

Nutritional status of pregnant women and its impact on fetal development: A qualitative study

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ABSTRACT

Introduction: Maternal nutrition plays a fundamental role in ensuring optimal fetal growth and development. Inadequate nutrient intake during pregnancy increases the risk of complications such as low birth weight, preterm birth, and developmental delays. This study examines the nutritional status of pregnant women and its impact on fetal development, with a focus on dietary practices and maternal perceptions of nutrition.

Methods: This qualitative study involved in-depth interviews with 20 pregnant women selected through purposive sampling. Data were collected using semi-structured interview guides and analyzed through thematic content analysis. The study focused on participants' nutritional knowledge, dietary behaviors, access to nutritious foods, and perceptions of fetal development.

Results: Findings revealed three major themes: (1) Maternal nutritional awareness, where most participants had basic knowledge of essential nutrients but lacked detailed understanding of recommended dietary intake; (2) Dietary practices and influencing factors, showing that meal patterns were often inconsistent due to socioeconomic constraints, food aversions, and cultural beliefs; and (3) Perceived impact on fetal development, with participants acknowledging the importance of nutrition but demonstrating limited ability to maintain balanced diets. Poor nutritional status was commonly associated with symptoms such as fatigue, inadequate weight gain, and concerns about fetal growth.

Conclusion: The study concludes that suboptimal nutritional status among pregnant women may have a negative impact on fetal development. Improving maternal nutrition requires targeted educational interventions, enhanced access to nutritious foods, and culturally appropriate health counseling. Collaboration between healthcare providers, families, and community programs is essential to promote healthier dietary behaviors during pregnancy. Further research is recommended to explore effective strategies for improving maternal dietary adherence.

Keywords: Dietary practices; Fetal development; Maternal health; Nutrition; Pregnancy.



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INTRODUCTION

Maternal nutrition is widely recognized as one of the most critical determinants of pregnancy outcomes and fetal development. Adequate intake of essential macro- and micronutrients during pregnancy plays a pivotal role in supporting maternal physiological changes, promoting placental function, and ensuring optimal fetal growth ([Abdulsalam *et al.*, 2025](#)). Numerous studies have demonstrated that poor nutritional status in pregnant women can lead to adverse consequences such as intrauterine growth restriction, low birth weight, impaired brain development, and increased neonatal morbidity ([Amqam *et al.*, 2025](#)). Despite the abundance of global evidence, nutritional challenges among pregnant women remain prevalent, particularly in low- and middle-income regions where socioeconomic disparities, cultural beliefs, and limited access to health services significantly influence maternal dietary behavior ([Arda, Lalla and Suprpto, 2023](#)).

During pregnancy, women experience increased nutritional demands to meet both their own maternal metabolic needs and the requirements of fetal growth and development. However, many pregnant women struggle to achieve the recommended dietary intake due to inadequate nutritional knowledge, morning sickness, loss of appetite, food taboos, and financial limitations ([Barneze Costa *et al.*, 2025](#)). These barriers often lead to insufficient consumption of nutrient-rich foods such as vegetables, fruits, protein sources, and iron-containing foods. Furthermore, cultural practices may restrict certain food items believed to harm pregnancy, even though such beliefs lack a scientific basis ([Ferede *et al.*, 2025](#)). As a result, the risk of maternal undernutrition and micronutrient deficiencies remains high, contributing to a cycle of poor maternal health and suboptimal fetal development ([Behrasi *et al.*, 2024](#)).

Despite ongoing health education initiatives and maternal care programs, many pregnant women continue to exhibit inadequate nutritional practices ([Carr, 2025](#)). This issue has implications not only for the mother's health but also for the developing fetus. The primary problem addressed in this study concerns the persistent gap between recommended nutritional guidelines for pregnant women and their actual dietary behaviors in daily life ([Carvalho-Sauer *et al.*, 2025](#)). While antenatal care programs encourage balanced diets, nutritional counseling is often insufficient, generalized, or poorly understood by pregnant women ([Chen *et al.*, 2025](#)). Compounding this issue is the limited exploration of the lived experiences, perceptions, and decision-making processes of pregnant women regarding their own nutrition ([Farah, Abdilahi and Osman, 2025](#)). Moreover, although quantitative data on maternal nutrition are widely available, there remains a lack of in-depth qualitative understanding of how pregnant women interpret nutritional advice, the contextual challenges they face in accessing nutritious foods, and the cultural norms that shape their dietary choices. These factors contribute to a persistent disconnect between policy recommendations and real-world maternal dietary behaviors ([Chandia-Poblete *et al.*, 2025](#)).

