ORIGINAL ARTICLE

Prevalence and Determinants of Anaemia among Children Aged 6-59 Months in an Urban Area of Western Uttar Pradesh: A Community-Based Cross-Sectional Study

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Abstract

Background: Anaemia remains a major public health problem among under-five children. In India, 67.1% of children aged 6-59 months are anaemic as per NFHS-5. This study estimated the prevalence of anaemia and its associated socio-demographic, nutritional, and maternal factors among children aged 6-59 months in an urban area of Western Uttar Pradesh. **Material & Methods:** A community-based cross-sectional study was conducted in the urban field practice area of UHTC, Department of Community Medicine, LLRM Medical College, Meerut, Uttar Pradesh, from October 2024 to September 2025. A total of 200 children aged 6-59 months were selected using multistage random sampling. Data were obtained using a pretested questionnaire. Haemoglobin estimation was done using a digital haemoglobinometer, and anaemia was classified according to WHO criteria. Data were analysed using Epi Info version 7.2.5. Chi-square test was applied, and $p<0.05$ was considered statistically significant. **Result:** The prevalence of anaemia was 54.0%. Among anaemic children, 62.0% had moderate and 38.0% had mild anaemia. Higher prevalence was observed among children aged 24-35 months. Significant associations were found with incorrect timing of complementary feeding initiation ($p=0.017$) and maternal iron-folic acid consumption during pregnancy ($p=0.018$). No significant association was observed with gender, socioeconomic status, or exclusive breastfeeding. **Conclusion:** Anaemia remains highly prevalent among under-five children. Strengthening complementary feeding practices and maternal iron supplementation is essential to reduce childhood anaemia.

Key-words: Anaemia, Under-five children, Complementary feeding, Iron supplementation.

Introduction

Anaemia remains a major public health problem among under-five children globally, affecting approximately forty percent of children aged 6-59 months.[1] In India, despite ongoing national programmes, the burden remains high, with 67.1% of children reported to be anaemic as per NFHS-5.[2] Iron deficiency, inappropriate infant feeding practices, infections, and poor maternal nutrition are key contributing factors.[3] Anaemia in early childhood can affect physical growth, cognitive development, and immunity, thereby increasing susceptibility to infections and long-term health consequences.

The Government of India has implemented the Anemia Mukt Bharat strategy focusing on the test-treat-talk approach.[4] However, gaps in early detection, treatment adherence, and follow-up continue to exist, particularly in urban populations. In addition, decreased awareness regarding appropriate infant feeding practices and maternal nutrition also contributes to the persistence of anaemia. Moreover, there is limited evidence regarding the role of socio-demographic, nutritional, and maternal determinants influencing anaemia among under-five children in urban settings. Identifying these factors is essential for planning targeted interventions and strengthening programme implementation. Therefore, the present study was undertaken to estimate the prevalence of anaemia and identify its socio-demographic, nutritional, and maternal determinants among children aged 6-59 months.

Aim & Objective

1. To estimate the prevalence of anemia among children aged 6-59 months in an urban area.
2. To identify socio-demographic, nutritional, and maternal determinants associated with anemia among children aged 6-59 months.

Material & Methods:

Study design and setting

A community-based cross-sectional study was conducted in an urban area of Meerut district, Uttar Pradesh, from October 2024 to September 2025. Following random selection of Ward No. 58 from the 90 municipal wards of Meerut, the study was carried out in the selected ward, which falls under the Urban Health Training Centre (UHTC) of the Department of Community Medicine, LLRM Medical College.

Study population

Children aged 6-59 months residing in the study area for at least six months were included in the study. Children with known chronic illnesses such as thalassemia, tuberculosis, renal or liver diseases were excluded.

Sample size

The sample size was calculated using the formula $n = Z^2pq/d^2$, considering the prevalence of anaemia among children of district Meerut as 55.2% (NFHS-5),[2] 95% confidence interval, and 7% absolute precision. The calculated sample size was 194, which was rounded off to 200.

Sampling technique

A multistage random sampling technique was employed. In first stage, one municipal ward (Ward No. 58) was selected randomly from a total of 90 wards of urban Meerut using the lottery method. The selected ward comprised 10 localities (mohallas) with a total population of 15,583, including 2,769 children aged 6-59 months.

In the second stage, study participants were selected from each locality using population proportionate sampling to ensure representative distribution. The required sample size (n=200) was allocated to each locality based on the proportion of children aged 6-59 months residing in that locality.

