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Food and nutrition concerns in child development

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Abstract
For every child and young person everywhere, food is life, a fundamental right and a foundation of healthy nutrition and sound physical and mental development. Nutrition has been a long key to our thought leadership. In 1990, spearheading hunger structure kicked off something new in setting out the different reasons for helpless sustenance. In 2019, the underscore is to what exactly makes great sustenance from the eating regimens of youngsters and women to the consideration they profit by, the food conditions in which they live, and the manners by which our social orders support the privilege to sufficient nourishment through our qualities and political responsibility.

Keywords: Foods, nutrients, children, health, vitamins, development etc.

Introduction
Nutrition is the science that interprets the nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It incorporates ingestion, retention, digestion, biosynthesis, catabolism and excretion. The diet of a living being is the thing that it eats, which is generally dictated by the accessibility and satisfactoriness of nourishments. For people, a healthy eating routine incorporates readiness of food and capacity strategies that safeguard supplements from oxidation, warmth or filtering, and that lessens danger of foodborne ailments. The seven significant classes of human supplements are starches, fats, fiber, minerals, proteins, nutrients, and water. Supplements can be assembled as either macronutrients or micronutrients (required in little amounts). In people, an unhealthy eating regimen can cause lack related sicknesses, for example, visual impairment, sickliness, scurvy, preterm birth, stillbirth and cretinism, or supplement overabundance health-compromising conditions, for example, stoutness and metabolic disorder; and such basic constant foundational infections as cardiovascular illness, diabetes, and osteoporosis. Undernutrition can prompt squandering in intense cases, and the hindering of marasmus in persistent instances of malnutrition. Human nutrition manages the arrangement of fundamental supplements in food that is important to help human life and great health. Helpless nutrition is an ongoing issue regularly connected to neediness, food security or a helpless comprehension of nutrition and dietary practices and helpless information about supplements needed by the body at different phases of life to forestall lack of supplements in body which can effectsly affect body.

Malnutrition and its results are enormous supporters of passings, physical distortions and incapacities around the world. Great nutrition is vital for kids to develop truly and intellectually, and for ordinary human organic turn of events. The human body contains substance mixes, for example, water, starches, amino acids (found in proteins), unsaturated fats (found in lipids), and nucleic acids (DNA and RNA). These mixes are made out of components, for example, carbon, hydrogen, oxygen, nitrogen, and phosphorus. Any investigation done to decide nutritional status must consider the condition of the body when tests, just as the substance structure of the entire eating routine and of the apparent multitude of materials discharged and wiped out from the body (counting pee and defecation). Youth and immaturity are times of fast physical, social, intellectual and conduct change. Ideal nutrition during youth and pre-adulthood is basic for the upkeep of development and great health. The dietary prerequisites of youngsters and youngsters are diverse to those of grown-ups and are continually changing as people develop and create. Building up great nutrition and physical movement designs in adolescence add to great health all through life. The qualities,

propensities and practices created during this period frequently impact practices in adulthood. Moreover there is developing proof that health during youth and puberty impacts on health during adulthood.

Various food and nutrition concerns

Physical effects

Inadequate nutrition during infancy, childhood or adolescence can restrict growth, weaken immunity and increase the incidence of infections and diseases. Undernutrition can begin with conception itself due to maternal undernutrition. This may lead to the delivery of low birth-weight babies. In India, although <1% preschool children suffer from severe forms of protein energy malnutrition (PEM), sub-clinical undernourishment is prevalent in almost half of <5-year-old children with symptoms such as underweight, stunting and wasting. Poor or insufficient diet can also cause catabolism of body tissues and failure to provide energy substrate. Continuous undernutrition during the childhood years leads to short stature in adults.

