



Perceived Nutritional Constraints and Preferred Interventions among Farm Women: Evidence from Mahbubnagar District, Telangana

Harshitha Chikene^{1*}, Ajay Kumar Prusty¹, Chinmaya Nanda² and Nibedita Mishra¹

¹Department of Agricultural Extension Education, M.S. Swaminathan School of Agriculture, Centurion University of Technology & Management, Odisha, India

²Department of Fisheries Extension, Economics & Statistics, School of Fisheries, Centurion University of Technology & Management, Odisha, India

*Corresponding author email id: chikeneharshitha@gmail.com

HIGHLIGHTS

- Low income was the most important factor that hindered the consumption of foods for good nutrition.
- Low levels of literacy and family priorities made a significant impact on dietary practices.
- Women's participation in household food decisions was the top suggested intervention.
- Strengthening nutrition-based education programs at the community level was recognised as the main intervention for improving nutritional status.

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Reviewed by: Dr. Gurava Reddy Kotapati (reddy.gurava@angrau.ac.in); Dr. Karamjit Sharma (sharmakaramjit@pau.edu); Dr. Kaushal Jha (kkjhanurd@rediffmail.com); Dr. Mandeep Sharma (mandeepsharmahsee@pau.edu)

ABSTRACT

Adequate nutrition is essential for maintaining the health, productivity, and well-being of farm women; however, several socio-economic and behavioural factors limit their access to nutritious foods. The study undertaken during 2025, examined the constraints affecting nutritious food consumption and identified suitable interventions among 180 farm women in Mahbubnagar district, Telangana. A descriptive research design was adopted, and respondents were selected through a multistage random sampling technique. The identified constraints and suggestions were prioritised using the Rank-Based Quotient (RBQ) method. The findings revealed that low income was the most significant constraint, followed by family priority, low literacy, inadequate nutrition education, gender norms, traditional food habits, and limited availability of nutritious foods. Farm women identified greater participation in household food-related decision-making, community-based nutrition education, promotion of nutrient-rich kitchen gardens, and balanced dietary practices as the most effective strategies. These findings provide valuable insights for developing nutrition-sensitive interventions and policies to improve dietary diversity and nutritional well-being among rural farm women.

INTRODUCTION

Women are the most important target group when it comes to nutrition. Today's lifestyle and altered eating habits have resulted in nutritional deficiencies all over the world. Even in a rich population, micronutrient deficiencies are of concern (Rani, 2018). Nutritious food is essential for good health. One of the most

important ways to be healthy is to eat the right foods. A well-balanced diet helps to maintain a healthy body and to prevent diseases (Kumbhare et al., 2023). Good nutrition is crucial to good health, better work productivity, and prevention of communicable and non-communicable diseases among rural people, especially the female farmers involved in agriculture (Wheeler & Nye, 2024).

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Although women play a vital role in food production, they are often disadvantaged in their nutritional status due to a lack of access to productive resources, low income and restricted participation in household decision-making (Gupta, 2024). Food affordability is a key driver of healthy food intake, with lower-income groups often choosing cheaper and higher-energy-density foods over those higher in nutrient content (Drewnowski et al., 2020). Women empowerment is the empowerment of women to participate in decision-making to function in poverty eradication, social integration and other areas in an integrated and sustainable way (Roy et al., 2024). In 2023, some 2.33 billion people were moderately or severely food insecure and 864 million were severely food insecure, reflecting the ongoing inequalities in access to sufficient food (FAO et al., 2024). Moreover, in 2022, approximately 2.8 billion people could not afford a healthy diet, and affordability continues to be a major challenge in low- and middle-income countries (LMICs) (FAO et al., 2024).

