Section: Obstetrics and Gynecology

Original Research Article

AN EXPLORATORY STUDY ON THE PREVALENCE AND FACTORS ASSOCIATED WITH ANEMIA AMONG WOMEN OF REPRODUCTIVE AGE (15–49 YEARS) IN RURAL AREA OF MANIPUR

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ABSTRACT

Background: Anemia is a global disease affecting mostly the reproductive women especially in the developing and under developed countries. In semi urban and rural India, the burden of anemia is much more. **Objective:** The objective of this study is to explore prevalence and factors associated with anemia among the reproductive age women in semi urban areas of Manipur.
Materials and methods: The Study is a Cross-sectional observational study done on reproductive age women (RAW)attending the OPD service at Kyamgei Churachandpur Medical College Hospital, Manipur for duration of 6 months from Dec 2024 to May 2025. All the consenting reproductive age women attending the OBG OPD at Kyamgei Churachandpur medical college Hospital Manipur were included in the study. Reproductive age women who do not response to all the questionnaires and Women who are not in the reproductive age group of (15–49 years) were excluded from the study.
Results: In the current study a total of 206 reproductive age woman participated in the study. 58 woman (28%) of the study participants were having anemia with hemoglobin <12 g/dl. Out of 58 anemic patients 86% were mild anemic and 12 % were moderately anemic and only 2% were severely anemic. Most of the anemic patients were under graduates and 31.8% of anemic patients used an iron vessel compared. Only 8 have excessive bleeding during cycle and none of the anemic patients use any form of birth spacing methods. Among anemic participants, 36 (62.1%) did not wash hands before cooking, while 22 (37.9%) did
Conclusion: This project has identified the prevalence of anemia and the factors related to anemia, and this will help in spreading awareness to the public and eradicating anemia from our community and will form basis of many research not only in anemia but also in other NCDS (Non-Communicable diseases)
Keywords: Anemia, RAW, Reproductive age women, Manipur.

INTRODUCTION

Anemia is a global concern affecting women of reproductive age (15–49 years old) in both developed and developing countries.
Anemia is classified as mild (10–12 g/dL), moderate (7–10 g/dL), or severe (7 g/dL).[1]
The World Health Organization (WHO) reports that the global prevalence of anemia is 39.8% among children aged 6–59 months and 29.9% among women of reproductive age (15–49 years).[2]
Anemia, as defined by the World Health Organization, is characterized by a decrease in the proportion of red blood cells, a reduction in hemoglobin concentration, or an insufficient oxygen-carrying capacity to meet the body's physiological needs.[3]
Anemia is a leading cause of infant and maternal death in the majority of these countries, and it is

linked to an increased risk of low birth weight, cognitive impairment, greater susceptibility to infection, and delayed physical and mental development, as well as reduced ability to work. The key risk factors that are prominent in low- and middle-income nations include dietary inadequacies, iron deficiency, infection/inflammation, and hereditary hemoglobin abnormalities.[4]

Need/Rationale of Study

Anemia is a leading cause of infant and maternal death in the majority of the developing countries, and it is linked to an increased risk of low birth weight, cognitive impairment, greater susceptibility to infection, and delayed physical and mental development, as well as reduced ability to work. .[4]

Healthcare providers play an essential role in preventing and treating anemia in the community and this study will help the healthcare workers to know the prevalence of anemia and the factors affecting anemia, thereby helping the healthcare sector in understanding and organizing awareness and treatment camps in the community.

Research Question

1. What is the prevalence of anemia in Reproductive age women in semi urban areas of Manipur?
2. Does the lifestyle, social culture and customs have association with anemia among the reproductive age women in in semi urban areas of Manipur?

Aim

The aim of the present study is to explore prevalence and factors associated with anemia among the reproductive age women in in semi urban areas of Manipur

Objectives

1. To know the prevalence of anemia, amount the reproductive age women in semi urban areas of Manipur.
2. To identify factors associated with anemia among the reproductive age women in semi urban areas of Manipur.

MATERIALS AND METHODS

The Study is a Cross-sectional observational study done on reproductive age women attending the OPD service at Kyamgei Churachandpur Medical College Hospital, Manipur for duration of 6 months from Dec 2024 to May 2025.

Eligible candidate: All the consenting reproductive age women attending the OBG OPD at Kyamgei Churachandpur medical college Hospital Manipur were included in the study

Non Eligible candidate: Reproductive age women (RAW) who do not response to all the questionnaires and Women who are not in the reproductive age group of (15–49 years) were excluded from the study.

Data Collection: After informing all the stakeholders, Department faculties and patients about the project plan, approval was be taken from the IEC. Data collection tool in the form of questionnaire was designed. Validation of the data collection tool was done and depending on the feedback the data collection tool was modified.

