

# A Community-Based Assessment of Nutritional Status among the Childbearing Age Women's in the Rural Areas of Karnataka

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## Abstract

**Background:** According to the World Health Organization, consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms as well as a range of non-communicable diseases and conditions. The health of an individual is known to be influenced by his/ her nutritional status. People are now consuming more foods high in energy, fats-free sugars and salt/sodium, and many people do not eat enough fruits, vegetables and dietary Fibre such as whole grains. The exact makeup of a diversified balanced and healthy diet will vary depending on individual characteristics, cultural context, locally available foods and dietary customs. **Objectives:** To assess the nutrient intake and measuring the nutritional status among the women in childbearing age at the rural areas. **Methodology:** A cross-sectional study was conducted to assess the dietary intake and the nutritional status of the rural women in the five different villages of Gadag district, Karnataka. Their socio-demographic details, food intake related data were collected using a questionnaire. 24 - Hour dietary recall was calculated using nutrient composition table and their nutritional status was calculated using BMI (Body Mass Index). **Results:** 105 women were interviewed. Majority of participants were of secondary school (32.38%), middle school (28.57%) and a majority of them were housewives. Majority of the participants (88.57%) energy intake was less than the recommended, all the 105 participants (100%) protein intake was less than 1gm/kg/body weight, majority of them consumed more fat (72.38%), sodium intake of all the participants 105 (100%) were more. The nutrient intake was calculated using a nutrition composition table from the ICMR (Indian Council of Medical Research), NIN (National Institute for Nutrition), Hyderabad. And the majority of their nutritional status (BMI) were normal (51.42%). Majority of the food groups consumed daily by the participants were cereals (96.19%), followed by pulses (64.76%) which were consumed majorly on 2 – 3 times in a week. Fruits (45.71%) and vegetables (63.80%) were consumed every week. Milk and milk products were consumed daily (87.61%). **Conclusion:** The main food groups consumed daily were cereals followed by pulses. The energy, protein intake was less and fat content was more than the recommended and nutritional status was normal among half of the study population.

**Keywords:** Body mass index, dietary intake; 24 - hour dietary recall; nutritional status; Childbearing age; Women's Nutritional status.

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## INTRODUCTION

In the Nutrition in Public Health, Handbook for Developing Programs and Services (2006) mentioned that assessment of public health nutrition problems is very important to address the nutritional issues like undernutrition, anaemia and over nutrition and its consequences [1].

As per the Food and agriculture organization, India is home to 25% of the world's hungry population and 194.6 million undernourished people for the period of 2014-2016. Concerning food consumption, urban women are reported to have better access to a variety of

food items. India is known for its diversity in culture and believes, so also their eating behaviors, especially the people from coastal regions are known to have different dietary habits. A healthy dietary habit helps an individual to stay fit and well throughout his life [2].

Despite the good economic performance, with over 200 million people who are food insecure, India is home to the largest number of hungry people in the world. The National Food Survey records of household food purchases and information concerning the dietary pattern of the population, obtained from estimates of total food consumption in the UK showed that the

nutritional value of the household diet exceeded the recommended daily intake for the majority of nutrients, at least until the end of 1973. Though dietary factors are implicated in chronic disease risk, assessment of dietary intake has limitations, including problems with a recall of complex food intake patterns over a long period [3].

The United States of America, the former Union of Soviet Socialist Republics and Australia. Compared to an average person in these regions and countries of the world, an average Indian consumes only about 2/3rd of the calories, about half the proteins, and around 1/4th the fats. Nutrition theorists believe that the total number of calories available in India is marginally higher than what is essential for the upkeep of the Indian population at a normal level of activity [4].

Among the Indian population, about 28% in the rural and 26% in the urban areas are estimated to be 2 below the poverty line, which is defined as the expenditure needed to obtain, on an average, 2400 Kcal per capita per day in the rural areas and 2100 Kcal in urban areas [5].

The world continues to face major challenges in achieving food security. In the context of the recent food price crises, the importance of food security in various facets of society has been emphasized. Although food security is essential to ensure adequate nutrition and prevent hunger, the concepts of food security, optimal nutrition and lack of hunger and undernutrition are interlinked but not synonymous. Food security is necessary to maintain an optimal nutritional status, and core to its definition is the requirement for nutritious food, which refers not only to sufficient quantities of food (in terms of calories) but also to sufficient quality (in terms of variety and micronutrient content) [6].

