



Effect of Various Socio-Economic Variables on Nutrient Intake of Pre-Schoolers

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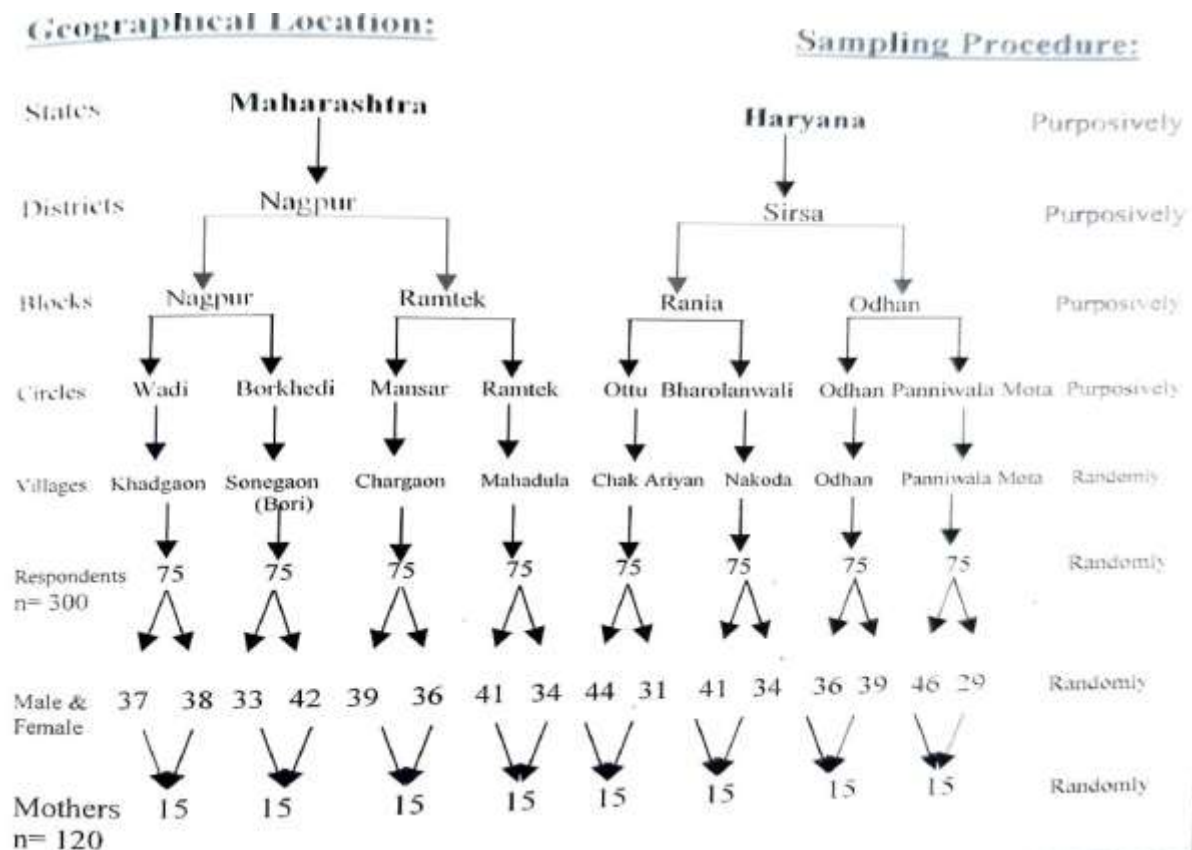
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Introduction

A Special attention should be given to the nutrition of pre-school children as a national priority because they are an easy victim of mal-nutrition and infection. Nutrients that pre-school children are obtaining through food have vital effects on physical growth and development, maintenance of normal body function, physical activity and health. So, the rate of growth and development of children depend to a large extent on the adequacy of the diet consumed by them. But food available to them is neither adequate nor suitable for maintenance of resistance to disease as well as physical development. So, the majority of pre-school children suffer from growth retardation of various degrees and nutritional deficiencies.

Keeping this in view, the study was planned to assess the effect of various socio-economic variables on nutrient intake of pre-schoolers.

Methodology





Effect of various socio-economic variables on nutrient intake of pre-schoolers

Income-effect on nutrient intake

The data in Table 1 showed that the income had direct impact on the diet of pre-school children (3 to 5 years). The intake of energy, thiamine, niacin, folic acid, vitamin C and iron increased with increase in family income i.e. more the income; higher was the intake of foods rich in above mentioned nutrients in Haryana and Maharashtra. Intake of β -carotene was higher in pre-school children of medium-income group in Haryana when compared to that of children from low-income group. Protein, riboflavin, vitamin B₁₂ and calcium consumption increased with increase income in both the States. Overall, most nutrients were consumed in better quantity among children who belonged to high-income group than those of low-income group. This may be due to higher intake of fats & oils, other vegetables, fruits etc. in the daily diets of children of high-income group than those belonging to low-income group. According to some nutritionist, well-nourished children had better food habits and better socio-economic status than children having poor health status. Few nutritionist also studied that family income affected the nutritional status of pre-schoolers. Kikafundaand Walker (2000) reported that consumption of micronutrient rich food and economic status of family were inextricably linked and this, in turn influenced the nutritional status of young children. Lakshmi *et al.* (2001) found that the proportion of anaemia was comparable between low and medium income categories but reduction in high-income category was observed. It was also noticed that higher intake of calcium was visible in high-income group children.

