PREVALENCE OF ANEMIA AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN RECEIVING ANTENATAL CARE IN PESHAWAR TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction:

Anemia, which mostly affects young children, pregnant and postpartum women, Pregnancy anemia is a major threat to the health of women and fetus across the world, the risk of Anemia is multifactorial in pregnancy. The study aims to evaluate the Prevalence of anemia among pregnant women receiving antenatal care at tertiary care hospitals in Peshawar.

Objective:

The primary objective was to determine the Prevalence of anemia among pregnant women receiving antenatal care while the secondary was to identify the socio-demographic factors associated with anemia in pregnant women such as age, education, socio economic status.

Design:

A cross-sectional institution-based approach was employed; a questionnaire-based method was used to assess anemia and its associated factors.

Method:

The study was conducted at Khyber teaching hospital (KTH) Peshawar from September to December 2024. A sample of 100 pregnant women was included, and various demographic and lifestyle factors were assessed.

Results:

In the study of 100 participants, 47.0% were found to be anemic and 53.0% participants were non-anemic. Among the anemic participants 35 (74.5%) were educated 12 (25.5%) were uneducated. Among the non-anemic participants 44 (83%) were educated 9 (17%) were uneducated. Among the anemic participants 40 (85%) were housewives 7 (15%) were employed. Among the non-anemic participants 31 (58.5%) were housewives 22 (41.5%) were employed.

Conclusion:

The study reveal a high prevalence of anemia among pregnant women in Peshawar, accompanied by significant associations between anemia and socioeconomic variables, particularly employment status. The persistence of anemia among participants with high educational attainment illustrates the complexity of the condition and the limitations posed by education alone in addressing this health issue.

Keywords: *Pregnancy anemia, Peshawar, antenatal care, socioeconomic factors, maternal health*

INRODUCTION
1.1: OVERVIEW

Anemia, which mostly affects young children, pregnant and postpartum women, and men saturating adolescent girls and women is defined by World Health Organization (WHO) as having a lower hemoglobin (Hb) level than the normal range, leading to a reduced oxygen caring capacity of red blood cells (RBCs) to body tissues. In severe anemia can cause poor cognitive and motor development in children and cause problem in pregnant women and babies. Anemia has been linked to adverse maternal and perinatal outcomes during pregnancy such as early birth, low birth weight and maternal mortality. WHO classifies anemia into different severity levels based on Hemoglobin (Hb) level, mild (10-11.9 g/dl), moderate (7-9.9 g/dl) and severe (<7.0 g/dl). In term of prevalence, anemia severity according to WHO, is categories as mild (prevalence between 5% and 20%), moderate (prevalence between 20% and 40%) and severe (prevalence greater than 40%).[1,3]

Pregnancy anemia is a major threat to the health of women and fetus across the world and most affected areas are LMIC's where pregnancy anemia is reputed to be a primary source of maternal morbidity and mortality.[5]

The causes of anemia in pregnancy are numerous and provide socio-demographic, obstetric, nutritional and health-related background. Factors like age, level of education, income and region of residence are shown to affect the prevalence of anemia. Teenage pregnancies and pregnancies in women of age >35 because of physiological and nutrition demands put the pregnant women at risk of anemia. Illiterate women are also ignorant to healthy diets and antenatal care thus the high risk among them.[6]

The risk of Anemia is multifactorial in pregnancy. Nutritional deficiency which includes poor protein diet, insufficient consumption of green vegetables, and poor family income is by far common cause, which refers to inadequate body stores of single or multiple nutrients needed for hemoglobin synthesis. Iron, folic acid, vitamins (B 12, A) etc. have been implicated in causation of nutritional anemia,[7] the most common nutritional shortfall to cause anemia is Iron insufficiency, the major factor which cause iron deficiency anemia is intake of less iron containing food, more iron requirement at some stages of life like pregnancy for fetus development and children for rapid growth and menstruation. The World Health Organization (WHO) has recognized anemia as major global health issue and aims to reduce it's prevalence by 50% among women of reproductive age by 2025 as part of its Global nutrition target I. The World Health Organization (WHO) recommends routine iron and folic acid supplements for pregnant women to prevent anemia.[8]

Anemia is a major public health concern, particularly in low and middle income countries, affecting 1.6 billion people or 24.8% of the world's population. It is worth noting by World Health Organization (WHO), prevalence of anemia among pregnant women is 41.8%, with the highest prevalence (631.3%) in Africa and 52.5% South East Asia. Sub-Saharan Africa (SSA) is the most affected region with 17.2 million pregnant women, accounting for 30% of the total global cases, pregnant women worldwide experienced anemia during pregnancy. Annually, approximately 510,000 maternal deaths occurred due to complications related to pregnancy and childbirth, with nearly 20% of these deaths occurring in developing countries often attribute to anemia.[1]

