

A PROSPECTIVE OBSERVATIONAL STUDY TO DETERMINE THE PREVALENCE OF
ANEMIA AMONG WOMEN OF REPRODUCTIVE AGE (15-50 YRS)

^{1*}Grandhe Purna Venkata Rajesh, ²Madisetty Naga Swapna Sri, ³Marri Mery, ⁴Nagaveni A., ⁵Thaticharla Pranathi, ⁶Dr. P. S. K. Suhil Azmi Pharm D., ⁷Dr. J. N. Suresh Kumar M. Pharm Ph. D.

⁶Assistant Professor,

⁷Principal Nips,

Narasaraopeta Institution of Pharmaceutical Sciences, Narasaraopet.



*Corresponding Author: Grandhe Purna Venkata Rajesh

Narasaraopeta Institution of Pharmaceutical Sciences, Narasaraopet.

DOI: <https://doi.org/10.5281/zenodo.18875479>

How to cite this Article: ^{1*}Grandhe Purna Venkata Rajesh, ²Madisetty Naga Swapna Sri, ³Marri Mery, ⁴Nagaveni A., ⁵Thaticharla Pranathi, ⁶Dr. P. S. K. Suhil Azmi Pharm D., ⁷Dr. J. N. Suresh Kumar M. Pharm Ph. D. (2026). A prospective observational study to determine the prevalence of anemia among women of reproductive age (15-50 yrs). European Journal of Pharmaceutical and Medical Research, 13(3), 444-449.

This work is licensed under Creative Commons Attribution 4.0 International license.



Article Received on 05/02/2026

Article Revised on 25/02/2026

Article Published on 05/03/2026

ABSTRACT

Background: Anemia remains a major public health problem worldwide, particularly among women of reproductive age. It contributes significantly to maternal morbidity, reduced work productivity, and adverse pregnancy outcomes. Despite ongoing national health programs, the burden of anemia continues to be high in developing countries. The study was conducted to access the prevalence of anemia among women of reproductive age who are living in rural areas around Narasaraopet. **Objectives:** To determine the prevalence of anemia among women of reproductive age and to assess its severity according to WHO guidelines for anemia classification. **Methods:** A prospective observational cross-sectional study was conducted among women aged 15–50 years attending GOVT HOSPITAL, NARASARAOPET from NOVEMBER 2025 to JANUARY 2026. The study included 100 women of reproductive age 15-50 years who are visiting the hospital for their routine checkups. Data was collected from the reports of the patients from the Dept of Obstetrics & Gynecology from Narasaraopeta Govt Hospital. Anemia was classified according to WHO criteria. Data were entered in Microsoft Excel and analyzed. **Results:** Among 100 women of reproductive age (15–50 years), the overall prevalence of anemia was 86%. Moderate anemia (43%) was the most common category, followed by mild anemia (34%), severe anemia (8%), and life-threatening anemia (1%), while 14% had normal hemoglobin levels. Anemia was more prevalent among pregnant women (95%) compared to non-pregnant women (83.75%). Age-wise analysis showed the highest burden among women aged 20–25 years, with consistently high prevalence across most reproductive age groups. Among pregnant women, anemia was observed across nearly all gestational age intervals (12–36 weeks), with an overall prevalence of 95% **Conclusion:** The study demonstrates a high prevalence of anemia among women of reproductive age. Early screening, nutritional education, and targeted public health interventions are essential to reduce the burden and associated complications.

KEYWORDS: Anemia, Reproductive age, Socio-economic indicators, Prevalence, Gender and WHO.

INTRODUCTION

Anemia remains one of the most widespread public health problems globally, particularly affecting women of reproductive age (15–50 years). According to the World Health Organization, anemia is defined as a haemoglobin concentration of less than 12 g/dL in non-pregnant women and less than 11 g/dL in pregnant women. It is a multifactorial condition characterized by a

reduced oxygen-carrying capacity of blood, leading to symptoms such as fatigue, weakness, impaired cognitive performance, and decreased work productivity.

Globally, anemia affects nearly one-third of women of reproductive age, with the highest burden observed in low- and middle-income countries. In India, anemia continues to be a major nutritional and public health

concern. Data from the National Family Health Survey have consistently reported a high prevalence of anemia among women, indicating persistent gaps in nutritional intake, healthcare access, and socioeconomic determinants of health.