Health and nutrition are the most important contributory factors for human resource development in the country. Ensuring food security is an issue of great importance for Asian countries including India. India represents almost 17.53 per cent of the world's population and it will surpass China by 2030 with the population growth rate at 1.58 per cent. India is predicted to have more than 1.53 billion people by the end of 2030 [7].

The diet of early humans was said to be highly varied i.e., it had low fat and high fiber, coupled with higher levels of physical activity. After about 10-12,000 years, industrial revolution and 2<sup>nd</sup> agricultural revolution began which lead to a greater shift in dietary pattern. Such diets were said to contain high fat, refined carbohydrate and low fiber. There are several factors that have been associated with the occurrence of malnutrition particularly among women such as the

socio economic status, culture, demography and dietary characteristics [8].

## MATERIALS AND METHODS

*Study settings:* Gadag is a district of Karnataka which has 60 villages and two towns. In which five villages were selected for the study to conduct. Those five villages were Binkadakatti, Hulkoti, Kalasapur, Kurthkoti, Nagavi. Binkadakatti and Hulkoti are urbanized when compared to the other three villages.

*Study design:* A cross-sectional study was conducted to assess the dietary intake and the nutritional status of the rural women of childbearing age. The data was collected using a quantitative method to assess the dietary intake and the nutritional status of women under childbearing age, this study was conducted from the time of July 2019 to September 2019.

*Study participants:* women who are under the childbearing age of 15 – 45 years have participated.

*Variables:* Socio-demographic variables & major nutrient intake, lifestyle and their nutritional status.

*Data sources:* It is a purely quantitative method; primary data was collected using a questionnaire and checklist. And the nutrient intake was assessed through nutrient consumption table. A pre-tested questionnaire was used to collect information regarding age, education qualification, head of the family education, income, socioeconomic status, 24-hour dietary recall, nutritional status through BMI (Body Mass Index) by taking the height and weight and then calculating the BMI using below mentioned formula. BMI Formula:  $\text{Weight (kg)} / [\text{height (m)}]^2$

### Sampling technique and Study size

A total of 29 wards in 5 villages were listed with population and calculated. A sampling interval was calculated by dividing the total population by 15. In each of the cluster 1<sup>st</sup> cluster was identified by a random number of 4 digits as the sample interval was 3142. The random number was 1317 which fell in 1<sup>st</sup> ward of Binkadakatti subsequent cluster were identified by adding sample interval of 3142. In each cluster, the total number of households in each cluster were divided by 7 as that many other samples were calculated to get a total of 105 beneficiaries. After identifying 1<sup>st</sup> household visited all the other households by tallying marking the households and a detailed interview was done on the Childbearing age women's.

### Quantitative variables

Women who had participated in the study were taken as an independent variable. Their age, height, weight, BMI, 24-hour dietary recall, were measured using international units.

**Statistical method**

Data was entered into an Excel sheet and analysed using v20 SPSS software, and the results were expressed using frequencies and percentages to assess the dietary recall and nutritional status among women of childbearing age.

**Ethical committee approval**

Ethical committee approval obtained from the Ethics committee of Karnataka State Rural Development and Panchayat Raj University, Gadag.

