Research Article

Nutritional and Health Profile of Pregnant and Lactating Women: A cross-sectional study in Kamrup Metro, Assam

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Abstract

Background: Pregnancy and lactation are nutritionally demanding periods during which inadequate dietary intake and micronutrient deficiencies may adversely affect maternal and infant health. Despite the expansion of antenatal and nutrition services in India, maternal undernutrition and anaemia remain important public health concerns, particularly in socioeconomically vulnerable communities. Assam continues to report a substantial burden of anaemia among women of reproductive age. Objective: To assess the nutritional status of pregnant and lactating women residing in Lokhra, Kamrup Metropolitan district, Assam. Methods: A community-based cross-sectional study was conducted among 80 pregnant and lactating women residing in selected areas of Lokhra block, Kamrup Metropolitan district, Assam. Data were collected through a structured questionnaire administered by personal interview. Dietary practices were assessed using a 24-hour dietary recall and food frequency questionnaire. Anthropometric assessment included measurement of height and weight and calculation of body mass index (BMI). Haemoglobin estimation was performed to assess anaemia status. Results: Nearly half of the participants were aged 25–30 years (48.7%), while 47.5% were aged 19–24 years. A substantial proportion had either no formal schooling (35.0%) or only primary education (38.8%). Most participants were homemakers (93.7%) and belonged to nuclear families (91.2%). Among the participants, 33.8% were in the first trimester, 30.0% in the second trimester, 7.5% in the third trimester and 28.8% were lactating. Regular antenatal visits were reported by 92.1% of participants, while 93.7% reported taking iron tablets and 87.5% reported receiving calcium supplementation. Dietary assessment demonstrated frequent consumption of rice, pulses, milk/curd and fermented foods, but relatively low consumption of green leafy vegetables, citrus fruits, fish, meat and eggs. Tea and coffee consumption was frequent. Three meals per day were reported by 65.0% of participants and 22.5% reported occasional meal skipping. Based on BMI categories reported in the study, 22.5% were underweight, 52.4% had normal BMI, 18.8% were overweight and 6.3% were obese. Anaemia was identified in 54 of the 80 participants (67.5%); 37.5% had mild anaemia, 25.0% moderate anaemia and 5.0% severe anaemia. The overall mean haemoglobin concentration was 10.63 ± 0.93 g/dL. Conclusion: The study demonstrates a substantial burden of anaemia and coexistence of undernutrition and excess weight among pregnant and lactating women in the study community. Although antenatal care attendance and reported supplementation coverage were relatively high, dietary diversity remained suboptimal, particularly for several micronutrient-rich food groups. Community-level nutrition counselling should therefore complement supplementation and antenatal care, with emphasis on dietary diversity, iron-rich foods, appropriate meal patterns and culturally acceptable nutrition education.

Keywords: Antenatal, Anaemia, Diet, Lactation, Maternal, Pregnancy.

1. Introduction

Maternal nutrition is a major determinant of maternal, fetal and infant health. Pregnancy increases requirements for energy, protein, iron, folate and other micronutrients, while lactation continues to impose substantial nutritional demands. Inadequate maternal nutrition can contribute to anaemia, impaired maternal well-being and adverse pregnancy outcomes and may influence infant growth and development. Recent evidence continues to show that maternal diets in India are often characterised by inadequate dietary quality and diversity, with socioeconomic conditions, maternal education, nutrition knowledge and antenatal care influencing diet quality (Kachwaha et al., 2026)

Maternal malnutrition in India increasingly reflects a dual burden in which undernutrition and micronutrient deficiencies coexist with overweight and obesity. National analyses have shown persistent anaemia alongside a substantial rise in overweight/obesity among women of reproductive age, emphasising the need for interventions that address multiple forms of malnutrition rather than focusing on a single nutritional outcome.(Prithishkumar et al., 2024)

(Gardner et al., 2025) A recent global systematic review similarly identified overweight/obesity with anaemia as an important manifestation of the double burden among pregnant women(Biete et al., 2026)
Anaemia remains one of the most important nutritional problems affecting women during pregnancy. NFHS-5 reported anaemia among 52.2% of pregnant women aged 15–49 years in India and 54.2% in Assam. More recent evidence indicates that anaemia in pregnancy is multifactorial, with dietary diversity, dietary practices, micronutrient deficiencies, educational status and other health and social determinants contributing to risk (Agarwal et al., 2025b) (Dagne et al., 2025) WHO continues to recommend daily iron and folic acid supplementation during pregnancy as an essential component of antenatal care, but effective prevention also depends on adherence, dietary quality, appropriate counselling and identification of non-iron causes of anaemia.(World Health Organization, 2024) (ICMR–NIN Expert Group on Nutrient Requirements for Indians, 2020)