Iron deficiency remains the most common cause of anemia; however, other contributing factors include folate and vitamin B12 deficiencies, parasitic infections, chronic diseases, genetic haemoglobin disorders, and menstrual blood loss. Social determinants such as poverty, limited dietary diversity, early marriage, repeated pregnancies, and poor health-seeking behaviour further aggravate the problem. Anemia in women of reproductive age has serious consequences, including reduced physical capacity, increased susceptibility to infections, adverse pregnancy outcomes, and intergenerational effects on child health.

Despite several national programs and nutritional supplementation strategies, the burden of anemia remains unacceptably high. Accurate estimation of prevalence through well-designed prospective observational studies is essential for identifying at-risk populations, understanding local determinants, and strengthening targeted interventions.

Therefore, the present prospective observational study aims to determine the prevalence of anemia among women of reproductive age and to assess associated demographic and clinical factors. The findings of this study are expected to contribute valuable evidence to guide policy decisions and improve preventive and therapeutic strategies at the community level.

MATERIALS AND METHODS

A prospective observational study was conducted to determine the prevalence of anemia among women of reproductive age (15–50 years) attending the outpatient department of Govt hospital, Narasaraopeta, over a period of 3 months November 2025 to January 2026. Ethical approval was obtained from the Institutional Ethics Committee NIPS prior to commencement of the study, and written informed consent was obtained from all participants. Women aged 15–50 years who were willing to participate were included in the study. Women with known haematological disorders, those who had received blood transfusion within the preceding three months, critically ill patients, and those currently receiving treatment for anemia were excluded.

The sample size was calculated using the standard formula $n = Z^2pq/d^2$, assuming a 95% confidence interval and a 5% margin of error, based on previously reported prevalence rates. Participants were recruited consecutively during the study period. A structured and pre-validated questionnaire was used to collect data on socio-demographic characteristics (age, educational status, occupation, socioeconomic status), dietary habits, menstrual history, obstetric history, and relevant medical conditions.

Approximately 2–3 mL of venous blood was collected under aseptic precautions from each participant for hemoglobin estimation using an automated hematology analyzer. Anemia was defined and classified according to the criteria established by the World Health Organization. Hemoglobin levels <12 g/dL in non-pregnant women and <11 g/dL in pregnant women were considered indicative of anemia. Severity was categorized as mild, moderate, or severe based on standard WHO cut-off values.

The collected data were entered and analyzed using Microsoft Excel (Microsoft Corporation, USA). Descriptive statistics were applied to calculate frequencies, percentages, means, and standard deviations. The prevalence of anemia was expressed as a proportion of the total study population.

RESULTS

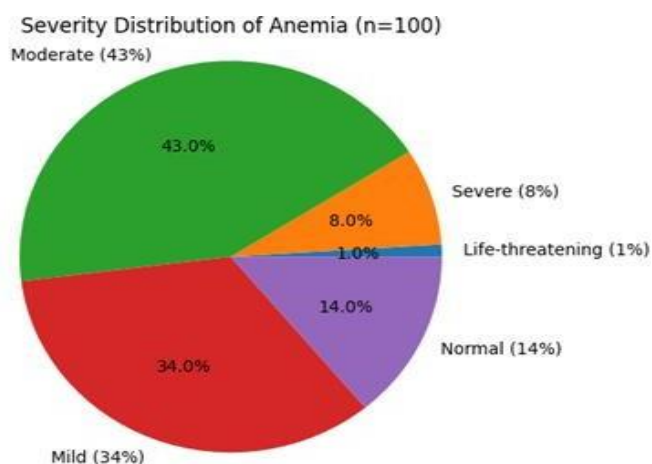
A total of 100 women of reproductive age (15–50 years) were included in the present study. Hemoglobin levels were assessed to determine the prevalence and severity of anemia.

Severity-Based Distribution of Anemia

Out of 100 participants, 86 women were found to be anemic, resulting in an overall prevalence of 86%, while 14% had normal hemoglobin levels (≥ 12 g/dL). Based on severity classification, moderate anemia (Hb 8–10 g/dL) was the most common form, affecting 43% of participants, followed by mild anemia (Hb 10–12 g/dL) in 34%. Severe anemia (Hb 6–8 g/dL) was observed in 8% of women, and 1% had life-threatening anemia (Hb <6 g/dL). These findings indicate that although most cases were mild to moderate, a notable proportion of women were affected by severe forms requiring urgent attention.