**RESULTS****Table-1: Socio demographic details of the study participants**

Demographic details	Frequency(no=105)	Percentage (%)
<b>Age group ( years)</b>		
<less than 20	14	13.33%
21 – 25	41	39.04%
26 - 30	26	24.76%
31 - 35	11	10.47%
36 – 40	12	11.42%
>41	1	0.95%
<b>Education qualification -</b>		
Illiterate	11	10.47%
Primary school	14	13.33%
Middle school	30	28.57%
Secondary school	34	32.38%
Intermediate/diploma	3	2.85%
Graduate	7	6.66%
Professional	6	5.71%
<b>Religion</b>		
Hindu	89	84.76%
Muslim	16	15.23%
Others	0	0
<b>Marital Status</b>		
Married	84	80%
Unmarried	20	19.04%
Divorcee	1	0.95%
<b>Head of the family</b>		
Male	93	88.57%
Female	12	11.42%
<b>Head of the family education</b>		
Illiterate	44	41.90%
Primary school	15	14.28%
Middle school	19	18.09%
Secondary school	17	16.19%
Intermediate/diploma	2	1.904%
Graduate	6	5.71%
Professional	2	1.90%
<b>Occupation</b>		
Professional	5	4.76%
Technicians and associate professional	3	2.85%
Skilled Workers and Shop & Market Sales Workers	9	8.57%
Skilled Agricultural & Fishery Workers	52	49.52%
Plant & Machine Operators and Assemblers	13	12.38%
elementary occupations	16	15.23%
Unemployed	4	3.80%
<b>Income (INR)</b>		
≥ 78,063	0	0
39,033–78,062	1	0.95%
29,200 –39,032	5	4.76%
19,516–29,199	14	13.33%
11,708–19,515	11	10.47%
3,908–11,707	35	33.33%
≤ 3,907	39	37.14%
<b>SES Scale</b>		
Upper class	1	0.95%
Upper middle	14	13.3%
Lower middle	25	23.80%
Upper lower	65	61.90%
Lower	0	0

(Modified Kuppuswamy scale- 2019)

**Socio-demography of the participants**

The study includes 105 women who were under the childbearing age (15 – 45 years). As per table 1, most of the participants were under the age group of 21 – 25 years (39.04%). Most of the participants had completed secondary school (32.38%). Majority of the participants belongs to the Hindu family, followed by Muslim. Most of the participant's head of the family's

education background were illiterate followed by middle school and the majority of them were skilled agricultural. Male dominancy is more when compared to female in the families. And as per their income, almost 70% of the family's income was less than 11000/- and the majority of the participants belongs to the upper lower-class (table 1).

**Table-2: 24-hour dietary recall of the participants**

Age group (Years)	Dietary intake of participants (n=105)									
	Energy(kcal)			Protein (gm)		Fat (gm)			Sodium (mg)	
	<1500kcal	1500 – 2000 Kcal	>2000 Kcal	<1.0gm/kg/body wt	Recommended 1.0gm/kg/body wt	<25 gm	25 – 30gm	>30 gm	<1500 mg	1500-2000mg
<less than 20	14	-	-	14	-	5	-	9	-	14
21 – 25	36	5	-	41	-	6	6	29	-	41
26 - 30	24	2	-	26	-	6	-	20	-	26
31 - 35	9	2	-	11	-	1	3	7	-	11
36 – 40	9	2	1	12	-	1	-	11	-	12
>41	1			1	-		1			1
	93(88.57 %)	11(10.47 %)	1(0.95 %)	105(100 %)	-	19(18.09 %)	10(9.52 %)	76(72.38 %)		105(100 %)

The above-mentioned table says about the nutritional imbalance between the participants as per their age group. 105 participants participated in the study. As per the above table, hardly 10.47% of the participants consumed the recommended amount of energy. About 88.57% of the participants consumed less than the 1500 – 2000 Kcal which is recommended and they were mostly from the age group of 21 to 30 years of age group. As per the nutrient protein, all the

105 participants' protein intake is less than the recommended which is 1.0gm/kg/body wt., And they were majorly from the age group of 21 – 30 years of age. Majority of the participants 76(72.38%) fat consumption is more than the recommended which is more than >30gm and only about 10(9.52%) of them consumed as per recommended. As per the Sodium, all the 105 participants' sodium intake is more than 1500 – 2000mg as sodium is being used every day in the diet.

**Table-3: Average frequency of consumption of food groups in a month:**

Food groups	Frequency of foods consumed			
	Daily	2 – 3 times in a week	Weekly Once	Less often
Cereals, millets and grains	101– (96.19%)	4 – (3.80%)	0	0
Pulses and legumes	3 – (8.57%)	68 – (64.76%)	34 – (32.38%)	0
Green leafy vegetables	17 – (16.19%)	60 – (57.14%)	28 – (26.66%)	0
Other vegetable group	0	38– (36.19%)	67 – (63.80%)	0
Fruits group	4 – (3.80%)	15 – (14.28%)	48 – (45.71%)	38–(36.19%)
Nuts and oil seeds group	20 – (19.04%)	76 – (72.38%)	9 – (8.57%)	0
Condiments and spices	67 – (63.80%)	36 – (34.28%)	2 – (1.90%)	0
Fish, meat and poultry	32 – (30.47%)	29 – (27.61%)	8 – (7.61%)	1 – (0.95%)
Milk and milk products	92 – (87.61%)	13 – (12.38%)	0	0
Fats and oils	41 – (39.04%)	36 – (34.28%)	28 – (26.66%)	0
Sugar group	68 – (64.76%)	20 – (19.04%)	17 – (16.19%)	0
Beverages and carbonated drinks	99 – (100%)	6 – (5.71%)	0	0