The nutritional situation is particularly relevant in Assam, where dietary patterns are influenced by local food culture and where rice and other cereal-based foods form important components of the traditional diet. Although fish, fermented foods, pulses, green leafy vegetables and other nutrient-rich foods are culturally available, their consumption may vary according to socioeconomic conditions, availability, preferences and pregnancy-related food practices. Recent Indian research also indicates that low dietary quality during pregnancy remains a concern and is associated with household and maternal characteristics, including socioeconomic status, education, nutrition knowledge and antenatal-care exposure (Kachwaha et al., 2026)

Dietary diversity is particularly important during pregnancy and lactation because no single food group can provide all nutrients required during these physiologically demanding periods. Low dietary diversity has been identified as a modifiable risk factor for anaemia in pregnancy, supporting the need for food-based strategies alongside supplementation (Dagne et al., 2025) Thus, assessment of actual food-group consumption can provide useful contextual information even when individual nutrient intakes are not quantified.

Previous research in Assam has documented nutritional vulnerability among pregnant women, including anaemia and inadequate maternal weight gain. However, community-level information describing dietary practices alongside anthropometric and haemoglobin status remains important for developing locally appropriate nutrition interventions, particularly in semi-urban populations where nutritional transition may produce simultaneous undernutrition and excess weight.

The present study was therefore undertaken to assess nutritional status, dietary practices and selected health characteristics among pregnant and lactating women residing in Lokhra, Kamrup Metropolitan district, Assam.

2. Materials And Methods

2.1 Study Design And Setting

A community-based cross-sectional study was conducted in Lokhra block of Kamrup Metropolitan district, Assam. Data were collected from selected Anganwadi Centres functioning under the Integrated Child Development Services (ICDS) system in Lokhra. The study setting represented a semi-urban community and was selected to examine nutritional and health characteristics among women during pregnancy and lactation.

2.1 Study Population And Sample Size

The study population comprised pregnant women and lactating mothers residing in the selected areas of Kamrup Metropolitan district. A total of 80 participants were included in the study. Participants were selected using purposive sampling based on availability and willingness to participate.

- **Inclusion Criteria**
  Pregnant women of any trimester and lactating mothers residing in the study area were eligible for participation. Women who were willing to provide consent were included.

- **Exclusion Criteria**
  Women suffering from severe illness or pregnancy-related complications and those unwilling to participate were excluded.

2.2 Data Collection

Data were collected through personal interviews using a structured questionnaire. Information was obtained regarding sociodemographic characteristics, obstetric history, dietary practices, supplementation and antenatal care. Informed consent was taken from the respondents prior to the study.

2.3 Dietary Assessment

Dietary practices were assessed using a 24-hour dietary recall and a food frequency questionnaire. The food frequency assessment included commonly consumed food groups and individual food items such as rice, pulses, green leafy vegetables, fruits, milk and curd, fish, meat, eggs, fermented foods, tea, coffee, fast foods, sweets and oils/fats.

2.4 Anthropometric Assessment

Height and weight were measured using standard procedures. BMI was calculated from the recorded height and weight and participants were classified according to the BMI categories used in the original study.

2.5 Haemoglobin Assessment

Haemoglobin concentration was assessed to determine anaemia status. Participants were categorised into severe, moderate and mild anaemia and normal haemoglobin groups according to the cut-offs used in the study.

2.6 Statistical Analysis

Data were compiled and analysed using descriptive statistics. Frequencies, percentages and mean ± standard deviation were calculated. Dietary frequency scores were also summarised descriptively.

3. Results

3.1 Sociodemographic Characteristics

The study included 80 pregnant and lactating women. Most participants were young: 38 (47.5%) were aged 19–24 years, 39 (48.7%) were aged 25–30 years and only 3 (3.8%) were aged 31–36 years. The study population had relatively low formal educational attainment. Twenty-eight participants (35.0%) reported no formal schooling, while 31 (38.8%) had primary-level education. Sixteen women (20.0%) had completed higher secondary education and only five (6.2%) were graduates or above. The majority of participants were homemakers (93.7%), while 6.3% were employed in service-related occupations. Most participants lived in nuclear families (91.2%), with only 8.8% belonging to joint families.

