

Gender Differences in the Nutrient intake of Primary School Children



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Abstract

Nutritional status of children reflects the overall development of community. Nutrition in childhood is a basis for survival and good health in adulthood. According to UNICEF gender dimension in India shows that while there is economic growth of nearly 10% annually, rate of child under nutrition is very high. Child nutrition is very much a matter of gender for three main reasons. Firstly due to the specific nutritional needs of women during adolescence, pregnancy and lactation, secondly undernourished girls grow up to become undernourished women who give birth to new generation of undernourished children and lastly undernourished girls and boys do not perform well in school as compared to their well nourished peers and as adults they are less productive and make lower wages. According to World Bank Report the prevalence of underweight children in India is among the highest in the world. The problem of malnutrition is not always as straight as simply lack of food. It is now widely accepted that gender inequality dwells not only outside the household but also with in it. Many families do not share food equally among members. Mothers and girls are rarely given priority in traditional Indian families. In our patriarchal society it is a common practice that women eat last and when the food is scarce, men may receive more than women, boys more than girls and older children more than younger children. Therefore an attempt has been made to study the gender differences in the nutrient intake of the primary school children. Total 270 children were selected in the age group of 5-9 years from Chamoli district. Results of the study reveal that dietary intake of most of the nutrients were significantly higher in boys as compared to girls. However in some nutrients the intake was similar among boys and girls.

Keywords: Nutrient intake, gender differences, primary school children

Introduction

Children are the citizens of the nation in future, contributing to the vital human potential and they are to impart strength to the national economy and development. Better the nutritional status of the children, higher will be the nation rise. Childhood is a period of rapid physical and mental growth and development. The nutritional requirements are higher per unit of body weight than those of adults. Humans need a wide range of nutrients to lead a healthy and active life. The required nutrients for different physiological groups can only be derived from a well balanced diet. The amount of each nutrient needed for an individual depend upon his/her age, body weight and physiological status. Adults need nutrients for maintenance of constant body weight and for ensuring proper body functioning. Infants and young children grow rapidly and require nutrients not only for maintenance but also for growth. Nutrition plays a vital role as inadequate nutrition during childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development (Awasthi et.al.). School age period is nutritionally significant because this is the prime time to build up body stores for rapid growth of adolescence. Iram and Butt (2006) said that food availability and childcare practices are significantly related to child nutritional status. Inadequate energy and nutrients have a variety of poor outcomes including growth retardation, iron deficiency anaemia, poor academic performance and development of psychosocial difficulties. According to FAO mostly women and children experience hunger as a defining characteristic of their lives. Nearly 96% of those suffering from hunger live in the developing countries with sub-Saharan Africa (SSA) and South Asia (SA) the hardest hit. (FAO, WFP, 2000).

Child Nutrition deprivation index (CNDI) assessed the nutritional deprivation in children on the basis of malnutrition data with stunting, wasting, underweight and anaemia being the key

dimensions. Highest deprivation in state wise order are Assam, Bihar, Chhatisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand (Times of India, December 7, 2016). More than 40% children in pre-school age of 0-5 years are suffering from anaemia in India. Anaemia among children (6-59 months) was highest in Bihar (78%), Madhya Pradesh (74.1%), Uttar Pradesh (73.9%), Haryana (72.3%), Chhattisgarh (71.2%) and Jharkhand (70.3%) (40% of 5-yr-olds are anaemic, Times of India, New Delhi, August 5, 2011).

Mathura & Naik (1989) reported that in Karnataka, girls were found to be taller and heavier than boys in 9.5 and 10.5 years of age, this was due to the early pubertal growth spurt occurring in girls. Sharma & Kalia (1990) reported that sex difference reflected the trend that boys were slightly taller and heavier than the girls among the young children. The prevalence and severity of malnutrition increase with age and degree of malnutrition was apparent more among female children than in male children (Krishna et.al 1991). Kumari and Jain (2005) reported that in Bihar according to weight for age, nutritional status of girls was better than boys.

Pandey (2009) finds evidence of discrimination between boys and girls in early childhood feeding practices in her study of west Bengal. The complimentary food given between 6-18 months of age given to girls showed difference in food and content of protein, vitamins and minerals when compared to those given to boys. The contrast was sharper in protein rich food like eggs, meat and fish. Vashisht et al. (2005) evaluated physical growth and nutritional status of school going girls of Pauri Garhwal district of uttarakhand, they reported that low dietary intake was one of the major determinants of poor nutritional status of girl children in Pauri Garhwal.