Type of family-effect on nutrient intake

Type of family has an indirect impact on the amount of nutrient intake. In this study, it was observed that type of family whether it was nuclear or a joint family also influenced the nutrient intake. The result shown in the Table 2 have indicated higher intake of niacin, vitamin C and iron by the children of nuclear families than joint families. This might be due to higher intake of cereals, pulses, roots & tubers, fruits and other vegetables by children belonging to nuclear families than those from joint families. intake of β -carotene was higher in joint families than children belonging to nuclear families. Higher consumption of green leafy vegetables among the children belonging to joint families might have contributed towards higher β - carotene intake.



Consumption of energy, protein, thiamine, riboflavin, calcium was slightly higher in nuclear families than joint families. On the other hand, intake of fats & oils and vitamin B₁₂ was slightly higher in children from joint families in Haryana. In Maharashtra, fat and vitamin B₁₂ consumption was similar in nuclear and joint families. Similar results have been observed in previous studies.

Size of family-effect on nutrient intake

Size of family had effect on the nutrient intake of children as shown in Table 3. The intake of calcium was higher in children from small sized families followed by medium size families. It may be due to higher intake of milk & milk products by the children belonging to small sized families followed by medium sized families. Intake of niacin, folic acid and iron was higher in large sized families followed by medium sized families in both the States except iron content in Maharashtrian families, which was found to be higher in small family. Niacin content was also more in small family in Haryana as compared to medium family. This might be due to slightly higher intake of roots & tubers, sugar & jaggery and green leafy vegetables by children belonging to large sized families followed by medium sized families.

Size of family had no significant ($P<0.05$) influence on the energy, fat, vitamin C and β -carotene intake. In contrast to present findings, Guimaraes *et al.* (1999) noticed a significant ($P<0.05$) relation between nutritional status of children and small sized families.

Caste-effect on nutrient intake

Caste has its impact on the type of foodstuffs consumed by the rural pre-school children; because it was directly related to the social customs that influence the amount of nutrients in diet. Intake of energy, fat and riboflavin was higher in upper and middle caste children than those from lower caste in Haryana and Maharashtra, respectively (Table 4). This might be due to higher consumption of pulses, roots & tubers, fats & oils and milk & milk products among children belonging to middle and upper castes. However, the intake of thiamine, niacin, folic acid, vitamin C and iron among pre-schoolers belonging to middle caste families was higher than those from higher and lower castes in both the States. It might be due to adequate consumption of other vegetables, cereals, green leafy vegetables and fruits among these pre-school children.



Consumption of β -carotene was higher in upper caste followed by *middle* caste families; it might be due to more intakes of fruits and green leafy vegetables in Haryana and Maharashtra, respectively. On the other hand, protein intake was observed to be higher among children from middle caste followed by those from high caste families, which might be because of more consumption of milk & milk products and cereals. Similar findings have been reported by various scientist who found that upper caste children consumed greater amount of nutrients than lower caste children. However, the intake of calcium in the present study was not significantly ($P<0.05$) different in all three-caste level when compared to that of RDA.

Education of mother-effect on nutrient intake

This factor has direct effect on the amount and type of food consumed by the children. It is presumed that educated mothers have more knowledge about nutrition. Data regarding effect of education of mother on daily nutrient intake of children has been presented in and Table 5. Intake of protein, riboflavin, vitamin B₁₂ and β -carotene was higher among children of mothers educated up to middle, high school or up to graduation level in both the States. This might be due to higher intake of milk & milk products, fruits, green leafy vegetables among children whose mothers were educated up to middle, matric or graduation level. However, the intake of energy was higher in children whose mothers were educated up to matric class than by those whose mothers were educated up to graduation level in Maharashtra State. Intake of thiamine, niacin and vitamin C was observed to be higher in children whose mothers were educated up to matric or graduate level. Fat intake was observed to be lower in illiterate mothers. Intake of calcium was found higher in children whose mothers were educated up to middle level in Haryana. It may be due to higher intake of milk & milk products among these children. Intake of more nutrients was found among the children whose mothers were educated up to middle, matric or graduation level in both the States. It might be due to the fact that mothers who were educated up to middle, matriculation or graduation had more knowledge about the nutritional requirements of rapidly growing pre-schoolers. They were giving higher amount of energy dense, body building and protective foods to children to meet their calorie, protein and some of the vitamins and minerals requirements. Similar findings were observed by Guimaraes *et al.* (1999) who reported that mothers' educational status affected the nutritional status of children. Few scientist also reported the beneficial effects of education of mothers on child's nutritional status.



Mothers' working status-effect on nutrient intake

Working mothers contribute towards the family income. On the other hand, housewives may have more time and pay more attention towards the food needs of their children.

Though, intake of energy, protein, thiamine, riboflavin, vitamin B₁₂, calcium, iron and β -carotene was slightly higher among children of non-working women (Table 6). The consumption of niacin and folic acid was slightly higher among children whose mothers were working.