At the third stage, eligible households were enrolled from each selected locality through door-to-door visits. The starting point in each locality was determined by randomly selecting a direction using the pencil-drop method from the centre of the locality. Subsequent households were visited sequentially until the required sample size for that locality was achieved.

From each household, one eligible child aged 6-59 months was included in the study. In cases where more than one eligible child was present, one child was selected using the lottery method. If no eligible participant was available in a household, the next household was approached.

Data collection

Data were collected using a predesigned and pretested questionnaire covering socio-demographic characteristics, infant feeding practices, and maternal factors. Haemoglobin estimation was carried out using a portable digital haemoglobinometer (AccuSure Hb-101) using capillary blood samples. Maternal anaemia status was obtained from available antenatal health records wherever available. In the absence of documented records, information was obtained from the mother's self-reported history of anaemia during pregnancy. No blood sample was collected from mothers as part of the present study.

Operational definitions

Anaemia was defined as haemoglobin level <11 g/dl as per WHO criteria. It was further classified as: Mild: 10-10.9 g/dl, Moderate: 7-9.9 g/dl, Severe: <7 g/dl.

Statistical analysis

Data were entered in Microsoft Excel and analysed using Epi Info version 7.2.5. Descriptive statistics were expressed as proportions. Association between variables was assessed using Chi-square test, and p-value <0.05 was considered statistically significant.

Ethical considerations: The study was approved by the Institutional Ethics Committee, Lala Lajpat Rai Memorial Medical College, Meerut (Approval No. SC-1/2026/670; dated 22/01/2026).

Result

A total of 200 children aged 6-59 months were included in the study. Table 1 presents their socio-demographic characteristics. The largest proportion of children belonged to the 48-59 months age group (28.5%), followed by the 36-47 months age group (24.0%), while 52.5% were males. According to the Modified B.G. Prasad Socioeconomic Status Scale, more than half of the participants (52.0%) belonged to Class II, followed by Class I (25.0%). The majority of children (68.0%) lived in joint families. Regarding maternal education, the largest proportion of mothers had completed high school (39.0%), followed by graduates and above (33.0%), whereas only 3.0% were illiterate. Most mothers were homemakers (90.0%), with only a small proportion engaged in professional (5.0%) or skilled occupations (3.5%). Among fathers, skilled workers constituted the largest occupational group (37.5%), followed by professionals (30.0%) and clerical workers/shop owners/farmers (19.5%).

Table 1: Socio-demographic characteristics of study participants (N=200)

Variable	Category	Frequency (n)	Percentage (%)
Age (months)	6–11	21	10.5
	12–23	35	17.5
	24–35	39	19.5
	36–47	48	24.0
	48–59	57	28.5
Sex	Male	105	52.5
	Female	95	47.5
Socioeconomic status (as per Modified B.G. Prasad SES scale)	Class I	50	25.0
	Class II	104	52.0
	Class III	35	17.5
	Class IV	11	5.5
Type of family	Nuclear	64	32.0
	Joint	136	68.0
Maternal education	Illiterate	6	3.0
	Primary	7	3.5
	Middle school	32	16.0
	High school	78	39.0
	Intermediate/Diploma	11	5.5
	Graduate and above	66	33.0
Mother's occupational status	Unskilled worker	01	0.5
	Semi-skilled worker	02	1.0
	Skilled worker	07	3.5
	Professional	10	5.0
	Home maker	180	90.0
Father's occupational status	Unskilled worker	18	9.0
	Semi-skilled worker	08	4.0
	Skilled worker	75	37.5
	Clerical, shop owner, farmer	39	19.5
	Professional	60	30.0

Table 2 shows the overall prevalence of anaemia among children aged 6-59 months was found to be 54.0%. Among the anaemic children, the majority had moderate anaemia (62.0%), while 38.0% had mild anaemia. No cases of severe anaemia were observed in the study population.

Table 2: Prevalence and severity of anemia among study participants (N=200)

Variable	Category	Frequency (n)	Percentage (%)
Anemia status	Present	108	54.0
	Absent	92	46.0
Severity (n=108)	Mild	41	38.0
	Moderate	67	62.0

Table 3 shows that anaemia prevalence was highest among children aged 24-35 months (64.1%) and lowest among those aged 48-59 months (40.3%). Anaemia was observed in 52.3% of males and 55.7% of females. Higher prevalence was seen among children from Class IV socioeconomic status (72.7%) and among children of illiterate (83.3%) and primary educated mothers (85.7%). However, age, sex, socioeconomic status, and maternal education were not significantly associated with anaemia (p>0.05). Type of family donot show a statistically significant association with anaemia (p=0.893).