Table 1. Sociodemographic characteristics of participants

Characteristic	n	%
Age		
19–24 years	38	47.5
25–30 years	39	48.7
31–36 years	3	3.8
Education		
No schooling	28	35.0
Primary school	31	38.8
Higher secondary	16	20.0
Graduate and above	5	6.2
Occupation		
Homemaker	75	93.7
Service	5	6.3
Family type		
Nuclear	73	91.2
Joint	7	8.8

The concentration of participants in the 19–30-year age group indicates that the study largely represented women in the younger reproductive age range. The high proportion of women with limited formal education is relevant when considering the design and delivery of nutrition counselling.

3.2 Pregnancy And Lactation Status

Among the 80 participants, 27 (33.8%) were in the first trimester, 24 (30.0%) were in the second trimester and 6 (7.5%) were in the third trimester. Twenty-three participants (28.8%) were lactating.

Table 2. Pregnancy and lactation status

Stage	n	%
First trimester	27	33.8
Second trimester	24	30.0
Third trimester	6	7.5
Lactating	23	28.8
Total	80	100.0

The participants therefore represented a range of reproductive stages, although women in the first and second trimesters constituted the largest groups. Regarding obstetric history, 7 participants (8.7%) were primigravida, while 20 (25.4%), 26 (32.3%) and 23 (28.6%) were classified as gravida 1, 2 and 3, respectively. Four women (5.0%) were gravida 4 or above.

3.3 Antenatal Care And Supplementation

Reported utilisation of maternal health services was relatively high. Seventy-four participants (92.1%) reported regular antenatal visits, while six (7.9%) reported irregular attendance. Seventy-five participants (93.7%) reported taking iron tablets, whereas five (6.3%) reported not taking them. Calcium supplementation was reported by 70 participants (87.5%), while 10 (12.5%) reported not receiving calcium supplementation.

Table 3. Antenatal care and supplementation practices

Indicator	n	%
Regular antenatal visits	74	92.1
Irregular antenatal visits	6	7.9
Reported iron tablet intake	75	93.7
No reported iron tablet intake	5	6.3
Reported calcium supplementation	70	87.5
No calcium supplementation	10	12.5

These findings indicate relatively high reported coverage of antenatal care and supplementation in the study population. However, the coexistence of high supplementation coverage with a high prevalence of anaemia suggests that service contact alone may not ensure adequate nutritional status.

3.4 Dietary Practices

Rice was the most frequently consumed food item, with 85.0% of participants reporting daily consumption. Pulses were consumed daily by 52.5%, while milk or curd was consumed daily by 55.0%. Fermented foods were also commonly consumed, with 47.5% reporting daily consumption. In contrast, only 22.5% consumed green leafy vegetables daily. Daily fish consumption was reported by 5.0%, while 20.0% consumed eggs daily and 7.5% consumed meat daily. Citrus fruit consumption was also relatively low, with only 10.0% reporting daily intake. Tea consumption was high: 57.5% reported consuming tea daily. Coffee was consumed daily by 37.5%. Consumption of fast food and sweets was relatively low. Only 2.5% reported daily fast-food consumption, while 45.0% reported never consuming fast food. Only 5.0% consumed sweets or sugar-based foods daily.

Table 4. Selected food-frequency patterns

Food item	Daily n (%)	3–6 times/week n (%)	1–2 times/week n (%)	Rarely n (%)	Never n (%)
Green leafy vegetables	18 (22.5)	24 (30.0)	22 (27.5)	12 (15.0)	4 (5.0)
Pulses/lentils	42 (52.5)	20 (25.0)	12 (15.0)	4 (5.0)	2 (2.5)
Meat	6 (7.5)	14 (17.5)	28 (35.0)	20 (25.0)	12 (15.0)
Fish	4 (5.0)	10 (12.5)	22 (27.5)	26 (32.5)	18 (22.5)
Eggs	16 (20.0)	22 (27.5)	24 (30.0)	12 (15.0)	6 (7.5)