Existing literature has predominantly focused on quantitative assessments of nutritional status during pregnancy, including anthropometric measurements, dietary recall analyses, and biomarkers of micronutrient deficiency. While these approaches provide valuable numerical indicators, they do not fully capture the sociocultural, economic, and psychological factors that influence maternal nutrition. Qualitative investigations remain relatively limited, especially those exploring how pregnant women perceive the relationship between their nutritional intake and fetal development. Additionally, previous studies often concentrate on structural determinants, such as poverty and food insecurity, but lack exploration of individual perspectives, including beliefs about food safety, pregnancy-related appetite changes, misconceptions about dietary restrictions,

and perceived barriers to adhering to healthy diets. This gap highlights the need for comprehensive qualitative research that delves into personal experiences and contextual realities influencing pregnant women's nutritional choices.

Another gap concerns the limited documentation of pregnant women's awareness and understanding of how nutrition affects fetal growth. Although general knowledge about "eating well during pregnancy" is common, many women express uncertainty about specific nutrient requirements, appropriate food portions, and the consequences of poor nutrition on fetal health. Understanding these perspectives is crucial for designing more effective maternal nutrition education strategies.

The novelty of this study lies in its qualitative design, which involves 20 informants, allowing for an in-depth exploration of the real-life experiences of pregnant women as they navigate nutritional challenges. Unlike previous research that relies mainly on quantitative measures, this study examines deeper contextual factors influencing maternal nutrition, including cultural norms, personal beliefs, emotional responses, and perceptions of fetal development. It also highlights how pregnant women interpret nutritional advice from healthcare providers, family members, and social networks, revealing gaps between medical recommendations and cultural practices. By integrating mothers' own understanding of fetal development rather than relying solely on biomedical perspectives, this study provides a more holistic view of maternal nutrition. These insights provide new directions for developing culturally sensitive and practical nutrition programs that better align with women's lived realities.

RESEARCH METHODOLOGY

Study Design

This study employed a qualitative research design to explore the nutritional status of pregnant women and its perceived impact on fetal development. A qualitative approach was used to gain an in-depth understanding of the lived experiences, beliefs, perceptions, and contextual factors that influence maternal nutritional practices. This design enabled the researchers to capture nuanced insights that could not be obtained through quantitative measurements alone.

Study Setting and Participants

The study was conducted in a community setting that provides antenatal care services, allowing access to a diverse group of pregnant women. A total of 20 informants were selected using purposive sampling, ensuring the inclusion of participants who met the following criteria: currently pregnant (in any trimester), Willing to participate in in-depth interviews, and Able to articulate personal experiences related to nutrition and pregnancy. The sample size of 20 was considered adequate for achieving data saturation, where no new themes or insights emerged during the final interviews.

Data Collection Techniques

Data were collected through semi-structured, in-depth interviews. An interview guide was developed to explore participants' nutritional knowledge, dietary behaviors, perceptions of fetal development, and the sociocultural factors influencing their dietary choices. Open-ended questions allowed participants to describe their experiences freely, while probing questions helped clarify complex issues or expand on relevant topics. Each interview lasted approximately 30–60 minutes and was conducted in a private setting to ensure confidentiality and encourage honest responses. With the participants' permission, all interviews were audio-recorded to ensure the accuracy and completeness of the data.

Data Analysis

The recorded interviews were transcribed verbatim and analyzed using thematic content analysis. The analysis followed these steps: Familiarization, which involved reading transcripts multiple times to gain an understanding of the overall content. Coding: Identifying meaningful statements, patterns, or concepts related to nutrition and fetal development. Theme Development: Grouping codes into broader categories and emerging themes. Interpretation: Examining relationships among themes to generate deeper insights into maternal nutritional practices and perceived impacts on fetal development. To enhance accuracy, coding was conducted independently by two researchers and later compared to ensure consistency. Any discrepancies were discussed until agreement was reached.

