not significantly affect the prevalence anaemia.

ANEMIA	EDUCATION LEVEL						
	Uneducated	Lower Primary	Higher Primary	High School	Higher Secondary	Graduate	
Normal	1	2	7	21	17	5	53 (13.9%)
Mild	14	7	28	86	68	24	227 (59.7%)
Moderate	6	3	9	35	21	13	87 (22.9%)
Severe	1	1	4	3	3	1	13 (3.4%)
	22 (5.8%)	13 (3.4%)	48 (12.6%)	145 (38.2%)	109 (28.7%)	43 (11.3%)	

Chi-squared 9.74
 DF 15
 Significance Level 0.836

Table 3

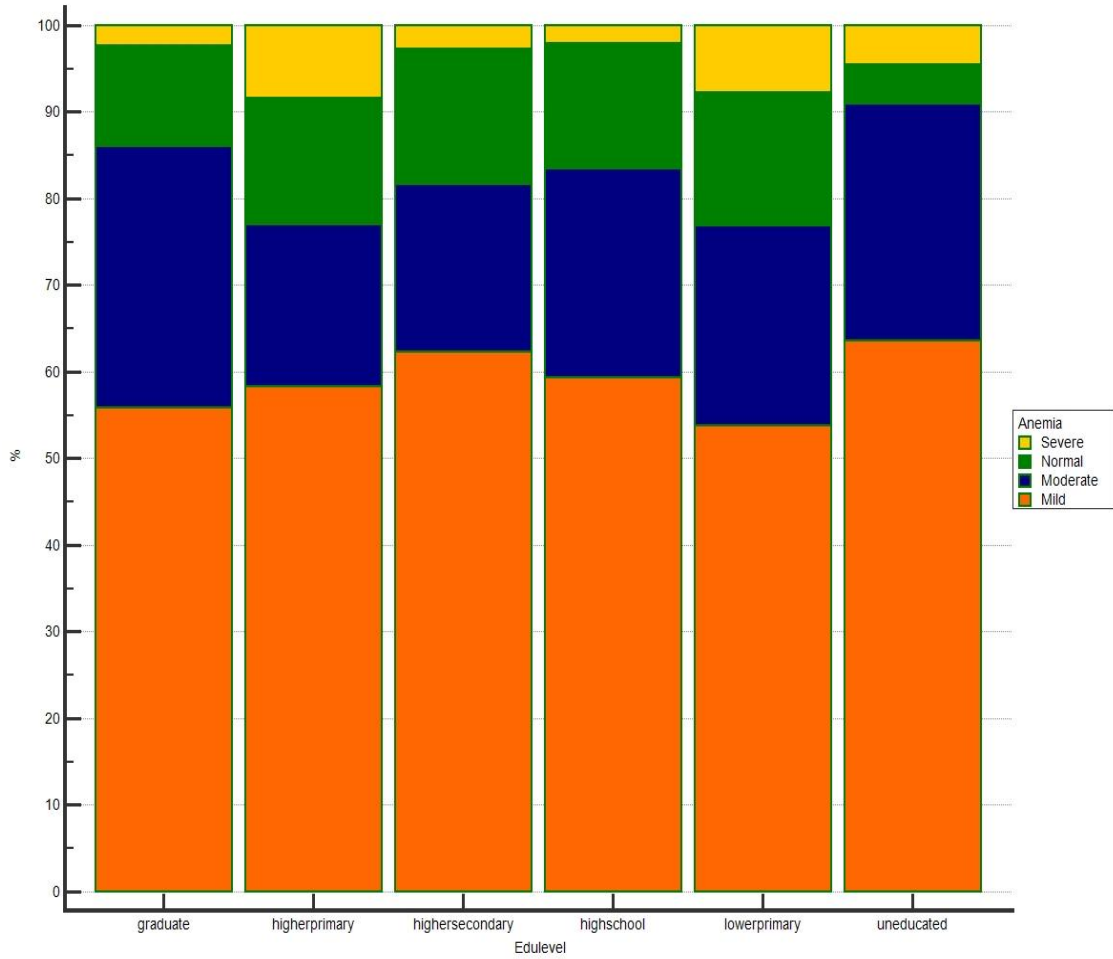


Figure 2

As shown in Table 4, it was observed that proportion of pregnant women suffering from anemia was maximum (94.59%) in the age group 30 years and above followed by the age group below 20 years (87.5%). The observed difference was statistically significant ($P < 0.5$).

ANEMIA	AGE				
	< 20	20 – 24	25 – 29	> 30	
Normal	7	22	20	2	51 (13.7%)
Mild	32	99	69	22	222 (59.8%)
Moderate	16	34	26	9	85 (22.9%)
Severe	1	4	4	4	13 (3.5%)
	56 (15.1%)	159 (42.9%)	119 (32.1%)	37 (10 %)	

Chi-squared 10.637
 DF 9.000
 Significance Level 0.301

(p < 0.5)
Table 4

Table 5 shows the prevalence of anemia in pregnancy with respect to Body Mass Index. It was observed that 64.2% of subjects with Normal BMI were suffering from anemia when compared with 71.7% , 84.9% and 79.2% of Underweight , Overweight and Obese women, respectively. The association observed between BMI and with the prevalence of anemia during pregnancy was statistically significant (P < 0.5).

