Volume : 2 | Issue : 11 | Nov 2013 • ISSN No 2277 - 8160

Research Paper | Medical Science

# A Community Based Study on Association of Anaemia in the Women of Child Bearing Age and the Level of Education


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## ABSTRACT

*Background: Several Diseases affect the man, causes of which may be infectious, metabolic, genetic or nutritious. Out of all the causes, nutritional cause is the commonest one throughout the world, primarily due to poverty and ignorance particularly in the underdeveloped and developing countries. Of the nutritional causes, anaemia ranks second most common problem after protein calorie malnutrition. Methods and materials: This is a community based cross sectional study and was done in 30 selected slum areas of Jodhpur city from 1st May 2010 to 30th October 2010. All the women in the reproductive age group (15-49 years), irrespective of their marital status were included in the study. A pre designed and tested questionnaire was used for the collection of details of the study subjects. After physical examination of the participants, study subject's blood was collected in separate prelablled vials containing 5 ml of Drakbin's solution. The samples were transported to the Laboratory maintaining the cold chain. Analysis of data was done using "Graph Pad Instat: Software. Results: It is observed that mild, moderate and severe anaemia is more common in illiterate women 40.29% (54), 22.38% (30) and 5.22% (7) respectively; with a total of 67.91% (91) illiterate women were anaemic than in literate women. As the level of education increases, anaemia in women decreases. Mild, moderate and severe anaemia in graduate women is 29.41% (5), 11.76% (2) and 0%..*



## KEYWORDS :


**Introduction:**
According to WHO report, about one third of the world's population is suffering from anaemia. Though, many factors are attributed to the high preponderance of anaemia in the general population[1, 3, 4, 5 & 6]. Iron deficiency accounts for the majority of the causes. Iron deficiency anaemia is not only responsible for high morbidity rate, but also for high mortality in some sections of the population specially pregnant women[8, 9, 10].

Iron deficiency anaemia is a problem of serious public health significance, showing its impact on psychological and physical development causing generalized weakness, lethargy, lassitude, sub optimal work performance and behavioral problems[11], and it may lead to poor intelligence and abnormal immune response. The reproductive period in women starts from menarche till menopause (roughly 15 to 49 years). During this period, there is periodical loss of blood every month, but generally there is no dietary change by the women to replenish the amount of blood loss. Further, during pregnancy, there is increase requirement of iron for the formation of blood for the developing foetus and blood loss which will occur during parturition. If nutritious diet rich in iron or iron supplements are not taken, this may lead to Anaemia.

Anemia is operationally defined[1, 3, 4, 5] as a reduction in one or more of the major RBC measurements:- Hemoglobin concentration, haematocrit, or RBC count. Clinical Manifestations and Complications of anaemia: Pallor, fatigue, tachycardia, blue sclera, splenomegaly, anorexia, pica (due to increased lead absorption)

Behavioral & Developmental: Lower test scores of mental and motor development among infants

**Causes of Anemia: Decreased erythrocyte production**
- Decreased erythropoietin production
- Inadequate marrow response to erythropoietin
- Erythrocyte loss
- Hemorrhage
- Haemolysis

**Aims and objectives: (1).** To provide detailed population based data to establish the frequency, severity and distribution of anaemia among the women in reproductive age group (15 - 49 years) in selected slum areas of Jodhpur City. **(2).** To study the effect of level of education and anaemia in these women and (3) To provide counseling to the women in reproductive age group on health & nutrition and prevention of anaemia.

**Study design and setting:** This is a community based cross sectional study and was done in 30 selected slum areas of Jodhpur city from 1st May 2010 to 30th October 2010.

**Methods and materials:-** Jodhpur city has a total of 215 slum areas out of which 30 slums were selected for the study.

**Study Population:** All the women in the reproductive age group (15-49 years), irrespective of their marital status were included in the study. The women who were free from infection and any other febrile disease had been included in the study. Women who had donated blood or received blood in the past six months were excluded from the study. Women who had an accidental haemorrhage were also excluded from the study. Out of the 215 slum areas 30 slums were selected for the study by the cluster sampling method. From the 30 selected slums 426 study subjects were selected by the simple random sampling method.

**Consent:** Informed oral and written consent of the participants had been taken after explaining them about the purpose of the study and for doing clinical examination and for taking blood samples.