Food insecurity disproportionately affects women, with 26.1% of adult women facing moderate to severe food insecurity, versus 24.2% of men, and almost 1/3rd of women worldwide eating diets that are not diverse enough (UN Women, 2025). The statistics show that while the food production system is an important source of food, access to nutritious foods and socio-economic constraints limit farmers' nutritional outcomes, especially farm women, and highlight the need for context-specific solutions and nutrition-sensitive policies. (Kumbhare et al., 2023) noted that there are 17 Sustainable Development Goals (SDGs) set by the United Nations, where SDG 2 is for zero hunger, food security, improved nutrition, and sustainable agriculture. The nutritional status, dietary diversity and food consumption pattern of rural women have been studied in several studies, and the socio-economic and demographic determinants have been emphasized. But few studies have considered the limitations to the consumption of nutritious foods and the perceived interventions by the farm women using the Rank-Based Quotient (RBQ) approach. Although the role of the farm women is very significant in agriculture, studies on nutritional status, dietary diversity, access constraints etc. in Mahbubnagar district of Telangana is limited. Furthermore, information about the participation of women in agriculture is limited in Mahbubnagar district. This study thus addresses this gap by establishing and prioritising nutrition constraints and context-specific interventions while informing nutrition-sensitive policies and extension programmes.

METHODOLOGY

Mahbubnagar district of Telangana, India, was purposively selected because of the predominance of agriculture in the area, coupled with the active role of women in agriculture. The mandals were selected by purposive sampling to get maximum participation of women in agricultural activities in four mandals: Mahbubnagar, Bhoothpur, Devarakadra and Koilkonda. The four mandals were chosen for their representative nature of the various farming systems: Mahbubnagar (urban-rural transition), Bhoothpur (rainfed agriculture), Devarakadra (minor surface irrigation with intensive monoculture), Koilkonda (highly rain-dependent dryland agriculture). A total of 12 villages were selected (3 villages from

each selected mandal). Random sampling was used to select 15 farm women from each of the villages, and a total of 180 women were sampled. A descriptive research design was employed to determine the main constraints for the consumption of nutritious food among the farm women and record their suggestions to improve their dietary practices and nutritional status.

The constraints and suggestions incorporated in the research were determined after an extensive literature review, Cronbach's Alpha for the identified scale items was 0.895, Interpretation was Good internal consistency. From this process, eight major constraints and five potential suggestions related to consuming nutritious food were finalised. Each constraint and suggestion was first ranked by the respondents in order of perceived importance, where Rank I was deemed to be of highest priority and the final rank was of lowest priority.

To prioritise the constraints and suggestions statistically, the Rank Based Quotient (RBQ) technique was used. Each rank given by the respondents was multiplied by the corresponding weight ($n+1-i$), where n is the number of ranks, and i is the rank given to the constraint or suggestion. The higher the rank, the more weight; the lower the rank, the less weight, and so on in this weighting procedure, which reflects more accurately what the respondents preferred. The weighted scores derived for each rank were aggregated over all the respondents and divided by the total number of respondents (N) and the total number of ranks (n). The value obtained was then multiplied by 100 to give a Rank-Based Quotient (0-100), with higher scores representing higher importance/priority. Last, the constraints and suggestions were ranked in order of their RBQ value to find their final rank.

$$RBQ = \frac{(\sum f_i (n + 1 - i))}{(N \times n)} \times 100$$

Where, f_i = Frequency of respondents assigning the i^{th} rank, n = Total number of ranks, i = Rank assigned, N = Total number of respondents

RESULTS

Perceived constraints affecting nutritional security among farm women

Table 1 shows the factors that affect the consumption of nutritious food amongst the farm women. According to the RBQ analysis, low income was the most important nutritional constraint (RBQ = 74.5). The ranking is by the respondents' perception of

Table 1. Ranking of Perceived Constraints Affecting Nutritional Security among Farm Women Using Rank-Based Quotient (RBQ)

S.No.	Constraints	RBQ	Rank
1.	Low Income	74.5	I
2.	Family Priority	64.8	II
3.	Low Literacy	59.5	III
4.	Nutrition Education	55.6	IV
5.	Gender norms	54.2	V
6.	Traditional food habits	53.8	VI
7.	Limited availability of nutritious foods	49.3	VII
8.	Lack of access to kitchen garden inputs	37.9	VIII

the relative importance of income in affecting their ability to access nutritious foods, not an indication of a causal link. The second most important constraint was family priorities, indicating that women had other family members' nutrition needs preceding their own. Low literacy and poor nutrition education were also deemed significant barriers to awareness of balanced diets and food choices. Some other limitations the respondents perceived were gender norms, traditional food practices, lack of nutritional food items and lack of access to kitchen garden inputs.