**Nutritional intake of the women's**

Majority of the food groups consumed daily by the participants were cereals (96.19%), followed by pulses (64.76%) which were consumed majorly on 2 – 3

times in a week. Fruits (45.71%) and vegetables (63.80%) were consumed weekly. Milk and milk products were consumed daily (87.61%) (Table 3).

**Table-4: Nutritional status of the women from the different villages**

Villages	BMI	Category
Binkadakatti n=14	6 – (42.85%) - Underweight 5 – (35.71%) - Normal 3 – (21.42%) – Pre – obese	13 – (92.85%) – Normal 1 – (7.14%) – Anemic
Hulkoti n=35	12 – (34.28%) - Underweight 16 – (45.71%) – Normal 4 – (11.42%) – Overweight 3 – (8.57%) – Pre - obese	30 – (85.71%) – Normal 5 – (14.28%) – Anemic
Kalasapur n=14	2 – (14.28%) – Underweight 9 – (64.28%) – Normal 3 – (21.42%) – Overweight	10 – (71.42%) – Normal 4 – (28.57%) – Anemic
Kurthkoti n=28	11 – (39.28%) – Underweight 17 – (60.71%) - Normal	23 – (82.14%) - Normal 5 – (17.85%) – Anemic
Nagavi n=14	7 – (50%) – Underweight 7 – (50%) - Normal	12 – (85.71%) - Normal 2 – (14.28%) – Anemic
Total =105	UW – 38, N – 54, OW – 7, PO – 6	N – 88, A – 17

(UW- underweight, N- normal, OW- over weight, PO- pre obese, A- anemic)

### Nutritional status of the women

It shows that most of the participants 54(35.71%) comes under the BMI range of normal, followed by underweight 38(36.19%). When compared according to the village it shows that participants from the village Hulkoti which is a developed place when compared with other villages were under the sedentary lifestyle with 4 participants who were overweight and 3 who were pre-obese, followed by Binkadakatti (Table 4).

### DISCUSSION

In the current, it was found that the majority of the participant belonged to the low and upper lower and lower middle income. A similar study conducted in the Mysuru district of Karnataka which was carried out with an interest to collect data regarding the on the nutritional and food security status of women by Prakash J, showed that majority of subjects belonged to low income group similar to our study [9].

Nutritional status is directly related to the health of the population and is influenced by levels of education, the standard of living and social status. In the current study majority of the participants were lacking in the consumption of energy, followed by protein intake. A similar study conducted in the district of Vijayapur, Karnataka on the assessment of nutritional status and dietary diversity of the 160 rural and urban household by Vijayalakshmi & Khed S. V. That the energy intake and other nutrient intake were lower than ICMR recommended. Dietary diversity result indicates urban households consume more diverse food items as compare to rural households [10]. Another study conducted at Nepal found the same results [11].

In the present study majority of the participants, nutritional status was normal among women, a similar cross-sectional study conducted in the selected community people at Orissa found similar

findings [12]. Another study conducted at Kerala and U S A found similar findings [13].

In the present study, it was found that 1/3<sup>rd</sup> of the women's are underweight, a similar study conducted Lagos state of Africa found the same findings [14]. A similar study conducted by the National Institute of Nutrition found the same findings [15].

### CONCLUSION

Most of the participants were from the age group of 21 to 30 years, with a higher education background of secondary school. The main food groups consumed daily were cereals followed by pulses. The energy, protein intake was less than the recommended and fat intake was more than the recommended. Nutritional status was normal among 51% of all the women, while 36% were underweight. They were lacking in the consumptions of fruits, vegetables and most of the participant's water consumption is also less.

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