

12. NUTRITION DURING CHILDHOOD

Childhood is the period from end of infancy upto adolescence. Hence, children from the age of 1 year to 10-12 years come under childhood. Specific changes among physical, social, cognitive, psychological and emotional domain occur during childhood. Changes in childhood affect their nutritional status and dietary pattern as well. We will study nutritional status and dietary pattern in to two parts :

1. Early childhood :

Children between the age of 1-6 years come under this group. This group is also called as preang or preschool age. Physical and dynamic maturation, body control, social and cognitive developments are more prominent as compared to physical growth and development during this period.

(I) Changes during preschool age :

- a. **Physical growth and development :** After babyhood or infancy, growth rate in height, weight, head and arm circumference and fatty deposition etc., decrease slightly during early childhood. Development in nervous and muscular system. Infant controls his body and starts walking as he reaches 2 year.
- b. **Development of the nervous system and muscles :** Child starts to walk and control his body by 2 years.

(II) Nutrition related problems : Preschool children are of very curious and notorious tendency. They look at every object in the environment and try to touch and taste them. Their nutritional requirements are higher due to physical development. Many children eat inedible substances during this age like sand, clay,

wax, soap etc., by hiding themselves from their elder ones. The strong tendency of eating inedibles is known as 'Pica'. Eating these substances children loose their appetite. Malnutrition among preschool children occurs due to disturbed digestion of nutrients not absorbed properly. It leads to decrease in the amount of food consumed, non nutritious food, poor quality food, faulty digestive system, increased chances of infection etc. In turn protein energy malnutrition, anemia, night blindness, rickets, scurvy, beri-beri, ariboflavinosis, pellagra may precipitate. Many microorganisms enter body through inedible items consumed in the form of Pica and cause various infectious diseases. Immunity to fight against diseases gets reduced among preschool children. In such a situation reduced appetite, pica, low nutrition/quality of food, malnutrition and increased chances of disease infection, etc., affects the nutritional status of preschool children. That's why, disease, infections and mortality rate is high in this age group. Hence, it should be imperative to pay proper attention towards nutrition and dietary management of preschool children.

2. Late childhood :

Children between the age of six year upto early adolescence, come under late childhood. The children of this stage go to school and get formal education, that is, till then their actual studies have started. Hence this age is called as school going age. The end of this age group depends upon gender and personal differences. Due to early puberty among girls, this age may last till 9-10 years while in boys this age lasts upto 11-12 years depending upon their pubertal changes. The rate of physical growth and development is

somewhat slow, stable and linear during this period. Their organs gradually attain maturity. Children attain proficiency in physical, dynamic, functions and become a part of competition in school. Children also learn the importance of discipline and moral values along with intellectual and social development.

(I) Changes during late childhood : The rate of growth (weight) during this period, increases from 2kg/year to 4 kg/year. Increment in weight of girls is due to deposition of adipose tissues while, in boys it is due to muscular development. Increase in height rate is about 5 to 6.5 cm, which is comparatively higher among girls. This increase in height rate is comparatively more in legs and hands than neck and trunk.

The temporary teeth of the boys fall and the permanent teeth begin to erupt and the process of kalasi Bhavana, which starts from the initial 3-4 months of the infancy still continues during early childhood. Considerable change in growth and development of girls and boys is seen but it is evident in late childhood. During first six years girls who were stunted and having less weight, will gain more weight

and height than boys by the age of 10 years. This is mainly because of early pubertal changes that occur among girls.

(II) Nutrition related problems : Functional and self-reliance qualities among children increase in late childhood. They always wants to complete their work as soon as possible and don't want any kind of interference. These children are more inclined towards play. Children of this group find difficulty in coping up between the harmony of increase in study load and their interest of play. They try to complete their work as soon as possible in order to play with playmates. Hence they become careless towards their food. Study period of 6-7 hours in school, homework, increase in class competition, coordination with classmates, etc., causes mental stress among children of this age group. Mental stress affects food appetite.