Table 3: Association of socio-demographic factors with anemia among study participants (N=200)

Variable	Category	Anemia (Present) n (%)	Anemia (Absent) n (%)	Total	p-value
Age (months)	6–11	13 (61.9)	8 (38.1)	21	0.140
	12–23	21 (60.0)	14 (40.0)	35	
	24–35	25 (64.1)	14 (35.9)	39	
	36–47	26 (54.2)	22 (45.8)	48	
	48–59	23 (40.3)	34 (59.7)	57	
Sex	Male	55 (52.3)	50 (47.6)	105	0.629
	Female	53 (55.7)	42 (44.2)	95	
Socioeconomic status	Class I	28 (56.0)	22 (44.0)	50	0.551
	Class II	55 (52.9)	49 (47.1)	104	
	Class III	17 (48.6)	18 (51.4)	35	
	Class IV	8 (72.7)	3 (27.3)	11	
Maternal education	Illiterate	5 (83.3)	1 (16.7)	6	0.204
	Primary	6 (85.7)	1 (14.3)	7	
	Middle school	19 (59.4)	13 (40.6)	32	
	High school	42 (53.8)	36 (46.2)	78	
	Intermediate/Diploma	6 (54.5)	5 (45.5)	11	
	Graduate and above	30 (45.5)	36 (54.5)	66	
Type of family	Nuclear	35(54.7)	29(45.3)	64	0.893
	Joint	73(53.6)	63(46.4)	136	

Table 4: Association of birth order, nutritional and feeding practices with anemia among study participants (N=200)

Variable	Category	Anemia (Present) n (%)	Anemia (Absent) n (%)	Total	p-value
Birth order	1	45(50.5)	44(49.5)	89	0.815
	2	55(56.1)	43(43.9)	98	
	3	6(60.0)	4(40)	10	
	>3	2(66.7)	1(33.3)	03	
Exclusive breastfeeding	Yes	74 (51.4)	70 (48.6)	144	0.234
	No	34 (60.7)	22 (39.3)	56	
Complementary feeding	<6 months	19 (73.1)	7 (26.9)	26	**0.017**
	6–8 months	66 (47.4)	73 (52.6)	139	
	>8 months	23(65.7)	12 (34.3)	35	
Birth weight	<2.5 kg	29 (65.9)	15 (34.1)	44	0.199
	2.5–3.5 kg	75 (50.7)	73 (49.3)	148	
	>3.5 kg	4 (50.0)	4 (50.0)	8	

Table 4 shows that anaemia prevalence increased with higher birth order, from 50.5% among first-born children to 66.7% among children with a birth order greater than three; however, this association was not statistically significant (p=0.815). Anaemia prevalence was also higher among children who were not exclusively breastfed (60.7%) and among low birth-weight children (65.9%), although these associations were not statistically significant (p>0.05). A significant association was observed between the timing of complementary feeding and anaemia (p=0.017), with a higher prevalence among children introduced to complementary feeding before 6 months (73.1%) or after 8 months (65.7%) compared to those introduced at 6-8 months (47.4%).

Table 5: Association of maternal factors with anemia among study participants (N=200)

Variable	Category	Anemia Present n (%)	Anemia Absent n (%)	Total	p-value
Maternal anemia	Yes	21 (60.0)	14 (40.0)	35	0.433
	No	87 (52.7)	78 (47.3)	165	
IFA consumption	Yes	84 (50.3)	83 (49.7)	167	**0.018**
	No	24 (72.7)	9 (27.3)	33	

Chi-square test applied; p < 0.05 considered statistically significant

Table 5 shows that anaemia prevalence was higher among children of anaemic mothers (60.0%) than non-anaemic mothers (52.7%), although the association was not statistically

significant (p=0.433). A statistically significant association was observed between maternal IFA consumption and childhood anaemia (p=0.018), with higher anaemia prevalence among children whose mothers did not consume IFA during pregnancy (72.7%) compared to those whose mothers consumed IFA (50.3%).

