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# Dietary pattern of preschool children in Bikaner district

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**Abstract**
One hundred fifty preschool children aged 3 to 5 years were purposely selected to study their dietary pattern. These children were studying in primary schools of Bikaner District (Rajasthan). The mothers of these children were also interviewed for knowing the feeding practices of the child. The information was collected with the help of questionnaire cum interview technique. It was observed that majority of the children (79.3 percent) were vegetarian followed by 14.7 percent non-vegetarian & 6.0 percent ova-vegetarian. Maximum subjects (71.2-73.6%) had no fixed pattern of meals followed by three meals (19.8-20.3%), two (3.3-3.4%) & four (3.3-5.1%) meals consumed by them in a day. In both the age groups, majority of the subjects (98.3-98.9%) had preference for varying types of fast food. The percent adequacy of food intake was ranging from 3.78-105.2 percent. The percent adequacy of nutrient intake ranged from 15.2-204.7 percent. Findings of the present study indicate a scope of an intervention programme for betterment in food habits of preschool children.

**Keywords:** preschool children, dietary pattern, nutrient intake

## 1. Introduction
Children are the future generation of any country and their nutritional needs are critical for the well-being of society. A child needs adequate dietary intake to provide enough nutrients and energy for him to grow, without reducing his body's ability to stay healthy. A good dietary practice helps to improve child survival, to promote healthy growth & development, to contribute better cognitive and economic development. It also reduces morbidity and mortality rate in children. The study conducted by Sankhala et.al. (2004) [9] found that there was highly inadequate (73 percent) energy and protein intake than recommended dietary allowances among the children of Udaipur district of Rajasthan. Laxmaiah *et al*. (2002) [6] also analyzed that the intake of macro and micronutrient rich foods such as cereals, pulses and green leafy vegetables, milk & milk products, fats and oils were lower than RDI among preschool children of Punjab. There is a relative scarcity of available literature on such information particularly from arid areas like Bikaner district (Rajasthan). In this perception the present study was contrived to study dietary pattern of preschool children in Bikaner district.

## 2. Materials and Methods
The study was conducted on 3-5 years old preschool children studying in primary schools of Bikaner (Rajasthan).This facilitated gathering of information about their dietary pattern. The first step of the study, taken by the investigator was to obtain the exhaustive list of all Government or non-Government primary schools of urban areas of Bikaner District (Rajasthan). The list was procured from the District Education Department, *Rani Bazaar*, Bikaner (Rajasthan) after submitting a written request. Thereafter, thirty percent of the enlisted schools were randomly selected. Thus, the study was conducted at seven primary schools of Bikaner. After seeking prior permission and having discussion with the respective school authorities a list of children belonging to the age group of 3-5 years, was prepared. These children were studying either in class Playgroup or Nursery or LKG or UKG or 1$^{St}$ standard. Out of the procured lists, 150 children were randomly selected from the seven identified schools on the basis of probability proportionate to size sampling (PPS) technique. Regularity in attending the school as well as willingness of the parents of the subjects to cooperate during the study was also taken care before selection of the subjects.

### Statistical Analysis of the Data
The Percentage, mean and standard deviation were used during present study for statistical analysis of the findings. 'The statistical analysis was carried out with the help of 'IBM Statistical Package for the social sciences, Statistics software.

## 3. Research Findings and Discussion
The results obtained from the present investigation as well as relevant discussion have been summarized under following heads:

**Dietary pattern**

**Table: 1.1:** Distribution of the subjects according to their dietary pattern

| S. No. | Dietary pattern | Age wise no. of subjects | | Total Subjects (N=150) |
|---|---|---|---|---|
| | | 3-4 years(n=59) | 4-5 years(n=91) | |
| 1 | **Food habits** | | | |
| | Vegetarian | 51 (86.4) | 68 (74.7) | 119 (79.3) |
| | Non-vegetarian | 6 (10.2) | 16 (17.6) | 22 (14.7) |
| | Ovo-vegetarian | 2 (3.4) | 7 (7.7) | 9 (6.0) |
| 2 | **No. of meals** | | | |
| | Two | 2 (3.4) | 3 (3.3) | 5 (3.3) |
| | Three | 12 (20.3) | 18 (19.8) | 30 (20.0) |
| | Four | 3 (5.1) | 3 (3.3) | 6 (4.0) |
| | Not fixed | 42 (71.2) | 67 (73.6) | 109 (72.7) |
| 3 | **Fast food consumption** | | | |
| | Preferred | 58(98.3) | 90(98.9) | 148(98.7) |
| | Frequently | 15 (25.4) | 17 (18.7) | 32 (21.3) |
| | Occasionally | 21 (35.6) | 30 (33.0) | 51 (34.0) |
| | Rarely | 22 (37.3) | 43 (47.3) | 65 (43.3) |
| | Not preferred | 1 (1.7) | 1 (1.1) | 2 (1.3) |

**Note:** Values in parenthesis indicate percentage of the subjects

**Food habits:** Table 1.1 Indicates that 74.7-86.4 percent of the subjects were vegetarian, 10.2-17.6 percent were non-vegetarian and only 3.4-7.7 percent of them were ova-vegetarian.

**No. of meals:** It can be observed that for majority of the subjects (71.2-73.6%) number of meals consumed each day was not in a fixed pattern these could be due to the moody behavior of the subjects being younger (3-5 years) in age.

**Fast food preference:** Table 1.1 depicts that except (1.1-1.7%), rest of all (98.3-98.9%)the subjects in both the age groups had preference for varying types of fast food like maggi, veg. burger noodles cheese pizza, manchurian etc.

**Food intake**

**Table 1.2:** Mean values of food intake of the subjects (3-4 year)

| Nutrients | Suggested intake* | Mean ± SD intake (n=59) | Percent adequacy |
|---|---|---|---|
| Cereals, grains & products | 120 | 139.7 ± 35.7 | 116.4 |
| Pulses & legumes | 30 | 10.0 ± 5.9 | 33.4 |
| Leafy vegetable | 50 | 1.89 ±4.45 | 3.78 |
| Roots & tubers | 50 | 14.57 ± 10.4 | 29.14 |
| Other vegetable | 50 | 8.81 ± 8.01 | 5.87 |
| Fruits | 100 | 57.17 ± 59.6 | 57.17 |
| Milk & milk products | 500 | 332.5 ± 136.9 | 66.5 |
| Fat ( visible) | 20 | 20.88 ± 5.97 | 104.4 |
| Sugar | 25 | 11.88 ± 9.19 | 47.52 |
| Meat & poultry | - | 13.07 ± 36.2 | - |
| Nuts & oil seeds | - | 5.35 ± 8.5 | - |

**Note:** Values in parenthesis indicate percentage of the subjects * IDA, 2011

**Table 1.3:** Mean values of food intake of the subjects 4-5 years

| Nutrients | Suggested intake* | Mean ± SD (n=91) | Percent adequacy |
|---|---|---|---|
| Cereals, grains & products | 210 | 138.2 ± 33.6 | 65.8 |
| Pulses & legumes | 45 | 10.14 ± 6.8 | 22.5 |
| Leafy vegetable | 50 | 1.90 ± 4.19 | 3.8 |
| Roots & tubers | 100 | 12.60 ± 9.6 | 12.6 |
| Other vegetable | 50 | 6.84 ± 8.30 | 13.68 |
| Fruits | 100 | 52.7 ± 50.03 | 52.7 |
| Milk & milk products | 500 | 292.3 ± 125.6 | 58.46 |
| Fat ( visible) | 25 | 26.3 ± 5.4 | 105.2 |
| Sugar | 30 | 19.3 ± 12.0 | 64.4 |
| Meat & poultry | - | 16.3 ± 43.8 | - |
| Nuts & oil seeds | - | 6.23 ± 9.97 | - |

**Note:** Values in parenthesis indicate percentage of the subjects***** IDA, 2011

**Food intake**

The nutritional status of any individual is directly associated to his food intake. During preschool age, additional amount of nutrients are needed to support growth and development (Robinson C.H., 1988). All the individual need a wide range of nutrients to lead a healthy and active life from the foods

they consume daily. The components of diet need to be chosen judiciously so that it provides all the nutrients in proper amount and appropriate proportions (ICMR, 1989) [3]. The percent adequacy of food intake by the subjects was ranging from 3.78-116.4 percent. The table 1.2 and 1.3 indicates that more than adequate intake of cereals and visible fat and inadequate intake of other vegetable, fruits, roots & tubers by the subjects.

