



Food and Nutrient Intake of Women along Rural, Periurban and Urban Areas of North Bengaluru

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ABSTRACT

Rural-urban migrants experience the environmental changes associated with urbanization very rapidly, as diet is an important risk factor for both obesity and diabetes, understanding the changes in dietary intake. The study was undertaken to assess the food and nutrient intake of women along rural, periurban and urban areas of north Bengaluru. 100 households were randomly selected from each study area. Semi-structured questionnaire was developed to elicit information on meal pattern, food habit and dietary intake. 24-hour recall method was used to assess nutrient intake of women. Results revealed that 96, 92 and 75 per cent of the respondents were non vegetarians in rural, periurban and urban respectively. Four, 8 and 25 per cent were found to be vegetarians in rural, periurban and urban respectively. Majority of the respondents consumed three meals per day among study areas. The mean intake of energy was found high (2165 kcal) followed by periurban (1975 kcal) and rural (1731 kcal), Similar pattern observed for protein, fat and iron intake. Fat intake is high in urban (324%) followed by periurban (261%) and rural (202%) adequacy exceeds from the requirement. Except for calcium intake, other nutrient intake showed a statistically significant difference among women. Non vegetarians were more compared to vegetarians among the three study areas and had practices three meals per day. Nutrients intake was adequate among urban women compared to periurban and rural.

Key words: Rural, Periurban, Urban, Women, Nutrient adequacy

INTRODUCTION

Agriculture plays a key role in increasing food availability and incomes, supporting livelihoods of rural households and contributing to the overall economy, and is thus central in improving food and nutrition security. Rural-urban migrants experience the

environmental changes associated with urbanization very rapidly, enabling epidemiologic transitions to be examined. Changes seen in migrants over relatively short time periods may, therefore, provide insights into the wider population health changes associated with urbanization.

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Urbanization involves changes in occupation patterns, lifestyles, family structures and value systems. These changes are reflected in changes in dietary pattern and in the levels of physical activity. In the urban population of India, refined wheat and rice have virtually displaced coarse grains and millets as the staple cereal, resulting in a substantial reduction in fiber content in the diet and, possibly, also the content of micronutrients such as vitamin B-complex, zinc etc. Cereal intake declines increase in socioeconomic scale and intakes of sugar and fats generally increase. Convenience foods and fast foods find increasing acceptance, especially in the context of globalisation. While the rural population is mainly engaged in agricultural occupations involving manual labour and a fairly high level of physical activity, urban occupations (except those of some of the urban slum dwellers) are generally of the 'skilled' and 'semi-skilled' categories that tend to favour sedentary life-styles.

Deaton and Dreze² provide a comprehensive analysis of the facts pertaining to, and possible interpretations of estimated average calorie intake in rural areas declined by about 10 percent over the two-decade period. The decline is higher at the upper end of the expenditure distribution. Urban areas witnessed a milder decline in estimated average calorie intake. Real average monthly per capita expenditure (MPCE) increased substantially (about 22 % in rural areas in India) over the same period. Average calorie intake in rural India declined by 14%, from 2291 Kcal per capita per day to 1971 Kcal per capita per day. Over the same period, the average intake-adjusted per capita expenditure increased by 28 per cent.

In the developing countries like India great interest has also been paid to a balanced and diversified diet, especially in relation to problems caused by nutritional deficiencies and their consequences. It has been clearly stated that a non-diversified diet can have negative consequences on individuals' health, well-being and development, mainly by reducing physical capacities and resistance to

infection, but also by impairing cognitive development, reproductive and even social capacities. In addition, the nutritional status of populations in urban areas is generally better than that in rural areas, one of the explanations for this difference being a more diversified diet in urban areas though access to more diverse foods sometimes leads to diets higher in fats, and can result in other health problems³.

MATERIAL AND METHODS

In each of the three study areas or transects, 100 representative households in each of the three transects were selected. 300 households were selected for the study. Random sampling technique was used. Further half of the sample households were subjected for 24-hour recall method. Nutrient intake was mainly focused on women. The available women throughout the survey were identified and selected. Semi-structured questionnaire was developed to elicit information on meal pattern, food habit and dietary intake. The term 'meal patterns' is an overarching construct that is often used to describe individuals' eating patterns at the level of a 'meal', such as the main meal (for example, breakfast, lunch or dinner) or a smaller-sized meal (for example, supper or snack). Meals per day - (once/twice/thrice or four times). The information provided by the respondent on food habit of the family for example vegetarian/non vegetarian was recorded.