Discussion

The present study revealed that the prevalence of anemia among children aged 6-59 months was 54.0%, indicating that anemia continues to be a significant public health problem in the study area. This finding is comparable with the National Family Health Survey-5 (NFHS-5), which shows an anemia prevalence of 66.4% among children in Uttar Pradesh.[2] Gupta et al. reported a prevalence of 47.5%, while Chungkham et al. reported 63.8%, which are comparable to the findings of the present study.[5,6] The similarity in prevalence across these studies may be attributed to the persistence of common risk factors such as inadequate dietary iron intake, suboptimal infant feeding practices, recurrent infections, and maternal nutritional deficiencies in Indian children. The slightly lower prevalence observed in the present study compared with the NFHS-5 estimates for Uttar Pradesh may reflect improvements in urban healthcare access, maternal health services, and implementation of the Anemia Mukt Bharat programme in the study area.

With respect to severity, the majority of anemic children in the present study had moderate anemia (62.0%), followed by mild anemia (38.0%), with no cases of severe anemia. Gupta et al.[5] also reported that moderate anemia constituted the major proportion of cases among under-five children. The predominance of moderate anaemia may indicate delayed detection and treatment of iron deficiency, whereby children remain undiagnosed until haemoglobin levels decline substantially. The absence of severe anaemia could be due to improved healthcare-seeking behaviour, routine screening, and early management through existing maternal and child health programmes.

The highest prevalence of anemia in the present study was observed among children aged 24-35 months (64.1%), followed by 6-11 months (61.9%) and 12-23 months (60.0%), with the lowest prevalence in children aged 48-59 months (40.3%). Kumar et al. and Mandal et al. also reported higher prevalence among younger children with a declining trend as age increases.[7,8] This age-related pattern is biologically plausible because children between 6 and 35 months undergo rapid growth, resulting in increased iron requirements. Inadequate dietary diversification and delayed or incorrect timing of complementary feeding initiation during this period may further increase the risk of iron deficiency. The decline in anaemia prevalence among older children may reflect improved dietary diversity and gradual replenishment of iron stores with age.

In the present study, no statistically significant association was found between gender and anemia, with prevalence of 52.3% among males and 55.7% among females. Kishore et al. also reported no significant gender difference in anemia prevalence among children.[9] The absence of a significant gender difference may be because nutritional requirements and feeding practices are broadly similar among boys and girls during early childhood. At this age, biological sex has a relatively limited influence on iron requirements compared with adolescence.

Although not statistically significant, a higher prevalence of anemia was observed among children belonging to lower socioeconomic classes, particularly Class IV (72.7%) in the present study. Kumar et al. also demonstrated higher anemia prevalence among children from lower socioeconomic groups.[7] Although the association was not statistically significant, the higher prevalence observed among children from lower socioeconomic classes may reflect reduced access to nutritionally diverse foods, poorer living conditions, and increased exposure to infections. The lack of statistical significance in the present study may be due to the relatively small number of participants in the lower socioeconomic categories.

A decreasing trend in anemia prevalence was observed with increasing maternal education, with highest prevalence among children of illiterate (83.3%) and primary educated mothers (85.7%), and lowest among those whose mothers were graduates and above (45.5%). Chandran et al. also demonstrated that lower maternal education is associated with higher anemia prevalence among children.[10] Mothers with higher educational attainment are generally more aware of appropriate infant feeding practices, dietary diversity, hygiene, and healthcare utilisation, which may contribute to better nutritional outcomes among their children. The absence of statistical significance in the present study may be attributable to the limited number of mothers in the lower educational categories.

Among nutritional factors, a statistically significant association was observed between the timing of initiation of complementary feeding and anemia. In the present study, anemia prevalence was highest among children introduced to complementary feeding before 6 months (73.1%) and after 8 months (65.7%), compared to 47.4% among those introduced at 6-8 months. Similar findings were reported by Dewey and Chaparro et al., who emphasized that inappropriate timing and poor quality of complementary feeding can increase the risk of iron deficiency and anemia during infancy and early childhood.[11] Delayed or inadequate complementary feeding may fail to meet the increased iron requirements during periods of rapid growth, thereby predisposing young children to anemia. Similarly, early initiation of complementary feeding may displace breast milk with foods of lower nutritional quality

and bioavailable iron, thereby increasing the risk of iron deficiency and subsequent anaemia.

Although not statistically significant, a higher prevalence of anemia was observed among children who were not exclusively breastfed (60.7%) compared to those exclusively breastfed (51.4%). Azzizah et al. also reported higher anemia prevalence among non-exclusively breastfed children.[12] Exclusive breastfeeding during the first six months of life supports optimal nutrition and reduces the risk of infections that may contribute to anaemia. However, the lack of statistical significance in the present study may be explained by the influence of other factors such as complementary feeding practices and maternal nutritional status.

