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# Health and Nutritional Status of Rural Women in Chikkballapur District

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**ABSTRACT: Health and nutrition status of women is very important because the nutrition status of women is influenced to other family members. When mother have good health and nutrition status she can take care of other members of the family too. Considering the research need in the particular area the present study was undertaken to assess the nutritional status and dietary pattern of rural women of Shidlgatta taluk in Chikkballapur district. Questionnaire was used for data collection of rural women (n=200). A well structured questionnaire was framed to gather the information on socio economic status, somatic measurements and dietary intake of the subjects. Further BMI, WHR were used to assess the nutritional status. The results found that majority of the respondents belonged to middle age group and high school education. Mean anthropometric measurement of rural women was 155.60 cm of height, 58.30 kg of weight. As per the BMI standards, it was observed that 10 per cent of women were undernourished, 35.50 per cent of women were normal, and 10.50 per cent of women were obese. The mean nutrient intake of energy (1629 Kcal) was on par with RDA Protein (42.20 g), fibre (17.60 g), iron (14.80 mg) were less than RDA. The per cent adequacy for fat and calcium was found to be higher than recommended in subjects whereas remaining all other nutrients consumption was found inadequate. From the study we can conclude that rural women need to improve their nutritional status through incorporating protein, fiber and energy rich foods in their daily diet.**

**Keywords:** Nutritional status, Diet survey, Anthropometric measurement.

## INTRODUCTION

More than 25% of farmers worldwide are women, according to the Food and Agriculture Organization (2011). In developing nations, women make up an average of 43% of the agricultural labour force. In India, women make up the majority of farmers, agricultural workers, and business owners. In rural India, the percentage is as high as 84%. Prior to independence, many people in the country were not even being able to dream of a square meal every day. However, as an attempt to boost the agricultural production by modernizing the technique of farming in the country (Annual report, 2021). The overall nutritional status has definitely improved during last few decades. Still, more than half of Indian children under five years of age are moderately or severely malnourished, 30 per cent of newborns are significantly underweight and 60 per cent of Indian women are anemic and such manifestations of malnutrition are certainly unacceptable (Sahu *et al.,* 2015).

The nutritional status of a community is influenced by number of interrelated and complex factors. From early pregnancy through old age, nutrition has a significant impact on health. Over the past 20 years, India's population's nutritional profile has seen a remarkable transition. With a lingering under nutrition problem, overweight and obesity are on the rise. Malnutrition is linked to poor health and poverty, but being overweight increases your chance of developing a number of chronic conditions, including type 2 diabetes, heart disease, and even some types of cancer. Dietary assessment is a crucial technique for evaluating dietary patterns. It provides information on people's current nutritional status, helps to track ongoing nutritional transitions, and helps to establish population-level public health policies and standards. The 24-hour dietary recall approach is one of the subjective methods used for nutritional assessment. The 24 hour recall approach is used in India by the National Nutrition Monitoring Bureau and the Indian Nutrition Profile Survey to evaluate dietary intake.

The 24 hr recall method and dietary pattern methods are open-ended surveys and collect detailed information on a variety of food consumed over 24 hr period.

The belief that a woman should eat better foods both the extremes- laymen and scientists (Rout, 2009). But there has been a gap between the thought and the action. Reproductive aged women are subject to numerous stresses affecting the health and wellbeing. Elderly women in many societies are deprived too. Thus, there exists an intergenerational cycle of growth failure for women. Assessment of women health is important hence nutritional assessment was carried out with the objective to assess nutritional and health status of the rural women by comparing 24 hr recall and 3-day dietary cycle as a tool for dietary assessment method at community level in rural part of Shidlgatta taluk of Chikkaballapur district in Karnataka.

## METHODOLOGY

The present study was carried out to understand and analyze the dietary pattern of rural women involved in farm activities. The study was conducted in Chickballapur district of Karnataka State, India during 2021-22. A total of 200 rural women from five villages *viz.,* Thippenahalli, Bodaguru, Basavapattana, Yenanguru and Hosapete of Shidlaghatta taluk were randomly selected as subjects for the study. Information was collected through pre-tested and modified interview schedule.

