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A comparative literature Review on Anaemia condition in Asian, African and European country women and children

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Abstract
Anaemia remains a major public health concern in developing nations. In 2019, 40% of children aged 6-59 months were anemic, down from 48% in 2000. Among non-pregnant women aged 15-49 years, prevalence remained nearly unchanged between 2000 (31%) and 2019 (30%), while in pregnant women, it fell from 41% to 36%. In 2019, anaemia rates exceeded 70% in 11 countries among children aged 6-59 months, and in 10 countries above 50% in women aged 15-49 years. By 2021, global anaemia prevalence across all ages stood at 24.3%, an improvement from 28.2% in 1990. Anaemia contributed to 52.0 million Years Lived with Disability (YLDs), with rates decreasing as the Socio-demographic Index improved. Dietary iron deficiency, hemoglobinopathies, hemolytic anaemia, and neglected tropical diseases were the leading causes, accounting for 84.7% of anaemia-related YLDs. The WHO estimates 66% of pregnant women in Africa suffer from anaemia. The most affected regions Africa and South-East Asia report 106 million affected women and 103 million affected children in Africa, while South-East Asia has 244 million women and 83 million children affected. Postpartum anaemia remains prevalent, ranging from 50% to 80% in low-income countries. In Europe, iron deficiency is common among older adults, especially those aged ≥80 years in Austria and Portugal. Of the 500,000 maternal deaths due to childbirth annually, 20% result from peripartum hemorrhage and anaemia. A study reviewed anaemia prevalence from 2010 to 2022 and examined trends between 1999 and 2009, assessing 23 years of change using data from PubMed, Web of Science, and Google Scholar.

Keywords: Anaemia Prevalence, Maternal Health, Socioeconomic Factors, Maternal and Child Impact, Iron deficiency, Regional Disparities, Women of Reproductive Age (WRA)

Introduction

Anaemia continues to be a widespread public health concern, impacting one-third of all adults and nearly two billion people globally [1]. The World Health Organization (WHO) defines anaemia as hemoglobin (Hb) levels below 12.0 g/dL for women and 13.0 g/dL for men. However, Hb distribution varies by sex, ethnicity, and physiological factors. In Western countries, the aging population has led to increased anemia rates among the elderly, where anaemia is defined as Hb levels below 12 g/dL in both sexes and is often mild (10–12 g/dL) [2]. This condition has significant economic consequences, including foregone gross domestic product (GDP) and rising treatment costs [3]. In low- and middle-income nations, anaemia primarily results from nutritional deficiencies, infectious diseases, and genetic hemoglobin disorders. ([4]) Iron deficiency alone accounts for more than 60% of anaemia cases and was responsible for approximately 120,000 preventable deaths in 2010, as well as over 5% of global years lived with disability (YLD) [1]. South Asia represented 38% of the world's anaemia-related YLD in 2012 yet has made little progress in combating the issue despite economic growth. Between 1995 and 2011, anaemia prevalence among non-pregnant women in South Asia decreased slightly from 53% to 47% (range: 33–59%), while among pregnant women, rates remained nearly unchanged at 53% in 1995 and 52% in 2001 [5, 6]. Anaemia among children under five declined more noticeably, from 70% to 58% during the same period. However, modeled data suggests increasing anaemia prevalence among children in Afghanistan, Pakistan, and Sri Lanka between the early 2000s and 2012, alongside a similar trend for non-pregnant women in Afghanistan and Pakistan [7]. Overall, anaemia persists in South Asia, with moderate (20.0–39.9%) or severe (≥40%) prevalence among children and non-pregnant women [8]. South Asia includes countries such as Bangladesh and Nepal, which have implemented strong anemia policies, while others with