Trustworthiness of the Study

Several strategies were employed to ensure credibility, dependability, confirmability, and transferability. Credibility Was Ensured Through Prolonged engagement with participants and triangulation of information through repeated probing. Dependability: Detailed documentation of all research procedures to allow replication. Confirmability: The Researcher's reflexivity to minimize bias during data interpretation. Transferability: Rich descriptions of context and participant characteristics to allow assessment of applicability to other settings.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional review board. All participants were informed about the study's objective, the voluntary nature of their participation, and their right to withdraw at any time. Informed consent was obtained before data collection, and anonymity was ensured by assigning codes instead of using real names. All data were stored securely and used solely for research purposes.

Table 1. Interview Guide Outlining Themes and Essential Questions

Theme	Essential Questions
Maternal Nutritional Awareness	1. Can you describe what you know about nutrition during pregnancy? 2. What types of foods do you believe are important for pregnant women? 3. Where do you usually get information about healthy eating during pregnancy? 4. Are there any foods you think should be avoided? Why?
Daily Dietary Practices	1. Can you describe what you usually eat in a day? 2. How has your diet changed since becoming pregnant? 3. Do you experience challenges such as nausea, appetite loss, or food cravings that affect your diet? 4. How do you decide what foods to eat or avoid each day?
Sociocultural and Economic Influences on Diet	1. Are there cultural or family beliefs that influence what you eat during pregnancy? 2. Does anyone in your household (husband, mother, mother-in-law) influence your food choices? 3. Are there financial challenges that affect your ability to buy certain foods? 4. What foods do you wish you could eat more often but cannot?
Perceptions of Fetal Development	1. How do you think your diet affects your baby's growth and health? 2. Have you noticed any changes in your pregnancy that you think relate to your eating habits? 3. What do you believe happens to the baby if a mother does not eat well? 4. Do you discuss fetal development or nutrition with healthcare providers?
Experiences with Healthcare Guidance	1. What advice have you received from healthcare providers about nutrition? 2. How easy or difficult is it for you to follow that advice? 3. What kind of nutrition guidance do you feel you still need? 4. How can healthcare services better support your nutritional needs?

RESULT

This section presents the findings obtained from in-depth interviews with 20 pregnant women, aimed at exploring their nutritional status and perceptions of how maternal nutrition influences fetal development. The analysis employed a thematic approach, enabling the emergence of key patterns and meanings from the participants’ narratives. Three major themes were identified, reflecting the women’s awareness and understanding of nutrition, their daily dietary practices shaped by sociocultural and economic factors, and their perceptions of the impact of nutrition on fetal growth. The results illustrate not only the knowledge and behaviors of pregnant women but also the contextual challenges they face in maintaining adequate nutrition throughout pregnancy. Each theme is described in detail to provide a comprehensive understanding of the lived experiences that shape maternal nutritional practices.

Table 2. Overview of Main Categories and Subcategories

Main Categories (Themes)	Subcategories
Maternal Nutritional Awareness	- General knowledge of healthy foods during pregnancy - Limited understanding of specific nutrient requirements (iron, protein, folic acid, calcium) - Sources of information (family, community beliefs, healthcare workers)
Dietary Practices and Influencing Factors	- Misconceptions and food-related myths - Daily meal patterns and eating frequency - Impact of pregnancy symptoms (nausea, vomiting, appetite loss) - Economic constraints affecting food access - Cultural food taboos and restrictions- Household influence (husband, mother, mother-in-law) on food choices
Perceived Impact of Nutrition on Fetal Development	- Beliefs about nutrition’s role in fetal growth - Concerns about maternal weight gain and anemia - Understanding of fetal activity and perceived health
Experiences with Healthcare Advice	- Challenges in adopting recommended dietary behaviors - Types of nutritional counseling received - Clarity and usefulness of the guidance - Barriers to following professional advice - Need for personalized and culturally sensitive education

Maternal Nutritional Awareness

Most participants demonstrated a basic understanding of the importance of nutrition during pregnancy, although their knowledge was often general and lacked specific details about individual nutrients. Many relied on information passed down through family or community traditions rather than formal health education.

One participant stated:

“I know I should eat more vegetables and fruits, but I’m not really sure which nutrients are important for my baby.” (Informant 4)

Several women revealed misconceptions about dietary restrictions, often shaped by longstanding cultural beliefs. For example:

“My mother-in-law told me not to eat pineapple because it can cause miscarriage, so I avoid it even though I’m not sure if it’s true.” (Informant 9)

These statements highlight gaps in participants’ understanding, particularly regarding scientific nutritional guidelines.