However, intake of fat and vitamin C was higher in amount among children whose mothers were housewives. It may be because of more use of fat as the cooking medium by the housewives. Compared to working mothers, housewives were including more amount of green leafy vegetables and fruits in the daily diets of their children which might have contributed towards higher vitamin C intake. Similarly, Bamji and Thimmayamma (2000) reported minor influence of mothers' occupation on diet and nutritional status of school children. In contrast, Toyama *et al.* (2001) concluded that children of working mothers in informal sectors were at risk of mal-nutrition than children of mothers working in formal sector.

Occupation of father-effect on nutrient intake

The data presented in (Table 7) show a higher intake of energy among children whose fathers were doing service than those whose fathers were labourers in Haryana and Maharashtra. Otherwise occupation of father, whether farming, business or manual labour did not affect the energy intake of pre-schoolers. It may be due to high intake of fats & oils among children whose fathers were servicemen. The fat intake of children having their fathers in farming or service was higher than those whose fathers were labourer or in business. The lowest consumption of fat was found among children whose fathers were labourers because fat is an expensive source of energy. This might also be due to higher intake of milk & milk products and fats & oils by children whose fathers were in farming or in service.

Riboflavin and calcium intake was the highest among the children whose fathers were in farming followed by those whose fathers' occupation was service, business and manual labour in descending order in Haryana and Maharashtra, respectively.



Iron intake was high among children having their fathers in service when compared to other occupation classes. This might be due to adequate intake of fruits by children whose fathers were in service.

Intake of folic acid was higher in children whose fathers were in service or business. Children having their fathers as labourers were consuming less amount of vitamin C than compared to those in service class. It may be due to adequate fruits' intake by the children whose fathers' occupation was of service, business or farming. Result are in consistent with those reported by earlier nutritionist.

Table 1 : Effect of income on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | |
|---------------|-------------------------------|----------------------------|---------------|----------------|
| Sr. No. | Nutrients | Daily mean nutrient intake | | |
| | | LIG (n=222) | MIG (n=56) | HIG (n=22) |
| i) | Energy (Kcal) ^{NS} | 1115.36±212.1 | 1132.62±237.1 | 1231.56±213.5 |
| ii) | Protein (g)* | 33.43±7.0 | 33.60±8.3 | 35.82±6.6 |
| iii) | Fat (g) ^{NS} | 38.56±12.1 | 43.28±12.6 | 45.31±13.7 |
| iv) | β-Carotene (µg) ^{NS} | 1197.37±757.9 | 1468.74±745.8 | 1355.60±636.3 |
| v) | Thiamine (mg)** | 1.0±0.2 | 0.90±0.3 | 2.04±0.2 |
| vi) | Riboflavin (mg)** | 0.61±0.1 | 0.63±0.2 | 0.66±0.60 |
| vii) | Niacin (mg)** | 7.56±1.9 | 7.56±2.3 | 8.87±1.9 |
| viii) | Folic Acid (µg) ^{NS} | 84.99 ± 28.1 | 79.51 ±46.6 | 95.13 ± 33.1 |
| ix) | Vit. C (mg) ** | 16.93 ± 9.6 | 13.08 ± 18.3 | 19.59 ± 16.1 |
| x) | Vit. B ₁₂ (µg) | 0.34±0.2 | 0.37±0.2 | 0.38 ± 0.2 |
| xi) | Calcium (mg) ^{NS} | 702.34 ± 251.8 | 732.38±295.1 | 741.55 ± 244.9 |
| xii) | Iron (mg) ^{NS} | 10.56 ± 2.1 | 9.94±14.6 | 13.12 ± 2.3 |



| MAHARASHTRA STATE | | | | |
|-------------------|-------------------------------|----------------|---------------|---------------|
| | | (n=259) | (n=35) | (n=6) |
| i) | Energy (Kcal) ^{NS} | 1099.38±278.6 | 1107.57±202.3 | 1239.47±247.6 |
| ii) | Protein (g) ^{NS} | 21.93±8.7 | 22.67± 9.3 | 25.83± 7.3 |
| iii) | Fat (g) [*] | 13.59±8.1 | 18.99±13.3 | 19.57±15.6 |
| iv) | β-Carotene (μg) ^{NS} | 485.35±268.7 | 667.87±275.1 | 798.61±205.3 |
| v) | Thiamine (mg)** | 0.93±0.3 | 0.95±0.2 | 1.57± 0.3 |
| vi) | Riboflavin (mg) ^{NS} | 0.49±2.7 | 0.54±3.6 | 0.68±2.3 |
| vii) | Niacin (mg)** | 6.57±1.5 | 7.37±2.1 | 7.94±2.3 |
| viii) | Folic Acid (μg) ^{NS} | 63.76 ± 29.3 | 73.58 ±59.8 | 81.25 ± 36.7 |
| ix) | Vit. C (mg) ^{NS} | 17.91 ± 18.6 | 18.16 ±20.1 | 19.38 ± 17.5 |
| x) | Vit. B ₁₂ (μg) | 0.20 ± 0.3 | 0.29 ± 0.3 | 0.31 ± 0.2 |
| xi) | Calcium (mg) ^{NS} | 228.36 ± 247.9 | 296.37 ±265.3 | 329.58 ±201.6 |
| xii) | Iron (mg)** | 7.53 ± 2.9 | 10.87 ± 11.5 | 11.89 ± 3.9 |

Values are mean ± SD.