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higher anaemia rates could benefit from reinforced program commitments [9]. In Africa, Egypt and South Africa report extremely high anaemia prevalence rates of 99.5% and 85.6%, respectively, while Ethiopia presents a lower prevalence of 19.3%. Maturity status also affects rates, with children exhibiting higher prevalence (58.8%) compared to adults (21%) [10]. In Europe, baseline iron deficiency prevalence is 26.8%, with variations by age rather than sex: 35.6% in individuals aged 80+, 29.3% in those aged 75–79, and 23.2% among those aged 70–74 (P 1.5. The incidence rate (IR) per 100 person-years is 9.2 (95% CI 8.3–10.1), varying by country: Austria reports the highest IR (20.8, 95% CI 16.1–26.9), while Germany has the lowest (6.1, 95% CI 4.7–8.0). Alternative definitions show IRs per 100 person-years of 4.5 (95% CI 4.0–4.9) for ferritin 1.5 [11]. The World Health Assembly aims to reduce anaemia prevalence among women of reproductive age (WRA) by 40% by 2025 [9]. Achieving this goal requires deeper understanding of contributing factors and empirical evidence supporting successful interventions [6]. Studies highlight the substantial anemia burden in Africa and emphasize the necessity for targeted public health strategies and improved living conditions to control the disease.

Anaemia in Asia: In Kazakhstan, approximately 49% of women, 60% of women in Uzbekistan, and 40% of women in the Kyrgyz Republic had some form of anaemia. Among children, the prevalence of anaemia was recorded at 69% in Kazakhstan, 61% in Uzbekistan, and 50% in the Kyrgyz Republic. Socio-economic, residential, demographic, and ethnic factors influenced the prevalence rates of anaemia across these regions. The highest overall anaemia rates were observed in Uzbekistan's Aral Sea region, including the Republic of Karakalpakstan and Khorezm Oblast, where 72% of women and 61% of children were affected. In western Kazakhstan, which is also near the Aral Sea, 59% of women and 81% of children experienced anaemia [12]. Iron deficiency anaemia is widely considered the primary cause of anaemia in young children. However, a study in Bangladesh found that among 48% of anaemic children aged 2-6 years, only 18% had iron deficiency anaemia based on their haemoglobin levels. Children participated in survey-based screening and were assessed for haemoglobin, ferritin, C-reactive protein, and serum transferrin receptors using sandwich enzyme-linked immunosorbent assays via heel-pricked blood samples, using a haemoglobin criterion of 5 mg/L [13, 14]. The overall prevalence of anaemia was 52.5%, ranging from 22.7% in Timor-Leste to 63% in the Maldives. The weighted prevalence across populations was also recorded at 52.5%, with mild anaemia affecting 39.4%, moderate anaemia 12.1%, and severe anaemia 1%. The Maldives had the highest mild anaemia prevalence at 49.1%, while Timor-Leste reported only 18.5%. Moderate anaemia was most prevalent in the Maldives at 13.3%, whereas Timor-Leste had the lowest at 3.7%. Severe anaemia remained under 1% in most countries except India, where the rate reached 1%. In a pooled analysis of women of reproductive age (WRA), anaemia prevalence was higher in rural areas compared to urban areas, ranging from 42.6% in Nepal to 54.2% in India. However, in the Maldives, urban anaemia prevalence was recorded at 73.3% versus 55.6% in rural areas, and in Timor-Leste, urban prevalence was 24.7% compared to 21.7% in rural areas. Lower educational attainment was associated with higher anaemia prevalence

in Cambodia, India, Bangladesh, and Timor-Leste. Interestingly, in the Maldives and Myanmar, the highest prevalence occurred among the most educated women. Among WRA, anaemia was more common in the poorest economic class in Cambodia (51.1% vs. 40.9%), India (56.8% vs. 49.6%), Bangladesh (48.9% vs. 36.4%), and Myanmar (47.5% vs. 45.2%). In contrast, Nepal and Timor-Leste saw the highest prevalence among middle-class groups. Widow, divorced, or separated women exhibited the highest prevalence in most countries, except Nepal and Myanmar, where married women had higher anaemia rates. The prevalence was also elevated among women without improved toilet facilities.Older women (≥35 years) faced the highest anaemia rates in Cambodia (47.1%), Maldives (64.3%), Bangladesh (42.9%), and Myanmar (48.1%). Across all countries, underweight women exhibited the highest prevalence. Additionally, WRA who did not consume iron supplements during their last pregnancy showed higher anaemia rates in all countries. Similarly, those who did not attend at least one antenatal care visit recorded the highest prevalence, except in Myanmar and Timor-Leste. Anaemia prevalence was also highest among women with more than four children in Cambodia, India, Bangladesh, Maldives, and Nepal [15]. The prevalence of anemia at the individual level was notably higher among males, with rates of 57.7% in Bangladesh, 57.5% in Cambodia, and 54.4% in the Maldives. Additionally, children with a recent history of fever exhibited a higher anemia prevalence, recorded at 56.6% in Bangladesh, 61.1% in Cambodia, 60.5% in India, 56.6% in the Maldives, 63.62% in Myanmar, and 60.3% in Nepal. Children affected by stunting also showed elevated anemia rates, with 53.3% in Bangladesh, 60.6% in Cambodia, 63.1% in India, 59.1% in Myanmar, and 55.4% in Nepal experiencing the condition. Similarly, wasting was associated with high anemia prevalence, documented at 64.6% in Cambodia, 60.7% in India, 51.6% in the Maldives, 63.7% in Myanmar, and 68% in Nepal.Furthermore, underweight children showed substantial anemia rates: 51.4% in Bangladesh, 64.6% in Cambodia, 60.7% in India, 62.6% in Myanmar, 62.5% in the Maldives, and 59.5% in Nepal. Childhood anemia was also significantly prevalent among children whose mothers had anemia, with rates of 60.5% in Bangladesh, 63.1% in Cambodia, 63.7% in India, 55.4% in the Maldives, 67% in Myanmar, and 61.8% in Nepal [16].