According to 2019 report in Pakistan 41.7% of reproductive age women (18-45 years) are suffering with anemia, National Nutritional Survey-2018 in

Pakistan revealed that 44.3% of women living in rural areas and 40.2% of women living urban areas having anemia.[3]

The anemia during pregnancy remains a significant public health challenge in Pakistan, particularly in region like Peshawar, where socioeconomic factors, nutritional deficiencies and limited access to health care facilities exacerbate the problem. In a country where maternal health is already a significant health risk due to limited quality health care facilities, especially in rural and undeserved regions, anemia during pregnancy add an additional burden. A significant proportion of pregnant women receiving antenatal care in Pakistan continue to suffer from this condition.[7,8]

1.2: RESEARCH OBJECTIVES

i. To determine the Prevalence of anemia among pregnant women receiving antenatal care at tertiary care hospitals in Peshawar.

ii. To identify the socio-demographic factors associated with anemia in pregnant women such as age, education, socio economic status.

iii. To evaluate the dietary habits and Nutritional status of pregnant women and the association with anemia prevalence.

METHODOLOGY
3.1: STUDY DESIGN

This was a cross-sectional institution-based study was carried out to assess the prevalence and associated factors of anemia among pregnant women attending the antenatal care.

3.2 STUDY SETTING

The study was carried out in Khyber teaching hospital (KTH) Peshawar, which is one of the largest hospitals of Khyber Pakhtunkhwa Khyber Teaching Hospital is a 1300+ bedded hospital in Peshawar offering comprehensive diagnostic facilities, outpatient clinics and inpatient services in 20+ medical & surgical specialties. KTH aims to provide the highest quality medical care to all patients with 'exceptional compassionate patient care with quality services' in an environment conducive to the practice of good medicine."

3.2: STUDY DURATION

This research was the mandatory component of the Post RN degree program in nursing such as, it was conducted in a limited time of 04 months duration from September to December 2024.

3.3: SAMPLE SIZE

The sample size for this study was calculated from the RAO software as 100 pregnant women visited the OPD of Khyber Teaching Hospital Peshawar during the study period.

3.4: SAMPLIMG TECHNIQUE

For this research the convenience sampling technique was used as this was convenient for the study and also for participants falling in the inclusion criteria.

3.5: SAMPLE SELECTION
3.5.1 INCLUSION CRITERIA

1. Gestational Age: Women at any stage of pregnancy (first, second or third trimester).

2. Age Range:(Pregnant women of reproductive age, typically between 15 and 49 years.

3. Women who are willing to participate in the study and provide informed consent.

3.5.2 EXCLUSION CRITERIA:

1. Women with known chronic diseases that can influence anemia status such as: Hemoglobinopathies (e.g., thalassemia sickle cell disease).

2. Women with multiple pregnancies (twins or more), as they may have different risk factors for anemia.

3. Women who do not consent to participate in the study or who withdraw from the study at any point.

RESULTS

This chapter presents the findings of the study titled "Prevalence of Anemia and Its Associated Factors Among Pregnant Women Receiving Antenatal Care in Peshawar Tertiary Care Hospital." The results are based on data collected from 100 pregnant women attending antenatal

care at the hospital. The data analysis focuses on the prevalence of anemia and its association with key demographic and socioeconomic factors.

4.1 Prevalence of Anemia
Out of the 100 participants included in the study, 47 were found to be anemic, representing a prevalence rate of 47%. The remaining 53 participants were non-anemic.

Anemic	non-anemic	Total
47	53	100
47%	53%	100%

4.2 Demographic Characteristics
4.2.1 Education Level
Educated Participants: A total of 79 participants (79%) were categorized as educated, having received formal education at various levels.
Uneducated Participants: The remaining 21 participants (21%) were uneducated, having no formal schooling.

Educated Participants	Uneducated Participants	Total
79	21	100
79%	21%	100%

4.2.2 Employment Status
Housewives: The majority of the participants (71%) were housewives.
Employed Participants: A smaller proportion (29%) were engaged in jobs or other forms of employment.

Housewives	Employed Participants	Total
71	29	100
71%	29%	100%

4.3 Relationship Between Anemia and Socioeconomic Factors
4.3.1 Anemia and Education Level
Among the anemic participants 35 (74.5%) were educated 12 (25.5%) were uneducated.
Among the non-anemic participants 44 (83%) were educated 9 (17%) were uneducated.

4.3.2 Anemia and Employment Status
Among the anemic participants 40 (85%) were housewives 7 (15%) were employed.
Among the non-anemic participants 31 (58.5%) were housewives 22 (41.5%) were employed.