Similarly, anemia prevalence was higher among low birth weight children (65.9%) compared to those with normal birth weight (50.7%) and higher birth weight (50.0%), although the association was not statistically significant. Xu et al. reported that children with low birth weight had a significantly higher risk of developing anemia during early childhood due to reduced iron stores at birth and increased nutritional demands during growth.[13] Although the association was not statistically significant in the present study, the observed trend is biologically plausible because low birth weight infants are born with reduced iron reserves and have increased iron requirements during rapid postnatal growth. The lack of statistical significance may be related to the relatively small number of low birth weight children included in the study.

Maternal factors also played a significant role in determining anemia among children. In the present study, maternal IFA consumption during pregnancy showed a statistically significant protective effect, with anemia prevalence of 72.7% among children whose mothers did not consume IFA compared to 50.3% among those who did. Nisar et al. also demonstrated that maternal iron-folic acid supplementation during pregnancy had beneficial effects on child health outcomes and may reduce the risk of childhood anemia.[14] Inadequate maternal iron intake during pregnancy can result in poor fetal iron stores, thereby predisposing children to anemia during early childhood. Balarajan et al. reported that maternal iron and folic acid supplementation during pregnancy was associated with improved birth outcomes and better fetal iron reserves, which may subsequently reduce the risk of anemia during early childhood.[15] Adequate maternal iron supplementation during pregnancy is therefore important for maintaining optimal iron stores in infants and young children. This finding also highlights the importance of ensuring adequate compliance with antenatal iron-folic acid supplementation under the Anemia Mukt Bharat strategy to improve both maternal and child health outcomes.

Although maternal anemia during pregnancy was associated with a higher prevalence of anemia among children (60.0% vs 52.7%), the association was not statistically significant. Similar findings were reported by Abioye et al., who observed that maternal iron deficiency anemia during pregnancy was associated with an increased risk of anemia among infants due to reduced fetal iron stores.[16] The absence of statistical significance in the present study may be due to the relatively small number of mothers with anaemia and the multifactorial nature of childhood anaemia, where postnatal feeding practices, infections, and environmental factors also contribute substantially to anaemia risk.

Overall, the findings of the present study indicate that anemia among under-five children is multifactorial, influenced by a combination of feeding practices, maternal health, and socioeconomic factors. Strengthening interventions focusing on appropriate complementary feeding, improving maternal IFA supplementation, and enhancing awareness regarding child nutrition is essential for reducing the burden of anemia in urban populations.

Conclusion

The present study highlights that anaemia remains a significant public health problem among children aged 6-59 months in the urban area, with a prevalence of 54.0%. Incorrect timing of complementary feeding initiation practices and inadequate maternal iron-folic acid supplementation during pregnancy were identified as significant determinants. Strengthening infant feeding practices and maternal health interventions is essential to reduce the burden of anaemia among under-five children.

Recommendation

Strengthening of Infant and Young Child Feeding (IYCF) counselling, with emphasis on timely complementary feeding and inclusion of iron- and vitamin B12-rich foods. Ensuring adequate coverage and compliance of iron-folic acid supplementation among pregnant women, along with maternal nutrition counselling. Regular screening and early detection of anaemia at community level using point-of-care haemoglobin estimation. Promoting behaviour change communication (BCC) to improve feeding practices, dietary diversity, and anaemia awareness among caregivers. Incorporating community-level assessment of nutritional causes, including dietary deficiencies and deworming. Strengthening follow-up under the Test-Treat-Talk strategy to ensure treatment adherence and monitoring.

Limitation of the study

- Being a cross-sectional component, causal relationship between risk factors and anaemia could not be established.
- Information on feeding practices was based on caregiver recall and may be subject to recall bias.
- The study was conducted in a single urban ward, which may limit the generalizability of the findings.

- Anaemia was diagnosed solely based on haemoglobin estimation; therefore, the specific type and underlying cause of anaemia could not be determined, and non-iron deficiency causes cannot be excluded.

Relevance of the study

Anaemia among under-five children remains a major public health concern in India despite ongoing national programmes like Anemia Mukt Bharat. Early childhood anaemia adversely affects growth, immunity, and cognitive development. This study provides evidence on the burden and key socio-demographic, nutritional, and maternal factors associated with anaemia in an urban area of Western Uttar Pradesh. The findings can help strengthen targeted interventions and improve the effectiveness of anaemia control strategies at the community level.