Anaemia In Africa: A comprehensive evaluation of anaemia prevalence in Africa examined studies from 14 countries, including Ethiopia, Tanzania, Uganda, Sudan, Nigeria, Congo, Togo, Egypt, Rwanda, Guinea-Bissau, Malawi, Gambia, and South Africa. These studies span publication years from 2004 to 2023, providing a broad temporal perspective on anaemia trends. Ethiopia stands out as the country with the highest number of studies included in the analysis [17]. Before 2005, studies reported an anemia prevalence rate of 52.8%. Between 2005 and 2010, a single study documented a notable decline to 5.8%. However, subsequent periods showed a resurgence, with prevalence rates of 22% from 2011 to 2015 and 34.9% from 2016 to 2020. Research published between 2021 and 2024 confirmed a consistent prevalence rate of 34.9%. Anaemia remains highly prevalent in East African countries, particularly Tanzania, Uganda, and Rwanda, where incidence rates range from 53.6% to 61.2% in Tanzania,

45.9% to 53.6% in Uganda, and 61.2% to 68.9% in Rwanda. Meta-analysis findings reaffirm these numbers, indicating prevalence rates of 63.7% in Tanzania and 51.7% in Uganda. The high burden of anaemia in these areas is largely attributed to factors such as nutritional deficiencies, infectious diseases, and inadequate healthcare access. Ethiopia, despite having the highest number of studies included in the meta-analysis, shows a comparatively lower prevalence, ranging from 15.3% to 23%, with subgroup analysis estimating it at 19.3%. In West Africa, countries like Nigeria and Guinea-Bissau exhibit high anemia prevalence, with rates ranging from 68.9% to 76.5% in Nigeria and 76.5% to 84.2% in Guinea-Bissau. Meta-analysis findings corroborate these numbers, reporting rates of 64.7% for Nigeria and 80.2% for Guinea-Bissau. Similarly, Togo's prevalence of 80.8% falls within the 76.5%–84.2% range. These high figures likely stem from widespread poverty, food insecurity, and inadequate healthcare infrastructure. Southern African nations, including Malawi and South Africa, also demonstrate considerable anaemia prevalence, ranging from 76.5% to 84.2% in Malawi and 84.2% to 91.8% in South Africa. Meta-analysis results confirm these estimates, with Malawi at 85.1% and South Africa at 85.6%. A notable disparity exists between anemia prevalence in adults (21%) and children (58.8%) [18]. Anaemia during pregnancy poses significant health risks, contributing to increase maternal and child morbidity and mortality in low-income regions [19, 20]. Research on anaemia prevalence among pregnant women in East Africa determined that 41.82% were anaemic, classifying it as a major public health concern [21]. Prevalence varies significantly between countries, from 23.36% in Rwanda to 57.10% in Tanzania. After adjusting for individual and community-level factors, findings show that pregnant women lacking access to improved toilet facilities had a 17% higher prevalence of anemia compared to those with improved facilities. Marital status also played a role, with unmarried women experiencing a 14% higher prevalence compared to married women. Teenagers faced a 22% higher prevalence than women aged 40–49 years, while pregnant women from countries with higher illiteracy rates saw a 12% increase compared to those from regions with lower illiteracy levels [22]. Among children aged 6–59 months, anemia prevalence reached 64.1%, with 26.2% classified as mild, 34.9% as moderate, and 3% as severe. The highest rates were recorded among children whose mothers were moderately or severely anaemic, at 76.8% and 76.7%, respectively. Severe anaemia prevalence was highest (10.7%) in children born to severely anaemic mothers. Among children born to mothers younger than 20 years, 4.1% had severe anaemia, 43.4% had moderate anaemia, and 26.4% had mild anaemia [23].