**Formation of four groups:-** The participants were divided in four groups. The first group (non anaemic) includes women with hemoglobin level above 12g percent , second group includes women with mild anaemia, Hb - 10 - 11.9 g percent, third group includes women with moderate anaemia Hb 7-9.9 g percent, fourth group includes women with severe anaemia Hb < 7g percent)

**Study instruments**: A pre designed and tested questionnaire was used for the collection of details of the study subjects.

After physical examination of the participants, study subject's blood was collected in separate prelablled vials containing 5 ml of Drakbin's solution. The samples were transported to the Laboratory maintaining the cold chain.

Measurement of haemoglobin - By Cyan methaemoglobin method: Principle - When blood is mixed with solution (Drakbin's reagent) containing potassium ferricyanide and potassium cyanide, all types of haemoglobin, except sulphaemoglobin is converted to cyanmethemoglobin which is measured at 540 nm in a spectrophotometer or green filter in a photoelectric colorimeter, against a standard. The intensity of colour is proportional to the concentration of haemoblobin.

**Results:**

In our study, 426 women in the reproductive age group from selected slum areas of Jodhpur city were included, out of which 250 (58.68%) were found to be anaemic. 160 (37.55%) women were found to have mild anaemia, 80(18.77%) women had moderate anaemia and 10 (2.34%) women were severely anaemic. In the study, 134 (31.45%) of the women were illiterate and 292 (68.54%) women were literate. Out of 43 (10.09%) just literate women 26 were anaemic and 17 were non anaemic. Out of 77 (18.07%) primary school educated women 48 were anaemic and 29 were non anaemic. In the study 62 (14.55%) women were having education up to middle level, out of which 37 were anaemic and 25 were non anaemic. In the study 45 (10.56%) women were having education up to secondary level, out of this 23 were anaemic and 22 were non anaemic. 33 (8.21%) women in the study were having education up to higher secondary level, out of these 14 were anaemic and 19 were nonanaemic. Out of 17(3.99) graduate women 7 were anaemic and 10 were non anaemic. In the study only 15(3.52%) women were post graduate and among them only 4 were anaemic and 11 were non anaemic.

**Table No. 1**
**Distribution of the study subjects on the basis of their Haemoglobulin (Hb) level**

| Mild anaemia | Moderate anaemia | Severe anaemia | Total anaemic | Non anaemic | Total |
|---|---|---|---|---|---|
| Hb- 10-11.9 g percent | Hb 7-9.9 g Percent | Hb < 7g percent | Any anaemic | Hb > 112 g percent | |
| 160 (37.55%) | 80 (18.77%) | 10 (2.34%) | 250 (58.68%) | 176 (41.31%) | 426 (100%) |

**Figure No. 1**
**Distribution of anaemic and non anaemic women**

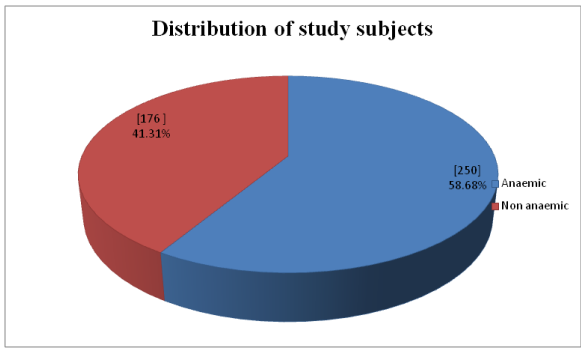



**Figure No. 2**
**Distribution of anaemic women [No. of subjects]**

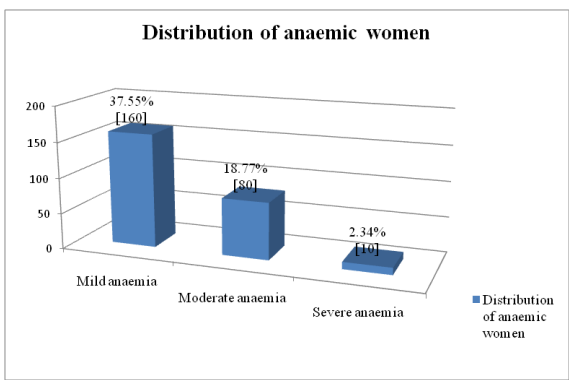
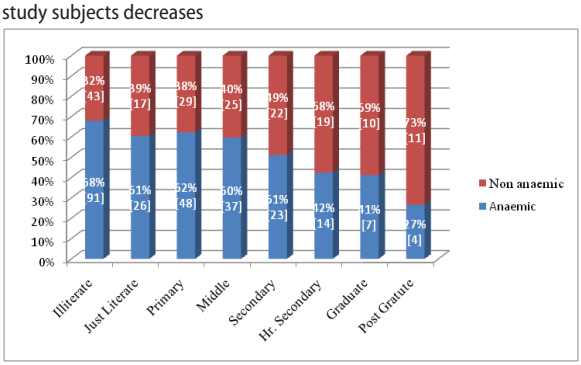



