## Original Research Article

# Effect of Socio-economic status on the dietary behaviours of rural women in Kurnool district of Andhra Pradesh, India


**Abstract**

The dietary behavior of rural women in India is a topic of significant importance and intrigue, reflecting a complex interplay of cultural traditions, socioeconomic constraints, and evolving dietary patterns. India, with its vast and diverse rural landscape, is home to a substantial proportion of its population, and women play a pivotal role in shaping the dietary habits of their households. Looking at the importance of the above-mentioned issues, the study was conducted in the Kurnool district of Andhra Pradesh to know the dietary behavior of rural women. Dietary behavior is operationalized as the variety and quantity of food (that includes cereals, pulses, vegetables, fruits and other foods) consumed in 30 days. 24hrs recall method developed by the Food and Agriculture Organization (FAO) was used for daily food consumption analysis. The multiple regression analysis technique was attempted to show the effect of socio-economic variables on the consumption of different food items. The results indicate that per-capita consumption of all the food items except the other vegetables was less than the Recommended Dietary Allowance (RDA). Cereals were the major contributor to the food security of the people and the respondents' average consumption of cereals was 284 g/day, whereas the RDA is 400g/day. The autonomous consumption in the case of vegetables is 70.84 grams per day, consumption in the case of pulses is 26.653 grams per day and consumption of fruits by women in the study area was found to be 19.3 grams per day.



**Keywords: Recommended Dietary Allowance (RDA), Dietary behavior, 24-hour recall.**




## INTRODUCTION

Dietary behavior plays a pivotal role in determining the health and well-being of individuals, and in the context of rural India, it takes on even greater significance. The dietary choices made by rural women have far-reaching consequences not only for their health but also for the overall nutritional status of their families and communities. In a country as diverse and culturally rich as India, where traditions, socio-economic disparities, and agricultural practices vary from one

region to another, understanding the dietary behavior of rural women is a complex yet essential endeavor.

Rural India is home to a significant portion of the country's population, and women constitute a substantial part of this demographic. These women are responsible for managing households, preparing meals, and often engaged in agricultural activities. Therefore, their dietary choices, food preferences, and nutritional knowledge are paramount in the broader public health and development context. This change in the diet has resulted in the occurrence of many health problems at an unprecedented rate not seen before. In parallel with these dietary changes, there is evidence of increased nutritional problems in women especially at reproductive age [1]. In India, 13.2percent of urban and 21.2percent of rural women have Body Mass Index (BMI) below normal. women who are overweight or obese (BMI ≥ 25.0 kg/m2) constitute 33.2percent (urban) 19.7percent (rural) and 53.8 percent of urban women and 58.5 percent of rural women are anemic, 12.4percent of women have hypertension (National Family Health Survey -5). Women's health and nutrition status affects their productivity and thereby their roles in society and their development [2]. Undernourished girls have a greater likelihood of becoming undernourished mothers who in turn have a greater chance of giving birth to low-birth-weight babies. This cycle can be compounded further in young mothers, especially adolescent girls who begin childbearing before they have grown and developed enough. When mothers take only short intervals between pregnancies and have many children, this can exacerbate nutrition deficits, which are then passed on to their children [3]. Therefore, now efforts are being made to close gender gaps and empower women and girls in the most vulnerable settings.It is essential to recognize that understanding these dietary behaviors is crucial for public health, as nutrition is intimately linked with the overall well-being and development of a society. Therefore, this exploration seeks to shed light on the challenges, opportunities, and potential interventions that can help improve the nutritional status and health of rural women in India.



## METHODOLOGY

The study was conducted in Andhra Pradesh state. The proposed research locale was selected purposively because the nutrition and health plight of rural women in Andhra Pradesh is worse when compared to other states of India. Considering the criteria of health and nutritional vulnerability, Kurnool districtis selected purposively. Further, 180 rural women were randomly

sampled from two blocks. Dietary behavior is operationalized as the variety and quantity of food (cereals, pulses, vegetables, fruits and other foods) consumed in 30 days. In this study, a 24-hour recall period developed by the Food and Agriculture Organization (FAO) was used to record the quantity and number of food items consumed by respondents in a day. The multiple regression analysis technique was attempted to show the effect of socio-economic variables on the consumption of different food items. To show the effect of socio-economic variables on consumption of different food items education, occupation type, and marital status were coded as dummy variables. Illiterate education (education), non-agriculture (occupation type), and unmarried were selected as base categories for comparison. Therefore, the per capita consumption of women who is illiterate, who is unmarried, and follow non-agricultural occupation as the base category variables and it indicates the autonomous consumption of various food items.

