

Prevalence and Socio-Demographic Factors Associated with Anemia among Females of Age Group 10-45 Years in a Rural Population of Gurugram, Haryana

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Abstract:

Introduction: Anemia is the most common nutritional deficiency disorder in the world. Its Prevalence is inordinately higher among developing nations, because of unfavorable socio- demographic factors and indigent access to healthcare services. Therefore, it is pertinent to find the prevalence of anemia and its associated factors. **Objective:** To find out prevalence and socio- demographic factors associated with anaemia among females of age group 10-45 years in a rural population of Gurugram, Haryana. **Method:** A cross sectional study was conducted in villages under PHC Garhi Harsaru in Gurugram, Haryana among 452 females of age group 10-45 years by two stage random sampling technique. **Results:** The mean age of the study subjects was 25 ± 6.39 years. The overall prevalence of anemia among women of age group of 10-45 years was found to be 62.39%. Joint family, lower literacy, and low socioeconomic status were found to be statistically significant risk factors for anaemia among study subjects. **Conclusion:** The prevalence of anemia was very high; therefore attempts should be made to sensitize the rural population through health and nutrition education, information, education and communication (IEC) and appropriate behaviour change communication (BCC) activities.


Key Words: Anemia, Joint family, Literacy status, Prevalence, Socio-economic status.

Introduction:

Anemia accounts for a majority of the nutritional problems across the world among women. Repeated childbearing, lactation, and poor access to nutritional supplements following menarche may cause or further exacerbate anaemia.^[1] Thus, the aetiology of anemia in India is multifactorial and population-specific. Its prevalence is inordinately higher among developing nations, because of low socioeconomic status and indigent access to healthcare services.^[2] World Health Organization (WHO) defines anemia as a condition in which the haemoglobin (Hb) content of blood is lower than normal as a result of deficiency of

one or more essential nutrients, regardless of the cause of such deficiencies.^[3] Based on concentration of haemoglobin in the blood, anemia is classified into three groups as mild, moderate or severe.^[4] Although it occurs in all the age groups, prevalence is on a higher side among women of childbearing age.^[5] Iron deficiency (lower concentration of hemoglobin) is influenced by various socio-demographic factors, may it be location, gender, ethnicity, income, low nutritional education, and lower socioeconomic Status.^[6-8]

The National Family Health Survey-5 (NFHS-5) data reported that anemia (Hb<12 gm/dl) is widely

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prevalent among all age groups, and is particularly high (nearly 57.0%) amongst the most vulnerable group (15-49 years) in all women.^[9] Data also show that there was an increment of 4% in the prevalence of anemia among women aged 15-49 years from NFHS-4 (53%) to NFHS-5 (57%).

High prevalence of anemia is an indicator of poor health and nutritional status. It has potential to negatively affect the social and economic development of Nation.^[10] Most researches on anemia in India have focused on urban settings.^[11] But very few are on rural settings. So, it is pertinent to find the prevalence of anaemia and its associated factors in rural settings. Adolescent period(10-19 years) is an important phase of life as it marks the beginning of menstrual cycle and reproduction.

In view of the above, this study was carried out to estimate the prevalence and determine socio-demographic factors associated with anemia among females of age group 10-45 years in rural population of Gurugram, Haryana.

Method:

This cross-sectional study was conducted in villages under PHC Garhi Harsaru which is situated in district Gurugram of Haryana State. The study area comprises of 45729 individuals distributed across 14 villages. The study was conducted among females of age group 10-45 years residing in rural area under PHC Garhi Harsaru of Gurugram district Haryana.

Sample size estimation was done by taking prevalence of anemia among 10-45 years females as 50%^[12] at 95% confidence interval and 5% desired level of precision. The sample size came out to be 384. However, 452 females participated in this study.

Out of 14 villages under PHC Garhi Harsaru, 7 villages were selected using simple random sampling (lottery method). A complete list of 4975 households in these seven villages was obtained and serially numbered. This was served as a sampling frame. From the list of population of every village received from Anganwadi, total 220 households were selected by probability proportional to size (PPS) sampling method which was expected to give sample size of

452 females for the study. A random number of 20 was selected which was less than the sampling interval.^[23] This number gave the location of first household in the first village. Then second household was selected by adding the sampling interval i.e. 23 to the first household. If the next household was found to be locked, then household adjacent to it was taken. From the selected households all females who were in the age group of 10-45 years and gave their consent to participate in the study were enrolled for the study. Consent was taken from the parents or local guardian for the study subjects who were below 18 years. Females below 10 years and above 45 years of age, suffering from chronic diseases, and not willing to participate in the study were excluded from the study.

