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NUTRITION: CORNERSTONE FOR HEALTHY LIFE

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ABSTRACT

Introduction: Nutrition is the scientific study of the food and nourishment, including food composition, dietary guidelines, and the role that various nutrients play. Dietary habits established in childhood are often carried into adulthood, so teaching children how to eat healthy at young age will help them stay healthy throughout their life. Nutritious food is that which provides sufficient energy and essential nutrients, helps in maintaining all biological processes of the body and health. Improper nutrition can result in grave diseases like severe acute malnutrition, Moderate acute malnutrition including underweight, stunting, micronutrient deficiencies and susceptibility to infections**. Materials and Methods:** All the references regarding nutrition are collected from various textbooks and online publications. Attempts are done to conceptualize the same to suit the need. **Results:** The balanced diet should comprise of carbohydrates, proteins, fats, minerals and vitamins. Daily recommended allowance of Food ingredients on an average are 1000kcal of energy, 20grams of protein, 25 grams of Fat, Calcium 600 mg, Iron 16-20 micro g/kg and so on. This requirement can be more in the critical periods of growth like Infancy, Adolescence and during disease convalescence. **Discussion:** Major Risk period for developing severe acute malnutrition is 6 months of life or during weaning period. The major risk period for growth stunting is between 4 and 24 months of age. During toddler age group fussy eaters and children accustomed to single food will end up in kwashiorkor, underweight/stunting. Micronutrients deficiency can impact upon overall performance of the child. **Conclusion:** It is estimated that 224 million children under 5 years are under nourished and 41 million are overweight or obese. "We are what we eat". Hence proper knowledge on nutrition can aid in prevention of triple burden of Malnutrition.

KEYWORDS: Nutrition, Malnutrition, Daily required allowances

INTRODUCTION

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition that is adequate, well balanced diet combined with regular physical activity is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.[1] Nutritious food plays significant role in providing sufficient energy, essential nutrients, helps in maintaining all biological processes of the body and health. Carbohydrate, proteins, water, fats, vitamins and minerals are the components of the healthy diet. Good nutrition helps in reducing heart disease, diabetes, high blood pressure and improves over all well-being. Malnutrition can increase morbidity and mortality by reducing the resistance to infections in children. Nutrition related factors contribute to about 45% of deaths in children. In India, statistics of children under 5 years reveal 35.7% are underweight, 38.4% are stunted, 21% are wasted and 58.4% are anemic.[2] In 2018 an estimated 6.2 million children and adolescents under age of 15 years died. Amongst these deaths, 5.3 million occurred in the first 5 years of age particularly those with sever acute malnutrition who are more susceptible to illness such as diarrhea and other respiratory disease.[3] Dietary habits established in childhood are often carried into adulthood, so teaching children how to eat healthy at young age will help them stay healthy throughout their life.[4] Hence nutritional status needs to be taken care in childhood especially during critical periods of developments.

MATERIAL AND METHODS

All the references regarding nutrition are collected from various textbooks and online publications. Attempts are done to conceptualize the same to suit the need.

RESULT

Prenatal nutrition: An adult women needs 1900kcal energy per day where as a pregnant lady needs 350kcal extra which is brought about by well-balanced pregnancy diet which consists of proteins 78g, vitamin C 60mg, calcium1200mcg, iron 35mg, fats 30mg and folic acid 300mg, which aids in proper fetal nutrition, and prevents the ill effects such as neural tube defects, megaloblastic anemia, low bone density, growth retardation, low birth weight, protein energy malnutrition and plays significant role in production of a healthy progeny which is superior in all the aspects than its predecessors.[5] As per Ayurveda predominant diet and regimen of garbhini needs to be Madhura Rasa Praya, SheethaVeerya, Brihmana, OjoVardhana and Anulomana which is a meticulous action plan to support the different developmental stages in the fetus as well as to prevent and manage minor health concerns in the pregnant lady.[6]

Nutrition in infancy: Babies are well known to thrive on breast milk during first 6 months of life.[7] Breast milk provides ideal nutrition for infants and contains antibodies which help in fight off viruses and bacteria. Daily recommended allowances.[8] and Nutritive values of breast milk are summarized in table 1.[9] On an average, baby should be fed 8 times, 15-20minutes/feed. Deficiency of breast milk leads to sever marasmic, dehydration, susceptible to infection and death.Thus by virtue of innate qualities breast milk can impart uninterrupted growth of body and organs, bestows health and longevity and reduces the risk of morbidity in both children and mother.[10]

Table 1: Nutritive value of breast milk and Daily required allowances (DRA).

Nutrients	DRA /24hours	Nutritive mean value of breast milk (per100ml)
Energy	550kcal	67 kcal
Proteins	9.3g	1.3g
Fats	31g	4.2g
Carbohydrate	60g	7.0g
Sodium	120mg	15mg
Calcium	210mg	35mg
Phosphorous	100mg	15mg
Iron	0.27mg	76mcg
Vitamin A	400mcg	60mcg
Vitamin C	40mcg	3.8mg
Vitamin D	5mcg	0.01mcg

After six months of age mother's milk alone is no longer sufficient,[11] hence complementary feeds which are nutrient dense should be introduced in order to fill the nutrient gap between the requirements and supply from the breast milk. Ayurveda emphasizes phalaprashana at the age of 6 months.[12] and gradual introduction of semisolid and solid feeds over six month onwards.[13] traditional weaning formulations are priyalamodaka, deepaniyamodaka, sangrahiyayogas are to be introduced.[14] WHO recommends for 6-8month old children, 2-3 meals should be given, at 9-11 months 3-4 meals and 12-24 months 3-4 meals along with nutritious snacks like fruits etc.[15] Few composition of complementary feeds (table 2) and Nutrients DRA for toddler age group of 1-3years (table 3),[16] are summarized.