Dietary intake in terms of food and nutrients was assessed for the women through 24 hour recall method. Baseline diet survey of the respondents was conducted by using 24 hour recall method using Standardized cups, vessels, paper discs and rubber balls. Respondents were asked to recall the type of preparation made for breakfast, lunch, evening tea and dinner *etc.* for the previous day (other than feasting and fasting day). Information on account of raw ingredients used for each preparation and also on the total cooked amount of each preparation was recorded in terms of standardization tools (standardization as per the procedure indicated by Bamji *et al.*¹.

The average raw ingredients in all the meals consumed by each respondent per day were calculated.

The schedules were properly sorted out after verification and serially numbered. Data on intake of foods- cereals, pulses, vegetables *etc.* evaluated. Using the quantity of foods consumed per day, nutrient intake

was calculated using tables of the Nutritive Value of Indian Foods⁵. These figures were compared against the RDA for sedentary women as per the revised requirements suggested by ICMR to provide a measure of adequacy or inadequacy of food and nutrient consumption⁴.

$$\% \text{ Adequacy} = \frac{\text{Intake of each nutrient}}{\text{Recommended allowances}} \times 100$$

RESULTS AND DISCUSSION

Table 1: Food habits and meal pattern

Variables	Study Areas						χ^2
	Rural (n=100)		Periurban (n=100)		Urban (n=100)		
Food habit	N	Percent	N	Percent	N	Percent	22.99*
Vegetarian	04	04.0	08	08.0	25	25.0	
Non vegetarian	96	96.0	92	92.0	75	75.0	
Total	100	100.0	100	100.0	100	100.0	
Meal pattern							
Once	04	04.0	00	00.0	00	00.0	143.06*
Twice	61	61.0	09	09.0	00	00.0	
Thrice	35	35.0	91	91.0	94	94.0	
Four	00	00.0	00.0	00.0	06	06.0	
Total	100	100.0	100	100.0	100	100.0	

* Significant at 5% level

Food habit

The results (Table 6) revealed that 96, 92 and 75 per cent of the respondents were non vegetarians in rural, periurban and urban respectively. Four, eight and 25 per cent were found to be vegetarians in rural, periurban and urban respectively. Majority of the non-vegetarians were found in rural compared to periurban and urban. However, these figures do not imply that they have non-vegetarian every day. The daily diet still consists of vegetables, milk, and pulses or beans. Vegetarians were more in urban compared to periurban and rural. Experts say increasing health awareness, coupled with the rising burden of lifestyle disorders may be influencing the palate. Several international researches and studies have found vegetarians

leading a healthier life compared to meat-eaters. Awareness about the health benefits of a vegetarian diet may also be catching up fast among the urban. There was a significant ($X^2=22.99$, $p \leq 0.05$) difference between the three study areas for food habit.

Meal pattern

Majority of the respondents consumed two meals per day in a rural household, followed by thrice and one meal per day. In periurban, 91 per cent of the respondents consumed three meals per day, followed by two meals per day. While in urban 94 per cent of respondents consumed three meals per day and six per cent of them take four small meals per day. Significant ($X^2=143.06$) difference was found between the study areas. In periurban and urban three meals per day is common whereas,

one and two meals per day are more observed among rural respondents, due to their occupational status and the habit followed.

Similar results were observed by Mamatha, majority of entrepreneurs of all categories in

both the districts were in the habit of consuming three meals per day. More than 78.3 and 55.5 per cent were vegetarians and 21.7 and 45 per cent were non-vegetarians in Tumkur and Bangalore district, respectively.