Dietary Practices Influenced by Pregnancy Symptoms, Culture, and Economy

Daily eating patterns varied widely among participants. Many experienced nausea or appetite loss, especially in the first trimester, which significantly affected their ability to maintain a balanced diet.

One mother explained:

“In the morning I often skip breakfast because I feel nauseous. I only eat when I really feel I can keep it down.” (Informant 2)

Economic limitations also played a crucial role in food choices. Some participants reported difficulty accessing nutrient-rich foods, such as fish, eggs, or meat, due to financial constraints.

As shared by another participant:

“I want to eat more protein, but sometimes we just don’t have the money to buy meat or fish.” (Informant 15)

Cultural beliefs additionally influenced dietary behavior. Some foods were avoided due to community myths or symbolic associations.

One woman noted:

“People here say eating eggs will make the baby too big and cause problems during delivery, so I try not to eat too many.” (Informant 7)

Family members also played a significant role in shaping dietary decisions.

“Most of the time, my mother-in-law prepares the meals, so I eat what she cooks even if it’s not what the midwife recommended.” (Informant 11)

Perceived Impact of Nutrition on Fetal Development

Participants generally believed that maternal nutrition affects fetal health, although the degree of understanding varied among them. Some mothers perceived a clear connection between their diet and fetal growth.

One participant expressed:

“When I eat better, I feel my baby moves more, and I think it means the baby is healthy.” (Informant 5)

Others worried that inadequate nutrition might harm their baby, although the specific mechanisms of this harm were unclear.

“I’m afraid my baby won’t grow well because I don’t eat enough, but sometimes I just can’t force myself to eat.” (Informant 13)

A lack of understanding about how nutrients contribute to fetal organ development was common.

“I know food is important, but I don’t really know how it helps the baby’s brain or body develop.” (Informant 18)

These perceptions underscore the need for clearer, more practical education that links nutrition to fetal developmental outcomes.

Experiences with Healthcare Advice

While all participants reported receiving some form of nutritional counseling during antenatal visits, many felt the guidance was too general or difficult to apply.

One participant commented:

“The midwife always says to eat healthy food, but she doesn’t tell me exactly what I should eat every day.” (Informant 1)

Others struggled to follow the advice due to personal or contextual challenges.

“I want to follow what the nurse says, but with nausea and our financial situation, it’s not easy.” (Informant 10)

Some participants requested more personalized guidance.

“I wish they gave examples of affordable foods or weekly meal plans for pregnant women like me.” (Informant 20)

This highlights the need for more practical, culturally sensitive, and economically informed nutritional counseling.

Maternal nutrition plays a fundamental role in supporting healthy fetal development, influencing fetal growth, organ formation, and overall pregnancy outcomes. Adequate intake of essential nutrients, such as protein, iron, folic acid, and calcium, is crucial for preventing complications like low birth weight, anemia, and developmental delays. Therefore, optimal maternal nutrition is a key determinant of fetal health and well-being. Findings from this study indicate that pregnant women have only a partial understanding of their nutritional needs. They are aware that healthy eating is important, but they lack specific knowledge about the functions of nutrients. Misconceptions influenced by cultural traditions and incomplete health information further limit their ability to make informed dietary choices. Various contextual factors, including economic conditions, cultural norms, family influence, and access to healthcare guidance, shape nutritional behavior during pregnancy. These determinants significantly affect whether pregnant women can adopt and maintain recommended dietary practices.

The study reveals that participants face multiple barriers to maintaining good nutrition, such as food taboos, financial constraints, pregnancy-related symptoms, and generalized or unclear nutritional counseling. These factors contribute to inconsistent dietary practices, hindering pregnant women from fulfilling their nutritional requirements. Combining the major and minor premises, the study concludes that although maternal nutrition is essential for fetal development, pregnant women struggle to achieve adequate dietary intake due to limited knowledge and contextual constraints. Effective interventions must therefore integrate cultural sensitivity, economic support, and practical, personalized nutritional guidance to bridge the gap between recommended practices and real-life behavior.