Rice	68 (85.0)	8 (10.0)	3 (3.8)	—	0
Citrus fruits	8 (10.0)	14 (17.5)	26 (32.5)	24 (30.0)	8 (10.0)
Tea	46 (57.5)	18 (22.5)	10 (12.5)	4 (5.0)	2 (2.5)
Coffee	30 (37.5)	16 (20.0)	14 (17.5)	12 (15.0)	8 (10.0)
Fermented foods	38 (47.5)	26 (32.5)	12 (12.5)	4 (5.0)	0
Milk/curd	44 (55.0)	20 (25.0)	10 (12.5)	4 (5.0)	2 (2.5)
Fast food	2 (2.5)	4 (5.0)	10 (12.5)	28 (35.0)	36 (45.0)
Sweets/sugar foods	4 (5.0)	8 (10.0)	18 (22.5)	30 (37.5)	20 (25.0)
Oils/fats	40 (50.0)	24 (30.0)	10 (12.5)	4 (5.0)	2 (2.5)

The frequency-score analysis showed the greatest relative deficits for citrus fruits, eggs, fish and green leafy vegetables when compared with the study's selected reference frequencies. Tea and coffee were consumed at frequencies above the reference values used in the original analysis.

Table 5. Mean dietary-frequency scores compared with study reference values

Food item	Mean ± SD frequency score	Reference score	Difference
Green leafy vegetables	3.41 ± 2.49	7	−3.59
Pulses/lentils	5.05 ± 2.39	7	−1.95
Meat	1.96 ± 2.07	3	−1.04
Fish	1.49 ± 1.87	3	−1.51
Eggs	3.16 ± 2.48	7	−3.84
Rice	5.80 ± 2.31	7	−1.20
Citrus fruits	2.12 ± 2.19	7	−4.88
Tea	5.25 ± 2.35	2	+3.25
Coffee	3.86 ± 2.84	2	+1.86
Fermented foods	5.04 ± 2.21	5	+0.04
Milk/curd	5.19 ± 2.34	7	−1.81
Fast food	0.76 ± 1.43	1	−0.24
Sweets/sugar foods	1.32 ± 1.83	2	−0.68
Oils/fats	5.06 ± 2.30	7	−1.94

3.5 Meal Pattern And Hydration

Most participants reported consuming three meals per day (65.0%), while 20.0% consumed four meals and 15.0% consumed two meals. Regular meal timing was reported by 85.0% of participants. However, 22.5% reported occasional meal skipping. Only 27.5% reported regular snacking between meals. Regarding water intake, 57.5% reported consuming approximately three litres per day, 25.0% consumed less than two litres and 17.5% consumed more than three litres.

3.6 Physical Activity, Sleep And Symptoms

Moderate physical activity was reported by 60.0% of participants, while 30.0% reported light activity and 10.0% were classified as sedentary. Most participants reported approximately seven hours of sleep per day (62.5%). Twenty-five percent reported more than eight hours, whereas 12.5% reported sleeping for less than six hours. Leg cramps were the most frequently reported symptom, affecting 50.0% of participants. Fatigue was reported by 25.0%, nausea by 15.0% and back pain by 10.0%. These symptoms are nonspecific and should not be interpreted as evidence of a particular micronutrient deficiency in the absence of biochemical assessment.

3.7 Anthropometric Status

According to the BMI classifications reported in the original study, 42 participants (52.4%) were classified as having normal BMI, 18 (22.5%) as underweight, 15 (18.8%) as overweight and 5 (6.3%) as obese.

Table 6. BMI distribution

BMI category	N	%
Underweight (<18.5 kg/m²)	18	22.5
Normal	42	52.4
Overweight (25–29.9 kg/m²)	15	18.8
Obese (>30 kg/m²)	5	6.3
Total	80	100.0

Thus, undernutrition coexisted with overweight and obesity within the study population, suggesting the presence of a dual burden of malnutrition.

3.8 Haemoglobin Status

Anaemia was detected in 54 of the 80 participants, corresponding to a prevalence of 67.5%. Mild anaemia was the most common category, affecting 30 participants (37.5%), followed by moderate anaemia in 20 participants (25.0%). Four participants (5.0%) had severe anaemia. Twenty-six participants (32.5%) had haemoglobin concentrations in the normal category used by the study.

