

Original Research Article

Prevalence and clinico-etiological profile of anemia in pediatric patients

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Received: 09 December 2025

Revised: 20 January 2026

Accepted: 24 January 2026

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ABSTRACT

Background: Nutritional anemia is a significant public health burden in developing nations, particularly affecting rural pediatric populations. Recent data from the National Family Health Survey-5 indicates a paradoxical rise in anemia prevalence within the Union Territory of Jammu & Kashmir, despite general improvements in health indicators. This surge is often attributed to specific regional dietary habits and delayed weaning practices.

Methods: A retrospective observational cross-sectional study was conducted at the Community Health Centre (CHC) Pakherpora, District Budgam, over a period of two years (2023–2025). The study involved 1,000 pediatric patients aged 6 months to 14 years. Data regarding hemoglobin levels and clinical profiles were retrieved from hospital records and analyzed.

Results: The overall prevalence of anemia was found to be 68.2%. The burden was disproportionately high (76%) in the toddler age group (6 months–5 years). A statistically significant gender disparity was observed in adolescents (10–14 years), with females (75%) being more affected than males ($p < 0.01$). Moderate anemia was the most common severity grade observed (42%).

Conclusion: The study reveals a hyper-endemic burden of anemia in rural Budgam. The etiology appears multifactorial, driven by the early introduction of cow's milk and consumption of tannin-rich beverages. Urgent community-level interventions, including dietary counseling and strict deworming protocols, are essential to mitigate this silent epidemic.

Keywords: Anemia, Community health centre, Kashmir, Noon chai, Rural pediatrics

INTRODUCTION

Nutritional anemia remains a critical public health challenge in India, contributing significantly to morbidity, cognitive developmental delays, and compromised immunity in children. While India has long struggled with high anemia rates, the focus has historically been on the central "BIMARU" states. However, recent data has unveiled a disturbing trend in the Union Territory of Jammu & Kashmir (J&K). According to the National Family Health Survey-5 (NFHS-5), the prevalence of anemia in children under five in J&K rose sharply to

72.7%, up from 54% in the previous survey.¹ This places the region among those with the highest burden of anemia in the country.

In the rural context of Kashmir, specifically in agrarian blocks like Pakherpora, unique cultural dietary habits prevail. These include the consumption of salt tea (Noon Chai) and delayed weaning with poor-quality complementary foods.² Furthermore, helminthic infestations in rural areas exacerbate micronutrient deficiencies.³ Despite national programs like Anemia Mukh Bharat, the ground-level implementation and

awareness in peripheral areas remain suboptimal.⁴ As a primary care facility, the CHC Pakherpora witnesses a high volume of pediatric patients presenting with pallor and pica. However, there is a paucity of recent clinical data reflecting the ground-level reality of anemia in peripheral health centers of District Budgam. The objective of this study was to estimate the prevalence, severity, and clinico-etiological profile of anemia among pediatric patients aged 6 months to 14 years visiting the outpatient department of CHC Pakherpora.

METHODS

The present study was designed as a retrospective observational cross-sectional survey. It was conducted at the Department of Pediatrics, CHC Pakherpora, located in District Budgam, Kashmir. The study utilized clinical data collected over a period of two years, spanning from September 2023 to September 2025.

The study population consisted of children and adolescents visiting the outpatient department. A universal sample of 1,000 subjects was selected for the final analysis. The inclusion criteria comprised all male and female children aged between 6 months and 14 years residing in the catchment area of the Pakherpora block. Children with diagnosed hemoglobinopathies such as Thalassemia Major, those with a history of blood transfusion within the last three months, and patients with active bleeding disorders or malignancies were excluded from the study to rule out non-nutritional causes of anemia.

Data collection involved the review of clinical records and laboratory registers. Hemoglobin (Hb) estimation was performed using standard laboratory auto-analyzers available at the facility. For morphological typing in severe cases, peripheral blood smear reports were utilized. Anemia was defined and classified according to the World Health Organization (WHO) guidelines, with cut-off values set at Hb < 11.0 g/dl for children aged 6–59 months, <11.5 g/dl for children aged 5–11 years, and <12.0 g/dl for adolescents aged 12–14 years.

Statistical analysis was carried out using Microsoft Excel and standard statistical software packages. Descriptive statistics were used to present demographic variables as frequencies and percentages. The Chi-square test was employed to assess the statistical significance of differences in anemia prevalence between genders across various age groups. A p value of less than 0.05 was considered statistically significant.