## RESULTS AND DISCUSSION

Table 1.0 indicates the per-capita consumption of ten food groups. The results indicate that per-capita consumption of all the food items except the other vegetables was less than the Recommended Dietary Allowance (RDA). Cereals were the major contributor of the food security of the people. [4]. The respondents' average consumption of cereals was 284 g/day, whereas the RDA is 400g/day, which depicts that only 70 percent of the required amount of cereals was consumed by the respondents. It indicates the declining trends of monthly per capita cereals consumption [5]. Similarly, pulses, vegetables, sugar, milk, fruits and edible oils, all had witnessed lesser consumption of the required diet. However, total vegetable and milk consumption was appreciably near to RDA and other vegetables exceeded the RDA. Whereas leafy vegetables, roots and tubers are consumed in lesser amounts. Similar results were reported that the probability of consuming roots and tuber is lower in all regions of India [6].

**Table 1.0 Dietary behavior of rural women of Andhra Pradesh**

| **Food groups** | **Per capita consumption( g/day)** | **Recommended Dietary Allowances (RDA)(g/day)** | **Percent deficit in consumption** |
|---|---|---|---|
| | **Column1** | **Column2** | **Column2-1** |
| **Cereals** | 284 | 400 | 29.0 |
| **Pulses** | 55 | 80 | 31.0 |

| | | | |
|---|---|---|---|
| **Total vegetables** | 242 | 300 | 19.4 |
| **Leafy vegetables** | 37 | 50 | 26.0 |
| **Root sand tubers** | 32.5 | 100 | 67.5 |
| **Other vegetables** | 172.5 | 150 | +15 |
| **Fruits** | 19 | 100 | 81.0 |
| **Oil** | 24 | 30 | 20 |
| **Sugar** | 24 | 30 | 20 |
| **Milk** | 250 | 300 | 17.0 |

Table 2.0 shows that the multiple linear regression model is significant and the total variation in the dependent variable i.e., per capita consumption was explained by the variables included in the model was 74percent. Variables such as family size, land holding, monthly income, household production, expenditure on food, postgraduate education, and occupation type had a significant effect on the consumption of cereals. The consumption in the case of cereals is 284 grams per day. Coefficients indicate that a unit increase in household size leads to a 2.46 g decrease in the consumption of cereals, one-acre increase in the land holding increases the per capita consumption of cereals by 5.70 g. On average, if monthly income increases by Rs 1 then per capita consumption of cereals decreases by 0.02 g., income has a negative association indicating higher income lower the consumption of cereals, this is because, as the income increases, it is spent on more nutri-rich foods like fruits, and others. The same findings were reported that the sharp fall in cereal consumption has been attributed to changes in consumer preferences from food to non-food items, and within the food group from cereals to non-cereal food items [8]. Women with post-graduate degrees consumed 37.74 grams less cereals than illiterate women. Similarly, respondents who had non-agriculture as an occupation consumed 3.73g less cereals than the one who had agriculture as the main occupation. The findings of the study revealed that demographic factors except income and age influence the consumption pattern of millets [9]. With the increase in the level of income, people were spending more on pulses, milk and milk products [10]