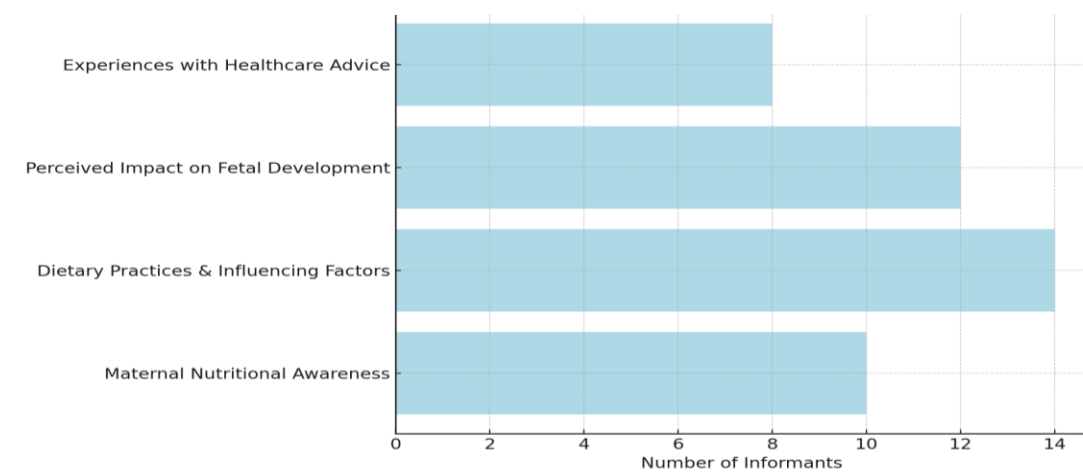


Figure 1. Distribution of informants across the main themes identified in the study

Figure 1 illustrates the distribution of informants across the four main themes that emerged from the qualitative analysis. The horizontal bar chart provides a visual representation of how frequently each theme was expressed by the 20 pregnant women interviewed. This distribution reflects the relative prominence of each issue within the participants' lived experiences. The most frequently mentioned theme, Dietary Practices and Influencing Factors (14 informants), indicates that pregnant women face considerable challenges in maintaining consistent and nutritious eating

habits. These challenges stem from a variety of interconnected factors, including nausea, appetite loss, economic limitations, and cultural restrictions. The high frequency of this theme suggests that daily dietary behavior is an area of significant struggle and requires targeted support through practical, culturally sensitive nutrition interventions.

The second most frequent theme, Perceived Impact of Nutrition on Fetal Development (12 informants), shows that most participants recognize a general link between maternal diet and fetal health. However, their understanding remains broad rather than specific. This finding demonstrates that, although awareness exists, there is still a need for more transparent and more accessible explanations that connect key nutrients to fetal organ growth, brain development, and overall pregnancy outcomes. Maternal Nutritional Awareness (10 informants) appears as the third most prominent theme. This reflects a moderate level of general knowledge among participants but highlights existing gaps in the detailed understanding of nutritional requirements. Misconceptions and reliance on informal sources of information further underscore the need for improved and more accurate nutrition education during antenatal care.

Finally, Experiences with Healthcare Advice (8 informants), although the least frequent, still represents a meaningful area of concern. Participants appreciated receiving guidance, but often found it to be too general, difficult to follow, or not tailored to their specific circumstances. Overall, the pattern shown in Figure 1 emphasizes the need for comprehensive, culturally informed, and economically feasible strategies to support pregnant women in achieving better nutritional practices.

DISCUSSION

This study provides meaningful insights into the nutritional experiences of pregnant women by examining their knowledge, daily dietary practices, sociocultural influences, and perceptions of fetal development. The findings reveal complex interactions between individual understanding, cultural expectations, economic conditions, and healthcare support. This section discusses these findings in relation to existing literature and highlights their implications for improving maternal nutrition.

First, the study reveals that pregnant women generally have an awareness of the importance of nutrition, yet their understanding of specific nutrient requirements remains limited. Participants commonly expressed that they knew they should “eat healthy” but were unsure which food groups or nutrients were essential ([Guthrie et al., 2025](#)). This aligns with previous research indicating that many pregnant women rely heavily on informal sources such as family traditions and community beliefs rather than evidence-based information ([Hernández et al., 2025](#)). Studies from various low- and middle-income countries also report that maternal knowledge often focuses on broad dietary recommendations without an understanding of micronutrient needs related to iron, folic acid, calcium, and protein ([Herrero Jiménez et al., 2025](#)). The presence of misconceptions, including food avoidance based on myths, further complicates mothers’ efforts to maintain an optimal diet. These findings underscore the importance of health systems providing more precise, more comprehensive, and culturally sensitive nutrition education ([Kaçar et al., 2024](#)).