Intake of fruits and vegetables was also noted to be lower than RDI by Tara *et al.,* (2010) [11] similar to present findings. Awasthi and kumar (2011) [1] while carrying out a study on nutritional status of 3-4 year old preschool children in Kanpur also reported more than adequate intake of cereals and inadequate intake of other vegetable, roots & tubers by the subjects under their study. Similarly, the results regarding food intake of 4-5 years age group are in accordance with Chandana and sehgal (2011) [2] who also found that the daily mean intake of cereals, pulses, green leafy vegetables, milk & milk product and sugar &Jaggery was lower than the RDA in the diets of preschool children.

**Nutrient intake**

**Table 1.4:** Mean nutrient intake of the subjects (3-4 years)

| Nutrients | Suggested intake* | Mean ± SD intake (n=59) | Percent adequacy |
|---|---|---|---|
| Energy (kcal) | 1060 | 1081.9± 441.6 | 102 |
| Protein (g) | 16.7 | 34.2± 21.1 | 204.7 |
| Carbohydrate (g) | 172.2 | 141.1± 47.9 | 81.9 |
| Total fat (g) | 27 | 42.3 ± 18.3 | 156.6 |
| Visible fat (g) | 13.5 | 14.1 ± 5.9 | 104.4 |
| Invisible fat (g) | 13.5 | 28.2 ± 12.4 | 208.8 |
| β-carotene (µg) | 3200 | 521.7 ±87.5 | 16.3 |
| Retinol (µg) | 400 | 444.00 ± 37.61 | 111.0 |
| Thiamine (mg) | 0.5 | 0.7 ± 0.3 | 140 |
| Riboflavin (mg) | 0.6 | 0.8 ± 0.4 | 133.3 |
| Niacin (mg) | 8 | 6.65± 2.19 | 83.1 |
| Vitamin C (mg) | 40 | 20.2 ± 16.7 | 50.5 |
| Calcium (mg) | 600 | 517.1± 196.6 | 86.1 |
| Iron (mg) | 09 | 8.63 ± 27.7 | 95.8 |
| Zinc (mg) | 5 | 2.10 ± 1.0 | 42 |

**Note**: Values in parenthesis indicate percentage of the subjects *ICMR, 2010

**Table 1.5:** Mean values of nutrient intake of the subjects 4-5 years

| Nutrients | Suggested intake * | Mean ± intake(n=91) | Percent adequacy |
|---|---|---|---|
| Energy (kcal) | 1350 | 1096.94± 632.02 | 81.2 |
| Protein (g) | 20.1 | 30.2± 19.4 | 150.2 |
| Total fat (g) | 25 | 42.46 ± 20.58 | 169.84 |
| Visible fat | 12.5 | 13.16 ± 5.48 | 105.2 |
| Invisible fat | 12.5 | 29.3 ± 15.1 | 234.4 |
| Carbohydrate (g) | 219.3 | 148.5± 92.3 | 67.8 |
| β-carotene (µg) | 3200 | 487.5 ± 81.15 | 15.2 |
| Retinol (µg) | 400 | 456.04 ± 10.70 | 114.0 |
| Thiamine (mg) | 0.7 | 0.8 ± 1.0 | 114.2 |
| Riboflavin (mg) | 0.8 | 0.8 ± 1.2 | 100.0 |
| Niacin (mg) | 11 | 6.62± 2.7 | 60.18 |
| Vitamin C (mg) | 40 | 20.71 ± 16.2 | 51.7 |
| Calcium (mg) | 600 | 468.7± 189.4 | 78.1 |
| Iron (mg) | 13 | 8.68 ± 3.0 | 66.7 |
| Zinc (mg) | 7 | 2.4 ± 1.4 | 34.2 |

