



ASSOCIATION OF SOCIO-DEMOGRAPHIC FACTORS WITH IRON DEFICIENCY ANAEMIA AMONG THE PREGNANT WOMEN OF THE POOR URBAN POPULATION OF AJMER CITY

SWAPANA JOHN^{1,2*} AND PRAKASH C. SHARMA¹

¹Department of Zoology, S.P.C Government College, Beawar Road, Ajmer, India.

²Department of Zoology, Sophia Girls' College (Autonomous), Ajmer, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Received: 20 March 2021

Accepted: 24 May 2021

Published: 25 May 2021

Case Study

ABSTRACT

Background: Till date Iron deficiency anaemia remains the main cause for anaemia among pregnant women. India stands ahead to all other nations in the world in the prevalence of iron deficiency anaemia among pregnant women. However, if left untreated, it can lead to many undue and unhappy adverse results on the mother and the foetus as well. This is an observational study to find relation between socio-demographic factors and anaemia among the poor pregnant women of the target group.

Materials and Methods: Questionnaire based survey of random pregnant women coming to Janana Hospital. Descriptive statistics was applied.

Results: The median age of women most affected were from the age of 20 to 30 years. Increasing number of gravidas also has an adverse effect on causing anaemia. Educational qualification contributes positively in building the health of the women. Non vegetarian diet had a benefit over the vegetarian diet in controlling anaemia. Women married at 20 or before were more susceptible to anaemia. The best BMI range is 18.5 to 24.9 kg/m².

Conclusion: Socio-demographic determinants have a role to play in deciding the commencement of anaemia among the pregnant women. The poor sections of the society are therefore more susceptible to develop anaemia during pregnancy.

Keywords: Anaemia; Age; Demographic determinants; Education; Gravida; Nutrition; Pregnancy; Pregnancy outcomes; Socio-economic status; Women.

1. INTRODUCTION

The most prevalent nutritional deficiency affecting the women of reproductive age in developing as well as developed countries is Iron deficiency anaemia [1]. It is a global pandemic impacting around 3.6 billion

people globally [2]. In the year 1995, the global occurrence of anaemia among the expectant mothers was 43% and though it slipped to 38% in the year 2011, it showed a great disparity in the range varying between developed and developing countries from 17% and 56.4 respectively [3]. According to the 2016

*Corresponding author: Email: swapna4christ@gmail.com;

Global Nutritional Report India lags behind at 170th position in the world with respect to women suffering from anaemia [4]. In a survey conducted in various regions of India brought to light that nearly 87% of pregnant women experience anaemia and nearly 10% of the pregnant women are suffering from severe anaemia (Hb < 80 g/l) [5]. Contemplating over the adverse effects of Iron Deficiency anaemia during pregnancy on the expectant mother, this study was embarked to access the possible relationship between different socio-economic and demographic determinants leading to Iron deficiency anaemia among pregnant women.

2. MATERIALS AND METHODS

An observational study was conducted between February 2021 to April 2021 on the pregnant women in their last trimesters coming to Janana Hospital situated in the outskirts of Ajmer city, in the OPD of Obstetrics and Gynecology as well as during the time of delivery. A sample of 100 patients were interviewed with the help of a questionnaire-based format after getting their consent. Detection of Iron deficiency was done based on their Hb level. Further their socio-economic and demographic factors were

studied to relate its association with Iron deficiency anaemia. Descriptive statistics is used to harvest the results.

3. OBSERVATION AND RESULTS

A total of 100 pregnant women belonging to the poorer strata of Ajmer city were considered for the study. Their Haemoglobin estimation was considered for the detection of iron deficiency anaemia. Following were the socio-demographic factors that were taken into consideration for the research.

3.1 Age

There were 49 women belonging to the age group of 20-25 years while 25 were in the age group of 25-30 years and 03 were above 35 years of age, while 11 were in the range of 30 -35 years of age. However, there were instances of 12 women having age less than 20 years. (Table 1) The present study showed that the worst hit women suffering with anaemia belonged to the age group of 20-25. However, the maximum number of anaemic cases fall under the median age group of 20 to 30 years which constituted to be 76.38 percent in total (Fig. 2).