Preferred interventions for overcoming nutritional constraints

Table 2 depicts the farm women's suggestions to address the identified nutritional challenges. The survey results showed that the most important focus was on women's participation in food-related decisions within the household, as 79.4% of respondents considered it to be the most important intervention (Rank Ist). It assumes that women's empowerment in decision-making processes allows them to shape food choices, food planning and resource distribution, all of which will eventually result in increased dietary diversity and nutrition outcomes. Strengthening community-based nutrition education programmes was the next most popular suggestion (78.5%), indicating the need to keep educating the community about balanced diets, nutrient needs, healthy preparation of food and proper feeding practices through continuous nutrition education. The third most commonly identified training priority was to train women to grow nutrient-rich kitchen gardens (61.1%), which highlights the importance of boosting household access to fresh vegetables and fruits and decreasing reliance on market availability. The fourth most important item was encouraging women to engage in 'balanced dietary habits' (53.4%), which indicates the importance of ongoing behaviour change communication for regular consumption of nutritious and diversified foods. Preference for frequent meetings by Anganwadi workers/nutrition experts (27.4%) was ranked at Vth, which is again important suggestion to improve the nutritional status of farm women. Overall, the results indicated that women believe empowerment, nutrition education, kitchen gardening, and nutrition-related practices are the most effective interventions for enhancing nutritional outcomes and the nutritional status of households.

DISCUSSION

The results indicate that factors impacting farm women's nutritional status do not stand alone, but rather are interlinked. Dietary behaviour is affected by all these economic restrictions, gender differences, knowledge deficits, and food access barriers. Thus, a comprehensive approach which involves livelihood strengthening, women empowerment, nutrition education,

behavioural change communication, and nutrition-sensitive agriculture is needed to improve nutrition outcomes. Extension agencies can play a major role in improving dietary diversity and nutritional security among farm women if the role of extension agents is strengthened to provide the interventions in their immediate context. Households face financial constraints when purchasing healthy foods because of increasing food prices. Women's nutritional needs are often overlooked as priority is given to other family members. Limited literacy decreases the ability to understand nutrition related information, and lack of contact with extension decreases exposure to nutrition education. Women are less likely to be involved in food decision-making due to cultural beliefs and gender norms, and people are reluctant to change traditional food habits, which impacts dietary diversity. The lack of access to local markets, limited access to kitchen gardens and inputs, and seasonal shortages further constrain the uptake of nutritious and sustainable diets. The results of the present study are similar to the results of (Ravi et al., 2024; Kujur et al., 2026). The RBQ responses indicated that the issue of low income was considered as the most important perceived nutritional constraint, as it did not allow them to afford the purchase of rich nutrient foods and a balanced diet. Low income had the highest RBQ ranking because financial constraints were seen as the most proximal obstacle to purchasing healthy foods. Seasonal agricultural activities were the primary livelihood of most households, restricting food availability. In contrast, gender norms and nutrition education had an indirect impact on nutrition practices and were of less priority than economic constraints. The results of the present study corroborate findings of Chaturvedi et al. (2024), who found that women in rural households are largely engaged in domestic and care-related work activities, and during these activities, their capacity to ensure a well-balanced and nutritious diet is reduced. The research highlighted that the nutritional needs of women are often neglected in favour of their family's nutritional requirements, which contributes to poor nutritional status and dietary diversity in the household. The perceived constraint that stood out as the most important was low income, as many farm households relied on seasonal farm income, making it difficult to have access to a variety and adequate nutritional intake all year round. Moreover, low literacy rates and inadequate nutrition education limited awareness of balanced diets and healthy food choices, limiting the uptake of recommended nutrition. Limited decision-making power among female members of the household was another factor that slowed the use of better nutrition practices, since women's nutritional needs were not always prioritized. The results of these findings indicate that integrated interventions (combining income generation, nutrition education and women's empowerment) are needed to improve nutritional practices.