**Table No. 2**
**Distribution of study subjects on the basis of level of education and anaemia**

| Education | Anaemic | | | | Non anaemic | Total |
|---|---|---|---|---|---|---|
| | Mild | Moderate | Severe | Total anaemic | | |
| Illiterate | 54(40.29)* | 30(22.38) | 7(5.22) | 91(67.91) | 43(32.08) | 134(31.45) |
| Just Literate | 17(39.53) | 9(20.93) | 0(00) | 26(60.46) | 17(39.53) | 43(10.09) |
| Primary | 30(38.96) | 16(20.77) | 2(2.59) | 48(62.33) | 29(37.66) | 77(18.07) |
| Middle | 24(38.70) | 12(19.35) | 1(1.61) | 37(59.67) | 25(40.32) | 62(14.55) |
| Secondary | 16(35.55) | 7(15.55) | 0(00) | 23(51.11) | 22(48.88) | 45(10.56) |
| Hr. Secondary | 10(30.30) | 4(12.12) | 0(00) | 14(42.42) | 19(57.57) | 33(8.21) |
| Graduate | 5(29.41) | 2(11.76) | 0(00) | 7(41.17) | 10(58.82) | 17(3.99) |
| Post Gratute | 4(26.66) | 0(00) | 0(00) | 4(26.66) | 11(73.33) | 15(3.52) |
| Total | 160(37.55) | 80(18.77) | 10(2.34) | 250(58.68) | 176(41.31) | 426(100) |

*Percentage is given in parenthesise.

**Figure No. 3**
As the level of education increases, the proportion of anaemia in the study subjects decreases




**Discussion:-**

It is observed that mild, moderate and severe anaemia is more common in illiterate women 40.29% (54), 22.38% (30) and 5.22% (7) respectively; with a total of 67.91% (91) illiterate women were anaemic than in literate women. As the level of education increases, anaemia in women decreases. Mild, moderate and severe anaemia in graduate women is 29.41% (5), 11.76% (2) and 0%. NFHS-3, Rajasthan also shows higher prevalence of anaemia in illiterate women, the mild, moderate and severe anaemia was in 36.8, 16.5 and 2.3 percent of the uneducated women respectively, with an average of 55.5 percent (1310 out of (2360) of the uneducated women in reproductive age group were found to be having anaemia and as the level of education increases the prevalence of anaemia decreases. In 10 years or more education completed women mild, moderate and severe anaemia was in 27.6, 8.6 and 0.7 percent of the 10 years or more education completed women respectively, with an average of 36.8 percent (165 out of (448) of the 10 years or more education completed women in reproductive age group were found to be having anaemia (NFHS-3, Rajasthan).

Similarly Nadeem Ahmed et al-2010 (70) also observed reversed association of anaemia with the education level. They observed higher prevalence (82.4%) of anaemia in illiterate pregnant women, than in literate women. Women who has an education up to or more than matriculation level were having less prevalence of anaemia. Loretta Brabin et al. (1995) in Bombay observed high prevalence of overall anaemia in women who have 4-9 years education and less prevalence (16.88%) of overall anaemia in women who have more than 10 years education.

Similar results were also observed in a study done by Desalegan et al. they observed higher (53.7%) prevalence of aneamia in Illiterate women than in literate women (37.1%)[l.

Virender P. Gautam et al in rural areas of Delhi in 2000 also observed similar results, they observed an inverse relationship with the level of education and degree of anaemia.

Pushpa O et al in Aurangabad in 2006-8 also observed higher proportion of pregnant women suffering from anaemia were 96.4%, 94.8%, 92.1% and 91.5% among illiterate, those educated up to primary, middle school and high school respectively. It was found that lower the educational level of the women, higher the probability of suffering from anaemia.

K.N. Agarwal et al in a multicentric study all over India in 2001 to 2003 also observed an inverse relationship with the level of education and the degree of anamia

**Conclusion and summary:** In the present study it is observed that anaemia is more common, 67.91% in illiterate women than in literate women. As the level of education increases, anaemia in women decreases. Anaemia is least common 26.66% in post graduate women.

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