**Table 2.0 Determinants of per capita consumption of cereals**

| | ***B Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** |
|---|---|---|---|---|
| Intercept | 174.31 | 10.168 | 17.085 | 0.001*** |
| Family size | -2.46 | 1.049 | -2.293 | 0.020** |
| Landholding(ac) | 5.70 | 0.944 | 6.173 | 0.001*** |
| Monthly income(Rs) | -0.02 | 0.004 | -6.705 | 0.001*** |

| | | | | |
|---|---|---|---|---|
| Household production (qtl) | 0.07 | 0.021 | 3.622 | 0.005*** |
| Expenditure on food (Rs) | 0.33 | 0.061 | 5.309 | 0.001*** |
| Social participation | -10.42 | 3.905 | -2.983 | 0.850 |
| Marital status | 0.43 | 5.770 | 0.094 | 0.940 |
| Family type | 8.00 | 4.679 | 1.620 | 0.091 |
| No of cow sand buffaloes | 2.39 | 1.545 | 1.489 | 0.126 |
| Primary education | -11.10 | 7.858 | -1.362 | 0.162 |
| Secondary education | -1.24 | 8.498 | -0.053 | 0.884 |
| Highschool education | 2.77 | 9.484 | 0.434 | 0.770 |
| Undergraduate education | 11.83 | 11.495 | 1.043 | 0.310 |
| Postgraduate education | -37.74 | 20.669 | -1.872 | 0.071* |
| Occupation | -43.73 | 4.790 | -9.269 | 0.001*** |
| $R^2$ | 0.74 | | | |
| F value | 0.001 | | | |

Table 3.0 Indicates that land holding, monthly income, household production, expenditure on food, graduation and post-graduate education had a significant effect on the consumption of pulses. The autonomous consumption in the case of pulses is 26.653 grams per day as normal consumption is 55g per day supporting this a similar study found that the per capita consumption was about half of the recommended intake [11]. The coefficient for land holding indicates that one unit increase in land holding leads to a 0.56 g increase in the consumption of pulses. Similar results concerning recommended per capita intake of pulses there were significant variations for medium farmers (-39.13%), small (-39.98%) and landless categories (-77.56%) of farmers except for the large farmers for whom the gap was found to be only -2.63% [12]. On average, if monthly income increases by Rs 1 then per capita consumption of pulses increases by 0.002 g. One quintal increase in household production increases the 0.017 grams of pulse consumption per day and one unit increase in the expenditure on food increases the 0.023g of pulse consumption. Women who had graduate and post-graduate degrees consumed 3.05 and 3.955 grams more pulses than the illiterate women, respectively. Higher consumption of the pulse is reported as Kurnool is one of the leading red gram-producing districts of Andhra Pradesh.

**Table 3.0 Determinants of per capita consumption of pulses**

| | ***B Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** |
|---|---|---|---|---|
| Intercept | 26.653 | 1.147 | 23.246 | 0.001*** |
| Family size | -0.093 | 0.118 | -0.784 | 0.473 |
| Landholding(ac) | 0.564 | 0.106 | 5.300 | 0.001*** |
| Monthly income(Rs) | 0.002 | 0.001 | 5.066 | 0.001*** |
| Household production (qtl) | 0.017 | 0.002 | 7.434 | 0.001*** |
| Expenditure on food (Rs) | 0.023 | 0.007 | 3.270 | 0.001*** |
| Social participation | 1.438 | 0.440 | 3.265 | 0.443 |
| Marital status | 1.406 | 0.651 | 2.161 | 0.316 |
| Family type | -0.063 | 0.528 | -0.120 | 0.829 |
| No of cows and buffaloes | -0.163 | 0.174 | -0.935 | 0.324 |
| Primary | 0.495 | 0.886 | 0.558 | 0.540 |
| Secondary | 0.871 | 0.958 | 0.909 | 0.313 |
| Highschool | 1.028 | 1.069 | 0.961 | 0.263 |
| Undergraduate | 3.050 | 1.296 | 2.354 | 0.020** |
| Postgraduate | 3.955 | 2.331 | 1.697 | 0.085* |
| Occupation | 0.787 | 0.540 | 1.456 | 0.196 |
| $R^2$ | 0.69 | | | |
| F value | 0.001 | | | |

Table 4.0 shows the multiple linear regression model is significant and has a good fit. R-value indicates that 70 percent of the variation in the per capita consumption of vegetables is explained by the independent variables present in the regression model. Table 4.0 also indicates that land holding, monthly income, household production, expenditure on food, and post-graduate education significantly affect the consumption of vegetables. The autonomous consumption in the case of vegetables is 70.84 grams per day. Normal consumption was 242g per day, it is higher than the average Indian consumption per day (232g/day). This is because of consumption of roti as a staple food in the district which requires subji . The above table shows that one unit increase in land holding and household production leads to a 2.91g and 0.1g increase in the per capita consumption of vegetables respectively. Those respondents who studied post-graduation consumed 81 g more vegetables than the illiterate respondents. Schreinemachers*et al.,* (2015)observed household

production as an effective intervention in Bangladesh for increasing the supply and consumption of a diverse range of vegetables in poor rural households.