Study was done only after taking Consent from the participating reproductive age women and the identity anonymity was maintain for all the participating patients.

- Before the data collection and blood sample collection patients were given a brief talk about the project and how the result of the project will help the doctors understand the prevalence of anemia and the factors affecting and will help in creating awareness of anemia in the community and planning community teaching programs to prevent and treat anemia
- The blood sample for hemoglobin estimation was taken in OPD sample collection room and validated data collection tool in form of Validated Questionnaire was administer to the reproductive age female patients to know the factors affecting the anemia. The questionnaire was of two parts -first part was of demographic characteristics while the second part was of lifestyle and culture and customs that the study participants followed.

Statistical Analysis

All data was kept confidential. It was entered into an Excel spreadsheet and analyzed.

Prevalence was calculated as percentage and 95% confidence interval. P value of < 0.05 was taken as significant.

Implications of proposed study

This project will help in identifying the prevalence of anemia and the factors related to anemia, and this will help in spreading awareness to the public and eradicate anemia from our community.

RESULTS

In the current study 206 RAW (reproductive age women) participated in the study. Most of the participants belongs to the age group 40 to 49 yrs of age. 145(70%) participants participating RAW studied only up to 10+2 level.64 participants (31 %) have household income 26 to 50 k.120 (58%) belongs to Hindu religion and 164(79.6%) belong to Nuclear family.

Table 1: Demographic profile of all the study participants and Anemic participants

Variable	Frequency (All the study participants)	Frequency (Anemic participants)
Age (years)		
<20	31	8
20-29	39	21
30-39	44	11
40-49	62	25
Religion		
Hindu	120	38
Meetei	75	18
Muslim	8	2
Others	3	0
Education		
Illiterate	1	1
<10	55	14
10+2	90	32
Graduate	58	18
Post Graduate	1	0
Type of family		
Nuclear	164	51
Joint	40	7
Income		
5 – 25k	139	40
26 -50k	64	15
51-75k	2	3
>1L	1	

Table 2: The lifestyle habits of all the study participants

Variable	Frequency (All the study participants)	Frequency (Anemic participants)
Use of iron vessel in cooking		
Yes	130	27
No	76	31
Dietary Habit		
Vegetarian	75	27
Non Vegetarian	131	31
Having coffee or tea with food		
Yes	82	27
No	123	31
Taking whole grain > or = 2times /week		
Yes	73	9
No	133	49
Cycle rhythm		
Regular	153	44
Irregular	51	14
Excessive bleeding during cycle		
Yes	39	8
No	169	50
Using birth spacing		
Yes	205	0
No	1	58
Having worms in stool		
Yes	100	36
No	106	29
Washing hand after defecation		
Yes	94	40
No	112	18
Washing hand before cooking		
Yes	139	22
No	67	36

In the current study the prevalence of anemia was 29%. 50 out of the 58(86%) anemic participants were having mild anemia, 7 out of 58 (12%) were having moderate anemia and only 2% were having severe anemia. Among the anemic patient most of them 25 out of 58 (43.1%) belongs to the age group of 40 – 49 years of age and most of the anemic patient 38 out of 58 (65.5%) were Hindu by religion.

Chi-square and Fisher's exact tests were performed to assess associations between demographic variables and anemia. Age showed a statistically significant association with anemia ($p < 0.05$), with the highest prevalence seen among 20–29 years and 40–49 years. Religion, education status, family type, and income did not demonstrate statistically significant associations ($p > 0.05$), although anemia prevalence was higher among participants from nuclear families and lower-income households.

In the current study, among anemic participants, 27 (31.8%) used an iron vessel compared to 31 (68.9%)

who did not. A statistically significant association was found between the use of an iron vessel and anemia (χ^2, p = 0.003), indicating that not using an iron vessel was associated with higher anemia prevalence. Regarding the dietary habits a higher proportion of anemic participants were non-vegetarian (31/58; 53.4%) than vegetarian (27/58; 46.6%).

However, this association was not statistically significant (p = 0.083). A total of 27 anemic participants consumed tea/coffee with food, while 31 did not. No significant association was observed between tea/coffee intake and anemia (p = 0.296). Only 9 (15.5%) anemic participants consumed whole grains regularly, compared to 49 (84.5%) who did not. This association was strongly significant (p < 0.001), showing that low whole-grain intake was associated with anemia. Irregular cycles were reported by 14 anemic participants, but this distribution showed no statistical association with anemia (p = 1.000). Although anemia prevalence was higher among those reporting excessive bleeding (8/58; 13.8%), the association was not statistically significant (p = 0.347).

Anemia was more prevalent among those with a history of worm infestation (36/58; 62.1%) than those without (29/58; 37.9%), but the association was not statistically significant (p = 0.236). Failure to wash hands after defecation was significantly associated with anemia. Among anemic participants, 18 (31.0%) did not wash hands, compared to 40 (69.0%) who did. The association was highly significant (p < 0.001). Among anemic participants, 36 (62.1%) did not wash hands before cooking, while 22 (37.9%) did. This factor showed a strong association with anemia (p < 0.0001).