Table 1: Distribution of Study Participants Based on Severity of Anemia (n = 100).

Distribution of Study Participants Based on Severity of Anemia (n = 100)			
Hemoglobin Level (g/dL)	Severity Category	Number (n)	Percentage (%)
12 and above	Normal (No anemia)	14	14%
10 to 12	Mild Anemia	34	34%
8 to 10	Moderate Anemia	43	43%
6 to 8	Severe Anemia	8	8%
less than 6	Life Threatening	1	1%
Total		100	100%
Overall Prevalence of anemia is 86%			



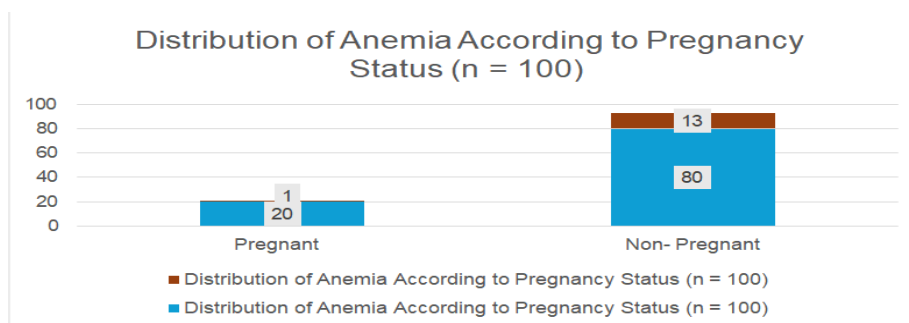
Distribution of Anemia According to Pregnancy Status

Among the 100 participants, 20 were pregnant and 80 were non-pregnant. Anemia was highly prevalent among pregnant women, with 19 out of 20 (95%) being anemic, whereas 67 out of 80 (83.75%) non-pregnant women

were anemic. Only one pregnant woman had normal hemoglobin levels. The findings demonstrate a comparatively higher burden of anemia among pregnant women, highlighting pregnancy as a significant risk factor.

Table 2: Distribution of Anemia According to Pregnancy Status (n = 100).

Distribution of Anemia According to Pregnancy Status (n = 100)					
Pregnant / Non-Pregnant	Total No. of women	No. of Anemic women	No. of Non Anemic women	Prevalence of anemia(%)	
Pregnant	20	19	1	95%	
Non- Pregnant	80	67	13	83.75%	



Age-Wise Distribution of Anemic Women

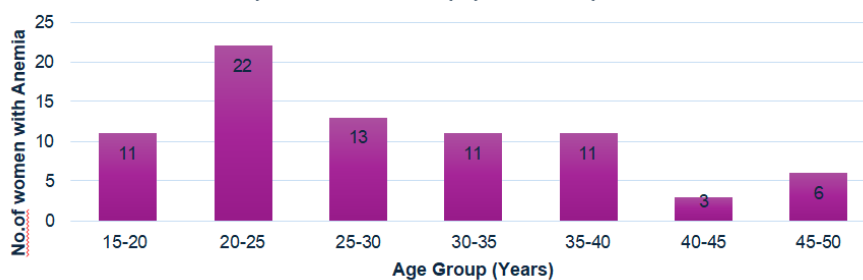
Age-wise analysis revealed that anemia was most frequently observed in women aged 20–25 years, with 22 cases reported in this group. High prevalence rates were also noted in the 30–35 years (91.7%) and 35–40 years (91.7%) age groups. Women aged 25–30 years showed

an 81.3% prevalence, while those aged 15–20 years had a comparatively lower prevalence of 57.9%. The lowest prevalence was observed in the 45–50 years age group (50%). These results indicate that anemia is particularly common among young and middle reproductive age women.

Table 3: Age-Wise Distribution of Study Participants (15–50 Years) (n = 100).