Table1. Age distribution in women with iron deficiency anaemia

Age	Total No of women	No of women who were anaemic
<20	12	07
20-25	49	38
25-30	25	17
30-35	11	08
>35	03	02
Total	100	72

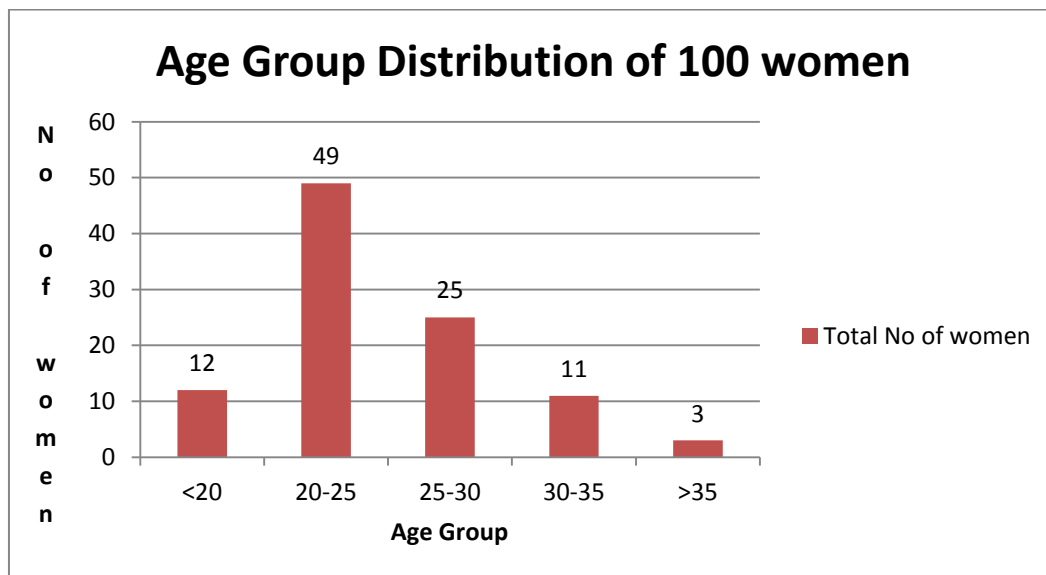


Fig.1. Age distribution in women with iron deficiency anaemia (%)

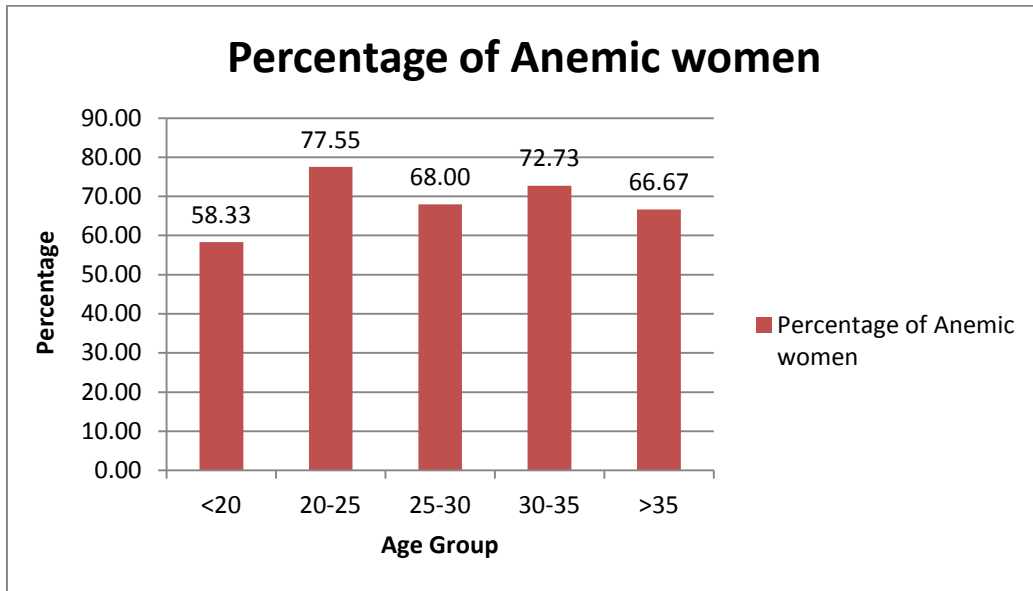


Fig.2. Percentage of anaemic women (%)

3.2 Number of Gravida’s and Anaemia

For around 54 women it was their first gravida. Out of these women with first pregnancy there were 9.9% of women who had Hb between 7 to 8gm/dl and 15.38% pregnant women having Hb between 8-10 gm/dl.