WHO Child Growth Standards (0–5 years)

The WHO Child Growth Standards for children aged from birth to five years, released in 2006, are different to other growth charts previously used worldwide. The WHO Child Growth Standards are the result of a large study initiated by the World Health Organization in 1997. The Multicentre Growth Reference Study was a longitudinal study involving over 8000 children in Brazil, Ghana, India, Norway, Oman and the United States. The study was purposely designed to produce a growth standard (as opposed to a growth reference) by selecting children living in conditions in which they would be likely to reach their full genetic growth potential. These conditions include optimal feeding practices (eg, breastfeeding and appropriate introduction of complementary foods); good health care (eg, prevention and control of infection); and a healthy environment (eg, mother not smoking during and after pregnancy). This study demonstrates that when children born in different regions of the world are given the optimal start to life, they have the potential to grow and develop at a similar rate. The WHO Child Growth Standards establish the breastfed infant as the normative model for growth and development. The adoption of these standards aligns with the recent WHO and now New Zealand recommendation that infants are exclusively breastfed to around six months of age, then introduced to appropriate complementary food while breastfeeding is ongoing.

Vegetables and fruit

Vegetables and fruit provide energy, carbohydrate, dietary fibre, vitamins (including vitamin A, vitamin C and folate) and minerals (including potassium and magnesium). Starchy root vegetables (eg, potatoes, kūmara and taro) are important sources of carbohydrate in the diet. In addition to providing many nutrients, most vegetables and fruit are low in energy and contribute to satiety (feeling of abdominal fullness after eating), so may help people maintain a healthy weight. High intakes of vegetables and fruit have been shown to reduce the risk of cardiovascular disease, type 2 diabetes and many cancers. Plant foods such as vegetables and fruit contain a wide range of different compounds that promote good health. Some of these compounds have already been identified (eg, dietary fibre, phytochemicals) and others are as yet unknown. It is the synergistic effect of this mixture of protective compounds that provides the benefit. For this reason, eating a wide range of whole or minimally processed vegetables and fruit is the best method for gaining optimal nutrient intake and reducing the risk of chronic disease.

To obtain a wide range of nutrients it is important to eat many different types of vegetables and fruit every day. Colour is a good guide to ensuring variety with vegetables and fruit, which are often classified as green (eg, broccoli, spinach, kiwifruit), yellow/orange (eg, carrots, pumpkin, mandarins), red (eg, tomatoes, red peppers, strawberries), blue/ purple (eg, beetroot, eggplant, plums) or brown/white (eg, onions, potatoes, bananas). Commercially frozen vegetables and fruit are usually picked at their prime and 'snap frozen' so they should retain many of their nutrients. Canned vegetables and fruit are also picked at their prime and retain many nutrients, although beware of added sugar and salt. Juiced vegetables and juiced or dried fruit contain fewer beneficial compounds than whole foods. Juiced or dried fruit are high in sugar. If vegetable or fruit juice or dried fruit is consumed, it contributes up to one serving only of the total recommended number of servings for this food group so that additional servings of fresh, frozen or canned vegetables and fruit are still required to meet recommendations.

Milk and milk products

Milk and milk products provide energy, protein, fats (mostly saturated), vitamins (riboflavin, B12, A) and minerals (calcium, iodine, phosphorus, zinc). They are particularly important for children and young people to ensure optimal bone health. Reduced or lowfat milk and milk products are the best choices because these foods include less saturated fat, and often more protein and calcium than high-fat alternatives. All types of milk and milk products (eg, yoghurt, cheese) from all animal sources (eg, cow, goat) are included in this food group. Milk alternatives, such as soy and rice milk fortified with calcium and other nutrients, also belong to this food group. Some plant milks contain significantly lower levels of nutrients (eg, energy, protein) than cow's milk so should not be considered equivalent. Breast milk is included for children being breastfed.

Health and nutrition's for child development

During early childhood characterized by rapid growth it would seem very necessary that children be provided with an adequate amount of energy. In particular, the macronutrients contained in foods that can provide children with energy are fats, carbohydrates and proteins. Proteins are essential for human cells. Excellent sources of high-quality proteins are animal liver, meat, fish, cheese, milk and eggs and some products of vegetable-origin, such as products derived from soybeans, green beans and legumes. Products derived from wheat also constitute a source of protein, but the majority of vegetables and fruits contain only a limited amount. The second macronutrient essential for guaranteeing a correct and balanced energy level for children is that of fats. Fats consumed in the diet represent for children a source of energy and essential fatty acids. Structural fats are an essential part of the cell membrane, neural fabric and overall cellular structure, while stored fats present especially in adipose tissue, primarily composed of triglycerides provide a long-term energy reserve for the body.