Objective of The Study

To compare the daily nutrient intake of primary school children according to gender.

Materials And Methods

The sample consisted of 270 children of the 7 primary schools. The sample children were in the age group of 5-9 years. Both purposive and multistage random sampling techniques were used for the study. Out of thirteen districts in uttarakhand, Chamoli district was selected. Chamoli is an upper Himalayan district in Uttarakhand state. There are nine blocks in Chamoli district, two blocks namely Narayan bager and Tharali was selected and then seven primary schools were selected randomly from the selected blocks. Then total 270 children were selected in the age group of 5-9 years. Out of 270 children, 149 were male children and 121 were female children. The information about children and their families was collected by interviewing children at school and their mothers at their respective homes. The dietary assessment included dietary survey of children. The 24-hour recall method and food frequency questionnaire was followed for surveying the children and mothers. Standardized cups and spoons were used for converting the reported

quantities into actual measure and weights, size of chapatti, consistency and daal and curry and additional ghee consumed were also taken in to account. Nutritive value of diets consumed per day the children was calculated in terms of calories, protein, fat, calcium, iron, thiamine, niacin, riboflavin, β - carotene and ascorbic acid using food composition tables of Gopalan et.al (1989).

Statistical Tools Used For Data Analysis:

The statistical techniques used by the investigator are as follows:

1. Mean
2. Standard Deviation
3. t-test

Results and Discussions

Table 1

Comparison of daily nutrient intake by 5-year-old boys and girls

| Nutrients (units/day) | Boys (N=9) | | Girls (N=13) | | t-value |
|------------------------------|------------|-------|--------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Energy | 1147.44 | 48.26 | 1097.77 | 44.57 | 2.44* |
| Protein | 24.53 | 1.91 | 23.55 | 1.74 | 1.23 |
| Fat | 24.98 | 2.17 | 23.98 | 2.00 | 1.06 |
| Calcium (mg) | 603.33 | 9.01 | 587.23 | 18.84 | 2.71* |
| Iron (mg) | 10.5 | 1.02 | 9.51 | 0.89 | 2.34* |
| Thiamine (mg) | 0.86 | 0.07 | 0.75 | 0.08 | 2.87* |
| Riboflavin (mg) | 1.01 | 0.19 | 0.85 | 0.12 | 2.24* |
| Niacin (mg) | 7.36 | 0.57 | 7.04 | 0.53 | 1.31 |
| Folic Acid (μ g) | 95.33 | 3.46 | 91.15 | 3.21 | 2.86* |
| β -carotene (μ g) | 512.11 | 19.24 | 499.84 | 15.73 | 1.58 |
| Ascorbic acid (mg) | 25.89 | 2.37 | 23.69 | 2.85 | 0.17 |

For d.f. = 11

*Significant at 0.05 level of significance

Entries in table no. 1 reveal that out of eleven t values calculated six were found to be significant at 0.05 level of significance. It also shows that intake of energy, calcium, iron, thiamine, riboflavin and folic acid were higher among boys than the girls. Where as with regard to the intake of other nutrients like protein, fat, carotene and ascorbic acid boys and girls do not differ significantly.

Table 2

Comparison of Daily Nutrient intake by 6-year-old Boys and Girls

| Nutrients (units/day) | Boys (N=30) | | Girls (N=21) | | t-value |
|------------------------------|-------------|-------|--------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Energy | 1165.0 | 36.05 | 1143.04 | 29.05 | 2.4* |
| Protein | 25.58 | 1.95 | 24.21 | 1.03 | 2.34* |
| Fat | 25.54 | 1.89 | 25.21 | 2.10 | 0.57 |
| Calcium (mg) | 657.2 | 41.34 | 651.95 | 46.12 | 0.41 |
| Iron (mg) | 11.16 | 0.80 | 10.37 | 0.97 | 3.03* |
| Thiamine (mg) | 0.87 | 0.04 | 0.79 | 0.05 | 5.17** |
| Riboflavin (mg) | 0.98 | 0.04 | 0.89 | 0.04 | 6.66** |
| Niacin (mg) | 7.43 | 0.49 | 7.15 | 0.47 | 1.98 |
| Folic Acid (μ g) | 97 | 2.95 | 92.86 | 1.70 | 6.32** |
| β -carotene (μ g) | 526.23 | 11.28 | 510.50 | 11.05 | 4.95* |
| Ascorbic acid (mg) | 26.28 | 1.47 | 26.58 | 2.25 | 0.54 |

For d.f. =49

*Significant at 0.05 level of significance

**Significant at 0.01 level of significance

Entries in table no. 2 show that intake of energy, protein, iron, thiamine, riboflavin, folic acid, β -carotene was higher among boys than the girls. There was no significant difference in the intake of fat, calcium, niacin and ascorbic acid between boys and girls.