Information regarding socio-demographic characteristics *viz.* age, education, marital status, occupation, family size, family type, number of earners in the family, land holding and family income was analyzed using percentage, frequencies, mean and standard deviation. Research design was represented in figure 1.

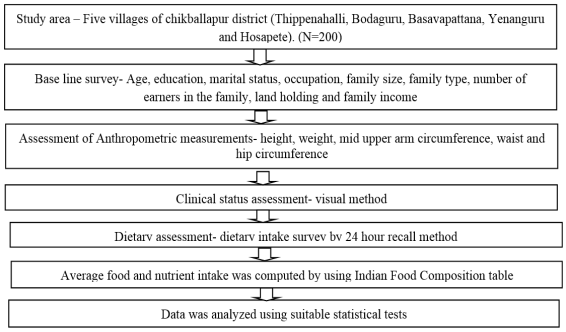


**Fig. 1.** Research design.

*A. Somatic Status*

Anthropometric measurements such as height, weight, mid upper arm circumference, waist and hip circumference were assessed at the baseline. Weight was measured using pre-calibrated digital weighing scale without footwear. Height was measured accurately to the nearest 0.1 cm using a vertical rod. The subject was asked to remove the shoes and stand on the height rod platform by the scale with foot parallel with heals, shoulders and back of the head in an upright posture. Waist and hip circumference was taken for computation of waist- hip ratio. Body mass index was calculated using height weight data of the subjects.

The investigator used a visual method to evaluate the clinical state (presence of any deficiency symptoms at the time of survey). The ICMR proforma was modified. Morbidity status of the subjects was assessed by subjects were orally enquiry whether they suffered from any of the disorders for the past three months.

*B. Dietary Assessment*

Dietary intake data for all subjects was collected thrice for every subject on a week day to avoid bias and average food and nutrient intake computed using Indian Food Composition table (Longvah *et al.,* 2017).

*C. Calculation of per cent adequacy*

Following verification, the schedules were appropriately arranged and assigned a serial number. Data on dietary intake, including cereal, pulses, fruits, and vegetables, among other items, were assessed. Protein, fat, fibre, calcium, iron, and zinc intake were determined based on the daily caloric intake of foods. These numbers were compared to the (RDA, 2020) in order to determine whether or not dietary intake of food and nutrients was enough.

*D. Data analysis*

Data was analyzed by calculating Mean, SD and percentage to determine the difference in parameters.

## RESULTS AND DISCUSSION

It is important to have a detailed knowledge regarding the diets actually eaten by the respondents both for assessing their nutritional adequacy and taking steps for correcting deficiencies in the diets.

Results in Table 1 highlights that 44.5 per cent of the rural women belong to middle age (36-50 years) category followed by young (32.0 %) and old age (23.5 %). It was incidental that more number of respondents was in the middle age group. Moreover, middle aged rural women have more family responsibility, efficiency and sensibility. They may also work with a sense of commitment and involvement.

It is universal fact that education plays a key role in moulding and bringing desirable changes among human beings. It could be seen from Table 1 that 28.0 per cent had high school education followed by 24.0 per cent illiterate, 14.0 per cent middle school, 13.0 per cent intermediate, 11.0 per cent graduation and above 10.0 per cent up to primary school.

Majority of the respondents follows agriculture as main occupation (63.5 %) followed by labour (6.5 %). Family size of respondents were mainly small family group (1-4 members) with 47.5 per cent followed by medium family group (5-6 members) 33.0 per cent. Fifty three per cent of family members were belongs to nuclear family followed by joint family with 36.5 per cent.

Mean anthropometric measurements of rural women of five villages were presented in the Table 2. Mean height of respondents found to be highest in basavapattana rural women (157.13 cm) followed by yennanguru village respondents (59.61 cm). Mean weight of the rural women were ranged from 57.13-59.61 kg. Mid upper arm circumference of the respondents found to be highest in yennanguru village respondents (26.25 cm). Waist and hip circumference of the respondents were ranged between 83.22-87.23 cm, 92.34-95.23 cm respectively.