Age-Wise Distribution of Study Participants (15–50 Years) (n = 100)	
Age Group (Years)	No. of women with anemia
15-20	11
20-25	22
25-30	13
30-35	11
35-40	11
40-45	3
45-50	6

Age-Wise Distribution of Study Participants (15–50 Years) (n = 100)



Anemia Distribution Among Pregnant Women by Gestational Age

Gestational Age (Weeks)	Number of Anaemic Women
12-16 weeks	3
16-20 weeks	4
20-24 weeks	5
24-28 weeks	3
28-32 weeks	2
32-36 weeks	2

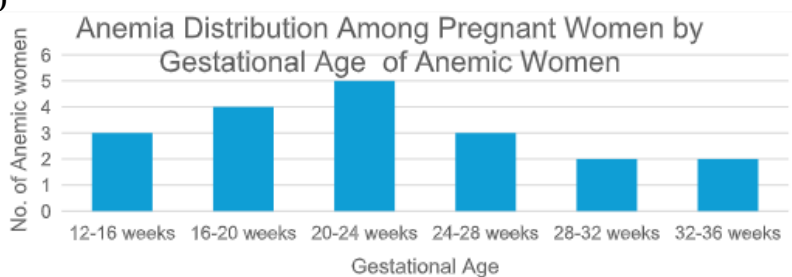
Bution of Anemia

Gestat ional Age- Wise Distri

Among pregnant women (n = 20), anemia was widely prevalent across all gestational age groups. All women in the 12–16, 16–20, 20–24, 24–28, and 32–36 weeks intervals were anemic (100%). In the 28–32

weeks interval, 2 out of 3 women were anemic (66.7%), which was the only interval showing a non-anemic case. Overall, anemia prevalence among pregnant women was 95%, indicating a substantial burden throughout pregnancy irrespective of gestational age.

Table 4: Distribution of Anemia Among Pregnant Women According to Gestational Age. (12–36 Weeks) (n = 20)



DISCUSSION

The present prospective observational study revealed a high overall prevalence of anemia (86%) among women of reproductive age. This finding indicates that anemia remains a significant public health concern in this population. The majority of cases were classified as moderate anemia (43%), followed by mild anemia (34%), suggesting that although life-threatening cases were rare (1%), a substantial proportion of women had clinically significant hemoglobin deficiency that may impact daily functioning, productivity, and maternal health outcomes.

Pregnancy was associated with a higher prevalence of anemia (95%) compared to non-pregnant women (83.75%). This finding is consistent with the increased physiological demand for iron and expanded plasma

volume during pregnancy, which predispose women to hemodilution and iron deficiency. The high burden observed among pregnant women highlights the need for strengthened antenatal screening, early iron supplementation, and nutritional counseling.

Age-wise distribution showed that anemia was particularly prevalent among women aged 20–25 years, with consistently high prevalence in the 30–40 years age groups as well. These age groups represent the most reproductively active segment of the population, which may explain the increased burden due to repeated pregnancies, inadequate birth spacing, nutritional deficiencies, and socioeconomic factors.

Gestational age analysis demonstrated that anemia was present across nearly all trimesters (12–36 weeks),

indicating that hemoglobin deficiency persists throughout pregnancy rather than being confined to a specific gestational period. This emphasizes the importance of continuous monitoring during antenatal visits.

Overall, the findings suggest that anemia among women of reproductive age, particularly pregnant women, remains alarmingly high and warrants immediate public health intervention.

CONCLUSION

The study concludes that anemia is highly prevalent (86%) among women of reproductive age, with moderate anemia being the most common severity category. Pregnant women are disproportionately affected, with a 95% prevalence rate. Anemia was observed across all age groups and gestational periods, indicating a persistent and widespread burden.

Early screening, routine hemoglobin monitoring, iron and folic acid supplementation, nutritional education, and strengthened antenatal care services are essential to reduce the burden of anemia and improve maternal health outcomes. Targeted public health strategies are urgently required to address this preventable condition.