Notably the women with 2 to 3 gravida or with more than 4 gravida it was found that the proportion of affected women were more with an increase in gravidas (Table2). 100 percent anaemia was found in women with 4 or more gravidas but of various order (Fig. 3).

Table 2. Number of Gravidas and its association to anaemia

Gravida	Total No of women	No of women who were anaemic(gm/dl)			
		<7	7-8	8-10	Total
First child	54	nil	08	20	28
2-3 children	33	03	12	16	31
>4 children	13	02	03	08	13
Total	100	05	23	44	72

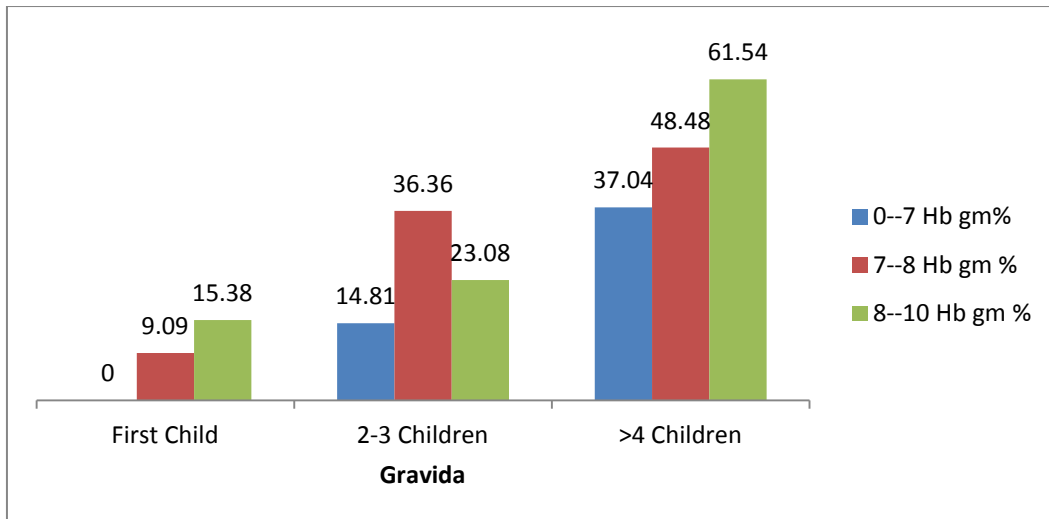


Fig. 3. Number of gravidas and its association to anaemia (%)

3.3 Educational Level

The vast majority of women under consideration were either illiterate or had primary education only. There were 09 women who had completed their secondary education and just 05 women who were able to finish their senior secondary schooling. Out the 44 illiterate women 6.82% of them showed that they had an Hb below 7gm/dl thus had severe anaemia. Out of the 81 women who were either illiterate or had only primary education, there were 85.18% of pregnant women who suffered either from mild, moderate or severe anaemia. The women with increase in their educational status showed a decrease in the incidences on anaemia. This was justified by the fact that there was none anaemic who were graduate or above (Table 3). Thus, it can be concluded that education has a significant impact in reducing the incidences of anaemia among pregnant women (Fig. 4).

3.4 Socio-economic status

As per the available data it showed that the major section of the expectant mothers belonged to the

socio-economic classes I and II category. Class I had 75% of women who were anaemic and class II had 64.86% anaemic. Taking into consideration the class III and IV category there were only 09 women in total who were suffering from anaemia that is just 12.5% of the total anaemic women. All the severe anaemic cases belonged to class I and II. There were 27 women in this group who had Hb less than 8gm/dl and 36 women had Hb less than 10 gm/dl, together they make 87.5 percent of the total anaemic women. (Table 4). Therefore, it can be established that the socio-economic factors play an important role in causing anaemia among pregnant women (Fig. 5).