Fig. 2, depicts the body mass index of rural women. According to body mass index, women were categorized

into normal, underweight, overweight, pre obese and obese. Thirty five point five per cent of respondents were normal, Ten per cent of them were underweight and 18 per cent of respondents were overweight.

**Table 1: Demographic profile of the respondents (N=200).**

| Characters | Category | No. | % |
|---|---|---|---|
| **Age** | Young (18-35yrs) | 64 | 32.0 |
| | Middle (36-50yrs) | 89 | 44.5 |
| | Old(above 50yrs) | 47 | 23.5 |
| **Education** | Illiterate | 48 | 24 |
| | Up to Primary School | 20 | 10 |
| | Middle School | 28 | 14 |
| | High School | 56 | 28 |
| | Intermediate | 26 | 13 |
| | Graduation& Above | 22 | 11 |
| **Marital Status** | Single | 0 | 0 |
| | Married | 186 | 93 |
| | Divorcee | 0 | 0 |
| | Widow | 12 | 6 |
| | Separated | 2 | 1 |
| **Occupation** | Agriculture | 127 | 63.5 |
| | Labour | 13 | 6.5 |
| | Service (Govt./Private) | 12 | 6.0 |
| | Small Business | 4 | 2.0 |
| | House wife | 44 | 22.0 |
| **Family Size** | Small family (1-4 members) | 95 | 47.5 |
| | Medium family (5-6 members) | 66 | 33.0 |
| | Large family (>6 members) | 39 | 19.5 |
| **Family type** | Nuclear family | 106 | 53 |
| | Joint family | 73 | 36.5 |
| | Extended family | 21 | 10.5 |
| **Number of earners in the family** | < 2 earners | 42 | 21.0 |
| | 2 – 4 earners | 138 | 69.0 |
| | > 4 earners | 20 | 10.0 |

**Table 2: Mean anthropometric measurements of respondents (N=200).**

| Anthropometric measurements | Mean score | | | | | Mean±SD |
|---|---|---|---|---|---|---|
| | Bodaguru | Thippenahalli | Hosapete | Basavapattana | Yennanguru | |
| **Height (cm)** | 152.59 | 156.77 | 154.80 | 157.13 | 156.88 | 155.63±1.93 |
| **Weight (kg)** | 57.32 | 58.07 | 57.13 | 59.61 | 57.78 | 57.982±0.98 |
| **MUAC (cm)** | 25.7 | 26.10 | 26 | 25.86 | 26.25 | 25.982±0.21 |
| **WC (cm)** | 84.46 | 83.22 | 86.44 | 85.05 | 87.23 | 85.28 ±1.59 |
| **HC (cm)** | 93.14 | 94.67 | 95.23 | 93.43 | 92.34 | 93.762±1.17 |

MUAC- Mid upper arm circumference, WC- Waist circumference, HC- Hip circumference