(III) Nutrition requirements during childhood : The need for diverse nutrients for childhood is based on the demand of specific nutrients requirements for growth and development. Indian Council of Medical Research (ICMR) has recommended daily dietary requirements of nutrients for each and every group which is as follows :

Table : 12.1 Recommended dietary allowances of nutrients during childhood

Nutrients	Childhood (age in years)				
	1-3	4-6	7-9	10-12	
				Boys	Girls
Energy (Kcal)	1240	1690	1950	2190	1970
Protein (gm)	22	30	41	54	57
Fat (gm)	25	25	25	22	22
Calcium (mg)	400	400	400	600	600
Iron (mg)	12	18	26	34	19
Beta carotene (µg)	1600	1600	2400	2400	2400
Thiamine (mg)	0.6	0.9	1.0	1.1	1.0
Riboflavin (mg)	0.7	1.0	1.2	1.3	1.2
Niacin (mg)	8	11	13	15	13
Pyridoxine (mg)	0.9	0.9	1.6	1.6	1.6
Vitamin C (mg)	40	40	40	40	40
Folic acid (µg)	30	40	60	70	70
Vitamin B-12 (µg)	0.2-1.0	0.2-1.0	0.2-1.0	0.2-1.0	0.2-1.0

(NIN 2010)

From the above table, it is indicative that with the increase in age of children the nutritional requirements of all nutrients increase. Nutritional requirements of each nutrient prescribed is same for girls and boys from the age of one year to 9 years. There after separate requirements are proposed for girls and boys. Girls and boys have increased demand of nutrients because of the commencement of pubertal changes among children of 10-12 years age.

Energy requirements can be completely fulfilled by including carbohydrate rich food products like wheat, jaggery and fat in their diet. Inclusion of wheat in food fulfills energy requirements and also satisfies appetite. Proper amount of carbohydrates in food also spares protein.

The use of fats in food does not means fried and heavy food items, rather fats in food can be incorporated in a variety of dishes using butter, cream or oil.

Growing children require more proteins because it helps in building the body. Incorporate complete protein rich food items for having high quality protein, like; milk and milk products (curd, cottage cheese, khoa), egg, meat, fish, etc. Protein quality can be improved by mixing cereals and pulses for vegetarian children.

There should be proper intake of nutrients like minerals, calcium, iron, vitamin A, D, C and folic acid in our food to achieve functions like, body building, development and growth of teeth and bones,

formation of blood and to raise hemoglobin level in blood etc., Requirement of these nutrients in food can be achieved by incorporating food items like, fresh fruits, green leafy vegetables, yellow colored fruits and vegetables, juicy fruits, etc., in the diet. Requirements of water soluble vitamins, 'B' complex increases with increase in energy requirements because these vitamins play an important role in energy metabolism. Vitamin B complex can be enriched in diet of children by incorporating food items like; cereals, pulses and fermented food products which are good sources of vitamins.

We should encourage children to have enough water (about 6-8 glasses) through out a day. Use of beverages like lemonade, squashes, soups, milk, buttermilk, should be used instead of tea, coffee and aerated drinks.

(IV) Dietary management : The rate of growth and development during childhood should be maintained regularly and gradually so that the nutritional status of the child remains good. The mother should give her child a balanced diet according to the table.

Milk is the main constituent of diet during infancy. By reaching preschool age along with milk, child starts eating other food items prepared for other family members. These children are always inclined towards play being curious and fickle rather than their diet. A diverse and delightful meal given in quiet and happy atmosphere from time to time gives them satisfaction and motivation to eat.

Table 12.2: Balance diet for children (NIN - 2010)

Food groups	Quantity of food (gm.)				
	1-3 years	4-6 years	7-9 years	10-12 years	
				Boys	Girls
Cereals	120	210	270	330	270
Pulse	30	45	60	60	60
Milk (ml)	500	500	500	500	500
Roots and Tubers	50	100	100	100	100
Green leafy vegetable	50	50	100	100	100
Other vegetables	50	50	100	100	100
Fruits	100	100	100	100	100
Sugar	25	30	30	35	30
Ghee/Oil	20	25	25	25	25

Note: For non-vegetarian children we can give 50 gm egg/meat/fish can be replaced by 30 gm pulses

This is the time, when we can teach children about healthy and good eating practices.