3.5 Eating Patterns and Diet

Our data showed that 32 women followed a non - vegetarian diet while 68 women were strictly vegetarian (Table 5). In terms of percentage, it was found that almost 90% of women with vegetarian diet suffered from anaemia, whereas only 34% women among non-vegetarian were anaemic (Fig. 6).

Table 3. Educational qualification and its association with anaemia

Education Level	No. of women	No of women who were anaemic (gm/dl)			
		<7	7-8	8-10	Total
Illiterate	44	03	10	26	39
Primary	37	02	11	17	30
Secondary	09	00	02	01	03
Senior Secondary	05	nil	nil	nil	Nil
Graduation and above	05	nil	nil	nil	Nil
Total	100	05	23	44	72

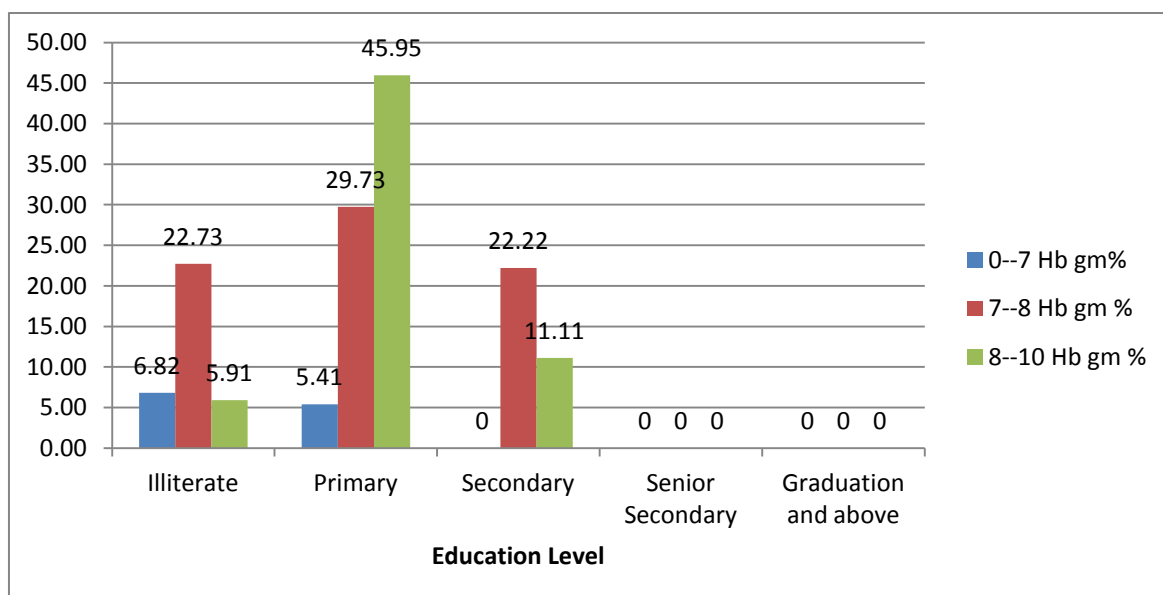


Fig. 4. Educational qualification and its association with anaemia (%)

Table 4. Socio-economic strata and its association with anaemia

Income (per month)	Socio-economic class	Total No of women	No of women who were anaemic (gm/dl)			
			<7	7-8	8-10	Total
<2000	I	52	02	14	23	39
2000-5000	II	37	03	08	13	24
5100-7500	III	09	00	01	07	08
7600-8000	IV	02	00	00	01	01
Total		100	05	23	44	72

Category I = income <2000, Category II = Income between 2000-5000, Category III = Income between 5100-7500, Category IV = Income between 7600-8000