**Significant at 1% level *Significant at 5% level NS = Non-significant.

Table 2 : Effect of type of family on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | |
|---------------|-----------------|----------------------------|---------------|-----------------------|
| Sr. No. | Nutrients | Daily mean nutrient intake | | 'z' Value |
| | | Nuclear (n=152) | Joint (n=148) | |
| i) | Energy (Kcal) | 1169.63±225.4 | 1128.69±207.5 | 0.1153 ^{NS} |
| ii) | Protein (g) | 34.85±6.9 | 33.51±7.4 | 2.7495 ^{**} |
| iii) | Fat (g) | 40.58±11.2 | 42.17±14.2 | 1.7318 ^{NS} |
| iv) | β-Carotene (μg) | 1222.65±829.0 | 1472.30±623.5 | 0.0079 ^{NS} |
| v) | Thiamine (mg) | 0.99±0.2 | 0.93±0.3 | 55.5807 ^{**} |
| vi) | Riboflavin (mg) | 0.64±0.2 | 0.62±0.2 | 94.9676 ^{**} |
| vii) | Niacin (mg) | 8.73±1.9 | 7.39±2.2 | 5.3126 ^{**} |



| | | | | |
|--------------------------|--|---------------------|---------------------|------------------------|
| viii) | Folic Acid (μg) | 83.85 \pm 39.7 | 89.23 \pm 32.9 | 0.6658 ^{NS} |
| ix) | Vit. C (mg) | 17.44 \pm 6.5 | 12.92 \pm 17.1 | 2.5143 [*] |
| x) | Vit. B ₁₂ (μg) | 0.35 \pm 0.2 | 0.36 \pm 0.2 | - |
| xi) | Calcium (mg) | 719.05 \pm 249.1 | 709.95 \pm 258.9 | 0.0844 ^{NS} |
| xii) | Iron (mg) | 12.91 \pm 2.3 | 9.54 \pm 11.7 | 0.8897 ^{NS} |
| MAHARASHTRA STATE | | | | |
| | | (n=156) | (n=144) | |
| i) | Energy (Kcal) | 1047.57 \pm 268.3 | 1009.37 \pm 287.6 | 0.0973 ^{NS} |
| ii) | Protein (g) | 23.79 \pm 7.5 | 22.95 \pm 6.8 | 0.8768 ^{NS} |
| iii) | Fat (g) | 18.76 \pm 10.4 | 17.57 \pm 12.9 | 0.8644 ^{NS} |
| iv) | β -Carotene (μg) | 698.67 \pm 210.3 | 700.89 \pm 212.6 | 0.3488 ^{NS} |
| v) | Thiamine (mg) | 0.91 \pm 0.3 | 0.87 \pm 0.3 | 26.9772 ^{**} |
| vi) | Riboflavin (mg) | 0.52 \pm 0.2 | 0.48 \pm 0.2 | 149.7132 ^{**} |
| vii) | Niacin (mg) | 8.32 \pm 2.1 | 7.15 \pm 3.7 | 3.2766 ^{**} |
| viii) | Folic Acid (μg) | 66.99 \pm 40.7 | 73.56 \pm 31.5 | 0.4514 ^{NS} |
| ix) | Vit. C (mg) | 19.87 \pm 9.3 | 15.86 \pm 18.1 | 1.8522 ^{NS} |
| x) | Vit. B ₁₂ (μg) | 0.29 \pm 0.3 | 0.29 \pm 0.3 | - |
| xi) | Calcium (mg) | 309.03 \pm 108.5 | 298.65 \pm 105.7 | 0.1443 ^{NS} |
| xii) | Iron (mg) | 10.87 \pm 3.6 | 6.55 \pm 9.3 | 2.0307 [*] |

Values are mean \pm SD.

****Significant at 1% level**

***Significant at 5% level**

NS = Non-significant.