The approval from the Institutional Ethical Committee of SGT University was obtained before commencing the study. A written informed consent was obtained from each subject for their participation after the nature of the study was fully explained to them in their local languages. The primary tool in this study was a predesigned and pretested interview schedule for recording of personal and sociodemographic profile of study subjects. The tool was administered by the investigator herself. Another tool used in this study was Sahli's Haemoglobinometer for estimation of hemoglobin concentrations of eligible subjects. Haemoglobin estimation was done by trained laboratory technician and public health nurse of the community medicine department. In Sahli's acid hematin method^[13] blood was mixed with an acid solution so that hemoglobin is converted to brown-colored acid hematin. This was then diluted with water till the brown color matched that of the brown glass standard. The hemoglobin value was read directly from the scale. Grades of anaemia for various age groups were classified as per WHO.^[14] Modified B.G. Prasad socioeconomic scale was used to classify the socioeconomic status of the study participants.^[15]

Collected data was first entered in the MS Excel spreadsheet and coded appropriately. Prevalence of anemia was estimated in terms of percentage and

association between socio-demographic factors with anemia was analyzed using Pearson's Chi-square test of significance. The level of significance was considered at $p < 0.05$. All statistical analyses were performed using Epi info 7.2 software.

Results:

Majority (65.27%) of the females were in the age group of 20-30 years. Overall, 95.79% were Hindus. Maximum number (84.51%) of females was married, 13.72% were unmarried, and 1.77% was widow/separated. It was found that majority (50.44%) had education till secondary level. The occupational status revealed that maximum number (41.15%) of the study subjects was involved in semiskilled work (including housewives). Majority (78.54%) of the study participants belonged to joint family. Maximum number (32.08%) of participants belonged to class II socioeconomic status, followed by class I (28.32%), class III (23.23%), class IV (13.27%), and class V (3.10%).

The, overall prevalence of anemia among study participants was 62.39%. The prevalence of anaemia was highest in 20-30 years age group i.e. 62.71%, followed by 62.63% in 31-45 years and 60.34% in 10-19 years age group. The prevalence was found to be almost equal in all age groups. On severity scale, 33.41%, 23.23%, and 5.75% had mild, moderate, and severe anaemia, respectively. (Figure 1) Severe degree of anemia was maximally prevailed (13.79%) among 10-19 years of age group. (Figure 2)

Table 1 shows that the prevalence of anemia was significantly ($p=0.006$) higher among those belonged to joint families (65.63%) as compared to those belonged to nuclear families (50.52%). However, age, religion, and caste did not emerge as risk factors for anemia in this study.

Table 2 shows that the prevalence of anemia was significantly ($p = 0.0001$) highest (88.61%) among those who were illiterates followed by primary level of education (84.69%). The prevalence was

comparatively lower among those who were educated upto secondary level (48.25%) and those who were graduate and above (40.43%). Occupation of the study subjects had no association with anemia ($p=0.753$).

The prevalence of anemia was the lowest (53.91%) among those belonged to socioeconomic class I. Increase in the prevalence of anemia was noted towards the lower socioeconomic status categories. The association between socioeconomic status with anemia was found to be statistically significant ($p=0.0006$).

Figure 1: Distribution of study subjects according to severity of anaemia (N=282)

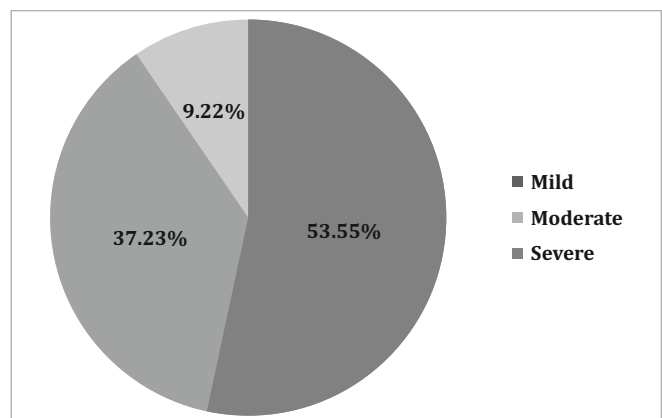


Figure 2: Severity of anaemia according to age groups (N =282)