Second, dietary practices were strongly influenced by pregnancy symptoms, cultural norms, and socioeconomic constraints. Many women reported skipping meals due to nausea, reduced appetite, or vomiting symptoms that are expected during pregnancy but often unaddressed in dietary counseling ([Kamudoni et al., 2024](#)). Cultural restrictions also played a significant role, with some foods believed to cause miscarriage, fetal abnormalities, or difficult labor. Similar patterns have been documented in previous studies, where traditional food taboos persist across generations and shape maternal dietary behavior ([Kinshella, Moore and Elango,](#)

2025). The influence of family members, particularly mothers-in-law and husbands, further demonstrates how household dynamics impact nutritional choices. Economic limitations were another significant barrier, as many participants could not afford protein-rich foods or fresh produce. These findings emphasize that maternal nutrition cannot be improved without addressing the broader social and economic environment in which women make food choices (Kretschmer *et al.*, 2025).

Third, the participants' perceptions of fetal development reflected a basic understanding that maternal nutrition affects the baby's health, though the mechanisms were often unclear. Many mothers believed that eating well leads to a "healthy" or "active" baby, while a poor diet may result in weak fetal growth (Lawson, Comerford and Mitchell, 2024). However, most lacked detailed knowledge of how specific nutrients support brain development, organ formation, or the maturation of the immune system. This gap between general awareness and specific understanding is consistent with research showing that pregnant women frequently receive limited or simplified explanations during antenatal visits. The findings highlight the importance of linking nutrition education to fetal outcomes in a manner that is both readily comprehensible and actionable for women (Lim *et al.*, 2025).

Fourth, experiences with healthcare advice were mixed. Although all participants reported receiving some form of guidance, many felt the counseling was too brief, too general, or not tailored to their daily realities (Magna *et al.*, 2025). This is consistent with studies suggesting that antenatal care often focuses on standard messages rather than personalized recommendations based on economic status, cultural practices, or pregnancy-related symptoms (Mahen, Wihongi and Connolly, 2025). The participants' desire for practical examples, such as affordable meal plans or culturally acceptable substitutes, illustrates the need for healthcare providers to adopt more contextualized and interactive communication strategies (Tursunova *et al.*, 2025). Overall, the interactions between knowledge, cultural influences, socioeconomic factors, and healthcare support create a complex environment that shapes maternal nutritional behaviors. Improving maternal nutrition, therefore, requires interventions that go beyond simply providing information (Suprpto, 2022). Public health strategies must consider cultural norms, household dynamics, and economic barriers. Community-based programs involving family members, especially influential figures such as mothers-in-law, may help reduce negative food taboos and support healthier eating patterns. At the same time, strengthening the capacity of healthcare workers to deliver clearer, more practical guidance could bridge the gap between recommended dietary practices and real-life behavior (Rahmadani, Lumintang and Chabibah, 2025).

The study's qualitative design provides a rich, contextualized understanding of the experiences of pregnant women. By emphasizing their voices and personal narratives, the findings highlight challenges that quantitative data alone cannot capture. The results underscore the need for holistic approaches that integrate cultural, economic, and educational dimensions of maternal nutrition. The study reveals that the nutritional status of pregnant women is shaped by interconnected factors that extend beyond individual knowledge. Addressing these issues requires a multipronged strategy that combines tailored health education, community engagement, and improved access to nutritious foods. Such approaches have the potential to enhance maternal well-being and promote healthier fetal development.

CONCLUSION

This study concludes that pregnant women's nutritional behaviors are shaped by a combination of limited nutritional knowledge, sociocultural beliefs, economic constraints, and pregnancy-related symptoms. While participants recognize the general importance of nutrition

for fetal development, they often lack a specific understanding of essential nutrients and face significant challenges in adhering to recommended dietary practices. These findings highlight a persistent gap between biomedical guidelines and the lived realities of pregnant women, demonstrating the need for more accessible, contextualized, and culturally sensitive nutrition support. To address these challenges, healthcare providers should enhance antenatal nutrition counseling by offering practical, personalized guidance that takes into account cultural norms, financial constraints, and common pregnancy symptoms. Community-based strategies involving family members, especially husbands and mothers-in-law, should be integrated to reduce restrictive food taboos and support healthier dietary choices. Additionally, improving access to affordable, nutrient-rich foods through local programs or subsidies can help pregnant women meet their nutritional needs and promote healthier fetal development.

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Conflict of Interest

There are no potential conflicts of interest relevant to this article.

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