**Table 4.0 Determinants of per capita consumption of vegetable**

| | ***B Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** |
|---|---|---|---|---|
| Intercept | 70.848 | 11.679 | 6.066 | 0.001*** |
| Family size | -0.651 | 0.884 | -0.736 | 0.462 |
| Landholding (ac) | 2.911 | 0.796 | 3.659 | 0.003*** |
| Monthly income (Rs) | -0.013 | 0.003 | -4.334 | 0.001*** |
| Household production (qtl) | 0.100 | 0.017 | 5.721 | 0.001*** |
| Expenditure on food (Rs) | 0.185 | 0.051 | 3.600 | 0.001*** |
| Social participation | 2.018 | 3.291 | 0.613 | 0.542 |
| Marital status | -0.859 | 4.863 | -0.177 | 0.859 |
| Family type | -0.374 | 3.943 | -0.095 | 0.924 |
| No of cows and buffaloes | -0.268 | 1.302 | -0.206 | 0.837 |
| Primary education | 10.770 | 6.623 | 1.626 | 0.105 |
| Secondary education | 10.289 | 7.162 | 1.437 | 0.152 |
| High school education | 10.027 | 7.993 | 1.255 | 0.211 |
| Undergraduate education | 1.432 | 9.688 | 0.148 | 0.882 |
| Postgraduate education | 81.468 | 17.420 | 4.677 | 0.001*** |
| Occupation | -6.329 | 4.037 | -1.568 | 0.118 |
| R2 | 0.70 | | | |
| F value | 0.001 | | | |

Table 5.0 specifies that the multiple linear regression model is significant and 72 percent of total variation in the dependent variable. Results show that land holding, monthly income, household production, expenditure on food and post-graduate education explain the significant variance in the per capita consumption of fruits. The autonomous consumption of fruits by women in the study area was found to be 19.3 grams per day. The coefficient for land holding reveals that a one-acre increase in the land holding increases the per capita consumption of fruits by1.067 g, if monthly income increases by Rs 1, then per capita consumption of fruits increases by 0.003 g. Choudary *et al.*,(2020) found that interest, caste, income, and prices determined the consumption of fruits. One

quintal increase in household production increases the0.007 grams of fruit consumption per day and one unit increase in the expenditure on food increases the 0.008g of fruit consumption. Women who had post-graduation consumed appreciably higher (9.70 g) amounts of fruits than the illiterate. consumption of fruits among women is found to be low as income levels and production both are low in the sampled area.

**Table 5.0 Determinants of per capita consumption of fruits**

| | ***B Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** |
|---|---|---|---|---|
| Intercept | 19.347 | 4.803 | 4.028 | 0.001*** |
| Family size | -0.658 | 0.495 | -1.328 | 0.462 |
| Land holding(ac) | 1.067 | 0.446 | 2.393 | 0.003*** |
| Monthly income(Rs) | 0.003 | 0.002 | 2.049 | 0.001*** |
| Household production (qtl) | 0.007 | 0.010 | 0.708 | 0.001*** |
| Expenditure on food (Rs) | 0.008 | 0.029 | 0.282 | 0.004*** |
| Social participation | 3.071 | 1.845 | 1.664 | 0.54 |
| Marital status | -0.057 | 2.726 | -0.021 | 0.859 |
| Family type | 0.077 | 2.210 | 0.035 | 0.924 |
| No of cow sand buffaloes | 0.063 | 0.730 | 0.087 | 0.837 |
| Primary education | -1.722 | 3.712 | -0.464 | 0.105 |
| Secondary education | 0.144 | 4.014 | 0.036 | 0.152 |
| Highschool education | 4.753 | 4.480 | 1.061 | 0.211 |
| Undergraduate education | 10.330 | 5.430 | 1.902 | 0.882 |
| Postgraduate education | 9.701 | 9.764 | -0.994 | 0.001*** |
| Occupation | -1.867 | 2.263 | -0.825 | 0.118 |
| $R^2$ | 0.72 | | | |
| F value | 0.001 | | | |