Table 7. Haemoglobin status of participants

Haemoglobin category	n	%
Severe anaemia (<7 g/dL)	4	5.0
Moderate anaemia (7–9.9 g/dL)	20	25.0
Mild anaemia (10–10.9 g/dL)	30	37.5
Normal (≥11 g/dL)	26	32.5
Total	80	100.0

The mean haemoglobin concentration was 10.63 ± 0.93 g/dL overall. Among anaemic participants, the mean haemoglobin concentration was 9.80 ± 1.12 g/dL, compared with 12.10 ± 0.76 g/dL among participants classified as non-anaemic.

4. Discussion

The present community-based study demonstrates a substantial burden of anaemia and nutritional vulnerability among pregnant and lactating women in a semi-urban community of Kamrup Metropolitan district, Assam. The findings are particularly relevant because they were observed despite relatively high reported utilisation of antenatal services and supplementation. The overall pattern is consistent with the increasingly recognised complexity of maternal malnutrition, in which inadequate dietary quality, micronutrient deficiencies and excess weight may coexist.(Prithishkumar et al., 2024) (Gardner et al., 2025) (Biete et al., 2026)

The prevalence of anaemia in the present study was 67.5%, which is higher than the 54.2% prevalence reported among pregnant women in Assam in NFHS-5. Direct comparison should nevertheless be made cautiously because the present study included both pregnant and lactating women, used a purposive sample of only 80 participants and was conducted in a specific community setting. The higher prevalence may therefore reflect the characteristics of the selected study population rather than the prevalence in Kamrup Metropolitan as a whole. Recent Indian studies continue to report substantial anaemia burdens among pregnant women; for example, a 2025 multicentre study from Gujarat reported 64.2% prevalence and demonstrated associations with low dietary diversity, underweight status and educational disadvantage.(Agarwal et al., 2025b)

The haemoglobin distribution is clinically important. One-third of participants had normal haemoglobin, whereas approximately two-thirds were anaemic. Mild and moderate anaemia together accounted for the majority of cases, although 5.0% had severe anaemia. WHO identifies anaemia as a major public health problem among pregnant and postpartum women and recommends daily iron and folic acid supplementation during pregnancy.(World Health Organization, 2024) (ICMR–NIN Expert Group on Nutrient Requirements for Indians, 2020) The persistence of a high anaemia burden therefore suggests that preventive strategies need to extend beyond nominal programme coverage to effective implementation and individual-level nutritional assessment.

An important finding was the high reported level of iron supplementation. More than nine in ten participants reported taking iron tablets, and 92.1% reported regular antenatal visits. This apparent contradiction between reported supplementation and the high prevalence of anaemia suggests that maternal anaemia cannot be addressed solely through tablet distribution. Adherence, duration of supplementation, dosage, timing of intake, absorption, pre-existing iron stores and non-iron causes of anaemia may all contribute. Recent implementation research in India has similarly highlighted gaps between awareness, receipt and effective use of iron-folic acid supplementation, including counselling, follow-up and system-level barriers.(Agarwal et al., 2025b) However, the present study did not collect ferritin, vitamin B12, folate or inflammatory biomarkers, so the underlying aetiology of anaemia cannot be established. The dietary findings provide additional context. Rice was consumed daily by 85.0% of participants, while pulses, milk/curd and fermented foods were also relatively frequent components of the diet. However, the consumption of several nutrient-rich foods was comparatively low. Only 22.5% of women consumed green leafy vegetables daily, 10.0% consumed citrus fruits daily, 5.0% consumed fish daily and 7.5% consumed meat daily. Eggs were consumed daily by 20.0%. This pattern suggests limited dietary variety and is broadly consistent with recent evidence from India showing that maternal diet quality during pregnancy can remain low and is influenced by education, socioeconomic status, nutrition knowledge and antenatal-care exposure.(Kachwaha et al., 2026) The low consumption of green leafy vegetables, citrus fruits and animal-source foods may contribute to a diet with limited diversity. However, the present study did not calculate individual nutrient intakes from the 24-hour recall. Therefore, the observed food-frequency patterns should be interpreted as indicators of dietary practice rather than direct estimates of nutrient adequacy.

Low dietary diversity is increasingly recognised as a modifiable contributor to anaemia. A recent umbrella review found that low dietary diversity and poor dietary practices were associated with higher risk of anaemia during pregnancy, supporting the interpretation that dietary counselling should complement iron-folic acid supplementation.(Dagne et al., 2025) In the present setting, practical counselling could emphasise affordable and locally acceptable combinations of pulses, green leafy vegetables, seasonal fruits, eggs and appropriate fish or other animal-source foods, while considering household food access and cultural practices.