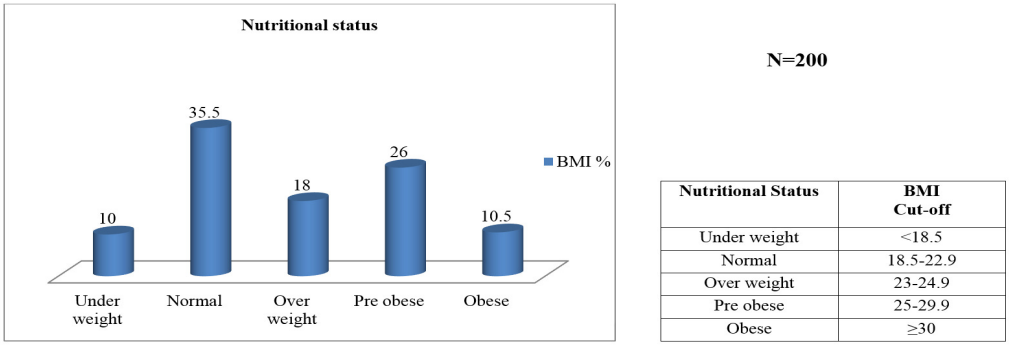


**Fig. 2.** Classification of respondents based on Body mass Index (BMI).

Whereas 26 per cent of them were pre obese and around 10.50 per cent of respondents were obese. Similar findings have been observed by Marutesh *et al.*, (2019) who reported 16 per cent obese in rural women of Bangalore rural district. Waghmare *et al.,* (2022) observed lower results for underweight and normal (5.5 and 29.0) whereas higher results for overweight and obese (35.3 and 30.1). Diendere *et al.,* (2020) found higher results underweight and normal (16 and 70.9) whereas lower results for overweight compared to present study. M'bobda *et al.,* (2020) observed lower results for under weight (4 %) and normal (32 %) whereas higher results for overweight (61 %) and obesity (98 %).

Waist to hip ratio were categorized in to two groups normal (<0.8) and higher (>0.8). Waist to hip ratio was presented in Fig.3. Seventy six per cent of rural women respondents belongs to higher waist to hip ratio followed by twenty four per cent of rural women belongs to normal waist to hip ratio category. When estimating nutritional status in underdeveloped nations, where the population is frequently undernourished and has few fat reserves, a change in this indicator reflects the overall body stress. It has been noted that the waist-to-hip ratio has been calculated as a proxy for total body subcutaneous fat. This observation was in concurrence with the findings of Menon *et al.* (2011) who reported that body weight was highest in older individuals. The possible factors of variation are in waist/ hip ratio significant linear correlation with weight. Gutierrez *et al.,* (2022) observed higher normal WHR 38.64 whereas lower higher WHR category 61.36 per cent compared to present study. Kaur *et al.,* (2019) observed similar results for waist to hip ratio compared to present study.

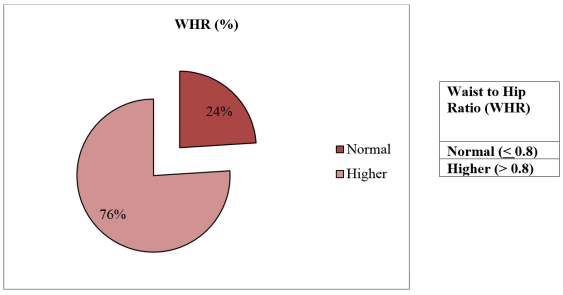


**Fig. 3.** Classification of respondents based on Waist Hip Ratio (WHR).

The occurrence of the illness among women is presented in Table 3. The illness reported among women in the study were found be higher gastritis (31 %) followed by pain in hands and legs/ Joint pain (28 %), cold (21 %), body ache (18.5 %), cough (16 %), backache (8 %), fever (7.5 %), tooth ache (6.5 %), fatigue (5.5 %). The least illness found in headache (3.5 %), vomiting (2.5 %) and Diarrhea (1 %). This might be because women have a heavy burden because they work for 8 to 9 hours at work and then continue working at home once they get home. This was consistent with research by Jain and Singh (2013), who found that more than three-fourths of rural women were frequently exposed to health risks such as whooping cough (60%) and back/body aches (74%), which were brought on by their involvement in agricultural occupations. These health hazards included skin irritation (88%), headaches (80%), hardness of the hands and feet (76%) and back/body aches (74%).

**Table 3: Morbidity status of respondents (N=200).**

| Sr. No. | Morbid condition | Respondents | |
|---|---|---|---|
| | | N | (%) |
| 1 | Gastritis | 62 | 31 |
| 2 | Joint pain | 56 | 28 |
| 3 | Cold | 42 | 21 |
| 4 | Body ache | 37 | 18.5 |
| 5 | Cough | 32 | 16 |
| 6 | Back ache | 16 | 8 |
| 7 | Fever | 15 | 7.5 |
| 8 | Tooth ache | 13 | 6.5 |
| 9 | Fatigue | 11 | 5.5 |
| 10 | Headache | 7 | 3.5 |
| 11 | Vomiting | 5 | 2.5 |
| 12 | Diarrohea | 2 | 1 |

Chemicals called nutrients are found in the food we eat every day. Energy, protein, fat, vitamins, and minerals are among the nutrients. The 24 hour recall approach was employed to determine the diet of the rural women since it was found to be effective in determining the average nutritional intake of a group when a large number of subjects were involved. Furthermore determined were the percentages of adequacy and deficiency.