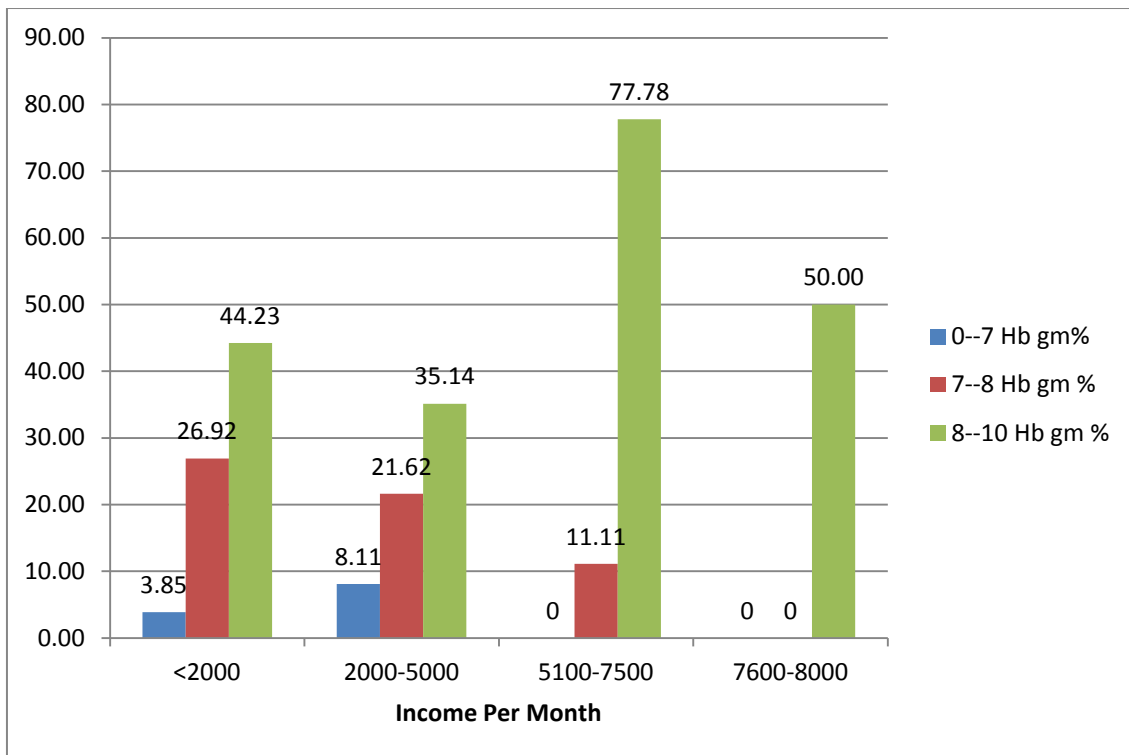


Fig. 5. Socio-economic strata and its association with anaemia (%)

Table 5. Dietary pattern and its association with anaemia

Diet	Total No of women	No of women who were anaemic (gm/dl)			
		<7	7-8	8-10	Total
Vegetarian	68	05	18	37	61
Non- vegetarian	32	00	05	07	11
Total	100	05	23	44	72

3.6 Age of Marriage

From our data, 36 women were married at an age between 20-25. Out of these women there were 4 who had Hb less than 8gm/dl while 17 of them had an Hb between 8 and 10gm/dl. Nonetheless, there were 58 women who were married before they could reach 20 years of age, among whom there were 3.45% women

who suffered from severe anaemia having Hb less than 7gm/dl and there were 36.21% who had Hb less than 8gm/dl and nearly 44 percent women who had Hb below 10 gms/dl (Table 6). Therefore, it could be observed that the women who got married at the age of 20 or before were more likely to develop anaemia during pregnancy (Fig. 7).

