

## Nutrient Intakes of Children Residing in Squatter Settlements on Pavements and Along Roadsides in Jaipur City

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### INTRODUCTION

An upsurge of migrants from within and outside the state of Rajasthan has led to the springing up of squatter settlements on pavements and vacant plots along the roadsides of cities. People are forced to reside in the open due to lack of housing facilities. Migrants enter big cities in search of employment or to sell their goods. Such people squat on any available land and gradually seek access to basic amenities in their most meager forms. They subsist on low incomes. This influences their capacity to purchase food for their families, thereby compromising the nutritional status of their children.

A review of literature suggests that there is a paucity of data on the nutritional status of young children of families residing on pavements and squatter settlements along roadsides in big cities. Hence, an attempt was made to get an insight into the dietary pattern and nutrient intakes of children of such families.

### METHODOLOGY

*Selection of Subjects:* No enumeration of squatter settlements had been made in Jaipur city when the present study was conducted from April 1999 to March 2001. The Jaipur Nagar Nigam and the Jaipur Development Authority (JDA) officials provided some information on the whereabouts of a few squatter settlements; the rest of the information was obtained from the residents of squatter settlements, their leaders and local people living nearby. Squatters residing on the pavements and on vacant plots alongside the roads were approached for data collection. A total of 42 squatter settlements were covered.

*Dietary Survey:* Dietary intake data was collected for 281 children from as many families selected through purposive sampling technique. The mother of the child was the respondent. Dietary data were assessed through 24 hour dietary recall method. The intake was determined with the help of standardized *bhigonas*, *katoris*, glasses, ladles and spoons. The recipes were standardized in the laboratory for the calculation of the dietary

intakes. Dietary intake data were translated into nutrient intake data with the use of Nutritive Value of Indian Foods (Gopalan et al., 1996).

*Statistical Analysis:* The mean nutrient intake data of boys and girls were tested for statistical differences (Gupta, 1982).

### RESULTS AND DISCUSSION

A two-meal pattern was followed in the squatter settlements. Early in the morning, the family members including children had a cup of tea, accompanied with biscuits, bread, toast, etc., which were bought from nearby provision shops or from push carts passing by. The main meal was cooked in the afternoon and it comprised *chapatis* and a dish of *dal/vegetable*. The left over *dal/vegetable* was consumed in the evening along with freshly prepared *chapatis* or an additional chutney or *dal/vegetable*. The children would eat some fruits, biscuits, rusks, bread, etc., in between meals and they purchased these from vendors passing by. Some of the children were breast fed too, but it was mainly for palliative reasons. Hence, breast milk was not included in the calculation of nutrient intakes.

The purchase of most of the food items was on a daily basis. However, wheat flour was purchased for 2-3 days at a time. There were usually small provision stores located close to or within the squatter settlements which stocked items such as wheat flour, oil (loose, not in packs), pulses and salt (loose, not in packs). Snacks such as biscuits, *namkeen*, toast, *pipe* (deep fried rice flour preparation), cream rolls, roasted gram, candies, groundnuts, etc., were also available with them. The purchase of fruits and vegetables was made from itinerant vendors who passed the roads the whole day long. Push carts selling other items like '*chaat*', '*paani patasha*', '*revari*', '*gajak*', ice cream, ice lollies, etc., were also approached by the children. It was observed that the mothers would hand out small coins as of 50 paise or one/two rupees to the children 2-3 times in a day for purchase of such items. These snacks might be of low nutritive value but were indulged in by the mothers for palliative reasons. However, if

