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Exploring Essential Nutritional Guidelines For Optimal Growth And Development In Infants Aged 1 To 5 Years

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ABSTRACT:

Background: Nutrition is an internal condition that relates to the availability and utilization of energy and nutrients at the cellular level. It is crucial for infants aged one to five years, playing a significant role in various stages of life. Adequate genetic information and a favorable environment are essential for optimal growth and development, supported by sufficient nutrition and appropriate psychosensory and affective stimulation.

Objective: To highlight the importance of providing infants with complementary nutrients starting around six months of age and to emphasize the role of high-quality, nutrient-dense foods in early childhood development.

Methods: Review of nutritional requirements for children, focusing on the necessity of complementary foods, the importance of high-quality food consumption, and the impact of caregivers' knowledge on the nutritional value of preschool lunch boxes.

Results: The consumption of food is a critical determinant of children's health, providing essential vitality and nutrients for growth. Proteins, carbohydrates, and lipids are primary energy sources, while minerals like calcium, phosphorus, and magnesium, as well as vitamins A and D, act as cofactors in cellular metabolism and tissue growth. Adequate intake of these nutrients is vital, and a lack of caregiver knowledge can lead to increased consumption of industrialized foods, excessive carbohydrates, and insufficient fruits and vegetables.

Conclusion: Ensuring proper nutrition in early childhood is essential for healthy development. Special attention should be given to critical minerals and vitamins, and caregiver education is crucial to prevent reliance on industrialized foods and to promote a balanced diet rich in fruits and vegetables.
KEYWORDS: Breast Milk, Complementary Foods, Vitamins and minerals, Nutritional Quality, Fruits and vegetables.

INTRODUCTION:

Even though the Convention on the Rights of the Child stipulates that "All boys and girls have the same right to sufficient and adequate food," the truth is that this right is not met in situations where there is poverty and relocation. Nutrition is a fundamental right. Fulfils, resulting in a decline in the overall health and happiness of children. The benefits of breast milk in infant nutrition are well known; however, many professionals believe that these benefits are limited to its excellent digestibility, its sterility, and the fact that it is more cost-effective. However, the truth is that the benefits of breast milk are not less important than the possibility of assisting in the development of children's bodies and intelligence; it contains amino acids that are required for normal brain development; it protects children from infections and diseases; and it contains the necessary amounts of vitamins (phosphorus, iron, proteins, fats, and sugars). A child's consumption of mother's milk offers the highest level of protection against a variety of illnesses, including diarrhea and dehydration, respiratory infections, constipation, colic and allergies, skin disorders, measles, cholera, and other conditions (Duggan et al., 2016).

Because the brain and nervous system reach up to 70 percent of its maximum growth during the first year of life, the first years of a child's life are of the utmost significance. This is because both the brain and the nervous system reach 25 percent of their final size at birth. As a result, receiving appropriate nourishment throughout the early years of childhood confers higher advantages, and failing to do so during this period can result in irreparable harm to both the body and the brain. All children have the right to a level of living that is sufficient for their physical, mental, spiritual, moral, and social development, as stipulated by the Convention on the Rights of the Child (Demmer, Cifelli, Houchins, & Fulgoni III, 2018).

A population's level of development can be inferred from the nutritional status of children under the age of five, which has been recognized as a valuable indication of that population's overall development. There are still large population groups that are living in a state of food insecurity and suffering from chronic malnutrition in Latin America and the Caribbean at present. According to estimates provided by the World Health Organisation, in developing countries with high mortality rates, child malnutrition is a cause of fifteen percent of the years of life that are lost due to death or disability (Weker et al., 2017).

In significant part, the environment and a particular social setting are responsible for the production of food. Although nutrition has a biological basis, it is more accurately described as the result of a complex interaction between environmental, cognitive, physiological, and societal factors. Eating behavior is a collection of acts that an individual engages in to create their relationship with food throughout their lifetime. The behaviors that are associated with food are acquired through direct experience with food, imitation, the availability of food, economic income, emotional symbolism, and cultural traditions (Michaelsen, 2000). Differences in lifestyle, hygiene, eating habits, and ways of perceiving the environment are brought about by the diversity that exists within families. Some families believe that a child who is overweight is in better physical condition and is more likely to be resistant to infections than a child who is typical in terms of weight (Wu & Chen, 2009).