Table 3: Effect of size of family on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | |
|-------------------|-------------------------------|----------------------------|--------------------------|------------------------|
| Sr. No. | Nutrients | Daily mean nutrient intake | | |
| | | Small family (n=61) | Medium family (n=208) | Large family (n=31) |
| i) | Energy (Kcal) ^{NS} | 1125.96±221.2 | 1144.60±197.7 | 1157.24±231.1 |
| ii) | Protein (g) ** | 33.49±6.9 | 34.72±6.5 | 32.89±7.4 |
| iii) | Fat (g) ^{NS} | 40.94±13.7 | 40.26±11.7 | 41.55±13.7 |
| iv) | β-Carotene (μg) ^{NS} | 1327.12±643.3 | 1279.56±854.7 | 1266.34±704.4 |
| v) | Thiamine (mg)** | 0.93±0.2 | 0.95±0.2 | 0.99 ± 0.2 |
| vi) | Riboflavin (mg)** | 0.63±0.2 | 0.63±0.1 | 0.59 ± 0.2 |
| vii) | Niacin (mg)** | 7.94±1.8 | 7.56±2.2 | 8.62 ±2.1 |
| viii) | Folic Acid (μg) ^{NS} | 79.51 ± 27.6 | 85.44 ±51.0 | 96.54 ± 36.4 |
| ix) | Vit. C (mg) ^{NS} | 17.60 ± 13.5 | 16.74 ± 15.0 | 12.56 ± 17.4 |
| x) | Vit. B ₁₂ (μg) | 0.37±0.2 | 0.37±0.2 | 0.29 ± 0.2 |
| xi) | Calcium (mg) ^{NS} | 741.85 ± 237.9 | 718.47±275.5 | 653.23 ± 272.2 |
| xii) | Iron (mg) ^{NS} | 9.13 ± 2.3 | 10.65±16.0 | 14.76 ± 2.4 |
| MAHARASHTRA STATE | | | | |
| | | (n=88) | (n=187) | (n=25) |
| i) | Energy (Kcal) ^{NS} | 1064.88±201.5 | 1073.67±181.6 | 1078.25±268.1 |
| ii) | Protein (g) ^{NS} | 24.48±7.5 | 24.46± 6.1 | 22.79± 6.9 |
| iii) | Fat (g) ^{NS} | 20.1±12.7 | 19.85±10.9 | 19.87±13.7 |
| iv) | β-Carotene (μg) ^{NS} | 708.73±201.5 | 675.66±237.6 | 654.43±227.6 |
| v) | Thiamine (mg)** | 0.79±0.2 | 0.86±0.2 | 0.88± 0.2 |
| vi) | Riboflavin (mg)** | 0.47±0.2 | 0.49±0.2 | 0.50±0.3 |
| vii) | Niacin (mg)** | 6.87±2.6 | 7.90±3.1 | 8.01±2.0 |
| viii) | Folic Acid (μg) ^{NS} | 59.86 ± 38.5 | 62.39 ±57.6 | 70.75 ± 44.7 |
| ix) | Vit. C (mg) ^{NS} | 19.53 ± 12.7 | 18.63 ±14.9 | 14.63 ± 16.8 |
| x) | Vit. B ₁₂ (μg) | 0.31 ± 0.3 | 0.29 ± 0.3 | 0.27 ± 0.2 |
| xi) | Calcium (mg) ^{NS} | 387.76 ± 108.7 | 268.89 ±181.6 | 208.35 ±176.4 |
| xii) | Iron (mg) ^{NS} | 10.25 ± 2.4 | 9.86 ± 9.3 | 7.67 ± 8.5 |

Values are mean ± SD. **Significant at 1% level *Significant at 5% level NS = Non-significant.

Table 4 : Effect of caste on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | |
|--------------------------|-------------------------------|-----------------------------------|--------------------------------|-------------------------------|
| Sr. No. | Nutrients | Daily mean nutrient intake | | |
| | | Lower caste (n=155) | Middle Caste (n=97) | Upper Caste (n=48) |
| i) | Energy (Kcal) ^{NS} | 1061.70±229.1 | 1194.21±219.0 | 1135.25±185.7 |
| ii) | Protein (g) * | 32.18±7.8 | 35.88±6.9 | 33.46±5.5 |
| iii) | Fat (g) ^{NS} | 34.22±13.7 | 42.30±12.7 | 43.83±12.4 |
| iv) | β-Carotene (µg) ^{NS} | 1160.71±721.2 | 1254.22±689.3 | 1417.17±639.7 |
| v) | Thiamine (mg)** | 0.90±0.3 | 1.02±0.2 | 0.90 ± 0.2 |
| vi) | Riboflavin (mg)** | 0.59±0.2 | 0.64±0.1 | 0.64 ± 0.2 |
| vii) | Niacin (mg)** | 7.54±2.1 | 8.43±1.8 | 7.69 ± 1.8 |
| viii) | Folic Acid (µg) ^{NS} | 77.13 ± 42.7 | 98.69 ± 28.1 | 76.50 ± 23.5 |
| ix) | Vit. C (mg) ^{NS} | 12.97 ± 18.4 | 20.19 ± 12.9 | 14.42 ± 9.8 |
| x) | Vit. B ₁₂ (µg) | 0.32±0.2 | 0.36±0.2 | 0.37 ± 0.1 |
| xi) | Calcium (mg) ^{NS} | 680.88 ± 274.8 | 700.38±257.5 | 756.38 ± 213.3 |
| xii) | Iron (mg) ^{NS} | 9.11 ± 10.1 | 12.62±2.3 | 9.94 ± 2.1 |
| MAHARASHTRA STATE | | | | |
| | | (n=178) | (n=117) | (n=05) |
| i) | Energy (Kcal) ^{NS} | 1019.87±198.6 | 1059.37±201.5 | 1058.63±109.6 |
| ii) | Protein (g) ^{NS} | 19.87±6.5 | 24.76±5.8 | 23.64± 5.1 |
| iii) | Fat (g) ^{NS} | 16.87±16.8 | 19.69±15.6 | 20.78±10.6 |
| iv) | β-Carotene (µg) ^{NS} | 476.85±201.3 | 686.25±212.7 | 703.37±231.6 |
| v) | Thiamine (mg)** | 0.89±0.2 | 0.96±0.2 | 0.92± 0.3 |
| vi) | Riboflavin (mg)** | 0.40±0.2 | 0.56±0.2 | 0.48±0.2 |
| vii) | Niacin (mg)** | 6.76±2.9 | 7.29±2.1 | 6.83±2.4 |
| viii) | Folic Acid (µg) ^{NS} | 60.11 ± 41.0 | 74.62 ± 27.5 | 69.51 ± 24.3 |
| ix) | Vit. C (mg) ^{NS} | 16.75 ± 20.1 | 20.15 ± 13.6 | 19.95 ± 25.7 |
| x) | Vit. B ₁₂ (µg) | 0.20 ± 0.3 | 0.28 ± 0.2 | 0.25 ± 0.2 |
| xi) | Calcium (mg) ^{NS} | 240.58 ± 103.9 | 291.57 ± 121.7 | 325.83 ± 129.0 |
| xii) | Iron (mg) ^{NS} | 7.15 ± 8.5 | 10.67 ± 7.3 | 9.86 ± 11.6 |