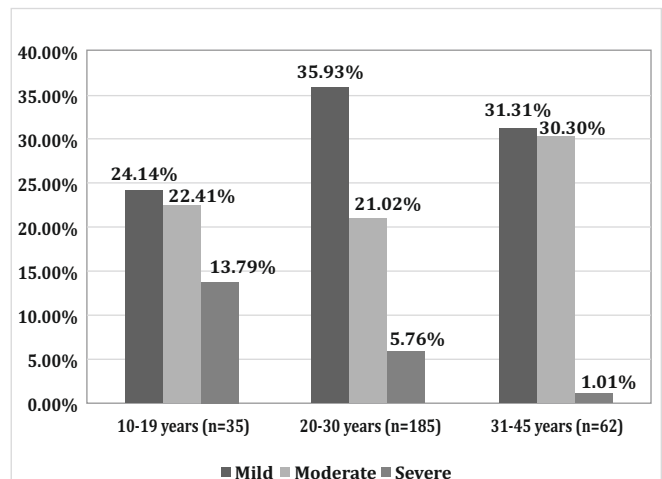


Table 1: Association of Demographic Factors with Anemia among Study Subjects (N=452)

Parameters	Non anemic N=170 (%)	Anemic N=282 (%)	Chi square	p value
Age group (in year)				
10-19	23 (39.66%)	35 (60.34%)	0.1188	0.9423
20-30	110 (37.29%)	185 (62.71%)		
31-45	37 (37.37%)	62 (62.63%)		
Religion				
Hindu	164 (37.88%)	269 (62.12%)	0.514	0.7734
Muslim	3 (27.27%)	8 (72.73%)		
Others	3 (37.50%)	5 (62.50%)		
Caste				
General	50 (44.64%)	62 (55.36%)	3.9736	0.1371
OBC	76 (37.25%)	128 (62.75%)		
SC/ST	44 (32.35%)	92 (67.75%)		
Type of family				
Joint	122 (34.37%)	233 (65.63%)	7.4208	0.006
Nuclear	48 (49.48%)	49 (50.52%)		

Table 2: Association of Occupation and Literacy Status of Subjects with Anemia (N=452)

Parameters	Non anemic N=170 (%)	Anemic N=282 (%)	Chi square	p value
Occupation				
Student	21 (41.18%)	30 (58.82%)	1.9479	0.7543
Skilled	25 (32.89%)	51 (67.11%)		
Semiskilled	75 (40.32%)	111 (59.68%)		
Unskilled	28 (34.57%)	53 (65.43%)		
Unemployed	21 (36.21%)	37 (63.79%)		
Literacy Status				
Illiterate	9 (11.39%)	70 (88.61%)	73.02	0.0001
Primary	15 (15.31%)	83 (84.69%)		
Secondary	118 (51.75%)	110 (48.25%)		
Graduate and above	28 (59.57%)	19 (40.43%)		

Discussion:

The present study was a community based cross sectional study conducted among females in the age group of 10-45 years residing in the rural areas of P.H.C Garhi Harsaru. A total of 452 females were recruited for the study. The mean age of the study subjects was 25 years ± 6.39 ; 65.27% study subjects belonged to the age group of 20-30 years and 21.90% belonged to the age group of 31-45 years. This finding is comparable with that reported in the study by Aarti Acharya et al^[16] at Rural Health Training Centre Udairamsar, Bikaner, Rajasthan in which majority (64.44%) of the subjects belonged to the age group of 20-25 years.

In the present study 62.39% of the subjects were found to be anemic. The National Family Health Survey (NFHS-5) conducted in 2019-21 in Haryana and Gurgoan reported prevalence of anemia to be 60.4% and 67.5%, respectively in women aged 15-49 years which is almost similar to the present study.^[17,18] This is consistent with the studies done by Reshmi PS et al^[19] where prevalence of anemia among adolescent girls was found to be 59% and Pande et al^[20] where prevalence was reported to be 61%. However, a study by Chandrakumari et al^[21], reported a lower prevalence (48.63%) of anemia in a rural setting among a group of adolescent girls attending a tertiary care hospital. In the present study overall, 33.41% of the study subjects had mild anemia, 23% had moderate anemia and 5.75% had severe anemia. Majority of the subjects presented with mild anemia. In a study done by Seth RK et al^[22] in rural women of UP mild anemia was observed among 55.4% of the women, 34.3% and 10.3% of the women were moderately and severely anemic, respectively. Kamath R et al^[23] found that, out of 55.8% anemic women in a tribal area, 3.5% were severely anemic, 19.4% were moderately anemic 32.9% were mildly anemic.