Several studies that have been conducted over the past twenty years in industrialized nations have discovered that there is a negative correlation between socioeconomic status and the prevalence of obesity in children. A variable frequency of unhealthy habits and behaviors in various socioeconomic groups is one of the mechanisms that has been proposed to explain this link based on the hypothesis that it exists. Eating patterns that are associated with an increased risk of childhood obesity are among the habits and behaviors that are included in this category. Several aspects of dietary intake have been identified as possibly contributing to the prevalence of overweight and obesity in children (Riley et al., 2018).

These include the frequency and distribution of meals throughout the day, the consumption of sugary drinks and snacks, the high consumption of fast food, the size of portions, skipping breakfast, eating away from home, and the low consumption of fruits and vegetables (Cunha et al., 2015).

Individuals should be able to identify the risks that reflect the results of the intake, digestion, absorption, metabolism, and excretion of nutrients that are sufficient or not sufficient for energy needs and macro and micronutrients in a person. The assessment should be a part of the typical health examinations as well as epidemiological studies that allow individuals to identify the risks.

In this order of ideas, nutritional assessment is a methodology whose objectives are: a) Determine the clinical signs and symptoms that indicate possible deficiencies or excesses of nutrients, b) Measure the body composition of the subject, c) Analyse the associated biochemical indicators with malnutrition, d) Assess whether dietary intake is adequate, e) Assess the subject's functionality, f) Diagnose the nutritional status, g) Identify patients who can benefit from nutritional action, and e) Subsequently assess the effectiveness of nutritional treatment; To accomplish this, it is necessary to incorporate three extremely significant aspects: an analysis of the body's size and composition, as well as a global assessment (Ertem & Ergün, 2013).

A significant public health concern is the prevalence of overweight and obesity among preschool-aged children. Overweight children made up 6.5% of children under the age of five who visited health facilities across the country in the year 2015, while obese children made up 1.5% of the nationwide population. Food modernization, which includes an increase in the manufacture and consumption of industrialized foods that are high in simple sugars and saturated fats, Miranda et al., and inadequate information on the side of the individual who prepares the preschool lunch box are all potential factors (Nurliyana et al., 2016).

In the past several years, there have been significant shifts in the lifestyles of the general public, and along with those shifts, there have also been changes in the diets of children and students. The increased economic development, along with the technological advancements in food and cooking (Demmer, Cifelli, Houchins, & Fulgoni, 2018), the incorporation of women into work outside the home, the new family structure, the significant influence of advertising and television, the earlier incorporation of children into school, and the increased possibility of choosing their menus without adequate family supervision, among other factors, are various factors that contribute to the consumption of foods that have (Organization, 2019)high caloric content and low nutritional quality.

Table 1: Summary of Key Findings on Child Nutrition and Rights

Aspect	Key Findings	Reference
Right to Sufficient and Adequate Food	Not met in situations of poverty and relocation, impacting the health and happiness of children.	Convention on the Rights of the Child
Benefits of Breast Milk	Contains essential amino acids, protects against infections and diseases, offers necessary vitamins	Duggan et al., 2016
Importance of Early Nutrition	Critical for brain and nervous system development; inadequate nutrition can cause irreparable harm	Demmer, Cifelli, Houchins, & Fulgoni III, 2018
Nutritional Status as Indicator	Reflects the population's overall development; food insecurity and chronic malnutrition are prevalent in some regions.	Walker et al., 2017
Interaction of Factors in Nutrition	Eating behaviors are influenced by environmental, cognitive, physiological, and societal factors.	Michaelsen, 2000
Socioeconomic Status and Obesity	Negative correlation: unhealthy eating patterns contribute to childhood obesity	Riley et al., 2018

Table 2: Determinants and Consequences of Nutrition in Children

Determinant	Description	Reference

Environment and Social Setting	Influence on food production and eating behaviors	Michaelsen, 2000
Caregiver Knowledge	It affects the nutritional value of preschool lunch boxes; a lack of knowledge leads to poor food choices.	Nurliyana et al., 2016
Socioeconomic Factors	Socioeconomic status linked to obesity; unhealthy eating patterns prevalent in lower socioeconomic groups	Riley et al., 2018
Public Health Concern	Overweight and obesity in preschool-aged children; food modernization and caregiver knowledge implicated	Nurliyana et al., 2016
Lifestyle Changes	Economic development and technology impact children's diets, leading to higher consumption of low-quality food.	Organization, 2019; Saavedra & Prentice, 2023