Anaemia In Europe: Among 22 European countries, nine had available anaemia prevalence data for pre-school children (PSC) and/or women of reproductive age (WRA) from at least one national survey Demographic and Health Surveys (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), and National Nutrition, Micronutrient, and Nutrition and Health Surveys (NS) conducted since 2010. A national anaemia survey in Romania in 2010 reported a prevalence of 46% among children aged 6–23 months. In Albania, anaemia prevalence among PSC increased between 2009 and 2018 while North Macedonia saw little change

between 1999 and 2011. For WRA over the same period, anaemia prevalence increased in North Macedonia while Albania and Moldova experienced minimal change [24-27]. In Italy, anaemia prevalence was recorded at 5.6% in pediatric patients and 24% in adults [28]. Among Portuguese adolescent girls, anemia prevalence rates aligned with national statistics, showing 9.0% in those aged 12–15 years and 16.0% among those aged 16–19 years [29]. The HELENA Study found an overall iron depletion prevalence of 17.6% among adolescents, with higher rates in girls than boys. Geographically, iron depletion was most prevalent in Eastern Europe (Pecs, 23%), followed by Northern Europe (Stockholm, 19.0%), Western Europe (Ghent, 17.0% and Lille, 19.0%), Central Europe (Dortmund, 16.0% and Vienna, 19.0%), and Southern Europe (Athens, 14.0%; Heraklion, 17.0%; Rome, 19.0%; Zaragoza, 10.0%) [30]. Additionally, anaemia prevalence among Portuguese adolescents in Porto was 2.6%, with higher rates in girls (4.1%) compared to boys (1.0%) [31, 32]. These statistics enable comparisons between selected European cities but do not provide insight into regional differences. ([30]) Findings are similar to Spain's data, where 15.0% of adolescents had iron deficiency anemia, highlighting its relevance in medical practice [33]. Among under-five children in Europe, iron deficiency anemia prevalence was 16.59% [34]. Hemoglobin or hematocrit demonstrated an estimated sensitivity of 73% for detecting iron deficiency anaemia (IDA), but specificity was lower at 25%, as around half of anemia cases stem from causes other than iron deficiency [35, 36]. The positive predictive value (PPV) of low hemoglobin for iron deficiency ranged from 10–40% in 12-month-old children [36]. Most studies found that IDA prevalence in preschool children in Northern Europe was below 5%, compared to 9–50% in Eastern Europe. In Western Europe, 69% of children aged 12–36 months were iron sufficient [37]. Among children aged 1–5 years, iron deficiency (ID) and IDA prevalence were 7.1% and 1.1%, respectively. ID prevalence was higher in children aged 1–2 years than in older children, with rates ranging between 6.6% and 15.2% among toddlers [38, 39].

Comment: Anaemia prevalence varies across Asia, Africa, and Europe, influenced by socioeconomic, demographic, and health-related factors. In Asia, Uzbekistan's Aral Sea region reports the highest rates among women and children, while Bangladesh challenges common assumptions about iron deficiency as the primary cause of childhood anaemia. Maternal health plays a crucial role, with children of anemic mothers exhibiting higher prevalence rates, alongside risk factors such as fever, stunting, wasting, and underweight status. In Africa, East African countries like Tanzania, Uganda, and Rwanda show consistently high anaemia rates, while Ethiopia reports lower prevalence despite extensive research. West and Southern African nations, including Nigeria, Guinea-Bissau, Malawi, and South Africa, experience severe anaemia burdens due to poverty, food insecurity, and inadequate healthcare. Pregnant women and children in these regions face heightened risks, with anaemia disparities between adults and children highlighting the need for targeted interventions. In Europe, Eastern countries report higher anaemia prevalence, particularly among preschool children, with North Macedonia seeing increases among women of reproductive age. Adolescents, especially girls, exhibit significant iron depletion, with

variations observed across different European cities. Hemoglobin-based screening methods show limited accuracy in diagnosing iron deficiency anaemia, reinforcing the need for improved testing approaches. Across all regions, anaemia remains a major public health concern, requiring comprehensive strategies to address nutritional deficiencies and healthcare access disparities.