**Note:** Values in parenthesis indicate percentage of the subjects *ICMR, 2010

**Nutrient intake**

Food is the conveyer of nutrients and consumption of adequate diet is required for maintenance, repair, growth and development of the body. Low intake of any of the nutrient can lead to a significant contribution to poor anthropometric, clinical and over all nutritional status. Average nutritional composition of the diet was calculated in terms of raw weight and the results of present study were compared with recommended dietary intake (ICMR, 2010) [4]. The adequacy of protein, fat, thiamine, riboflavin and retinol was noted to be 111.0-204.7 percent of RDA for both the age groups. Energy intake of 3-4 year old subjects was adequate (102.0%) & for the elder group it was noted to be 81.2 percent of RDA. Intake adequacy of carbohydrate, niacin, calcium & iron ranged between 66.7-95.8 percent. Adequacy of β-carotene, vitamin C & zinc intake varied between 15.2-51.7 percent of RDA for both the age groups. Swaminathan *et al.* (2005) [10] conducted a study on dietary pattern of children belonging to higher socio economic strata at south India, also noticed that intake of total fat was higher and carbohydrate was lower than RDA alike present findings. The present findings about mean nutrient intake are almost in conformity with those reported by Ndiku *et al.* (2007) [7], who also found that energy intake, was high in preschool children.

## 4. Conclusion

Nutrition of pre-school children (3-5 years age group) is of paramount importance because the foundation for lifetime

health, strength and intellectual vitality is laid during this period. The findings of the present study revealed that majority of the subjects in both the age groups had normal health status, due to high intake of fat. But, their food habits showed remarkable deficiencies in the intake of vegetables, fruits and pulses. This resulted into overall low intake of β-carotene, vitamin C, niacin and minerals. This study open up avenues for further studies on promotion of healthy food habits through nutrition intervention programs. It is acclaimed for further study that nutrition education package need to be developed for preschool children with the emphasis on better food choices.

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**6. References**

1. Awasthi S, Kumar R. Prevalence of malnutrition and internal parasites in school slums children in Lucknow. Ind. J of Pediatric. 2011; 34:599-605.
2. Chandana S, Sehgal S. Nutritional status of preschool children – A comparative study of boys and girls. Ind. J. Nutr. Dietet. 2011; 31(6):323-327.
3. ICMR. Nutrient requirement and recommended allowance for Indians. Indian Council of Medical Research, New Delhi, 1989.
4. ICMR. Nutrient requirement and recommended allowance for Indians. Indian Council of Medical Research, New Delhi, 2010.
5. Indian Dietetic Association (IDA), 2011.
6. Laxmaiah A, Mallikharjuna RK, Brahmam GNV, Kumar S, Ravindranath M, Kashinath K, *et al*. Diet and nutritional status of rural preschool children in Punjab. Ind. J. Pediatric. 2002; 39: 331-338.
7. Ndiku M, Jaceldo-Siegl K, Singh P, Sabat J. Gender inequality in food intake and nutritional status of children under 5 years old in rural Eastern Kenya. European Journal of Clinical Nutrition. 2007; 65:26-31.
8. Robinson CH. Normal and therapeutic nutrition, Oxford and IBH publishing co., New Delhi, 1988, 91-102.
9. Sankhala A, Sankhala AK, Bhatnagar B, Singh A. Dietary status of Children of Udaipur District. Anthropologist. 2004; 6(4):257-259.
10. Swaminathan MC, Kumari KL, Rao HD. Study on dietary patterns of urban school children in south India. Indian Journal of Medical Research. 2005; 12:1136-1147.
11. Tara L, Adams AK, Jobe JB, Cronin KA, Suanne MV, Ronald JP. J.AM diet association. 2010; 110 (7):1049-1057.