Values are mean ± SD.Significant at 1% level *Significant at 5% level NS = Non-significant.**

Table 5 : Effect of mother’s education on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | | | |
|-------------------|-------------------------------|----------------------------|-------------------|------------------|------------------|-------------------|
| Sr. No. | Nutrient | Daily mean nutrient intake | | | | |
| | | Illiterate (n=192) | Primary (n=53) | Middle (n=20) | Matric (n=31) | Graduate (n=4) |
| i) | Energy (Kcal) ^{NS} | 1102.83±237.6 | 1160.34±226.8 | 1292.82±229.9 | 1256.40±202.5 | 1263.48±229.5 |
| ii) | Protein (g) * | 33.45±8.3 | 33.31±7.1 | 38.14±8.4 | 38.12±6.2 | 39.14±6.1 |
| iii) | Fat (g) ^{NS} | 38.45± 16.2 | 44.00± 7.9 | 49.59± 8.9 | 47.18±12.9 | 48.14±15.8 |
| iv) | β-Carotene (µg) ^{NS} | 1176.52±736.6 | 1292.45±604.1 | 1820.64±693.3 | 1700.22±652.3 | 1717.25±608.5 |
| v) | Thiamine (mg)** | 0.94±0.2 | 0.87±0.3 | 1.01±0.3 | 1.11±0.2 | 1.10±0.3 |
| vi) | Riboflavin (mg)** | 0.60±0.2 | 0.61±0.1 | 0.77±0.2 | 0.73±0.1 | 0.75±0.2 |
| vii) | Niacin (mg)** | 7.45±1.7 | 7.00±2.00 | 8.95±1.8 | 8.99±0.1 | 9.00±1.9 |
| viii) | Folic Acid (µg) ^{NS} | 83.50 ± 33.6 | 84.41 ± 29.5 | 92.23± 21.5 | 89.76 ±37.2 | 91.75 ± 29.8 |
| ix) | Vit. C (mg) ^{NS} | 13.33 ±18.8 | 20.86 ±17.2 | 23.41 ±23.0 | 27.33 ±11.6 | 29.33 ± 20.5 |
| x) | Vit. B ₁₂ (µg) | 0.32 ±0.2 | 0.37 ±0.2 | 0.49 ±0.3 | 0.46 ±0.2 | 0.48 ±0.2 |
| xi) | Calcium (mg) ^{NS} | 689.60 ±294.0 | 717.90 ±177.3 | 904.45 ±242.2 | 727.25 ± 248.5 | 896.26 ± 241.7 |
| xii) | Iron (mg) ** | 10.40 ±2.1 | 9.14 ±2.1 | 10.27 ±2.4 | 11.91 ± 7.8 | 12.94 ± 6.1 |
| MAHARASHTRA STATE | | | | | | |
| | | (n=45) | (n=71) | (n=84) | (n=95) | (n=5) |
| i) | Energy (Kcal) ^{NS} | 1156.75±281.5 | 1196.36±261.71 | 1256.85±212.6 | 1298.59±198.7 | 1287.67±237.6 |
| ii) | Protein (g) ^{NS} | 21.87± 8.9 | 26.35±9.6 | 27.91±8.7 | 28.95±7.6 | 29.87±7.8 |
| iii) | Fat (g) ^{NS} | 12.47± 17.3 | 18.65±16.5 | 21.81± 17.9 | 22.67±18.5 | 22.24±17.6 |
| iv) | β-Carotene (µg) ^{NS} | 596.67±201.5 | 678.95±198.6 | 784.56±231.6 | 786.65±237.5 | 797.94±178.5 |
| v) | Thiamine (mg)** | 0.79±0.3 | 0.85±0.3 | 0.98± 0.2 | 0.99± 0.2 | 0.98± 0.2 |
| vi) | Riboflavin (mg)** | 0.36±0.1 | 0.47±0.2 | 0.57± 0.2 | 0.68± 0.1 | 0.58± 0.2 |
| vii) | Niacin (mg)** | 6.85±1.9 | 7.20±1.3 | 7.91±2.1 | 8.25±1.8 | 8.29±1.2 |
| viii) | Folic Acid (µg) ^{NS} | 58.67 ±38.9 | 62.36 ± 26.7 | 76.87± 31.5 | 75.99 ±26.3 | 75.91 ±31.5 |
| ix) | Vit. C (mg) ^{NS} | 14.58 ±17.9 | 17.76 ±24.6 | 19.69 ±19.5 | 19.81 ± 23.5 | 20.93 ± 21.5 |
| x) | Vit. B ₁₂ (µg) | 0.20 ± 0.3 | 0.26 ±0.3 | 0.38 ±0.2 | 0.37 ±0.2 | 0.29 ±0.2 |
| xi) | Calcium (mg) ^{NS} | 198.67 ±222.2 | 257.86 ±189.9 | 310.57 ±201.5 | 297.28 ±141.6 | 299.57 ± 102.8 |
| xii) | Iron (mg) ** | 7.95 ± 2.7 | 6.87 ±3.5 | 10.87 ±3.6 | 10.95 ± 8.5 | 11.76 ± 7.9 |

Values are mean ± SD. **Significant at 1% level *Significant at 5% level NS = Non-significant.