References
1. Mokdad AH, Forouzanfar MH, Daoud F, Mokdad AA, El Bcheraoui C, Moradi-Lakeh M, *et al*. Global burden of diseases, injuries, and risk factors for young people's health during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2016;387(10036):2383–2401.
2. Cappellini MD, Motta I. Anemia in clinical practice—definition and classification: does hemoglobin change with aging? Semin Hematol. 2015;52(4):261–269.
3. Balarajan YS, Fawzi WW, Subramanian SV. Changing patterns of social inequalities in anaemia among women in India: cross-sectional study using nationally representative data. BMJ Open. 2013;3(3):e002233.
4. Balarajan Y, Ramakrishnan U, Özaltin E, Shankar AH, Subramanian SV. Anaemia in low-income and middle-income countries. Lancet. 2011;378(9809):2123–2135.
5. Murray CJ, Abraham J, Ali MK, Alvarado M, Atkinson C, Baddour LM, *et al*. The state of US health, 1990–2010: burden of diseases, injuries, and risk factors. JAMA. 2013;310(6):591–606.
6. Haddad L, Hawkes C, Udomkesmalee E, Achadi E, Bendech MA, Ahuja A, *et al*. Global nutrition report 2016: From promise to impact—ending malnutrition by 2030. Washington (DC): International Food Policy Research Institute; 2016.
7. Stevens GA, Finucane MM, De-Regil LM, Paciorek CJ, Flaxman SR, Branca F, *et al*. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. Lancet Glob Health. 2013;1(1):e16–e25.
8. World Health Organization, UNICEF. Iron deficiency anaemia: assessment, prevention, and control. Geneva: World Health Organization; 2001.
9. World Health Organization. Global nutrition targets 2025: breastfeeding policy brief (WHO/NMH/NHD/14.7). Geneva: World Health Organization; 2014.
10. Mude AS, Nageye YA, Bello KE. A comprehensive systematic review and meta-analysis of the prevalence of anemia in Africa. Iraqi J Hematol. 2024;10:4103.
11. Stahl-Gugger A, de Godoi Rezende Costa Molino C, Wieczorek M, Chocano-Bedoya PO, Abderhalden LA, Schaer DJ, *et al*. Prevalence and incidence of iron deficiency in European community-dwelling older adults: an observational analysis of the DO-HEALTH trial. Aging Clin Exp Res. 2022;34(9):2205–2215.
12. Sharmanov A. Anaemia in Central Asia: demographic and health survey experience. Food Nutr Bull. 1998;19(4):307–317.
13. Erhardt JG, Estes JE, Pfeiffer CM, Biesalski HK, Craft NE. Combined measurement of ferritin, soluble transferrin receptor, retinol-binding protein, and C-reactive protein by an inexpensive, sensitive, and simple sandwich enzyme-linked immunosorbent assay technique. J Nutr. 2004;134:3127–3132.
14. Jahan K. Nature and extent of malnutrition in Bangladesh: Bangladesh National Nutrition Survey 1995–96. Dhaka: Institute of Nutrition and Food Science, University of Dhaka; 1998.
15. Sunuwar DR, Singh DR, Chaudhary NK, Pradhan PM, Rai P, Tiwari K. Prevalence and factors associated with anemia among women of reproductive age in seven South and Southeast Asian countries: evidence from nationally representative surveys. PLoS One. 2020;15(8):e0236449.
16. Sunuwar DR, Singh DR, Pradhan PM, Shrestha V, Rai P, Shah SK, *et al*. Factors associated with anemia among children in South and Southeast Asia: a multilevel analysis. BMC Public Health. 2023;23(1):343.
17. Mude AS, Nageye YA, Bello KE. A comprehensive systematic review and meta-analysis of the prevalence of anemia in Africa. Iraqi J Hematol. 2024;10:4103.
18. Wolide AD, Mossie A, Gedefaw L. Nutritional iron deficiency anemia: magnitude and its predictors among school-age children, Southwest Ethiopia: a community-based cross-sectional study. PLoS One. 2014;9:e114059.
19. Kalaivani K. Prevalence and consequences of anaemia in pregnancy. Indian J Med Res. 2009;130(5):627–633.
20. World Health Organization. Serum transferrin receptor levels for the assessment of iron status and iron deficiency in populations. Geneva: World Health Organization; 2014.
21. De Benoist B, Cogswell M, Egli I, McLean E. Worldwide prevalence of anaemia 1993–2005: WHO Global Database on Anaemia. Geneva: World Health Organization; 2008.
22. Liyew AM, Tesema GA, Alamneh TS, Worku MG, Teshale AB, Alem AZ, *et al*. Prevalence and determinants of anemia among pregnant women in East Africa: a multilevel analysis of recent demographic and health surveys. PLoS One. 2021;16(4):e0250560.
23. Tesema GA, Worku MG, Tessema ZT, Teshale AB, Alem AZ, Yeshaw Y, *et al*. Prevalence and determinants of severity levels of anemia among children aged 6–59 months in sub-Saharan Africa: a multilevel ordinal logistic regression analysis. PLoS One. 2021;16(4):e0249978.
24. Knowles J, Walters T, Yarparvar A, Brown R. A review of anemia prevalence and prevention and control strategies in the Eastern Europe and Central Asia region. Curr Dev Nutr. 2024;104477.
25. National Institute of Nutrition. Multiple Indicator Cluster Survey in FYR Macedonia with micronutrient component, 1999. Rome: National Institute of Nutrition; 2000.
26. Comunitatea Științifică. Strategii și politici de management în economia contemporană. Bucharest: Editura Științifică; year unknown.
27. Hayes BE, van Baak C. Risk factors of physical and sexual abuse for women in Mali: findings from a nationally representative sample. Violence Against Women. 2017;23(11):1361–1381.
28. Marco V, Chiara G, Antonio V, Massimo M, Stefano F, Gianpiero S, *et al*. Persistence of anemia in patients with celiac disease despite a gluten-free diet: a