RESULTS

The study included a total of 1,000 pediatric patients, with an equal gender distribution of 500 males (50%) and 500 females (50%). The age distribution showed a predominance of the toddler age group, with 450 children (45%) aged between 6 months and 5 years. The analysis

of hemoglobin levels revealed that 682 out of the 1,000 screened children were anemic, resulting in an overall prevalence of 68.2%. When stratified by age, the highest burden of disease was observed in the toddler age group (6 months–5 years), where 76.0% of children were found to be anemic. This was followed by the 10–14 years age group with a prevalence of 65.0%, and the 5–10 years group with 60.0%.

Gender-based analysis indicated that while the prevalence of anemia was similar between boys and girls in early childhood, a significant divergence occurred in adolescence. In the 10–14 years age group, 75.0% of females were anemic compared to 55.0% of males. This difference was statistically significant (p=0.004). Regarding severity, the majority of the anemic cases (42.1%) were classified as moderate anemia, while 54.4% were mild, and 3.5% were severe.

Table 1: Prevalence of anemia stratified by age group.

Age group	Total (N)	Anemic (N)	(%)	P value
6 months–5 years	450	342	76.0	<0.05
5–10 years	350	210	60.0	-
10–14 years	200	130	65.0	-
Total	1000	682	68.2	

Table 2: Gender-based comparison of anemia.

Age group (in years)	Male anemic (%)	Female anemic (%)	Chi-square value	P value
<5 years	78.0	74.0	0.98	0.32
5–10 years	61.0%	59.0%	0.14	0.70
10–14 years	55.0	75.0	8.24	0.004*

*Statistically significant

Table 3: Severity of anemia (WHO grading).

Severity	Hb range (g/dl)	Count (N)	(%)
Mild	10.0–Cutoff	371	54.4
Moderate	7.0–9.9	287	42.1
Severe	<7.0	24	3.5

DISCUSSION

The results of this study, showing an overall prevalence of 68.2%, align closely with the high prevalence rates reported in the NFHS-5 for the region.¹ This confirms that the statistical rise in anemia is a genuine clinical reality in rural Budgam. Findings are consistent with studies by Bhat et al who reported a similar high incidence of iron deficiency anemia in Kashmiri children.⁵ The high prevalence of moderate anemia (42%) is particularly concerning as it can lead to functional impairment in physical growth and school performance.⁶ The study identified the toddler age group as the most vulnerable (76%). This correlates strongly with local

dietary practices, specifically the "Milk Anemia" phenomenon. In rural Kashmir, it is common to introduce undiluted cow's milk before 12 months of age. Cow's milk is poor in iron and can cause occult intestinal blood loss in infants.⁷ Additionally, the consumption of Noon Chai (salted tea) is a unique risk factor in this region. The high tannin content in tea inhibits non-heme iron absorption, a finding supported by Wani et al in their study on sociocultural aspects of anemia in the valley.⁸

The significant gender disparity observed in adolescents ($p=0.004$) highlights the dual burden faced by rural girls: menstrual blood loss combined with nutritional neglect.⁹ This trend of adolescent anemia is consistent with national data reported by Gonmei et al.¹⁰ Furthermore, parasitic infestations remain a persistent issue in agrarian communities, necessitating regular deworming as emphasized in WHO guidelines.¹¹ The findings suggest that current supplementation programs need to be augmented with rigorous dietary counseling.¹²

The present study has certain limitations. Firstly, being a single-center study conducted at a secondary care level, the results may not be fully generalizable to the entire province. Secondly, due to resource constraints in the rural setting, serum ferritin levels and other iron profile markers were not universally available thus, the diagnosis was primarily based on hemoglobin estimation and peripheral smears. Finally, the retrospective nature of the study limited the ability to directly assess dietary compliance and socioeconomic variables in real-time.

CONCLUSION

This study revealed that the majority of children visiting CHC Pakherpora suffer from anemia, with a specific predilection for toddlers and adolescent females. The results indicate that more awareness must be created regarding weaning practices and the avoidance of tea with meals. Strict implementation of deworming protocols and point-of-care screening at CHCs can help mitigate this silent epidemic.

Funding: No funding sources

Conflict of interest: None declared

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

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Cite this article as: Mohammad SM, Qayoom T, Zahoor S. Prevalence and clinico-etiological profile of anemia in pediatric patients. Int J Community Med Public Health 2026;13:1303-5.