DISCUSSION

In the current study the prevalence of anemia is 28% which is much less than the national prevalence of 53% according to NFHS-4 the anemia prevalence in our neighbouring countries 57% (Bangladesh) 51.1 % (Pakistan),41% (Nepal) according to study done by Gautam S et al, Merril RD et al and Singal N et al.[5,6,7]

In the current study 86%were having mild anemia 12% were having moderate anemia and 2 % were having severe anemia. This is different than the study done by Osborn AJ et al where 55% were having mild anemia,35% were having moderate anemia and 9.7% were having severe anemia.[8]

In the current study maximum number of study participants 25 (43.1%) belongs to 40 to 49 years of age which is similar to findings in the study done by A Sosa et al and Guralnik et al, where the prevalence is increases with age.[9,10]

In the current study maximum 50 (86.2%)anemic participants were having low income 5 to 25 k

And is similar to the study done by Osborn AJ et al, Balarajan YS et al, Rajaratnam J et al and Venkatachalam J et al.[8,11,12,13]

Most of the anemic participants 46(79.3%) are educated only less than or equal to 10+2 standard which is similar to the finding in the study done by Osborn AJ et al, Gebremedhin S et al and Ngnie-Teta I et al.[8,14,15]

In this study, several lifestyle and hygiene-related factors were evaluated for their association with anemia among women of reproductive age. The findings highlight important behavioral determinants that may contribute to anemia prevalence in the community.

The use of an iron vessel during cooking demonstrated a significant association with anemia. Participants who did not use iron utensils were more likely to be anemic, supporting earlier studies showing that cooking in iron vessels can increase dietary iron content and improve hemoglobin levels. This indicates a simple, low-cost strategy for improving iron intake, especially in low-resource settings.[16]

Whole-grain consumption was also significantly associated with lower anemia prevalence. Whole grains provide essential micronutrients including iron, folate, and B-complex vitamins; their inadequate intake, as observed among anemic participants, aligns with existing evidence on dietary contributors to iron deficiency. The finding underscores the importance of promoting balanced diets rich in whole grains as part of anemia prevention strategies.[17]

All the anemic patient doesn't use any form of birth spacing 36(62.07%) so the link anemia with any birth spacing could not be established in the current study. 36 (62.07%) have worms in and 18 (%) doesn't wash had after defecation and 36 (62.07%) doesn't wash hand before cooking showing that worm infestation along with lack of Hand hygiene could be the possible cause of anemia in the current study

Hygiene practices showed strong associations with anemia. Failure to wash hands before cooking and after defecation was significantly linked to anemia, suggesting a role of gastrointestinal infections and parasitic infestations as contributing factors. Although the presence of worms in stool was not statistically significant, the trend toward higher anemia prevalence in those with worm infestation supports the biological plausibility of chronic intestinal parasitism impairing iron absorption. These results emphasize that anemia prevention requires not only dietary interventions but also improvements in sanitation and hygiene behaviors.[18]

In contrast, factors such as dietary pattern (vegetarian vs non-vegetarian), consumption of tea or coffee with meals, menstrual cycle regularity, and excessive menstrual bleeding were not significantly associated with anemia in this population. While tea and coffee intake are known to inhibit iron absorption, the lack of statistical significance in this study may reflect differences in quantity consumed and timing relative

to meals. Similarly, menstrual characteristics may not have shown significance due to self-reporting bias or variation in individual bleeding patterns.[19,20]

Overall, the findings reveal that modifiable practices—including cooking methods, whole-grain intake, and personal hygiene play an important role in anemia prevalence. Integrating dietary education with hygiene and sanitation awareness could therefore produce substantial benefits. These results align with national guidelines emphasizing a multi-sectoral approach to anemia control, incorporating nutrition, health education, and public health measures.

Further studies with larger sample sizes and biochemical assessment of iron status are recommended to strengthen the evidence for these associations and to guide targeted interventions.

CONCLUSION

The study found an anemia prevalence of 28%, lower than national and neighboring country estimates, with most cases being mild. Anemia was more common among women with lower income and education levels and was significantly associated with modifiable factors such as lack of iron utensil use, poor whole-grain intake, and inadequate hygiene practices. While dietary patterns and menstrual factors were not significant, findings highlight the need for integrated nutrition, hygiene, and health education interventions to effectively reduce anemia in this population.

Limitations of the Study

1. The study was conducted in a single center on a relatively small sample size, which may limit the generalizability of the findings.
2. Data on dietary habits, menstrual patterns, and hygiene practices were self-reported and subject to recall and reporting bias.

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