Limitations Of The Study

- Despite providing valuable insights into the prevalence and severity of anemia among women of reproductive age, the present study has certain limitations.
- First, the sample size was relatively small ($n = 100$), which may limit the generalizability of the findings to the broader population. Larger multicentric studies would provide more representative data.
- Second, the study was conducted in a single setting, which may not reflect regional variations in nutritional status, socioeconomic conditions, or healthcare access.
- Third, the analysis was performed using basic statistical methods in Microsoft Excel without advanced inferential statistical testing. Therefore, associations between anemia and potential risk factors could not be explored in depth.
- Fourth, detailed biochemical investigations such as serum ferritin, vitamin B12, folate levels, or peripheral smear examination were not included, limiting the ability to determine the specific etiology of anemia.
- Finally, dietary patterns, socioeconomic status, educational level, menstrual history, and parity were not comprehensively assessed, which may have influenced the prevalence and severity of anemia.

ACKNOWLEDGEMENTS

We would like to thank all the staff of NIPS for their support during the study.

Funding: No funding sources.

Conflict of interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

REFERENCES

1. 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.
2. WHO, Prevalence of anemia in women of reproductive age (aged 15-49) (%) (2019) [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anemia-in-women-of-reproductive-age-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anemia-in-women-of-reproductive-age-(-))
3. Kinyoki D, Osgood-Zimmerman AE, Bhattacharjee NV, et al. Anemia prevalence in women of reproductive age in low- and middle-income countries between 2000 and 2018. *Nat Med.*, 2021; 27: 1761–82. <https://doi.org/10.1038/s41591021-01498-0>.
4. National Family Health Survey (NFHS-5), 2019–21: Mumbai: International Institute for Population Sciences. 2021. <https://rchiips.org/nfhs/NFHS-5Reports/India.pdf>.
5. National Family Health Survey (NFHS-4), 2015–16: Mumbai: International Institute for Population Sciences. 2015. <https://rchiips.org/nfhs/NFHS-4Reports/India.pdf>.
6. United Nations General Assembly. Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development. March, 2020. [https://unstats.un.org/sdgs/indicators/indicators-list/National Health Mission](https://unstats.un.org/sdgs/indicators/indicators-list/National%20Health%20Mission) <https://nhm.gov.in/>
7. Ministry of Health and Family Welfare (MOHFW), Government of India. Anemia Mukh Bharat— Intensified National Iron Plus Initiative (I-NIPI). 2018. <https://anemiamuktbharat.info/>
8. Alem, A.Z., Efendi, F., McKenna, L. et al. Prevalence and factors associated with anemia in women of reproductive age across low- and middle-income countries based on national data. *Sci Rep.*, 2023; 13: 20335 <https://doi.org/10.1038/s41598-023-46739-z>.
9. Givens, D.I.; Anitha, S.; Giromini, C. Anaemia in India and Its Prevalence and Multifactorial Aetiology: A Narrative Review. *Nutrients*, 2024; 16: 1673. <https://doi.org/10.3390/nu16111673>.
10. Let, S., Tiwari, S., Singh, A. et al. Prevalence and determinants of anaemia among women of reproductive age in Aspirational Districts of India: an analysis of NFHS 4 and NFHS 5 data. *BMC Public Health*, 2024; 24: 437. <https://doi.org/10.1186/s12889-024-17789-3>.
11. Mog M, Neogi D, Bharadwaz MP, Panda BK, and Sil A. Prevalence and factors associated with Anaemia in Married Women of Reproductive age group: Evidence from North East India. *Journal of*