We should keep following points in mind while planning a diet regime for preschool children :

- (a) Give food at fixed time interval when they are hungry so that they can learn to have food on time.
- (b) Children have small appetite, give them small portion of food so that they can easily finish their part.
- (c) Increase frequency of meal upto 5-6 times a day.
- (d) Food should be cut into small bites in order to avoid choking.
- (e) Food should be according to the choice of the child and have fewer spices.
- (f) In order to maintain good digestive system children should not be given product made from refined flour or fried and complex fibers products.
- (g) Children like sweets, so sugars should be included in their meals. But too much sweets items may stick to teeth, should be avoided.
- (h) Children's breakfast should include some protein rich products like, milk, egg, etc., along with cereals such as bread-jam, parantha etc.
- (i) Usually children don't like to have green leafy vegetables so these can be given in the form of stuffed paranthas, poori, pakoda, etc.
- (j) Try to change the method and pattern of cooking if the child doesn't like any food product than.
- (k) Various products like, dal, rice, chapatti, vegetables, salad, etc., cannot be given at same time, therefore they should given in mixed preparations so that children get balanced diet. i.e. dal parantha, curd or vegetable raita etc.
- (l) Children love variety of food so in order to create interest try to incorporate variety of foods.
- (m) Children usually love to have raw fruits and vegetables like tomatoes, cabbage, peas, carrot

and fruits, so give them fresh and thoroughly washed fruits and vegetables.

- (n) Don't give biscuits, bread, bhujia, etc., refreshments before meal timings because these products may reduce their appetite.
- (o) Try to give healthy beverages like, vegetable soups, fresh juice, lemonade, milk etc., instead of tea, coffee or aerated drinks.
- (p) Serve food in different designed and colorful plates; this will create interest among children.
- (q) Motivate children to eat meals by their own.
- (r) Teach children to maintain hygiene and adopt healthy practices like washing hands before and after their meals. Motivate them to eat food by chewing it properly and don't scold them while eating.

Diet regime for school going children :

Good hygiene and food habit should be inculcated in early childhood so that these habits get matured in late childhood. Their likes and dislikes are selected. They want to eat food accordingly. They don't like dal & greens at this age. Following points should be kept in mind while planning meal for school going children :

- (a) Breakfast should be nutritious enough and quick to eat like, stuffed parantha, sandwich, milk, etc.
- (b) Children eat easily in the company or with their peer group, so try to give some refreshment or lunch box so that they can have meals in school.
- (c) Their food should be simple, palatable and nicely presented.
- (d) Introduce new and interesting recipes in children's diet and try to change the pattern and cooking method of the food product if it is rejected by the child, rather scolding and forcing to eat the meal as such.
- (e) Try not to send money with your children otherwise they will have anything dirty, unhygienic and inappropriate food product from outside. This will also promote poor eating habits and causes ill health effect on children.

Important Points :

1. The time period from the end of infancy upto adolescence, is called childhood. Hence, children from the age of 1 year till 10-12 years come under childhood.
2. Childhood is divided into two stages; Early childhood which includes children from age 1-6 years and late childhood which includes children from 6 years till adolescence.
3. Late childhood is also called as school going age.
4. Rate of growth and development is high during infancy, while somewhat less during early childhood and again slightly rises during late childhood which increases rapidly during adolescence.
5. Food related requirements of children from early childhood group are more important because their requirements are reflected with their social environment, hobbies and abilities.
6. There is a need to increase interest of children from late childhood group into food as they became careless about their meals.
7. There should be proper amount of nutrients like minerals, calcium, iron, vitamin A, D, C and folic acid in our food to achieve functions like, body building, development and growth of teeth and bones, formation of blood and to raise hemoglobin level in blood etc.

Questions :

1. Choose a correct answer for following questions
 - (i) Children from the age of 1 to 10-12 come under
 - (a) Adulthood
 - (b) Infancy
 - (c) Early childhood
 - (d) Adolescence

- (ii) Early childhood is called as.
 - (a) School going
 - (b) Preschool
 - (c) Adolescence
 - (d) Infancy
 - (iii) Tooth decay of temporary teeth is found in age group of children.
 - (a) 4-5 years
 - (b) 5-6 years
 - (c) 9-10 years
 - (d) 6-8 years
2. Fill in the blanks :
 - (i) years infants starts walking and controlling bodily functions by their own.
 - (ii) Preschool children are very of and in nature.
 - (iii) and increases during late childhood.
 - (iv) Children should drink at least glasses of water in a day.
 3. What do you mean by pica?
 4. Define late childhood?
 5. Why protein is necessary for growing children?
 6. What points should kept in mind while preparing diet regime for preschool children?

Answer :

1. (i) c (ii) b (iii) d
2. (i) Two (ii) curious and notorious
(iii) self activity and self reliance
(iv) 6-8 years