Carbohydrates are the third and most important source of energy (in terms of quantity) for the body. Carbohydrates (sugars, starches and fiber) provide energy to all tissues in the human body, especially the brain and red blood cells which

normally utilize glucose as the “fuel” for cell activity. Alongside the main macronutrients, other essential elements in a proper diet for preschool- and school-age children are vitamins and minerals. In small children, an adequate supply of vitamin A is necessary for correct development of vision, to guarantee the integrity of epithelial tissue and development of tissue differentiation. The principal sources of vitamin A are: liver, dairy products, eggs, fish, margarine and certain types of fruit and vegetables (for example, carrots and yellow/orange colored fruit). Like vitamin A, B vitamins play a fundamental role in the growth of children, as well as their correct sustenance and development. Vitamin C is key to optimum functioning of the immune

Adequate nutrition is one of the important factor influencing growth & immunity. A balanced diet must contain sufficient amount of carbohydrate, protein, fat, vitamins, minerals and fibre in the required amounts. Each of these nutrients has a vital role in the all-round growth and development of children. A gap in intake of macro and micro nutrients can put a child into the vicious cycle that takes its toll on growth. This vicious cycle starts with inadequate nutrition and it may lead to infection & impaired immunity. As a result of this vicious cycle, a child may falter in desired growth for age. Breaking this vicious cycle is critical to help a child achieve age appropriate growth. Being physically active helps kids feel better in more ways than you may think. Kids who are physically active have better brain function and tend to do better in school than kids who aren’t. A balanced diet that contains all the food groups will help ensure your child has proper growth & development to stay healthy & disease free. The body gets the calories it needs for energy from 3 nutrients – carbohydrates, protein, and fat. Carbohydrates calories are the simplest form of readily available energy. As long as there is not an excess of carbohydrate foods, this energy is burned as fuel and is not converted into fat. Sources of complex carbohydrates such as whole grains and fresh fruits and vegetables with the skin left on provide fiber that the body digests more slowly and therefore are the best choices for kids and adults.

Water

Water is excreted from the body in multiple forms; including urine and feces, sweating, and by water vapour in the exhaled breath. Therefore, it is necessary to adequately rehydrate to replace lost fluids. Early recommendations for the quantity of water required for maintenance of good health suggested that 6–8 glasses of water daily is the minimum to maintain proper hydration. However the notion that a person should consume eight glasses of water per day cannot be traced to a credible scientific source. The original water intake recommendation in 1945 by the Food and Nutrition Board of the National Research Council read: "An ordinary standard for diverse persons is 1 milliliter for each calorie of food. Most of this quantity is contained in prepared foods". More recent comparisons of well-known recommendations on fluid intake have revealed large discrepancies in the volumes of water we need to consume for good health. Therefore, to help standardize guidelines, recommendations for water consumption are included in two recent European Food Safety Authority (EFSA) documents (2010):

(i) Food-based dietary guidelines and

(ii) Dietary reference values for water or adequate daily intakes (ADI).

These specifications were provided by calculating adequate intakes from measured intakes in populations of individuals with “desirable osmolarity values of urine and desirable water volumes per energy unit consumed.”

For healthful hydration, the current EFSA guidelines recommend total water intakes of 2.0 L/day for adult females and 2.5 L/day for adult males. These reference values include water from drinking water, other beverages, and from food. About 80% of our daily water requirement comes from the beverages we drink, with the remaining 20% coming from food. Water content varies depending on the type of food consumed, with fruit and vegetables containing more than cereals, for example.These values are estimated using country-specific food balance sheets published by the Food and Agriculture Organisation of the United Nations.The EFSA panel also determined intakes for different populations. Recommended intake volumes in the elderly are the same as for adults as despite lower energy consumption, the water requirement of this group is increased due to a reduction in renal concentrating capacity. Pregnant and breastfeeding women require additional fluids to stay hydrated. The EFSA panel proposes that pregnant women should consume the same volume of water as non-pregnant women, plus an increase in proportion to the higher energy requirement, equal to 300 mL/day. To compensate for additional fluid output, breastfeeding women require an additional 700 mL/day above the recommended intake values for non-lactating women. Dehydration and over-hydration-too little and too much water, respectively-can have harmful consequences. Drinking too much water is one of the possible causes of hyponatremia, i.e., low serum sodium.