ANEMIA	BMI				
	Underweight	Normal	Overweight	Obese	
Normal	15	19	8	11	53 (13.9%)
Mild	33	120	35	39	227 (59.7 %)
Moderate	21	49	8	9	87 (22..9%)
Severe	3	8	1	1	13 (3.5%)
	72 (18.9%)	196 (51.6%)	52 (13.7%)	60 (15.8%)	

Chi-squared 14.8530
 DF 9.0000
 Significance Level (0.0950

(p < 0.5)
Table 5

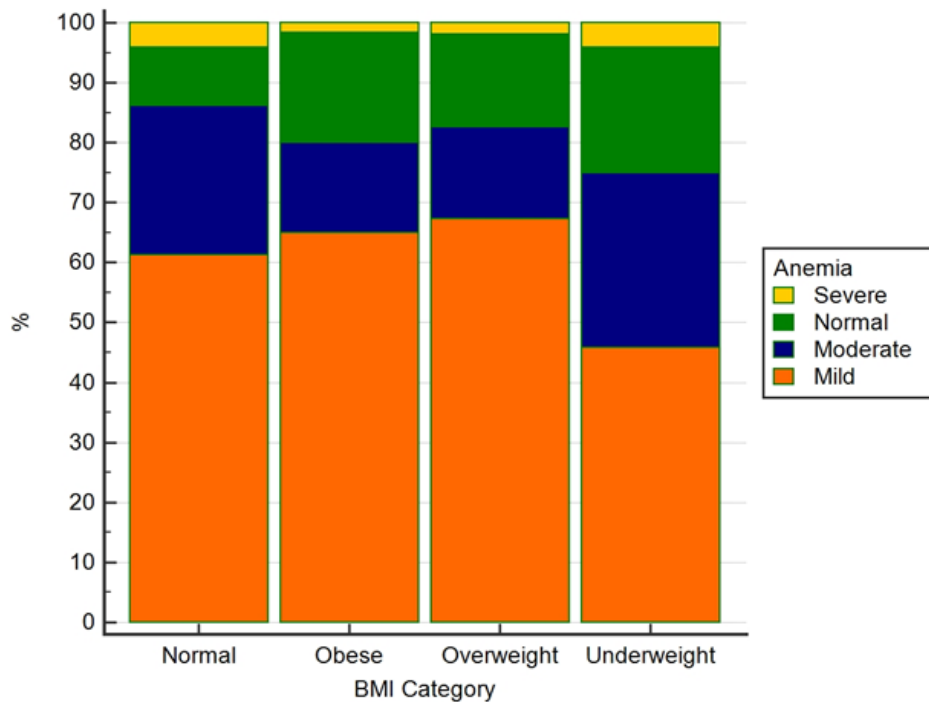


Figure 3

IV. Discussion

Although much effort has been taken to prevent anemia in Indian women, still the prevalence of anemia during pregnancy is found to be 86.3% from this study. World Health Organization (WHO)/World Health Statistics data shows that 40.1% of pregnant women worldwide were anemic in 2016^[6]. The condition is prominent in Southeast Asian countries where about half of all global maternal deaths are due to anemia and India contributes to about 80% of the maternal death due to anaemia in South Asia. There is marginally decrease in prevalence of anemia in pregnant women in India from 58% in NFHS-3 (National Family Health Survey-2005-06) to 50 % in NFHS-4 survey (2015-16).^[7]

As per Census 2011 , the literacy rate among females in Chhotaudepur district was 74.79%^[8]. However , education level was not significantly associated with anemia among pregnant women. Previous studies showed that educational level may influence knowledge and behavior that are important for making health behavior choices . In this study, pregnant women with a higher education level did not necessarily have better knowledge about anemia, and better knowledge of anemia did not necessarily translate into health behavioral outcomes. Future anemia interventions should focus on pregnant women of all education levels.^[9]

V. Conclusion

A very high prevalence of anaemia (86.3%), as also found in other similar studies in India in pregnant women is an indicator of the failure of National and WHO Programmes to address this problem. The health care system should not miss any health related opportunities during the important years of adolescence before marriage and child bearing age groups. Mandatory regular supply of IFA tablets to adolescent girls and pregnant women from 4th month onwards till 3 months (or even 6 months) postpartum, food fortification, along with correction of other nutritional deficiencies and timely interventions for reducing the burden of malaria, worm infestations and other infectious diseases should be ensured. All practitioners handling obstetrics cases should be motivated for prescribing iron preparations and balanced diet with good patient compliance. Timely monitoring of haemoglobin levels in pregnant women and early identification of the high risk women and adequately categorising them could drive the attention of policy makers towards the necessary steps and interventions which can be done to prevent the health hazards to the pregnant women and the foetus as well as can help to decrease the and mortality associated with anaemia.

AUTHOR STATEMENTS

We do not have any ethical approval , funding and competing references. We did not take any ethical approval as our study did not involve an collection or analysis of data that could be used to identify participants; physical contact with participants; any risk of discomfort or inconvenience to participants ; any risk of psychological distress to participants or their families; participants recruited from vulnerable groups, in particular children and those whose capacity to consent to participation may be challengeable because they have a temporary, fluctuating, or permanent impairment in, or disturbance of the functioning of the mind or brain; data collection that will be undertaken overseas. If the study contains any of these elements, then ethical approval should be sought from the appropriate Research Ethics Committee.

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