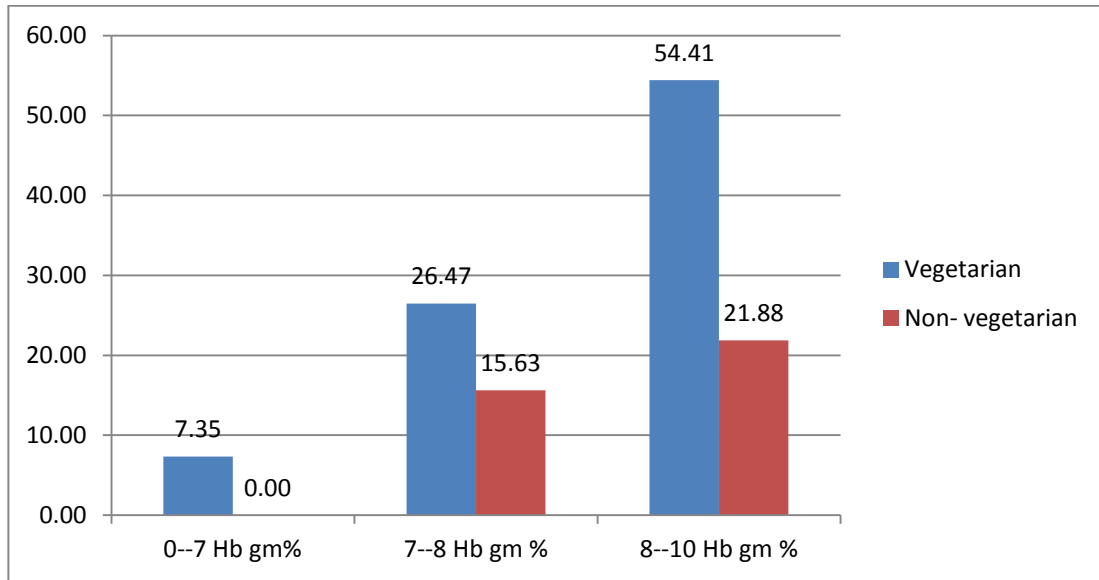


Fig. 6. Dietary pattern and its association with anaemia (%)

Table 6. Age at marriage and its association with iron deficiency anaemia

Age	Total No of women	No of women who were anaemic (gm/dl)			
		<7	7-8	8-10	Total
<20	58	02	21	25	48
20-25	36	02	02	17	21
25-30	05	01	nil	02	03
30-35	01	Nil	Nil	Nil	Nil
>35	nil	Nil	Nil	Nil	Nil
Total	100	05	23	44	72

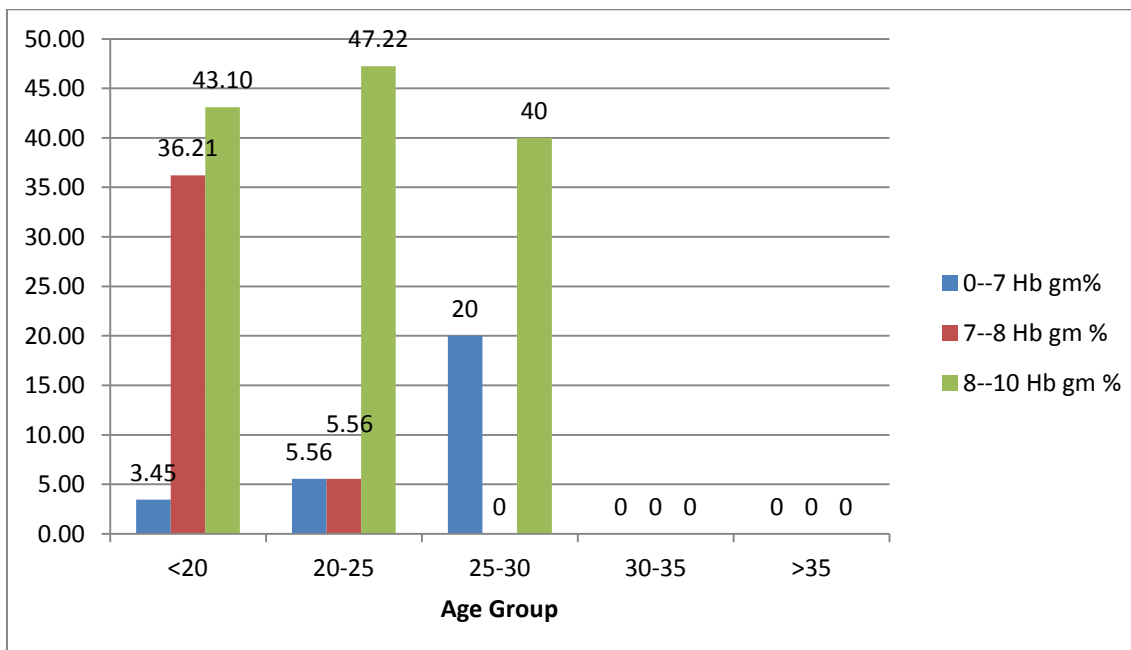


Fig. 7. Age at marriage and its association with iron deficiency anaemia (%)

3.7 Body Mass Index

The best range for BMI falls between 18.5 to 24.9 kg/m². There were only 08 women who belonged to this category out of which there were 5 who had Hb below 8gm/dl and 3 women who had their Hb between 8 and 10 gm/dl. There were 63 anaemic women who had their BMI less than 18.5 kg/m² out of these women there 23 who were suffering from anaemia and having Hb less than 8gm/dl (Table7). Therefore, it could be concluded that women with BMI less than 18.5 kg/m² are more susceptible to anaemia (Fig. 8).