**Table 1: Nutrient Intakes of 2-4 year old children of squatter settlements**

Nutrient	RDA	Mean intake Boys (n=72)	Percentage RDA	Mean intake Girls (n=67)	Percentage RDA
<b>2-3 years</b>					
Energy (kcal)	1240	777±158.95	62.7	787±170.71	63.5
Protein (g)	22	22.7±5.87	103.2	23.7±7.65	107.7
Total fat (g) <sup>a</sup>	34	21.7±9.69	63.8	20.4±5.07	60.0
Calcium (mg)	400	234.2±128.7	58.5	214.1±113.46	53.5
Iron (mg)	12	6.6±1.77	55.0	6.9±2.50	57.5
Carotene (mcg)	1600	279.0±533.61	28.8	249.3±524.34	24.9
Vitamin A (mcg) <sup>b</sup>		45.6±37.75		37.1±34.35	
Thiamin (mg)	0.6	0.67±0.18	111.7	0.71±0.25	118.3
Riboflavin (mg)	0.7	0.38±0.11	54.3	0.37±0.12	52.9
Niacin (mg)	8	5.86±2.26	73.2	6.14±2.23	76.7
Vitamin C (mg)	40	19.0±38.7	47.5	16.4±37.4	41.0
<b>3-4 years</b>					
Energy (kcal)	1240	910±189.57	73.4	880±188.66	71.0
Protein (g)	22	27.1±6.31	123.2	25.9±6.59	117.7
Total fat (g) <sup>a</sup>	34	24.0±8.58	70.6	24.6±8.68	72.3
Calcium (mg)	400	231.0±81.99	57.7	239.8±114.65	59.9
Iron (mg)	12	8.6±2.09	71.7	8.1±2.13	67.5
Carotene (mcg)	1600	463.9±121.6	37.6	493.5±126.0	40.0
Vitamin A (mcg) <sup>b</sup>		34.5±24.29		36.5±25.34	
Thiamin (mg)	0.6	0.84±0.19	140.0	0.80±0.20	133.3
Riboflavin (mg)	0.7	0.43±0.11	61.4	0.41±0.11	58.6
Niacin (mg)	8	7.24±1.81	90.5	6.99±2.08	87.4
Vitamin C (mg)	40	15.0±15.51	37.5	10.6±11.89	26.5

Mean±SD.

<sup>a</sup>Total fat taken as 25% of the total calories; RDA for visible fats=25g.

<sup>b</sup>Vitamin A(mcg) converted and added to carotenes (mcg) for calculating percentage contribution to RDA.

<sup>c</sup>t test values for mean nutrient intakes for boys vs girls non-significant at 5% level of significance.

the money doled out to the children everyday is spent on wise selection of food, it is expected that the energy deficits in the diets of the children could be bridged.

It is evident from the findings of the present study that the intakes of energy of both the boys and the girls were much below the recommended allowance in both the age categories (table 1). The energy intakes ranged from 62.7% to 73.4% of the RDAs. However, the mean protein intakes of the boys and the girls were above the RDA of 22g. The children derived the protein mainly from cereals while some even consumed pulses, meat and fish although in small amounts. The mean total fat intake was low and was 60.0% to 72.3% of the RDA.

The intake of milk, pulses and green leafy vegetables was low, leading consequently to low intakes of calcium, iron, beta- carotene and ascorbic acid. The families consumed only seasonal vegetables. The mean intakes of thiamin were adequate as the diet was predominantly

cereal based. The intakes of riboflavin and niacin were below the recommended dietary allowances.

The mean intakes of all the nutrients for the boys and the girls in both the age categories were found to be comparable. Statistical analysis of the data revealed no significant differences between the mean nutrient intakes of boys and girls. Moreover, on visits to these squatter settlements, it became evident that the younger children of both the sexes sat together to have their meals. Not on any occasion was it seen that the mother favoured the male siblings with larger servings. Hence, it was apparent that there was no significant variation in the nutrient intakes of boys and girls at this young age.