Minerals

Dietary minerals are inorganic chemical elements required by living organisms, other than the four elements carbon, hydrogen, nitrogen, and oxygen that are present in nearly all organic molecules. Some have roles as cofactors, while others are electrolytes.The term "mineral" is archaic, since the intent is to describe simply the less common elements in the diet. Some are heavier than the four just mentioned – including several metals, which often occur as ions in the body. Some dietitians recommend that these be supplied from foods in which they occur naturally, or at least as complex compounds, or sometimes even from natural inorganic sources (such as calcium carbonate from ground oyster shells). Some are absorbed much more readily in the ionic forms found in such sources. On the other hand, minerals are often artificially added to the diet as supplements; the most well-known is likely iodine in iodized salt which prevents goiter

Macronutrients

Protein

Protein is necessary to build, maintain and repair tissue. Proteins are the second most abundant compounds in the body after water. They form structural and functional components within every cell. Protein is also necessary to synthesise hormones, enzymes and antibodies. It can be used as a source of energy like the other macronutrients (fat and carbohydrate), although most protein is used for other functions. Proteins are constantly being broken down and resynthesized in a process called protein turnover. During growth, protein synthesis exceeds protein degradation. Proteins are made up of 20 amino acids. The body can synthesise some of these amino acids, but others must be obtained from food and these are referred to as indispensable (or essential) amino acids. In most populations with an abundant and varied food supply, protein intakes are adequate. However, protein deficiency can occur

when energy intakes are low, when the quality of amino acids is low or during illness (as a result of increased requirements for nutrients). Protein is particularly important during childhood and adolescence to ensure adequate growth.

Fats

In addition to being energy dense, fats provide essential fatty acids and have important structural and functional roles.1 Fatty acids are needed for nervous system myelination in children younger than 2 years of age.5 Cholesterol moieties act as precursors for cell membranes, hormones, and bile acids. Fats also facilitate absorption of fat-soluble vitamins. These functions of fats are important for neurological and ocular development. For children younger than 2 years, 25% to 40% of total calories should come from fat, and for older children 10% to 35% calories should come from fat.

Carbohydrates

A major energy source for all cells are carbohydrates which are the primary source of energy for erythrocytes and the CNS.1 They should provide 45% to 65% of total calories in a diet. Complex instead of simple carbohydrates should contribute to a greater extent in the diet. A higher intake of simple sugars in children can displace essential macro- and micronutrients, thereby increasing the risk of nutrient deficiencies. Fruits are a good source of simple carbohydrate and are also rich sources of vitamins and fibre. Whole fruits instead of fruits juices should preferably be given to children.

Micronutrients

Calcium

During childhood and adolescence, adequate calcium intake is important for bone health during growing years as well as later years of life. Milk and dairy products are a good source of calcium. Although recommended dietary allowances for calcium are about 600 to 800 mg/d, higher calcium intakes during adolescence helps to achieve peak bone mass.3 For children who do not consume adequate milk products, calcium requirements can be met through other sources such as tofu, green leafy vegetables, ragi, sesame seeds and calcium-fortified food products.

Iron

Iron deficiency is very common among children and is associated with anemia and neurocognitive deficits. Iron present in animal food sources is more bioavailable than that present in plant sources. Vitamin C rich foods promote the absorption of iron in the body.

