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Original Research Article

Prevalence of Anemia Among Patients Attending the Outpatient Department of a Tertiary Care Hospital

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Conflict of interest: Nil

Abstract:

Background: Anemia is a major public health problem worldwide, particularly in developing countries, and is associated with significant morbidity and reduced quality of life. Early detection in outpatient settings can help in timely intervention and prevention of complications.

Objectives: To determine the prevalence and severity of anemia among patients attending the outpatient department of a tertiary care hospital and to assess its association with demographic variables.

Methods: A hospital-based cross-sectional study was conducted over six months among 500 adult patients attending the outpatient department at Jannayak Karpoori Thakur Medical College & Hospital, Madhepura, Bihar for a period of 6 months. Hemoglobin estimation was performed using an automated hematology analyzer. Anemia was classified according to World Health Organization criteria. Data were analyzed using descriptive statistics.

Results: The overall prevalence of anemia was 62.4%. Females showed a significantly higher prevalence compared to males. Moderate anemia was the most common category. Mean hemoglobin level was significantly lower among females.

Conclusion: Anemia remains highly prevalent among outpatient attendees, particularly among women. Routine screening and targeted nutritional interventions are essential at the primary and tertiary care levels.

Keywords: Anemia, Prevalence, Hemoglobin, Outpatient department, Tertiary care hospital.

Introduction

Anemia is one of the most widespread nutritional and hematological disorders globally and continues to pose a major public health challenge, especially in low- and middle-income countries [1]. It is characterized by a reduction in hemoglobin concentration, red blood cell count, or oxygen-carrying capacity of blood, leading to tissue hypoxia and a range of clinical manifestations [2].

According to the World Health Organization, anemia affects nearly one-third of the world's population, with a disproportionately higher burden in South Asia and sub-Saharan Africa [3]. In India, anemia remains a persistent problem despite long-standing national nutritional programs, affecting both rural and urban populations [4]. The condition is particularly common among women of reproductive age, elderly individuals, and patients with chronic diseases [5].

The etiology of anemia is multifactorial, including nutritional deficiencies (iron, vitamin B12, folate), chronic infections, parasitic infestations, hemoglobinopathies, and chronic systemic illnesses [6]. Iron deficiency anemia remains the most common type, largely due to poor dietary intake, low bioavailability of iron, and increased physiological requirements [7].

Patients attending outpatient departments often represent a heterogeneous group with varying health conditions. Many individuals with anemia remain undiagnosed due to nonspecific symptoms or lack of routine screening [8]. Undetected anemia can adversely affect work productivity, cognitive

function, immune response, and overall quality of life [9].

Hospital-based prevalence studies provide valuable insight into the burden of anemia in the general population and help in planning preventive and therapeutic strategies [10]. Despite this, data from tertiary care outpatient settings in eastern India remain limited [11].

Therefore, this study was undertaken to assess the prevalence, severity, and demographic distribution of anemia among patients attending the outpatient department of a tertiary care hospital in Bihar.

Materials and Methods

Study Design: Hospital-based cross-sectional study.

Study Duration: The Study was conducted at Jannayak Karpoori Thakur Medical College & Hospital, Madhepura, Bihar, between July 2025 to December 2025. This study was conducted for 6 months duration.

Study Population: Adult patients attending the outpatient department during the study period.

Inclusion Criteria

- Age ≥18 years
- Willing to participate
- Provided informed consent

Exclusion Criteria

- Pregnant women
- Patients with acute blood loss
- Patients with known hematological malignancies

Sample Size: 500 patients.

Data Collection: Demographic details were recorded using a structured proforma. Venous blood samples were collected and hemoglobin levels estimated using an automated hematology analyzer.

Definition of Anemia

Based on WHO criteria:

- Males: Hb <13 g/dL
- Females: Hb <12 g/dL

Severity classification:

- Mild
- Moderate
- Severe

Statistical Analysis: Data were entered in MS Excel and analyzed using SPSS version 26. Results were expressed as mean ± standard deviation, frequencies, percentages, and 95% confidence intervals. Chi-square test was used to assess associations, with $p < 0.05$ considered statistically significant.

Results

A total of 500 patients attending the outpatient department were included in the study. The mean age of participants was 41.2 ± 14.6 years (range: 18–75 years). Baseline demographic characteristics are summarized in Table 1.

Table 1: Demographic distribution of study participants (n = 500)

Variable	Number	Percentage
Male	220	44.0
Female	280	56.0
Age <40 years	238	47.6
Age ≥40 years	262	52.4

As shown in Table 1, females constituted the majority of participants (56.0%), and more than half of the study population was aged 40 years or above.

Out of the 500 participants, 312 were found to be anemic, resulting in an overall prevalence of anemia of 62.4% (95% CI: 58.1–66.5). Gender-wise prevalence of anemia is presented in Table 2.