Table 2. Suggestions for overcoming the constraints faced by farm women in Mahbubnagar District, Telangana

S.No.	Suggestions	Percentage	Rank
1.	Ensure women's participation in household food-related decisions	79.4	I
2.	Strengthen nutrition-based education programs at the community level	78.5	II
3.	Farm women should be trained to adopt nutrient-rich kitchen gardens	61.1	III
4.	Motivate women to adopt balanced diets	53.4	IV
5.	Frequent meetings should be organised by the Anganwadi worker/nutrition expert to provide health and nutrition-related information	27.4	V

(Gokhale & Rao, 2022) also reported that educational level, income level and socio-economic status had significant impacts on dietary diversity among rural women. As food is available but not well utilised, the role of nutrition education is a constraint on how well food is used. While farm households may be able to grow a variety of agricultural products, low awareness of foods for dietary diversification, food combinations, availability of micronutrient-rich foods, and appropriate cooking methods may restrict the nutrition benefits. Nutrition education programmes can enhance knowledge, attitudes and practices about a healthy diet. The results of the present study were consistent with the results obtained by (Salam et al., 2023), who showed that structured nutrition education has a significant impact on increasing the knowledge of the participants about iron deficiency anaemia among the rural communities in Karnataka.

Salam et al. (2023) emphasized the importance of targeted educational approaches to increase awareness of nutrient needs, nutrient deficiency symptoms, nutrient prevention strategies, and proper nutrition practices. The authors stressed that poor nutritional knowledge and inadequate educational opportunities limit access to food resources within the household and often make individuals unable to make sound food choices. This was also observed in the current study, where low literacy was one of the key factors affecting diet patterns and nutrition status of the farm women. Low levels of education can limit access to reliable nutrition information, impact understanding of healthy eating, and limit the use of new food preparation and consumption practices. In addition, the results suggest that just providing food is not enough to improve nutrition outcomes if knowledge sharing and behavioural change strategies are not effective. The results of the present study corroborate the results of Islam et al. (2024), which indicated that women continue to be constrained in access to productive resources, decision-making, nutrition information, and health services in South Asia, primarily due to entrenched gender norms and unequal power relationships.

The traditional roles of women, which are often given priority over the nutritional needs of women, were highlighted as hurting the nutritional intake of women, because the nutritional needs of other members of the family are often given priority. These findings corroborate the findings of the current study, which found that gender norms were one of the dominant constraints affecting the dietary habits and dietary situation of farm women. Even though food availability has improved, food habits are very strong and resistant to change, as highlighted by Masters et al. (2022). Owoputi et al. (2022), However, determined that enhanced crop diversity and nutrition-sensitive farming increased food security and women's dietary diversity through increased availability of nutritious foods. The priority given to nutrition education, kitchen gardens and food balancing demonstrates that the respondents were aware of the importance of having agricultural production and nutrition improvement together. Likewise, the Women's Empowerment Framework points out that women's involvement in household decision-making is crucial in enhancing the dietary diversity and the nutritional status of the household. The importance of women's participation in food-related decisions in the present study reinforces this approach and showed that

women's empowerment is an important factor for food security of farm households.

CONCLUSION

Food choices are influenced by socio-economic, educational and cultural constraints, which need to be taken into account when improving the dietary pattern and nutritional status of farm women. Improving women's decision-making, nutrition education, kitchen gardens and nutritional practices can increase dietary diversity, food security and sustainable nutrition for rural women. The study offers significant policy implications from Department of Agriculture, Department of Women and Child Development, ICDS, Anganwadi Centres, KVKs, State Agricultural Universities, Panchayati Raj Institutions, and NGOs for agricultural extension and rural development, nutrition organisations, and local food production to develop nutrition-sensitive programmes that can incorporate nutrition education and women's empowerment. The results can support the design, implementation, and evaluation of nutrition and kitchen garden promotion and women's decision-making activities for agricultural extensionists to improve the nutrition dimension of agricultural activities.

DECLARATIONS

Ethical approval and consent to participate: The study involved no invasive procedure on human participants as such the committee of Department of Agricultural Extension Education, M. S. Swaminathan School of Agriculture, Centurion University of Technology & Management, Odisha waived the ethical approval. Informed consent was obtained from all respondents before data collection. The respondents were informed about the purpose of the study, and their participation was voluntary.

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