The frequent consumption of tea and coffee is another relevant dietary finding. Tea was consumed daily by 57.5% of participants and coffee by 37.5%. Polyphenols and tannins in tea and coffee can inhibit non-haem iron absorption, particularly when consumed close to meals. The manuscript reported that many women consumed these beverages around meal times. Nutrition counselling could therefore address not only the inclusion of iron-rich foods but also practical strategies to improve iron bioavailability, such as separating tea or coffee from major meals. This recommendation should be presented as a practical dietary strategy rather than evidence that tea or coffee alone caused the anaemia observed in this study.

The study population was characterised by relatively low educational attainment, with 73.8% having either no formal schooling or only primary education. Educational status is an important consideration when designing nutrition interventions. Recent evidence from India also indicates that maternal education, nutrition knowledge and socioeconomic circumstances are associated with maternal diet quality.(Kachwaha et al., 2026) Rather than relying exclusively on written materials, community-level counselling could use demonstrations, pictorial communication, locally available food examples and interpersonal counselling through frontline health workers.

The high prevalence of underweight participants (22.5%) alongside overweight and obesity demonstrates the coexistence of different forms of nutritional vulnerability. This finding is consistent with the broader double burden of malnutrition documented in Indian women of reproductive age, where anaemia persists alongside both underweight and increasing overweight/obesity.(Prithishkumar et al., 2024) (Gardner et al., 2025) A recent global meta-analysis further identified overweight/obesity with anaemia as a common double-burden phenotype among pregnant women.(Biete et al., 2026) However, because the sample included pregnant women at different gestational stages, BMI classification requires caution. Gestational weight gain and pre-pregnancy BMI are more appropriate measures for assessing nutritional status during pregnancy, and future studies should preferably incorporate these indicators.
The study also found relatively favourable meal-timing practices: 65.0% consumed three meals daily and 85.0% reported regular meal timing. Nevertheless, 22.5% reported occasional meal skipping and 72.5% did not report regular snacking. These findings suggest that improving overall dietary quality may be more important than simply increasing meal frequency. Nutrition counselling should focus on nutrient-dense meals and snacks rather than meal frequency alone.

The relatively high reported attendance at antenatal care provides an important opportunity for intervention. WHO recommends nutrition counselling as part of antenatal care, including guidance on healthy dietary patterns and appropriate supplementation.(World Health Organization, 2016) (World Health Organization, 2024) The present findings suggest that antenatal contact is occurring at a relatively high level in this community, but that the nutritional benefits of these contacts could potentially be strengthened through more intensive, individualised dietary counselling. Recent Indian evidence showing persistent gaps between programme contact and effective anaemia prevention further supports this approach.(Agarwal et al., 2025b)

The findings therefore point towards a need for an integrated approach. Supplementation should continue, but should be accompanied by practical food-based interventions, adherence support and appropriate screening for other causes of anaemia. In the Assam context, locally acceptable foods such as pulses, green leafy vegetables, seasonal fruits, eggs, appropriate fish varieties and other affordable nutrient-dense foods could be incorporated into nutrition education. Counselling should also be culturally sensitive and should consider household food practices and pregnancy-related food restrictions.

5. Conclusion

This community-based study identified a substantial burden of anaemia and nutritional vulnerability among pregnant and lactating women in Lokhra, Kamrup Metropolitan district, Assam. Two-thirds of participants were anaemic, with mild and moderate anaemia accounting for most cases. Undernutrition coexisted with overweight and obesity, indicating a dual burden of malnutrition.

Although reported antenatal care attendance and iron and calcium supplementation were relatively high, the dietary assessment demonstrated limited consumption of several nutrient-rich food groups, particularly green leafy vegetables, citrus fruits, fish, eggs and meat. The diet was largely centred on staple foods such as rice and pulses, while tea and coffee were consumed frequently.

These findings suggest that improving maternal nutrition requires more than supplementation alone. Strengthened dietary counselling, culturally appropriate behaviour-change communication, improved dietary diversity and regular nutritional screening should be integrated into existing antenatal and community-based maternal health services.
Larger community-based studies using probability sampling, quantified dietary intake and biochemical assessment of iron and other micronutrient status are warranted to better understand the determinants of maternal nutritional vulnerability in Kamrup Metropolitan and Assam.

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- **Conflict Of Interest**
The authors declare no conflict of interest.

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