Table 2: Gender-wise prevalence of anemia

Gender	Anemic (n)	Percentage
Male	112	50.9
Female	200	71.4

Table 2 shows that anemia was significantly more prevalent among females compared to males ($\chi^2 = 22.6$, $p < 0.001$).

The severity of anemia among the 312 anemic patients was classified according to WHO criteria. The distribution of severity is shown in Table 3 and illustrated in Figure 1.

Table 3: Severity of anemia among anemic participants (n = 312)

Severity	Number	Percentage
Mild	104	33.3
Moderate	156	50.0
Severe	52	16.7

As depicted in Table 3, moderate anemia was the most common form, accounting for half of the anemic cases.

The mean hemoglobin level among anemic patients was 9.8 ± 1.6 g/dL. Female patients had significantly lower mean hemoglobin levels compared to males (9.4 ± 1.5 g/dL vs. 10.3 ± 1.7 g/dL; p = 0.002). The distribution of anemia severity is visually represented in Figure 1.

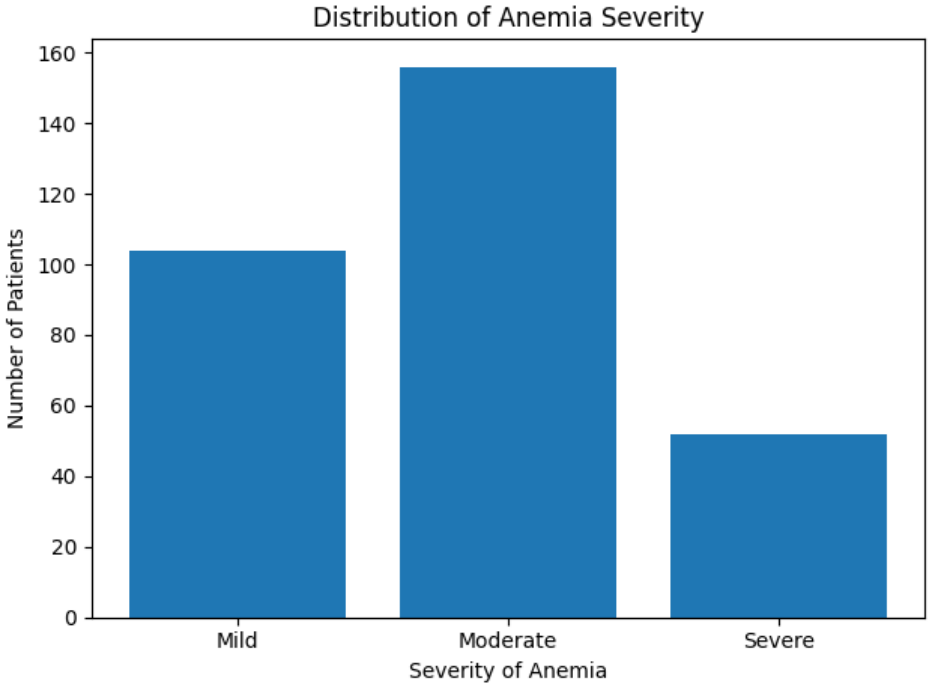

Figure 1: Distribution of anemia severity among study participants

Discussion

The present study highlights a high prevalence of anemia among patients attending the outpatient department of a tertiary care hospital. The overall prevalence of 62.4% indicates that anemia continues to be a significant health burden in the community, consistent with national and global estimates [12,13].

Female participants demonstrated a significantly higher prevalence of anemia compared to males. This finding aligns with previous studies and can be attributed to menstrual blood loss, nutritional deficiencies, and increased iron requirements [14,15]. Socio-cultural factors and dietary practices may further exacerbate this disparity [16].

Moderate anemia emerged as the most common severity category, similar to observations reported in hospital-based studies from other regions of India [17]. Moderate anemia, though often overlooked, can significantly impair physical capacity and productivity if left untreated [18].

The lower mean hemoglobin levels observed among females emphasize the need for routine screening and targeted interventions in this group [19]. Early identification in outpatient settings provides an opportunity for timely management before progression to severe anemia [20].

Hospital-based outpatient studies serve as an effective surveillance tool to assess the burden of anemia in the general population [21]. Integrating anemia screening with routine outpatient services can aid in early diagnosis and reduce long-term complications [22].

Strengthening nutritional education, improving dietary diversity, and ensuring adherence to national anemia control programs are crucial steps toward reducing the prevalence of anemia [23]. Community-level awareness and regular follow-up

can further enhance the effectiveness of these interventions [24,25].

Conclusion

Anemia is highly prevalent among patients attending the outpatient department, with a greater burden among females. Moderate anemia constitutes the largest proportion of cases. Routine screening, nutritional counseling, and early intervention are essential to address this persistent public health problem.

Limitations

- Single-center study
- Etiological classification of anemia was not performed

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