Table 2: Mean nutrient intake and adequacy among women

N=150

Nutrients	†RDA	Rural (n=50) Mean ±SD	% adequacy	Periurban (n=50) Mean ±SD	% adequacy	Urban (n=50) Mean ±SD	% Adequacy	F test
Energy	1900 kcal/d	1731±216	91	1957±196	103	2165±322	114	18.18**
Protein	55 g/d	44.3±9.8	81	53.8±14.3	98	61.56±8.5	112	15.51**
Fat	20 g/d	48.7±7.8	202	51.2±15.2	261	64.89±11.8	324	11.68**
Fiber	25 g/d	24.1±5.2	97	16.5±3.5	65	19.31±6.3	77	5.51*
Iron	21 mg/d	14.6±2.5	70	17.8±4.5	85	19.84±5.3	94	11.55**
Calcium	600 mg/d	1189.3±399.5	198	1128.3±237.7	188	1101.2±269.0	184	0.50 ^{NS}

*. Significant @ 0.05, **. Significant @ 0.01. NS- non significant

†Recommended Dietary Allowances sedentary women

The average consumption of fat was found higher in all the three regions compared with RDA is presented in Table 2 and shows energy, protein, fat, fiber, iron and calcium intake of women among study areas. Data set graphically represented in box plot diagrams. The mean intake of energy was found high (2165 kcal) followed by periurban (1975 kcal) and rural (1731 kcal), as fat intake contributes to energy. Similar pattern observed for protein, fat and iron intake. Results show fat intake is high in urban (324%) followed by periurban (261%) and rural (202%) adequacy exceeds

from the requirement. The intake of oils and fats was extremely high than the other nutrients, which needs to be reduced otherwise prolonged intake may lead to abnormalities in the lipid profiles. Similar findings were observed by Mishra and Mohanty⁶ on sedentary women who consumed 82-94g/day. There was a significant difference between the three study areas. Fig 2 depicts nutrient adequacy among women, which shows the consumption of calcium was found to be in rural (198%) followed by periurban (188%) and rural (184%).

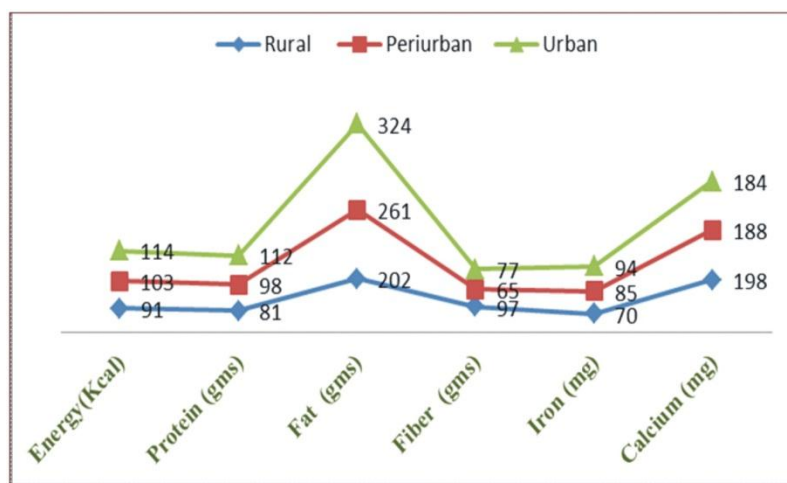


Fig. 2: Percent adequacy among rural, periurban and urban women

This might be due to the consumption of ragi as their staple food. The above results are in line with findings of Kaveri *et al.*, who studied on the nutrient intake of farm women and reported that the intake of calcium (539.01mg) was higher than the RDA. The iron intake was found inadequate in all the three study area women's' diet. Among three urban (94%) found to be more compared to periurban (85%) and rural (70%) women diets. Statistical results showed there was a significant difference between the groups for iron intake. Green leafy vegetable consumption is less in rural and periurban compared to urban and also less diversified diets among rural and periurban women diet, which might have resulted in low iron intake.

Fiber was more in rural women diet (97%) followed by urban (77%) and periurban (65%) however adequacy did not meet in any of the group. Similar results were found by Veena⁷ for fiber (94%) adequate in urban women. Except for calcium intake, other nutrient intake showed a statistically significant difference among women.

CONCLUSION

Nonvegetarians were more compared to vegetarians among the three study areas and had practices three meals per day. Energy, protein, fat and iron intake was adequate among urban women compared to periurban and rural. Fiber and calcium intake is high among rural compared to urban and periurban. Periurban women nutrient intake is in between

rural and urban. Importance of nutrition and knowledge need to be imparted among women along the rural-urban gradient.

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