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References

1. World Health Organization. Global anemia estimates, 2021 edition. World Health Organization, Geneva (2021).
2. International Institute for Population Sciences (IIPS) & Ministry of Health and Family Welfare (MoHFW). National Family Health Survey (NFHS-5), 2019-21: India Fact Sheet. IIPS, Mumbai (2021).
3. Kliegman, R. M., St. Geme, J. W., Blum, N. J., Shah, S. S., Tasker, R. C. & Wilson, K. M. Nelson Textbook of Pediatrics. 21st edn. Elsevier, Philadelphia (2020). p. 2523-2535
4. Ministry of Health and Family Welfare. Anemia Mukt Bharat: Intensified National Iron Plus Initiative (I-NIPI) Strategy Document. Government of India, New Delhi (2018).
5. Gupta, D., Mishra, S., Singh, M., Sharma, S., Agarwal, A., & Mittal, S. (2020). Anemia among 6 - 59 months children in a rural area of Bareilly district: a cross sectional study. International Journal Of Community Medicine And Public Health, 7(2), 673-677. https://doi.org/10.18203/2394-6040.ijcmph20200447
6. Chungkham HS, Marbaniang SP, Narzary PK. "Childhood Anemia in India: an application of a Bayesian geo-additive model". BMC Pediatr. 2021 Nov 30;21(1):529. doi: 10.1186/s12887-021-03008-0. PMID: 34847925; PMCID: PMC8630875.
7. Kumar A, Gulati BK, Sahu D, Ranjan V, Rao MVV. Socioeconomic determinants of anaemia in preschool children in Uttar Pradesh: evidence from NFHS-4 survey. Int J Community Med Public Health 2020;7:4461-6.
8. Mandal S, Behera J, Shit B, Paul S. Regional disparity of anemia among children and its determinants: A study of National Family Health Survey-5. Indian J Public Health. 2024;68(3):450-453. doi:10.4103/ijph.ijph_943_23.
9. Kishore S, Singh M, Jain B, Verma N, Gawande K, Kishore S, et al. A study to assess prevalence of anaemia among beneficiaries of Anaemia Mukt Bharat Campaign in Uttarakhand. J Family Med Prim Care. 2020;9(3):1691-1694. doi:10.4103/jfmpc.jfmpc_941_19.
10. Chandran V, Kirby RS. An Analysis of Maternal, Social and Household Factors Associated with Childhood Anemia. Int J Environ Res Public Health. 2021 Mar 17;18(6):3105. doi: 10.3390/ijerph18063105. PMID: 33802946; PMCID: PMC8002610.
11. Dewey KG. Increasing Iron Intake of Children through Complementary Foods. Food and Nutrition Bulletin. 2007;28(4_suppl4):S595-S609. doi:10.1177/15648265070284S412
12. Azizah FDD, Pamungkasari EP, Murti B (2023). Meta-Analysis the Effect of Exclusive Breastfeeding on Anemia in Children Under Five. J Matern Child Health. 08(02): 237-246. https://doi.org/10.26911/thejmch.2023.08.02.11.
13. Liu X, Liu X, Yang Z, Li Z, Zhang L, Zhang Y, et al. The association of infant birth sizes and anemia under five years old: A population-based prospective cohort study in China. Nutrients. 2024;16(12):1796. doi:10.3390/nu16121796.
14. Nisar, Y. B., Dibley, M. J., & Aguayo, V. M. (2016). Iron-Folic Acid Supplementation During Pregnancy Reduces the Risk of Stunting in Children Less Than 2 Years of Age: A Retrospective Cohort Study from Nepal. Nutrients, 8(2), 67. https://doi.org/10.3390/nu8020067
15. Yarlini Balarajan, S.V. Subramanian, Wafaie W. Fawzi,Maternal Iron and Folic Acid Supplementation Is Associated with Lower Risk of Low Birth Weight in India1-3,The Journal of Nutrition,Volume 143, Issue 8,2013,Pages 1309-1315,ISSN 0022 3166,https://doi.org/10.3945/jn.112.172015.
16. Abioye AI, McDonald EA, Park S, Ripp K, Bennett B, Wu HW, et al. Maternal anemia type during pregnancy is associated with anemia risk among offspring during infancy. Pediatr Res. 2019;86(3):396-402. doi:10.1038/s41390-019-0433-5.