The results of Table 6.0depict that the regression model is significant, it indicates that 66 percent of the variation in the dependent variable is explained by the independent variables taken under the regression study. Among all the independent variables family size and social participation have a significant effect on the per capita consumption of non-vegetarian food. One unit increase in the family size is decreasing the per capita consumption of nonveg by 1.48 g per day. Results also

reveal that 38 increased social participation is leading to the higher consumption of non-vegetarian food.The average consumption of meat and meat products was 11g/day, which is almost equal to the national average (12g/day)Organization for Economic Cooperation and Development (2023). It is because Andhra Pradesh is one of the leading meat-consuming states in India. Gupta and Kumar (2015) also reported in their study that among all the food items lowest consumption was seen in meat products (18 grams) and fruits (16 grams) in rural India.

**Table 6.0 Determinants of per capita consumption of non-vegetarian**

| | ***B Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** |
|---|---|---|---|---|
| Intercept | -2.187 | 5.407 | -0.405 | 0.686 |
| Family size | -1.482 | 0.558 | -2.658 | 0.008*** |
| Landholding (ac) | -0.672 | 0.502 | -1.339 | 0.182 |
| Monthly income (Rs) | 0.002 | 0.002 | 1.161 | 0.247 |
| Household production | -0.002 | 0.011 | -0.164 | 0.869 |
| Expenditure on food (Rs) | -0.028 | 0.032 | -0.860 | 0.390 |
| Social participation | 5.130 | 2.077 | 2.471 | 0.014** |
| Marital status | -0.409 | 3.068 | -0.133 | 0.893 |
| Family type | 0.107 | 2.488 | 0.043 | 0.965 |
| No of cows and buffaloes | 0.169 | 0.822 | 0.205 | 0.837 |
| Primary education | 0.690 | 4.178 | 0.165 | 0.869 |
| Secondary education | -2.602 | 4.519 | -0.576 | 0.565 |
| High school education | -3.381 | 5.043 | -0.670 | 0.503 |
| Undergraduate education | 23.577 | 6.112 | 3.857 | 0.001*** |
| Postgraduate education | 44.603 | 10.990 | 4.058 | 0.001*** |
| Occupation | 6.994 | 2.547 | 2.746 | 0.006*** |
| R2 | 0.66 | | | |
| F value | 0.001 | | | |



## CONCLUSION

Analysis of the dietary behavior of the respondents depicts that per-capita consumption of all the food items was less than the Recommended Dietary Allowance (RDA). Among all the food items,

cereals were consumed highest, the reason behind this was the respondents consumed mostly three meals per day which consisted of jowar roti and cooked rice. Jowar and rice were the major contributors of the food security of the people and the respondents' average consumption of cereals was 282g/day, it was less than the RDA which is about 400g/day, indicating 29 percent deficit in consumption of a required amount of cereals. It indicates the declining trends of monthly per capita cereals consumption as evidenced by Pavithra et al, 2009. Average vegetable consumption was 242g/day against the RDA of 300g/ day. Cereals and other vegetables were consumed in more amounts when compared to the other food groups, this can be because they consumed roti and vegetable subji or rice and vegetables three times a day as it is their traditional food habits. Among the total vegetables, other vegetables like cucurbits, tomato, ladies finger, and brinjal were consumed 15 percent more than the RDA, as Kurnool is a leading producer of tomato and ladies finger. Whereas leafy vegetables, roots and tubers are consumed in lesser amounts. Similar results were reported by Gupta and Mishra (2014). In their study, they reported that the probability of consuming roots and tuber is lower in all regions of India. Pulses, sugar, milk, fruits, and edible oils, all have witnessed lesser consumption of the required diet. Average pulse consumption per day was found to be 55g, which is appreciably higher than the rural Indian average (26g, National Sample Survey 5). Higher consumption of the pulse is reported as Kurnool is one of the leading red gram-producing districts of Andhra Pradesh. Mean milk consumption was 250g per day, which accounts for 83 percent of RDA. An appreciable amount of milk consumption is found in the study area as 82 percent of the households have at least one livestock. Average per capita consumption of fruits was 19g per day and deficiency in fruit consumption was 81 percent, highest among all the food groups. This finding is in line with the national average consumption of fruits (20g/day). A healthy amount of meat and meat products were consumed by the respondents in the study area,