Table 3
Comparison of daily nutrient intake by 7-year-old boys and girls

| Nutrients (units/day) | Boys (N=46) | | Girls (N=27) | | t-value |
|------------------------------|-------------|-------|--------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Energy | 1328.58 | 24.31 | 1311.59 | 31.07 | 2.43* |
| Protein | 28.58 | 1.09 | 28.99 | 1.98 | 0.99 |
| Fat | 26.82 | 1.42 | 26.56 | 1.60 | 0.43 |
| Calcium (mg) | 674.35 | 26.02 | 658.18 | 40.54 | 1.85 |
| Iron (mg) | 11.64 | 0.69 | 10.88 | 0.93 | 3.69* |
| Thiamine (mg) | 0.89 | 0.04 | 0.80 | 0.06 | 6.68** |
| Riboflavin (mg) | 0.98 | 0.11 | 0.89 | 0.59 | 4.51* |
| Niacin (mg) | 7.57 | 0.90 | 6.89 | 1.41 | 2.25* |
| Folic Acid (μ g) | 98.87 | 4.60 | 96.52 | 4.59 | 2.11* |
| β -carotene (μ g) | 538.68 | 9.54 | 532.81 | 13.18 | 2.02* |
| Ascorbic acid (mg) | 27.28 | 1.57 | 26.65 | 2.35 | 1.23 |

For d.f. = 71

*Significant at 0.05 level of significance

**Significant at 0.01 level of significance

Entries in table 3 show that there was a significant difference in the intake of energy, iron, thiamine, riboflavin, niacin, folic acid and β -carotene among boys and girls. Intake of these nutrients was higher in boys than the girls. Where as no significant difference was found in the intake of protein, fat, calcium and ascorbic acid between boys and girls.

Table 4
Comparison of daily nutrient intake by 8-year-old boys and girls

| Nutrients (units/day) | Boys (N=33) | | Girls (N=27) | | t-value |
|------------------------------|-------------|-------|--------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Energy (kcal) | 1383.27 | 16.95 | 1365.26 | 23.94 | 3.29* |
| Protein (gm) | 33.51 | 2.08 | 32.4 | 1.86 | 2.17* |
| Fat (gm) | 28 | 1.34 | 26.77 | 1.52 | 3.25* |
| Calcium (mg) | 666.73 | 14.79 | 651.18 | 14.09 | 4.15* |
| Iron (mg) | 12.75 | 1.27 | 12.77 | 1.03 | .08 |
| Thiamine (mg) | 1.14 | 0.23 | 1.01 | 0.19 | 2.5* |
| Riboflavin (mg) | 1.04 | 0.21 | 0.97 | 0.08 | 1.8 |
| Niacin (mg) | 7.78 | 0.68 | 7.77 | 0.58 | 0.06 |
| Folic Acid (μ g) | 124.64 | 8.19 | 122.22 | 7.43 | 1.19 |
| β -carotene (μ g) | 559.72 | 15.28 | 534.97 | 11.12 | 7.24** |
| Ascorbic acid (mg) | 27.34 | 1.73 | 28.01 | 2.45 | 1.18 |

For d.f. = 58

*Significant at 0.05 level of significance

**Significant at 0.01 level of significance

Entries in table 4 reveal that intake of energy, protein, fat, calcium, thiamine and β -carotene was higher among boys than in girls. Where as the intake of iron, riboflavin, niacin, folic acid and ascorbic acid was almost similar in boys and girls.