Table 6 : Effect of mother's working status on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | | |
|-------------------|-------------------------------|----------------------------|--|------------------------------|--------------------|
| Sr. No. | Nutrient | Daily mean nutrient intake | | | |
| | | Housewife (n=85) | Serving out in field (seasonal) (n=204) | Serving out in service (n=6) | Any other (n=5) |
| i) | Energy (Kcal) ^{NS} | 1157.50±212.3 | 1113.86±225.3 | 1119.80±200.3 | 1125.76±219.0 |
| ii) | Protein (g)** | 34.99±6.6 | 33.07±7.3 | 33.98±7.4 | 33.99±6.8 |
| iii) | Fat (g) ^{NS} | 43.12± 12.9 | 37.31± 13.2 | 38.31± 13.8 | 39.32± 14.6 |
| iv) | β-Carotene (μg) ^{NS} | 1317.82±724.3 | 1256.18±677.3 | 1297.18±689.7 | 1299.51±650.1 |
| v) | Thiamine (mg) ^{NS} | 0.95±0.2 | 0.94±27.0 | 0.91±0.5 | 0.93±0.3 |
| vi) | Riboflavin (mg)** | 0.64±0.2 | 0.61±0.2 | 0.60±0.3 | 0.63±0.2 |
| vii) | Niacin (mg)** | 7.88±2.0 | 7.98±1.9 | 7.13±2.1 | 7.26±2.8 |
| viii) | Folic Acid (μg) ^{NS} | 84.08 ± 32.7 | 86.46 ± 36.5 | 87.00 ± 37.5 | 86.37 ± 31.5 |
| ix) | Vit. C (mg) ^{NS} | 17.22 ±10.6 | 14.77 ±17.3 | 15.98 ±12.8 | 15.1 ±13.7 |
| x) | Vit. B ₁₂ (μg) | 0.37 ±0.2 | 0.33 ±0.2 | 0.39 ±0.3 | 0.38 ±0.2 |
| xi) | Calcium (mg) ^{NS} | 734.47 ±224.5 | 689.87 ±273.6 | 690.84 ±257.9 | 687.92 ±266.8 |
| xii) | Iron (mg)** | 10.29 ±2.3 | 10.09 ±8.3 | 10.15 ±3.5 | 10.15 ±3.9 |
| MAHARASHTRA STATE | | | | | |
| | | (n=125) | (n=167) | (n=6) | (n=2) |
| i) | Energy (Kcal) ^{NS} | 1063.72±248.3 | 1055.87±235.6 | 1056.77±201.9 | 1028.93±218.6 |
| ii) | Protein (g) ^{NS} | 23.86± 9.5 | 21.59±8.6 | 21.72± 8.1 | 22.51±7.3 |
| iii) | Fat (g) ^{NS} | 20.93± 12.5 | 15.61± 10.9 | 15.55± 9.2 | 19.85±4.2 |
| iv) | β-Carotene (μg) ^{NS} | 693.86±101.5 | 588.81±99.3 | 581.29±81.1 | 643.98±97.6 |
| v) | Thiamine (mg)** | 0.92±0.3 | 0.88± 0.3 | 0.87± 0.2 | 0.89± 0.2 |
| vi) | Riboflavin (mg)** | 0.58±0.1 | 0.48±0.2 | 0.39± 0.2 | 0.41± 0.2 |
| vii) | Niacin (mg)** | 6.93±2.5 | 7.21± 3.6 | 6.81± 1.1 | 5.98±2.4 |
| viii) | Folic Acid (μg) ^{NS} | 67.75 ± 39.6 | 71.63 ± 41.3 | 71.70 ± 36.5 | 69.53 ±32.7 |
| ix) | Vit. C (mg) ^{NS} | 18.26 ±19.7 | 14.96 ± 18.5 | 15.17 ±19.3 | 17.99 ± 15.3 |
| x) | Vit. B ₁₂ (μg) | 0.29±0.3 | 0.25±0.3 | 0.25±0.2 | 0.24±0.2 |
| xi) | Calcium (mg) ^{NS} | 315.93 ±201.5 | 289.87 ±235.9 | 278.93 ±241.5 | 240.32 ±212.7 |
| xii) | Iron (mg)* | 9.99 ± 6.5 | 8.26 ± 7.1 | 8.75 ± 7.3 | 6.92 ± 6.9 |

Values are mean ± SD. **Significant at 1% level *Significant at 5% level NS = Non-significant.