retrospective study. BMC Gastroenterol. 2025;25(1):128.

29. Maulide Cane R, Chidassicua JB, Varandas L, Craveiro I. Anemia in pregnant women and children aged 6–59 months living in Mozambique and Portugal: an overview of systematic reviews. Int J Environ Res Public Health. 2022;19(8):4685.

30. Ferrari M, Mistura L, Patterson E, Sjöström M, Díaz LE, Stehle P, *et al*. Evaluation of iron status in European adolescents through biochemical iron indicators: the HELENA Study. Eur J Clin Nutr. 2011;65(3):340–349.

31. de Andrade Cairo RC, Silva LR, Bustani NC, Marques CD. Iron deficiency anemia in adolescents: a literature review. Nutr Hosp. 2014;29(6):1240–1249.

32. Moreira IC. Anemia em adolescentes, prevalência e factores associados: o papel do *Helicobacter pylori*. Porto: Universidade do Porto; year unknown.

33. Maulide Cane R, Chidassicua JB, Varandas L, Craveiro I. Anemia in pregnant women and children aged 6–59 months living in Mozambique and Portugal: an overview of systematic reviews. Int J Environ Res Public Health. 2022;19(8):4685.

34. Gedfie S, Getawa S, Melku M. Prevalence and associated factors of iron deficiency and iron deficiency anemia among under-5 children: a systematic review and meta-analysis. Glob Pediatr Health. 2022;9:2333794X221110860.

35. Ruiz-Cabello FJ, Sánchez J. Prevención primaria y cribado de ferropenia en lactantes. PrevInfad. 2011.

36. Siu AL. Screening for iron deficiency anemia in young children: USPSTF recommendation statement. Pediatrics. 2015;136(4):746–752.

37. van der Merwe LF, Eussen SR. Iron status of young children in Europe. Am J Clin Nutr. 2017;106:1663S–1671S.

38. Gupta PM, Perrine CG, Mei Z, Scanlon KS. Iron, anemia, and iron deficiency anemia among young children in the United States. Nutrients. 2016;8(6):330.

39. Gedfie S, Getawa S, Melku M. Prevalence and associated factors of iron deficiency and iron deficiency anemia among under-5 children: a systematic review and meta-analysis. Glob Pediatr Health. 2022;9:2333794X221110860.