Table 2: Few composition of complementary feeds.

Complementary feed	Quantity
Fresh cow milk	200-250ml/day
Mashed banana/custard	¼- ½ katori
Powered murmura/rice flakes+milk+fat	¼- ½ katori
Khichadi(liquid consistency)+moongdal+rice +fat	¼- ½ katori
Biscuits/bread/sujji in milk+sugar+fat	¼- ½ katori
Boiled mashed potato/halwa	50-60g

Table 3: Nutrients DRA for toddler age group of 1-3years.

Nutrients	DRA
Energy	1060kcal
Proteins	16.7g
Iron	9.0mg
Calcium	600mg
vitamin B_{12}	0.2-1.0mcg
Vitamin A	400 RE *
Vitamin B_1	0.5mg
Vitamin B_2	0.6mg
Vitamin C	40mg
Zinc	5.0mg
Magnesium	50mg

*- Retinol equivalent

Nutrition in Toddler age

Children in the age group of 1 to 3 years are called toddlers. These are mostly picky eaters. Picky eating, is a complex behaviour that broadly refers to a combination of traits. As children start complementary feeding and become exposed to an increasingly diversified diet, many begin to exhibit "picky eating" behaviors.[17] Some of the common behavioural traits that have been used to characterize picky eating include food selectivity (i.e., avoiding the intake of certain foods or food groups), sensory-sensitivity (i.e., avoidance of a food based on its sensory properties, or requiring the preparation or presentation of meals in a very particular way) and lack of interest in eating (i.e., eats only small amounts of food, has a poor appetite, eats slowly).[18] They would prefer to eat spicy, fried, junk foods attractively packed rather than nutritious food. Thus it is mandatory to modify cooking and serving for these children to gain their attention. Hence some of the useful choices would be natural flavours like vanilla, cardamom, almonds, cashew, lemon along with colourful vegetables and fruits for enhancing taste and garnishing.

Nutrition in school going children: Growing children and adolescents require more calcium. The recommended dietary allowances for calcium are about 600-800 mg/day. Cooking oils/ghee (25-50g) should be consumed. Overindulgence in fats may be avoided. Excessive salt intake should be avoided particularly by children having a family history of hypertension. In addition to consumption of a nutritious well balanced diet, appropriate lifestyle practices and involvement in physical activity such as games and sports should be encouraged among children.

Nutrition during Adolescence: age between 10-19years is when second growth spurt takes place. An individual undergoes various physical, physiological, sexual, emotional, and social changes. They gain approximately 15-20% of adult height and 50% of adult weight. Adequate nutrition is utmost importance to meet requirements for growth and developments of pubertal period. Requirements for boys are higher than for girls because of difference in their growth and development. The only nutrients that is required is higher amount by girls is iron, due to menstrual blood losses. Consumption of whole balanced meals should be encouraged rather than dependency on junk food. Diet should contain calcium rich foods like milk, curd, paneer, cheese, sesame seeds, green leafy vegetables, egg, meat, pulses, nuts and seeds.[20] The dietary plan for various age groups containing balanced diet 19 is explained in Table 4.

Table 4: Balanced diet for infants, children and adolescents.

Food groups	g/portion	Infants 6-12 months	1-3 Yr	4-6 yr	7-9 yr	Years					
						10-12		13-15		16-18	
						Girls	boys	Girls	boys	Girls	boys
Cereals & millets	30	0.5	2	4	6	8	10	11	14	11	15
Pulses	30	0.25	1	1.0	2	2	2	2	2.5	2.5	3
Milk (ml) & Milk products	100	4	5	5	5	5	5	5	5	5	5
Roots and tubers	100	0.5	0.5	1	1	1	1	1	1.5	2	2
Green leafy vegetables	100	0.25	0.5	0.5	1	1	1	1	1	1	1
Other vegetables	100	0.25	0.5	1	1	2	2	2	2	2	2
Fruits	100	1	1	1	1	1	1	1	1	1	1
Sugar	5	2	3	4	4	6	6	5	4	5	6
Fat/oil (visible)	5	4	5	5	6	7	7	8	9	7	10

Nutrition in special cases: Nutritional needs vary with different clinical conditions like Diabetes mellitus, nutritional deficiency anemia, chronic kidney disease, chronic liver disease, diarrheal diseases and inborn errors of Metabolim etc. This is even true with during and just after illnesses. This needs a meticulous plan with a diet consultation.

DISCUSSION

Diet in children needs special attention with regards to quality and quantity. Meal skipping especially the breakfast can harm on a long run.[21] Balanced diet meticulously practiced based on the daily requirements of the body and developmental needs can aid in primary prevention of the diseases and hence called as mahabhaishajya (universal drug).[22] The plan should be

based on the daily requirement, expenditure with special emphasis on the critical periods during the developmental stage and illness. Thus including daily recommended food components in food as per the specific codes of diet and exercise is essential routine to be adapted. Weight gain and clinical improvement in the condition are definitive assessment tools. Improper nutrition can end up in acute or chronic nutritional deficiency and related disorders in children.[23] Estimation of specific nutrient serologically is confirmatory evidences.

CONCLUSION

Nutrition is just not eating but key to healthy long life of this and future generation.

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