Table 7 : Effect of occupation of father on nutrient intake of pre-school children (3 to 5 years)

| HARYANA STATE | | | | | | | |
|-------------------|-------------------------------|----------------------------|-------------------|--------------------|-------------------|-----------------------|---------------------------|
| Sr No | Nutrient | Daily mean nutrient intake | | | | | |
| | | Farming (n=46) | Service (n=19) | Business (n=27) | Labour (n=164) | Combination (n=42) | Caste Occupation (n=2) |
| i) | Energy (Kcal) ^{NS} | 1166.56±216.1 | 1210.67±202.5 | 1132.36±210.3 | 1085.09±227.7 | 1092.33±231.3 | 1088.56±210.7 |
| ii) | Protein (g) ** | 34.63±8.0 | 33.12± 6.7 | 34.55±6.4 | 33.80±7.3 | 34.63±7.5 | 33.96± 8.4 |
| iii) | Fat (g) ^{NS} | 45.00± 14.4 | 47.18±11.4 | 39.10± 12.4 | 34.14±11.7 | 40.18±13.5 | 35.01±14.9 |
| iv) | β-Carotene (µg) ^{NS} | 1380.42±627.1 | 1184.06±893.3 | 1441.67±751.7 | 1193.98±586.0 | 1166.46±687.5 | 1187.40±698.3 |
| v) | Thiamine (mg)** | 0.94±0.3 | 1.01± 0.3 | 0.95± 0.2 | 0.93±0.3 | 0.98± 0.3 | 0.94± 0.2 |
| vi) | Riboflavin (mg)** | 0.66± 0.2 | 0.63± 0.2 | 0.61± 0.1 | 0.58±0.2 | 0.62±0.1 | 0.59±0.1 |
| vii) | Niacin (mg)** | 7.27±2.1 | 8.90±2.2 | 8.29± 1.9 | 8.38±1.9 | 8.12±1.9 | 8.35± 2.7 |
| viii) | Folic Acid (µg) ^{NS} | 77.98 ± 42.2 | 95.42 ±56.1 | 94.72 ±33.0 | 86.08 ±22.9 | 86.91 ±37.3 | 87.20 ±48.6 |
| ix) | Vit. C (mg) ^{NS} | 17.21 ±21.9 | 22.06 ±18.5 | 18.51 ±7.8 | 12.22 ± 15.3 | 15.27 ±9.9 | 14.20 ± 14.7 |
| x) | Vit. B ₁₂ (µg) | 0.41 ± 0.2 | 0.32 ±0.2 | 0.36 ±0.1 | 0.31 ±0.2 | 0.38 ±0.2 | 0.30 ±0.3 |
| xi) | Calcium (mg) ^{NS} | 781.33 ±292.6 | 694.27 ±265.9 | 693.21 ±246.5 | 661.67 ±235.1 | 688.65 ±276.5 | 670.32 ±288.6 |
| xii) | Iron (mg) ^{NS} | 9.49 ± 16.1 | 14.15 ±2.6 | 10.32 ±2.2 | 10.96 ±2.3 | 12.57 ±14.3 | 10.81 ±2.9 |
| MAHARASHTRA STATE | | | | | | | |
| | | (n=45) | (n=33) | (n=29) | (n=170) | (n=23) | (n=0) |
| i) | Energy (Kcal) ^{NS} | 1128.91±248.5 | 1239.77±241.5 | 1109.63±202.6 | 1058.71±206.5 | 1065.53±222.3 | 0 (0) |
| ii) | Protein (g) ^{NS} | 21.75±9.3 | 22.63± 6.3 | 23.57± 6.8 | 20.63± 5.9 | 22.56± 6.5 | 0 (0) |
| iii) | Fat (g) ^{NS} | 18.95±6.7 | 19.36± 9.3 | 17.56± 10.6 | 15.44± 12.8 | 17.58± 10.1 | 0 (0) |
| iv) | β-Carotene (µg) ^{NS} | 723.53±198.5 | 687.41±108.5 | 776.79±112.5 | 598.73±136.4 | 688.76±118.3 | 0 (0) |
| v) | Thiamine (mg)** | 0.87±0.2 | 0.93±0.2 | 0.81±0.3 | 0.76±0.3 | 0.79±0.2 | 0 (0) |
| vi) | Riboflavin (mg)** | 0.67±0.2 | 0.61±0.2 | 0.59±0.3 | 0.43±0.2 | 0.46±0.2 | 0 (0) |
| vii) | Niacin (mg)** | 6.85±1.9 | 7.33±2.1 | 7.29±2.8 | 6.78± 1.9 | 6.95±2.3 | 0 (0) |
| viii) | Folic Acid (µg) ^{NS} | 61.81 ± 46.3 | 71.73 ± 33.7 | 72.56 ± 53.6 | 68.12 ± 41.6 | 61.97 ± 46.3 | 0 (0) |
| ix) | Vit. C (mg) ^{NS} | 17.87 ±16.4 | 19.81 ±20.3 | 19.75 ± 18.4 | 14.53 ±22.3 | 16.73 ± 19.3 | 0 (0) |
| x) | Vit. B ₁₂ (µg) | 0.32 ± 0.2 | 0.31 ± 0.2 | 0.28 ± 0.2 | 0.23 ± 0.2 | 0.27 ± 0.2 | 0 (0) |
| xi) | Calcium (mg) ^{NS} | 322.81 ±98.7 | 310.73 ±73.6 | 301.76 ±103.6 | 280.63 ±99.9 | 288.51 ±101.1 | 0 (0) |
| xii) | Iron (mg) ** | 7.13 ± 2.6 | 10.26 ± 1.9 | 9.31 ± 3.6 | 7.23 ± 2.1 | 8.96 ± 2.3 | 0 (0) |

Values are mean ± SD. **Significant at 1% level *Significant at 5% level NS = Non-significant.



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