Vitamin A

Vitamin A is a fat-soluble vitamin that is required for vision, immune function, regulation of cell growth and normal reproduction. The term vitamin A includes retinol and carotenoids (dietary precursors of retinol). Vitamin A requirements are generally expressed in terms of retinol equivalents (RE). One RE is defined as the biological activity associated with 1 µg of retinol. For information on carotenoid conversion factors, refer to the Nutrient Reference Values for Australia and New Zealand. In severe cases, vitamin A deficiency can cause a series of changes to the eye that can lead to blindness. Vitamin A deficiency reduces the ability to see in dim light, which is sometimes referred to as night blindness. Vitamin A deficiency is also associated with impaired immunity and increased risk of infection. High levels of vitamin A can be very harmful. The most serious consequences of vitamin A toxicity occur during pregnancy, where fetal abnormalities and miscarriage may result. As a fat-soluble vitamin, vitamin A can build up in the body; however, it is rare for vitamin A toxicity to occur from ingestion of foods. The usual causes of vitamin A toxicity are retinoid therapy or high intakes of dietary supplements.

Good sources of vitamin A as retinol include meat (especially liver), eggs (especially the yolk), milk, milk products and oily fish. Liver contains large amounts of vitamin A and as such is a good source but its consumption in children needs to be limited to prevent excess build-up of vitamin A. Good sources of beta-carotene, a precursor for vitamin A, include carrots, pumpkin, kūmara and dark-green leafy vegetables such as spinach and silverbeet.

Vitamin D

Vitamin D is critcial for calcium and bone metabolism, and its adequeate intake is important for long-term bone health. In infants vitamin D deficiency can cause rickets and very severe deficiency can also lead to hypocalcemic seizures.[5] Breastfeeding, darker skin, little sun exposure and fat malabsorption are the risk factors for Vitamin D deficiency. Breastfed infants and children who do not get at least 400 IU of vitamin D through diet should receive Vitamin D supplement.

Fiber

Dietary fiber is a carbohydrate, specifically a polysaccharide, which is incompletely absorbed in humans and in some animals. Like all carbohydrates, when it is metabolized, it can produce four Calories (kilocalories) of energy per gram, but in most circumstances, it accounts for less than that because of its limited absorption and digestibility.The two subcategories are insoluble and soluble fiber.

Insoluble dietary fiber

Consists mainly of cellulose, a large carbohydrate polymer that is indigestible by humans, because humans do not have the required enzymes to break it down, and the human digestive system does not harbor enough of the types of microbes that can do so.

Soluble dietary fiber

Comprises a variety of oligosaccharides, waxes, esters, resistant starches, and other carbohydrates that dissolve or gelatinize in water. Many of these soluble fibers can be fermented or partially fermented by microbes in the human digestive system to produce short-chain fatty acids which are absorbed and therefore introduce some caloric content. Whole grains, beans, and other legumes, fruits (especially plums, prunes, and figs), and vegetables are good sources of dietary fiber. Fiber is important to digestive health and is thought to reduce the risk of colon cancer. Fiber can help in alleviating both constipation and diarrhea by increasing the weight and size of stool and softening it. Fiber provides bulk to the intestinal contents, and insoluble fiber especially stimulates peristals is – the rhythmic muscular contractions of the intestines which move digesta along the digestive tract. Some soluble fibers produce a solution of high viscosity; this is essentially a gel, which slows the movement of food through the intestines. By slowing the absorption of sugar, fiber may help lower blood glucose levels, lessening insulin spikes and reducing the risk of type 2 diabetes. The link between increased fiber consumption and a decreased risk of colorectal cancer is still uncertain.

Conclusions

Understanding feeding behaviours requires the knowledge of feeding as a developmental skill that matures over time and is reliant on hunger (appetite) cues and experiential learning. Whereas feeding skills are well established by two years of age, hunger cues shift from primarily internal to external (family, school and societal) control only by 4-5 years. Thus, although initially problematic feeding behaviours tend to be reactions to internal cues, these behaviours can become conditioned to external (coaxing parents) and societal cues. Medical illnesses, prematurity and developmental disorders further interfere with the development of normal feeding behaviours. In order to help identify feeding problem, a number of feeding scales have been devised, but rarely used for assessment or treatment outcome. Yet, early behavioural intervention can play an important role in normalizing feeding behaviours and mealtime interactions, which in turn help promote independence and other self-help skills in the child. Most recently, an easy and short screening tool was developed for detecting problematic feeding behaviours in primary care offices, allowing early referral to appropriate feeding clinics.

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