Factors Associated with Anaemia in Children Aged 6-59 Months at Nakuru County Referral and Teaching Hospital, Kenya

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ABSTRACT

Background: Facility-specific evidence is needed to describe anaemia and guide appropriate clinical assessment among young paediatric inpatients. This study examined anaemia, haematological patterns and selected associated factors at Nakuru County Referral and Teaching Hospital.

Methods: A hospital-based analytical cross-sectional study enrolled 174 children aged 6-59 months during July-August 2026. Caregiver interviews and available complete blood count results provided sociodemographic, dietary, child-health and laboratory information. Descriptive analyses, bivariate tests and Firth penalised logistic regression were reported.

Results: Median child age was 10 months (IQR 8-17); 54.0% were male. The original criteria classified 117/174 children (67.2%) as anaemic. Among these, 53 were classified as mild, 52 moderate and 12 severe. Dietary and child-health analyses included 101 children: 37 (36.6%) had recent diarrhoea and 38 (37.6%) reportedly started complementary feeding at six months. Age-specific feeding indicators included 79 children.

Conclusion: The original analysis suggests a substantial anaemia burden in this inpatient sample. However, age-specific haemoglobin reclassification, reconciliation of laboratory categories and verification of analysis denominators are required. Adjusted associations remain provisional; these findings do not establish causation or county population prevalence.

INTRODUCTION & OBJECTIVES

Why this study? Children receiving inpatient care have clinical and nutritional characteristics that may differ from community populations. Local evidence can describe the children seen in the facility and identify questions for further investigation.

Study objectives
1. Describe child and caregiver sociodemographic and economic characteristics.
2. Describe dietary practices.
3. Assess child-health factors.
4. Determine anaemia status and haematological patterns.
5. Examine factors associated with anaemia.

Interpretation framework
Haemoglobin identifies anaemia; red-cell indices describe patterns. Neither a food-group recall nor microcytosis alone establishes iron deficiency. This cross-sectional study examines associations rather than causal determinants.

Scope: Children aged 6-59 months admitted to the general paediatric inpatient service during July-August 2026.

METHODS

Design and data: Analytical cross-sectional study; caregiver questionnaire, clinical information and available CBC results.

Recruitment: Researcher clarification confirms 174 eligible children, 174 caregivers approached and 174 consented/enrolled; no exclusions, refusals or withdrawals. The reported target was 190.

Analysis: Frequencies, percentages and medians (IQR); exploratory bivariate analyses and reported Firth regression. The implementation of systematic sampling and effective regression sample remain unverified.

RESULTS | OBJECTIVES 1-4

Objectives 1 and 4: Sociodemographic profile and original haematological findings.

Table 1. Profile and anaemia	Finding
Child age, median (IQR), months	10 (8-17)
Male children	94/174 (54.0%)
Household income <KES 5,000/month	71/174 (40.8%)
Anaemia, original criteria*	117/174 (67.2%)
Mild / moderate / severe*	53 / 52 / 12
Recorded microcytosis**	98/174 (56.3%)

*Original outcome and severity categories require WHO 2024 age-specific reclassification. **All 174 children; not an anaemia-only subgroup. Recorded and MCV-derived size categories disagree in 60 records.

Objectives 2 and 3: Reported dietary practices and child-health factors.

Table 2. Feeding and health	n/N (%)
Exclusive breastfeeding reported for first 6 months	74/101 (73.3%)
Complementary feeding started at 6 months	38/101 (37.6%)
Reported minimum dietary diversity, ages 6-23 months	60/79 (75.9%)
Diarrhoea, preceding 2 weeks	37/101 (36.6%)
Reported preterm birth	20/101 (19.8%)
Reported vitamin A supplementation	85/101 (84.2%)

Dietary indicators and derived scores require confirmation against the administered questionnaire. The reason for the 73-record difference between 174 and 101 is unresolved.

KEY FINDING

67.2%

117 of 174 children classified as anaemic under the original criteria.

Provisional estimate: requires reclassification before presentation as a final WHO-standard prevalence.

DISCUSSION

Clinical burden, with a defined boundary. The original estimate identifies anaemia as an important clinical issue in the enrolled inpatient group. Referral and admission selection limit extrapolation; 67.2% must not be interpreted as prevalence among all children in Nakuru County.

Dietary findings need careful interpretation. Reported feeding histories describe a potential focus for nutritional assessment, but one-day recall cannot establish usual intake or iron bioavailability. The administered flesh-food question and score derivation require verification. The data do not justify delaying complementary feeding beyond six months.

Illness and intervention histories are descriptive. Diarrhoea was reported in 36.6% of the 101-child subset. Its original crude comparison was not statistically significant (p = 0.229). Receipt of vitamin A or iron cannot be interpreted as a demonstrated treatment effect because timing, indication and confounding are unresolved.

Laboratory patterns are not aetiological diagnoses. Recorded microcytosis relates to the entire sample, and size classifications disagree in 60/174 records. Neither predominant anaemia morphology nor iron deficiency can be confirmed without laboratory reconciliation and appropriate additional testing.

Objective 5 remains unresolved. Uncertain regression membership, sparse cells and inconsistent confidence intervals/p-values prevent confirmation of independent associations. Nominal significance or high apparent classification accuracy cannot resolve these problems.

CONCLUSIONS & NEXT STEPS

The study provides a facility-based description of enrolled children and their reported feeding and health histories.

Before final reporting: reclassify haemoglobin by age; reconcile CBC categories; explain analysis denominators; rerun a clinically justified, parsimonious model.

Clinical implication: retain guideline-based anaemia evaluation and individualised nutritional assessment; do not derive screening rules from the unverified model.

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SELECTED REFERENCES

1. Balarajan Y, Ramakrishnan U, Özaltin E, Shankar AH, Subramanian SV. Anaemia in low-income and middle-income countries. *Lancet.* 2011;378:2123-2135. doi:10.1016/S0140-6736(10)62304-5.
2. World Health Organization. *Guideline on haemoglobin cutoffs to define anaemia in individuals and populations.* 2024. https://www.who.int/publications/i/item/9789240088542
3. World Health Organization; UNICEF. *Indicators for assessing infant and young child feeding practices: Definitions and measurement methods.* 2021. https://www.who.int/publications/i/item/9789240018389
4. World Health Organization. *WHO guideline for complementary feeding of infants and young children 6-23 months of age.* 2023. https://www.who.int/publications/i/item/9789240081864
5. World Health Organization. *Accelerating anaemia reduction: A comprehensive framework for action.* 2023. https://www.who.int/publications/i/item/9789240074033

Data source: Kiptoo S. MSc thesis, Kabarak University, October 2026; Chapters 3-5, Tables 4.1-4.14. Recruitment counts incorporate researcher clarification. Descriptive values are transcribed from the thesis; no dataset reanalysis was performed. Results labelled provisional remain unverified.