The quantity of nutrient intake was consumed by the rural women were recorded during study period and the mean nutrient intake was compared with recommended dietary allowances of rural women as depicted in Table 4. The mean nutrient intake of energy (1629 Kcal), protein (44.20 g), fibre (17.60 g), iron (14.80 mg) and Zinc (7.40 mg) were less when compared to the RDA except for fat (28.70 g) and calcium (1020.90 mg). Rural women were consuming more fat and calcium when compared to all other nutrients and it was more than RDA. The mean per cent adequacy of the rural women for fat and calcium was 121.8 and 102 per cent whereas the adequacy for energy, protein, fibre, iron, and zinc was 98.2, 121.8, 54.79, 50.91 and 56.34 per cent respectively, which were found to be below the RDA.

**Table 4: Mean and per cent adequacy of nutrient intake of rural women (n=200).**

| Nutrients | RDA | Mean intake | % adequacy |
|---|---|---|---|
| **Protein (g)** | 36.3 | 44.2 | 121.8 |
| **Fat (g)** | 20 | 28.7 | 143.5 |
| **CHO (g)** | 100 | 297 | 297 |
| **Energy (Kcal)** | 1660 | 1630 | 98.2 |
| **Calcium (mg)** | 1000 | 1020.9 | 102.09 |
| **Iron (mg)** | 29.0 | 14.8 | 50.91 |
| **Zinc (mg)** | 13.2 | 7.4 | 56.34 |
| **Dietary fibre (g)** | 30.0 | 17.6 | 54.79 |

Calcium is an important nutrient for powerful muscle contraction, bone structure maintenance; nerves signaling are calcium dependent physiological processes. All rural women intake of calcium was found to be high as observed by dietary calculation. This may be due to the intake of non-vegetarian meal and the consumption of finger millet, which is the staple food in this region.

Similar findings were observed in the study reported by Gangavath and Ashlesha (2019) where in, 100 rural women were selected randomly from Madirala village, Kothagudam district and interviewed using a structured questionnaire. Nutritive value was taken and calculated and compared with Recommended Dietary Allowances (RDA). The results of the study showed that 68 per cent were having normal BMI. Mean energy, protein, carbohydrate, fat, fibre, iron and calcium were 1271 Kcal, 41gm, 205gm 27.8gm, 23gm, 7mg and 315 mg which were not meeting the Recommended Dietary Allowances. The results revealed that except fat and fibre the remaining nutrients were not meeting the RDA. Lack of nutrition awareness, limited purchasing power, and non-availability of necessary food items at the dwelling were the most likely causes of inadequate intake of amount and quality of protein, dietary fibre, iron, and zinc. The aforementioned findings are consistent with those of Ravi and Usha (2017), who found that the study individuals' mean calcium consumption (757.45 mg) was greater than the RDA.

## CONCLUSIONS

This study on nutritional and dietary pattern of rural women results shows that protein, energy, fiber, iron and zinc is low when compared to RDA whereas consumption of fat and calcium is high when compared to recommended dietary allowances, with respect to nutrition adequacy calcium and fat was found to be higher than recommended in subjects whereas remaining all other nutrients consumption was found inadequate. In the present study, diets of women were nutrient deficient thereby affecting their physical working capacity and health ailments.

## FUTURE SCOPE

Study on health and nutrition status is an important factor to know the nutrition status of an individual, in the present study we analyzed nutrition status through anthropometric measurement and dietary recall method. Further the study on biochemical parameters analysis to know the health status is a good indictor to know the health status.

**Conflict of Interest.** No

**Author contribution.** Geetha K. and Geetha M. Yanakanchi Planned research work, provided all the facilities to conduct research and corrected manuscript. Latha Rani R. contributed on data analysis and wrote manuscript. Sneha Shigihalli and Sunitha A. B. contributed for research work carryout, wrote manuscript and data analysis.

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