- Biosocial Science.
<https://doi.org/10.1017/S0021932022000177>.
12. Jeevan, J., Karun, K.M., Puranik, A. et al. Prevalence of anemia in India: a systematic review, meta-analysis and geospatial analysis. *BMC Public Health*, 2025; 25: 1270. <https://doi.org/10.1186/s12889-025-22439-3>.
 13. Meshram II, Kumar BN, Venkaiah K, Longvah T. Subclinical vitamin A deficiency and anemia among women and preschool children from Northeast India. *Indian J Community Med.*, 2020; 45(3): 371–4. 31.
 14. Meshram II, Neeraja G, Longvah T. Vitamin A deficiency, anemia, and nutritional status of under 5-year children from Northeast India. *Indian J Community Med.*, 2021; 46(4): 673–9. 32.
 15. Mishra N, Kumar S, Parveen K. Essential determinants of anaemia among children of Uttar Pradesh (India): evidence from National Family Health Surveys. *Indian J Community Health*. 2016; 28(3): 254–9. 33.
 16. Panchal SS, Mishra U, Kothari C, et al. Prevalence of anemia in pre school tribal children with reference to parasitic infections and nutritional impact. *J Taibah Univ Med Sci.*, 2022; 17(6): 1087–93. 34.
 17. Philip RR, Vijayakumar K, Indu PS, Shrinivasa BM, Sreelal TP, Balaji J. Prevalence of undernutrition among tribal preschool children in Wayanad district of Kerala. *Int J Adv Med Health Res.*, 2015; 2: 33–8. 35.
 18. Sarna A, Porwal A, Ramesh S, et al. Characterisation of the types of anaemia prevalent among children and adolescents aged 1–19 years in India: a population-based study. *Lancet Child Adolesc Health*. 2020; 4(7): 515–25. 36.
 19. Sharma U, Yadav N. Prevalence and risk factors of anemia and zinc deficiency among 4-6-year-old children of Allahabad District, Uttar Pradesh. *Indian J Public Health*. 2019; 63(1): 79–82. 37.
 20. Singh RK, Patra S. Extent of anaemia among preschool children in EAG States, India: a challenge to policy makers. *Anemia*. 2014; 2014: 868752. 38.
 21. Sudhagandhi B, Prema A, Sundaresan S, William WE, Shivashekar G. Anemia in toddlers of Kattankulathur, Kancheepuram District, (Tamil Nadu) India. *Int J of Pharma Bio*. 2012; 3(1): B687–92. 39.
 22. Ahankari AS, Myles PR, Fogarty AW, Dixit JV, Tata LJ. Prevalence of iron-deficiency anaemia and risk factors in 1010 adolescent girls from rural Maharashtra, India: a cross-sectional survey. *Public Health*. 2017; 142: 159–66. 40.
 23. Banerjee M, Bhatti BVK, Roy D, Tomo S. A national survey of the prevalence of anemia and obesity in Indian School Children. *J Community Hosp Intern Med Perspect*. 2022; 12(5): 48–53. 41.
 24. Basu S, Basu S, Hazarika R, Parmar V. Prevalence of anemia among school going adolescents of Chandigarh. *Indian Pediatr*. 2005; 42(6): 593–7. 42.
 25. Bharati P, Shome S, Chakrabarty S, Bharati S, Pal M. Burden of anemia and its socioeconomic determinants among adolescent girls in India. *Food Nutr Bull.*, 2009; 30(3): 217–26. 43.
 26. Bhatia V, Parida SP, Mahajan PB, Sahoo DP, Bhattacharjee S. A community based study of anaemia burden using hemocue 201 in Eastern India. *Indian J Community Health.*, 2020; 32(2): 365–70. 44.
 27. Biradar SS, Biradar SP, Alatagi AC, Wantamutte AS, Malur PR. Prevalence of anaemia among adolescent girls: A one year cross-sectional study. *J Clin Diagn Res.*, 2012; 6: 372–7. 45.
 28. Bulliyy G, Mallick G, Sethy GS, Kar SK. Hemoglobin status of non-school going adolescent girls in three districts of Orissa, India. *Int J Adolesc Med Health*. 2007; 19(4): 395–406. 46.
 29. Chandrakumari AS, Sinha P, Singaravelu S, Jaikumar S. Prevalence of anemia among adolescent girls in a rural area of Tamil Nadu. *India J Family Med Prim Care.*, 2019; 8(4): 1414–7. 47.
 30. Chaudhary SM, Dhage VR. A study of anemia among adolescent females in the urban area of Nagpur. *Indian J Community Med.*, 2008; 33(4): 243–5. 48.
 31. Chauhan S, Kumar P, Marbaniang SP, Srivastava S, Patel R. Prevalence and predictors of anaemia among adolescents in Bihar and Uttar Pradesh, India. *Sci Rep.*, 2022; 12(1): 8197. 49.
 32. Gopalakrishnan S, Eashwar VMA, Muthulakshmi M, Geetha A. Intestinal parasitic infestations and anemia among urban female school children in Kancheepuram district, Tamil Nadu. *J Family Med Prim Care*, 2018; 7(6): 1395–400. 50.
 33. Goyle A Jr, Prakash S. Iron status of adolescent girls (10–15 years) attending a government school in Jaipur City, Rajasthan. *India Malays J Nutr.*, 2009; 15(2): 205–11.