Table 5
Comparison of daily nutrient intake by 9-year-old boys and girls

| Nutrients (units/day) | Boys (N=31) | | Girls (N=33) | | t-value |
|------------------------------|-------------|-------|--------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Energy (kcal) | 1405.77 | 25.25 | 1389.30 | 28.28 | 2.46* |
| Protein (gm) | 34.19 | 1.59 | 32.90 | 2.03 | 2.83* |
| Fat (gm) | 28.50 | 1.01 | 27.87 | 0.87 | 2.7* |
| Calcium (mg) | 692.64 | 24.01 | 672.61 | 38.11 | 2.53* |
| Iron (mg) | 12.46 | 1.22 | 12.53 | 1.23 | 0.21 |
| Thiamine (mg) | 1.11 | 0.19 | 0.97 | 0.16 | 3.19* |
| Riboflavin (mg) | 1.01 | 0.11 | 0.99 | 0.09 | 0.82 |
| Niacin (mg) | 7.72 | 0.68 | 7.61 | 0.56 | 0.75 |
| Folic Acid (μ g) | 126.0 | 5.4 | 123.09 | 7.37 | 1.8 |
| β -carotene (μ g) | 555.75 | 13.39 | 540.28 | 10.44 | 5.13* |
| Ascorbic acid (mg) | 27.36 | 1.67 | 27.83 | 2.68 | 0.83 |

For d.f. = 62

*Significant at 0.05 level of significance

Entries in table 5 show that out of eleven t values calculated, six were found to be significant at 0.05 level of significance. The intake of energy, protein, fat, calcium, thiamine and β -carotene were significantly higher among boys than girls. There is no significant difference among boys and girls with regard to intake of rest of the nutrients.

Conclusions

Daily intake of almost all the nutrients were significantly higher in boys and girls in the 5 years of age except protein, fat, niacin, β carotene and ascorbic acid, the daily intake of energy, protein, iron, thiamine, riboflavin, folic acid and β -carotene was significantly higher in boys than girls where as daily intake of fat, calcium, niacin and ascorbic acid was equal in boys and girls. Daily intake of protein, fat, calcium and ascorbic acid was equal in boys and girls in the age group of 7 years. Where as daily intake of energy, iron, thiamine, riboflavin, niacin, folic acid and β -carotene was significantly higher in boys than girls. In the age group of 8 years the daily intake of energy, protein, fat, calcium, thiamine and β -carotene was significantly higher in boys than the girls, where as daily intake of energy, protein, fat, calcium, thiamine and β -carotene was significantly higher in boys than girls where as daily intake of iron, riboflavin, niacin, folic acid and ascorbic acid was similar in boys and girls. Daily intake of iron, riboflavin, niacin, folic acid

and ascorbic acid was equal in boys and girls in the age group of 9 years where as daily intake of energy, protein, fat, calcium, thiamine and β -carotene was significantly higher in boys than girls in 9 year old children. On the basis of findings of the study it can be concluded that nutrient intake of female children was found to be low as compared to their male counterparts. So there is a need to change the traditional attitude towards girl child. Nutrition education must be imparted to mothers and children. Discriminatory norms and practices against girls must be changed and mass media can play a very constructive role in this respect.

References

1. Awasthi, C.P. Kumar, S. Tiwari, P.P. Singh, A.B. (2000) Nutritional Status of Preschool and School Children in rural areas of Sultanpur district. *Journal of Dairying Foods and Home Science* 19:16-21.
2. FAO (1996) Focus: Women and Food Security, Women and Population Division. www.fao.org
3. Iram, U. and Butt, M.S. 2006. Understanding the health and Nutritional status of children in Pakistan: A study of interaction of socio-economic and environmental factors. *International Journal of Social Economics*. 33 (2): 111-131.
4. Kids in Sonia's Rai Bareilly most nutritionally deprived, *Times of India*, December 7, 2016
5. Krishna, D: Rao, V and Reddy, P.J. 1991. Association of agro-economic and socio-demographic indicators and nutritional status of preschool children. *Journal of Nutrition and Dietetics*. 45: 264-275.
6. Kumari, S. and Jain, R. 2005. Assessment of nutritional status of school children from rural Bihar. *Indian Journal of Nutrition and Dietetics*. 42: 326-334.
7. Pandey, A. 2009. Gender differences in early childhood feeding practices in Rural West Bengal. *Gender and Discrimination: Health, Nutrition Status and Women in India*. Oxford University Press, New Delhi
8. Sinha, K. 40% of 5-yr-olds are anaemic, *Times of India*, New Delhi, August 5, 2011
9. Vashisht, R.N., Krishan K. & Devlal, S. 2005. Physical growth and nutritional status of Garhwali girls. *Indian Journal of Pediatrics*. 72(2): 573-578.