However, in a study conducted by Ramesh Verma et al^[24] in a rural block of Northern India, 18.8% were mildly anemic, 27.6% were moderately anemic and 2.5% were severely anemic. So, it may be inferred that depending upon the study area and study population the severity of anemia varies slightly.

In the present study, severity of anemia decreased with increasing age. A study by Seth RK et al^[22], also reported the prevalence of anemia was higher among the women of age 15-19 years than

higher age groups. On the contrary, many studies reported that anemia increases with increasing age. In a study carried out by Raghuram V et al^[25] among women in the reproductive age group in a rural area in South India found that prevalence of anemia was more among women aged 26-40 years. Similarly in a study done by Ramesh Verma et al^[24] in a rural block of Northern India the prevalence of anemia was found to be higher in the age group of 20-29 years. However, in a study done by Mishra P et al^[26] in Ambala found that prevalence of anemia was more between 15-30 years as they are under childbearing stage or they have given births, which is a major sensitive time to cause anemia. Many studies did not show any significant relationship with age similar to the results of the present study. For example, Kaur et al^[2] in their study in adolescent girls of rural Wardha, reported that age did not contribute significantly.

In the present study it was found that subjects of joint family had higher prevalence of anemia as compared to that of nuclear family and this difference was statistically significant (p value<0.05). Similar trend was documented by Bisoi S et al^[27] in a study among pregnant women in West Bengal. Unequal distribution of food in joint family and eating last or after serving the husband may contribute significantly to maternal anemia.

Anemia was significantly (p value<0.05) higher in subjects who were illiterates (88.61%) as compared to those who had primary and higher level of education (56.83%). Similar findings were also observed by Morsy and Alhady^[28] where they found that women with a higher education were less frequently anemic than illiterate women or women with a primary or secondary education. The reason for finding more anemia with low level of education as found by most researcher could be attributed to the simultaneous presence of low incomes, poor living conditions, poor diet, thereby, predisposing them to higher levels of anemia. This difference may be due to the availability of high quality food with better socio-economic status. Significant disparities were observed in prevalence of anaemia in females of different socioeconomic status. It was observed that females in the family belonging to socioeconomic class III, IV, V have higher prevalence of anemia than females belonging to the family of higher socioeconomic class as per modified B G Prasad scale and this difference was found to be statistically significant (p value<0.05).

Conclusion:

The overall prevalence of anemia among women of age group of 10-45 years was found to be 62.39%. Low socioeconomic status, joint family, and low literacy status were found to be a statistically significant risk factor for anemia. Other demographic factors did not emerge as significant risk factor in the present study.

Recommendations:

A significant association of anemia with socio-economic status suggests a need to develop strategies to improve the socio-economic status of the population through poverty alleviation programs. Women education should be promoted, especially in lower socioeconomic communities, to ensure overall healthy lifestyle and lower risk of anemia related concerns.

Declaration:

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Conflict of Interest: Nil

References:

- Anand T, Rahi M, Sharma P, Ingle GK. Issues in prevention of iron deficiency anemia in India. *Nutrition Journal*.2014; 30 (7-8):764-70.
- Kaur S, Deshmukh PR, Garg BS. Epidemiological correlates of nutritional anaemia in adolescent girls of rural Wardha. *Indian J Community Med*.2006; 31 (4):255-8.
- Anaemia [Internet]. World Health Organization; Available from: <https://> [Last accessed on 28 April 2023]
- Ramachandran P. Nutrition in Pregnancy. In: Gopalan C, Kaur S, editors. *Women and nutrition in India*, Nutrition Foundation of India. Special publication services.1989: 153-93.
- Shah BK, Gupta P. Weekly vs daily iron and folic acid supplementation in adolescent Nepalese girls. *Arch Paediatr Adolesc Med* 2002;156(2):131.
- Rengma MS, Sen J, Mondal N. Socio-economic, demographic and lifestyle determinants of overweight and obesity among adults of Northeast India. *Ethiopian Journal of Health Sciences* 2015 Jul; 25(3):199-208.
- Ali Abdelhamid Y, Chapman MJ, Deane AM. (2016). Peri-operative nutrition. *Anaesthesia*.2016 Jan;71:9-18.
- Pasricha SR, Black J, Muthayya S, Shet A et al. Determinants of Anaemia among Young Children in Rural India. *American Academy of Pediatrics* (2010) ;126(1):140-49.
- International Institute for Population Sciences (IIPS). National Family Health Survey -5 (2019-21). India Factsheet. Mumbai: International Institute for Population Sciences; 2022. Available from http://rchiips.org/nfhs/NFHS5_FCTS/India.pdf [Last accessed on 01 January 2023]
- Pratima V, Shradha S, Ashutosh K, Archana G and Ahillesh K. Prevalence of Anaemia in adults with respect to Socio-Demographic status, Blood groups and religion in North Indian population. *Int J Biol Med Res* 2012;3(4):2441-47.
- Chaudhary SM, Dhage VR. A study of anemia among adolescent females in the urban area of Nagpur. *Indian Journal of Community Medicine* 2008;33(4): 243-5.
- Lilare RR, Sahoo DP. Prevalence of anaemia and its epidemiological correlates among women of reproductive age group in an urban slum of Mumbai. *Int J Community Med Public Health* 2017;4:2841-6.
- Pal GK, Pal P. *Textbook of Practical Physiology*.2nd Edition, Chennai: India Orient Longman;2005.
- MoHFW. Government of India. Guidelines for control of iron deficiency anemia. Available at http://www.unicef.org/india10.National_Iron_Plus_Initiative.Guidelines_for_Control_of_IDA.pdf [Last accessed on 29 Mar 2023]
- Vasudevan J, Mishra AK, Singh Z. An update on B.G. Prasad's socioeconomic scale: May 2016. *Int J Res Med Sci*. 2016;4:4183-6.
- Acharya A, Acharya R, Meena RR. Retrospective study on prevalence of anaemia among pregnant women at booking in a health care centre in Udairamsar, Bikaner, Rajasthan, India. *Int J Community Med Public Health* 2017;4:235-7.
- National Family Health Survey-5, Haryana Fact Sheet. Available from; [Last accessed on Nov 15 2022]
- National Family Health Survey-5, Gurgaoan Fact Sheet. Available from; [Last accessed on Nov 15 2022]
- Reshmi PS, Takalkar AA. Prevalence of anemia in adolescent girls and its association with certain demographic variables: our experience from rural Telangana. *Int J Community Med Public Health* 2020;7:1075-7.
- Pande D, Saroshe S, Pandey D, Dixit S, Shukla H. Estimation of prevalence of anaemia using WHO hemoglobin color scale among non-pregnant females of urban slum. *GJMEDPH*. 2014;3(3):1-7.
- Chandrakumari AS, Sinha P, Singaravelu S, Jaikumar S. Prevalence of anaemia among adolescent girls in a rural area of Tamil Nadu, India. *Journal of Family Medicine and Primary Care*. 2019;8(4):1414-7
- Seth RK, Khan S. Some biosocial correlates of anemia in rural women of Bareilly, Uttar Pradesh. *Indian J Comm Health*. 2015; 27(1): 72-76.
- Kamath R, Majeed JA, Chandrasekaran V, Pattanshetty SM. Prevalence of anemia among tribal women of reproductive age in Udupi Taluk, Karnataka. *J Fam Med Prim Care*. 2013;2(4):345-8.
- Verma R, Kharb M, Deswal S et al. Prevalence of anaemia among women of reproductive age group in a rural block of Northern India. *Indian J Comm Health*.2014;26:359-64.
- Raghuram V, Manjula A, Jayaram S. Prevalence of anaemia amongst women in reproductive age group in a rural area in South India. *Int J Biol Med Res*. 2012; 3(2):1482-84.
- Mishra P, Ahluwalia SK, Garg PK, Kar R, Panda GK. The Prevalence of Anaemia among reproductive Age Group (15-45 Yrs) Women in A PHC of Rural Field Practice Area of MM Medical College, Ambala, India. *J Women's Health Care* 2012;1:113.
- Bisoi S, Haldar D, Majumdar T.K, Bhattacharya G.N, Ray S.K. Correlates of anemia among pregnant women in a rural area of West Bengal. *The Journal of Family Welfare*.2011;57:72-78.
- Morsy N, Alhady S. Nutritional status and socio-economic conditions influencing prevalence of anaemia in pregnant women. *Int J Sci Technol Res* 2014;3:54-60.