**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

**REFERENCES**

1. Alamirew, S. K., Lemke, S., Stadlmayr, B., & Freyer, B. (2023). Dietary Behaviour and

Sociocultural Determinants of Dietary Diversity among Rural Women of Reproductive Age: A Case of Amhara Region, Ethiopia. *Nutrients*, *15*(15), 3369.

2. Marshall, N. E., Abrams, B., Barbour, L. A., Catalano, P., Christian, P., Friedman, J. E., ... & Thornburg, K. L. (2022). The importance of nutrition in pregnancy and lactation: lifelong consequences. *American journal of obstetrics and gynecology*, *226*(5), 607-632.
3. Catalano, P. M., & Shankar, K. (2017). Obesity and pregnancy: mechanisms of short term and long-term adverse consequences for mother and child. *Bmj*, *356*.
4. Das, A., Raychaudhuri, U., & Chakraborty, R. (2012). Cereal based functional food of Indian subcontinent: a review. *Journal of food science and technology*, *49*, 665-672.
5. Pavithra, B. S., Basavaraja, H., Kiresur, V. R., Mahajanshetty, S. B., & Mageri, S. N. (2009). An economic analysis of food consumption pattern in Karnataka. *Karnataka Journal of Agricultural Sciences*, *22*(4), 840-845.
6. Gupta, A., & Mishra, D. K. (2014). Food consumption pattern in rural India: a regional perspective. *Journal of Economic and Social Development*, *9*(1), 1-16.
7. Chea, M., & Mobley, A. R. (2019). Factors associated with identification and consumption of whole-grain foods in a low-income population. Current developments in nutrition, 3(7), nzz064.
8. Choudhury, S., Shankar, B., Aleksandrowicz, L., Tak, M., Green, R., Harris, F., & Dangour, A. (2020). What underlies inadequate and unequal fruit and vegetable consumption in India? An exploratory analysis. Global Food Security, 24, 100332.
9. George, A., Mohan, A. R., & George, G. (2021). Impact of demographic factors on consumption pattern of millets in Kerala. *Mukt Shabd Journal*, *10*(V), 1521.
10. Verma, M. R., Datta, K. K., Mandal, S., & Tripathi, A. K. (2007). Diversification of food production and consumption patterns in India. *Journal of Agricultural & Food Information*, *8*(3), 87-100.
11. John, A. T., Makkar, S., Swaminathan, S., Minocha, S., Webb, P., Kurpad, A. V., & Thomas, T. (2021). Factors influencing household pulse consumption in India: A multilevel model analysis. *Global food security*, *29*, 100534.
12. Sah, U., Singh, S. K., Dubey, S. K., & Bhatt, S. (2017). Pulses Consumption and its Determinants among Rural Households: A Micro-level Evidences from Central Zone of Uttar Pradesh. *Indian Journal of Extension Education*, *53*(2), 6-10.

13. Schreinemachers, P., Patalagsa, M. A., Islam, M. R., Uddin, M. N., Ahmad, S., Biswas, S. C., & Takagi, C. (2015). The effect of women's home gardens on vegetable production and consumption in Bangladesh. *Food Security*, *7*, 97-107.
14. Daivadanam, M., Wahlstrom, R., Ravindran, T. S., Sarma, P. S., Sivasankaran, S., & Thankappan, K. R. (2018). Changing household dietary behaviours through community-based networks: A pragmatic cluster randomized controlled trial in rural Kerala, India. *PloS one*, *13*(8), e0201877.