4. DISCUSSION

The experience of being a mother; to bring forth from one's own body a new being is a matter of jubilation for a mother and her family irrespective of the numerous hardships and challenges a woman will experience in this journey of being a mother. This period of dynamic changes requires that the expectant mother pay critical attention to her health to ensure desirable birth outcomes and to avoid unnecessary trouble.

There was a general tendency among the poor strata to get their daughters married as soon as they attain puberty. At times they are married off before they turn 18 years of age. As a result, they become mothers at an age when they themselves are in a growing period. The nutrition meant for them is forwarded to the developing embryo as their demand precede over the mothers. Therefore, mostly the young mothers suffer from anaemia who generally lie in the age group of 20 or below and 20-25 years of age which is also the reproductive age.

There has never been a second thought that nutrition plays a pivotal role in a healthy birth outcome John, S., & Sharma, P. C. [6]. However, our study concluded that majority of the pregnant women who were on vegetarian diet, suffered from iron deficiency anaemia. There were women who followed some occult practice which restricted their diet also were led to anaemia and thus caused preterm birth, low birth weight and other complications in the neonate and the mother. Our study was supported by a similar observation made by Kapil, U., Pathak, P., et al. [7], Ladipo, O. A. [8] and Nair, M., et al. [9]. However,

Table 7. BMI and its association with iron deficiency anaemia

BMI	No of women who were anaemic	<7(gm/dl)	7-8 (gm/dl)	8-10 (gm/dl)
<18.5 kg/m ²	63	04	19	40
18.5to 24.9 kg/m ²	08	01	04	03
> 24.9 kg/m ²	01	nil	nil	01
Total	72	05	23	44

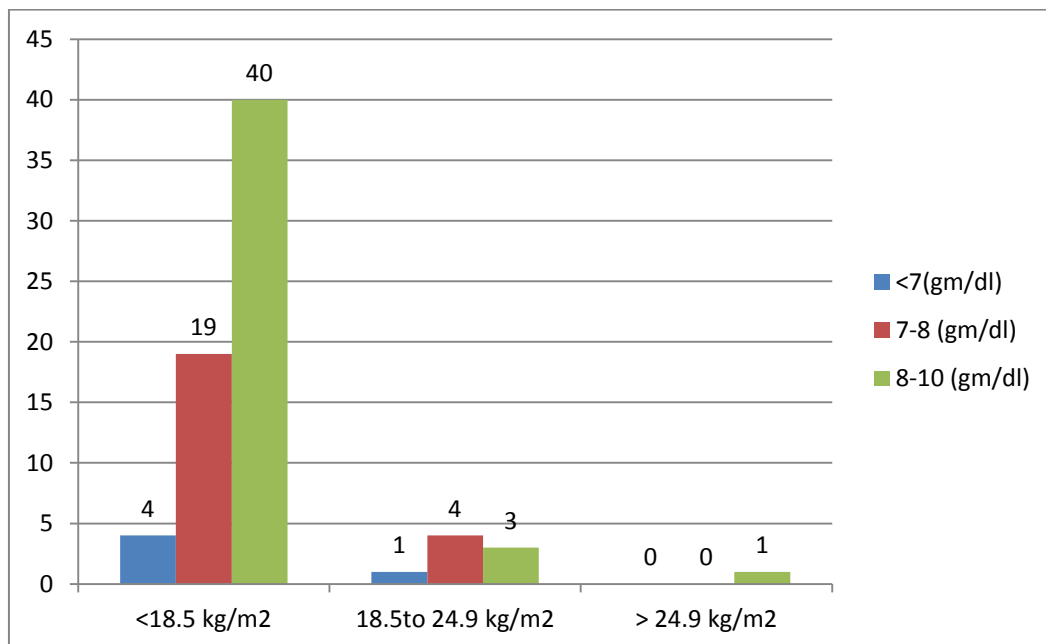


Fig. 8. BMI and its association with iron deficiency anaemia

Sharma, J. B., Soni, D., Murthy, N. S., & Malhotra, M. [10] stated that pregnant women on non-vegetarian diet were less likely to develop iron deficiency anaemia.