The mean daily nutrient intakes of pre-school children in the age group of 2-4 years (n=68) from the slums of Mumbai suburbs was 785±156 kcal of energy, 14±5g of protein, 208±78mcg of vitamin A and 8±3mg of iron. The contribution to RDA was 63.3% for energy, 63.6% for protein, 52.0% for vitamin A and 66.7% for iron (Bapat

and Aspatwar, 1993). These results corroborate those of the present study where energy intakes were about 63-73% of the RDA, carotenes about 25-40% and iron 55-72% of the RDAs. However, in the present study, the protein intakes were found to be adequate. The nutrient intake data of 1-3 and 3-6 year old children of slums of Ghaziabad revealed that the energy, iron, riboflavin, niacin and vitamin C intakes were below the RDAs (Garg et al., 1997) as was observed in the present study. Moreover, the protein intakes of 1-3 and 3-6 year old children were 7.2 and 9.2g, respectively above the RDAs. The intakes of calcium, vitamin A and thiamin were adequate, being higher or close to the RDAs. In the present study, protein and thiamin intakes were adequate but calcium and vitamin A intakes were much short of the RDAs.

Kanwar et al. (1994) presented the mean intakes of energy and protein of 2-3 and 3-4 year old rural children of Himachal Pradesh. The energy intakes were 75.3% for boys and 69.1% (RDAs) for girls in the age group of 2-3 years. The protein intake was 64.0% to 67.4% of the RDA in the younger age group. A similar trend for energy and protein intakes was evident for the older age group. The percent RDA intakes of the girls was lower than that of the boys, although the data were not statistically analysed. In the present study, the energy intakes were found to be lower and protein intakes adequate for both the age categories. There were no statistical differences in the nutrient intakes of the boys and the girls. The nutrient intakes of 2-3 year old children of rural areas of Haryana were assessed by Dahiya and Kapoor (1992). The energy intakes of boys were 63.5% of the RDA and those of the girls were 59.4% of the RDA. The protein intake was 2.3 to 15.4% higher than the RDAs. The iron and vitamin C intakes were below the RDAs. The results of this study are in agreement with those of the present study.

Chandrasekhar et al. (1997) from their study on the Oraons tribe of Ranchi District reported that the energy, protein and riboflavin intakes were higher than the RDA and fat, calcium, iron, carotene, thiamin and vitamin C intakes were lower than the RDAs in 1-3 year old children. In the older age group of 4-6 year old children, protein and riboflavin intakes were lower and thiamin intake higher than the RDA; for the rest of the nutrients, a pattern similar to that for the

younger age group was observed in the intakes of nutrients. In the present study, in both the age groups of 2-3 and 3-4 years, energy, total fat, calcium, iron, carotene, vitamin A, riboflavin, niacin and vitamin C intakes were below the RDAs and those of protein and thiamin adequate. Thiamin was found to be adequate due to their cereal based diets.

The results, therefore, highlight the fact that the dietary intakes of these children have to be substantially modified with emphasis on intakes of pulses, milk and milk products and fruits and vegetables within their economic constraints. This will augment the nutrient intakes and will have a positive impact on their nutritional status.

### CONCLUSION

People of low socio-economic groups have inadequate food intakes. This is related to their low purchasing power, misuse of money that can otherwise be wisely spent on food, and injudicious selection of food. The diets are predominantly cereal based. Milk and pulses are not consumed in adequate amounts. Fruits and vegetables find little place in the dietaries, except for some seasonal fruits occasionally, and roots and tubers.

In the present study, too, the intakes of most of the nutrients were found to be below the RDAs. Fortunately, no sex bias in nutrient intakes was observed. Thus, it is suggested that the squatter dwellers have to be made aware of the need for prudent expenditure of their income and wise selection and combination of a variety of foods. This would be a step towards improvement in their diets and nutrient intakes.

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**KEYWORDS** Nutrient intakes. Children. Squatter Settlements. Jaipur City.

**ABSTRACT** The nutritional status of 281 children in the age group of 2-4 years belonging to families residing on pavements and in squatter settlements along the roadsides of Jaipur city was assessed in terms of nutrient intakes. The mean intakes of energy, total fat, calcium, iron, carotenes, vitamin A, riboflavin, niacin and ascorbic acid were below the RDAs, except for protein and thiamin intakes. No statistically significant differences in the nutrient intakes of boys and girls were observed.

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