4.4 Summary of Key Findings
The overall prevalence of anemia among the study participants was 47%.
A higher proportion of anemic participants were housewives compared to those who were employed.
Although the majority of anemic participants were educated, the prevalence of anemia was higher among housewives than employed women, indicating that factors other than education might play a significant role in the occurrence of anemia. These findings suggest potential socioeconomic and lifestyle factors influencing anemia among

pregnant women. The implications of these results are discussed in the next chapter.

DISCUSSION

The findings of the present study indicate a notable prevalence of anemia among pregnant women attending antenatal care at a tertiary care facility in Peshawar, with an overall prevalence rate of 47%. This figure reflects global and regional patterns that characterize anemia as a significant public health issue, especially in low- and middle-income countries (LMICs). According to the World Health Organization (WHO), the worldwide prevalence of anemia during pregnancy approximates 40%, with the most elevated rates occurring in South Asia and sub-Saharan Africa, where prevalence figures can reach between 50% and 60%. The prevalence rate established in this investigation aligns closely with these global statistics, particularly those pertaining to Pakistan, where reports suggest that over half of pregnant women experience anemia.

An examination of the socioeconomic and demographic variables reveals significant associations between anemia and factors such as education and employment status. Although a substantial proportion (74.5%) of the anemic participants possessed educational qualifications, the prevalence of anemia was markedly higher among housewives (85%) compared to their employed counterparts (15%). This observation suggests that educational attainment may not be sufficient to mitigate anemia risk if other socioeconomic determinants and lifestyle factors remain unaddressed. Such results are congruent with previous studies that elucidate the multifaceted interplay of elements contributing to anemia in LMICs, including cultural norms, dietary diversity, and access to healthcare services.

The elevated prevalence of anemia among housewives may be linked to limited access to resources and insufficient information regarding nutritional requirements during pregnancy. Prior research has demonstrated that women with lower economic resources often encounter difficulties in obtaining iron-rich foods and accessing adequate antenatal care. Furthermore, housewives may exhibit a heightened susceptibility to anemia due to restricted mobility, adherence to traditional gender roles, and reduced exposure to health promotion initiatives compared to those who are employed.

The findings related to the interplay between education and anemia underscore that despite a majority of anemic participants being educated, the condition persisted at high rates. This persistence reflects broader socioeconomic influences such as household income, dietary practices, and healthcare utilization that surpass the effects of education alone. Even among women with educational backgrounds, adherence to nutritional guidelines and access to fortified foods may be constrained by economic limitations and cultural barriers.

Iron deficiency anemia (IDA), which accounts for approximately 75% of anemia cases globally, remains the most prevalent nutritional deficiency in pregnancy. The cereal-based dietary patterns prevalent in South Asian nations, including Pakistan, are deficient in bioavailable iron, exacerbating the anemia situation. This dietary profile, combined with cultural food restrictions and limited dietary variation, significantly contributes to the high rates of anemia. Similar findings have been documented in other regional studies, where inadequate antenatal care-seeking behavior and insufficient nutritional support were identified as salient factors (11, 20).

Moreover, the influence of parity and short inter-pregnancy intervals must be considered, as these factors can deplete maternal iron stores and increase the likelihood of anemia. High parity rates and inadequate spacing between pregnancies, commonly observed in LMICs, represent consequential obstetric risk factors. Regular antenatal visits, early screening, and appropriate iron and folic acid supplementation are essential preventive strategies. Nonetheless, adherence to these preventive measures poses challenges due to side effects and limited awareness. The WHO's recommendation for daily supplementation of 30–60 mg of elemental iron and 400 μg of folic acid is crucial for effective anemia management, yet its execution is often hindered in resource-limited environments.

Infections, including malaria and intestinal parasites, also substantially contribute to anemia prevalence by causing chronic blood loss and

hindering iron absorption. Although these factors were not the primary focus of this study, their potential influence on anemia cannot be dismissed when considering comprehensive management strategies.

CONCLUSIONS

The outcomes of this study reveal a high prevalence of anemia among pregnant women in Peshawar, accompanied by significant associations between anemia and socioeconomic variables, particularly employment status. The persistence of anemia among participants with high educational attainment illustrates the complexity of the condition and the limitations posed by education alone in addressing this health issue.

This investigation emphasizes the necessity for integrated strategies that encompass nutritional interventions, enhanced access to antenatal care, and community-based educational initiatives to address the fundamental causes of anemia. Strategies focusing on dietary diversification, iron and folic acid supplementation, and deworming programs are paramount for the reduction of anemia prevalence. Additionally, efforts aimed at improving women's economic empowerment and access to healthcare resources is essential.

Future research should prioritize longitudinal studies to explore the long-term effects of maternal anemia on child development and assess the effectiveness of context-specific interventions. Addressing identified gaps in the existing literature and customizing solutions to align with local socioeconomic and cultural contexts are crucial for achieving sustainable reductions in anemia among pregnant women in Pakistan and other LMICs.

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