The socio-economic factors also influence the diet intake and diet pattern. In addition to that an early marriage worsens their conditions leading to early motherhood, poor diet intake and incapacitated to work. These further burdens their socio-economic status leading to further poor diet and an increase in iron deficiency anaemia. Sibley, L., & Sipe, T. A. [11] was in support of our findings in the research. Notably menorrhagia also contributed to iron deficiency anaemia among the women of reproductive age and pregnancy aggravates the situation. Our study was supported by Chapple, A. [12]. Another pattern that was observable was that the anaemic pregnant women who were admitted with vaginal bleeding in their trimesters often ended up in preterm deliveries with low-birth-weight infants. This ratio was more for pregnant women with anaemia than other pregnant women with normal Hb level [13] also supported our theory.

5. CONCLUSION

To limit the menace of anaemia in pregnant ladies, it was recommended that the families must be given basic education on factors that can help in reducing the frequency of anaemia. While planning for the maternal and childcare interventions, the stakeholders must take into consideration the elevated incidence of anaemia and its associated factors with special emphasis on socio-demographic determinants.

ACKNOWLEDGEMENT

We express our sincere gratitude to Sophia Girls' College (Autonomous) and SPC Government college for all the support rendered during the course of the study. We are also grateful to the hospital staff of Victoria and Janana Hospital.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The ethical clearance was sought from the Victoria Hospital (Janana hospital is a branch of Victoria hospital) for the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. De Benoist B, Cogswell M, Egli I, McLean E. Worldwide prevalence of anaemia 1993-2005; WHO Global Database of Anaemia; 2008.
2. Selvarani P. Prevalence of anaemia and its association with demographic factors among Adolescent Girls in Coimbatore District, India. Executive Editor. 2017;8(2):207.
3. Tandon R, Jain A, Malhotra P. Management of iron deficiency anaemia in pregnancy in India. Indian Journal of Hematology and Blood Transfusion. 2018;34(2):204-215.
4. Achadi E, Ahuja A, Bendech MA, Bhutta ZA, De-Regil LM, Fanzo J, et al. Global nutrition report: from promise to impact: Ending Malnutrition by 2030. International Food Policy Research Institute; 2016.
5. Bora R, Sable C, Wolfson J, Boro K, Rao R. Prevalence of anaemia in pregnant women and its effect on neonatal outcomes in Northeast India. The Journal of Maternal-Fetal & Neonatal Medicine. 2014; 27(9):887-891.
6. John S, Sharma PC. Nutritional approach for the treatment of anaemia and iron deficiency anaemia. Bio Science Research Bulletin-Biological Sciences. 2020;36(1).
7. Kapil U, Pathak P, Tandon M, Singh C, Pradhan R, Dwivedi SN. Micronutrient deficiency disorders amongst pregnant women in three urban slum communities of Delhi. Indian paediatrics. 1999;36:983-990.
8. Ladipo OA. Nutrition in pregnancy: mineral and vitamin supplements. The American Journal of Clinical Nutrition. 2000;72(1):280S-290S.
9. Nair M, Choudhury MK, Choudhury SS, Kakoty SD, Sarma UC, Webster P, et al. Association between maternal anaemia and pregnancy outcomes: a cohort study in Assam, India. BMJ Global Health. 2016;1(1).
10. Sharma JB, Soni D, Murthy NS, Malhotra M. Effect of dietary habits on prevalence of anaemia in pregnant women of Delhi. Journal of Obstetrics and Gynaecology Research. 2003;29(2):73-78.
11. Sibley L, Sipe TA. What can a meta-analysis tell us about traditional birth attendant training

- and pregnancy outcomes?" *Midwifery*. 2004;20(1):51-60.
12. Chapple A. Iron deficiency anaemia in women of South Asian descent: A qualitative study. *Ethnicity & Health*. 1998; 3(3):199-212.
13. Goldenberg RL, Tamura T, Neggers Y, Copper RL, Johnston KE, DuBard MB, et al. The effect of zinc supplementation on pregnancy outcome. *Jama*. 1995;274(6):463-468.

© Copyright MB International Media and Publishing House. All rights reserved.