Table 3: Components of Nutritional Assessment

Component	Description	Reference
Clinical Signs and Symptoms	Indicate possible nutrient deficiencies or excesses	Ertem & Ergün, 2013
Body Composition Measurement	Assessment of the subject's physical composition	Ertem & Ergün, 2013
Biochemical Indicators	Analysis of biochemical markers associated with malnutrition	Ertem & Ergün, 2013
Dietary Intake Assessment	Evaluation of whether dietary intake is adequate	Ertem & Ergün, 2013
Functional Assessment	Assessment of the subject's overall functionality	Ertem & Ergün, 2013
Nutritional Status Diagnosis	Identification of nutritional status and potential benefits of dietary interventions	Ertem & Ergün, 2013
Effectiveness of Nutritional Treatment	Subsequent assessment of the effectiveness of implemented nutritional treatments	Ertem & Ergün, 2013

Table 4: Factors Contributing to Childhood Obesity

Factor	Description	Reference
Meal Frequency and Distribution	Impact on weight: irregular meal patterns contribute to obesity	Cunha et al., 2015
Sugary Drinks and Snacks	High consumption linked to increased risk of obesity	Cunha et al., 2015
Fast Food Consumption	Associated with higher calorie intake and obesity	Cunha et al., 2015
Portion Sizes	Larger portion sizes contribute to increased calorie intake and obesity	Cunha et al., 2015
Skipping Breakfast	Linked to a higher risk of obesity due to compensatory overeating later	Cunha et al., 2015
Eating Away from Home	Increased consumption of calorie-dense, low-nutrient foods	Cunha et al., 2015
Low Consumption of Fruits and Vegetables	Associated with inadequate nutrient intake and higher obesity risk	Cunha et al., 2015

According to the findings of several studies conducted in our nation, there is a growing consumption of energy, proteins,

animal fats, and manufactured products that are abundant in fats, processed sugars, and salt. Additionally, there is a decrease in the consumption of complex carbohydrates and specific vitamins and minerals (Saavedra & Prentice, 2023).

METHODOLOGY:

For this scientific effort, a literature review was conducted using a variety of databases. To carry out the current research, reputable information was taken into consideration, as well as works that are well-versed in this subject. These works are concerned with the study of fundamental nutrition in infants between the ages of one and five years old. Bibliographic information was utilized, which was obtained from books, electronic consultations, scientific articles, and magazines.

NUTRITIONAL CONDITION

The right to nutrition is an essential one. All children have the right to a level of living that is sufficient for their physical, mental, spiritual, moral, and social development, as stipulated by the Convention on the Rights of the Child. Article 6 of the Convention stipulates that the states that are parties to the Convention are obligated to ensure the child's life and growth to the most significant degree humanly possible. It is essential for the child's physical and intellectual development that they receive an adequate amount of nourishment, both in terms of quantity and quality.

It is necessary to conduct a comprehensive evaluation of children's nutritional state, taking into consideration the harmonious relationship between nutrition and growth because the nutritional condition of children is inextricably linked to their growth and development at various periods of life. The nutritional status of an individual is the end consequence of the equilibrium that exists between the nutrients that they consume and the nutrients that they require. When we talk about the availability and utilization of energy and nutrients at the cellular level, we are referring to a condition that occurs on the inside of the human himself. Several elements might affect an individual's nutritional condition. These factors include environmental, social, economic, cultural, and political issues. Both dietary habits and physical exercise have a significant impact, particularly on the development of preschool-aged children. It has been shown that children who are obese have a more extensive food intake and a lower NAF in comparison to their counterparts who are born with a normal body fat percentage.

The nutritional condition of children is influenced not just by biological variables but also by environmental and psychosocial determinants; the effects of this can be severe and long-lasting in terms of development. Through the use of a structured method that revolves around its components, which in this study are primarily focused on biological usage, food availability, and access to adequate food, food security makes it feasible to address nutritional status. Due to the rapid rate of growth that occurs in children, particularly during the first year of their lives, any event that disrupts this equilibrium has the potential to have a significant impact on it. For this reason, periodic health monitoring is the most valuable component for the early detection of nutritional changes. This is because it enables a prompt and adequate evaluation, which is the most essential factor in the process.

There is a direct connection between the socioeconomic elements of the society to which a community belongs and the nutritional status of that group, among other things. Individuals and families are socially and biologically vulnerable while they are living in poverty. One of the biological effects of poverty is that it causes children to have shorter stature than other children. Indigenous people are unable to have the opportunity to have a quality of life that is adequate because of the conditions of poverty in which they already live. According to the findings of a study that he conducted on the health and survival of Mayan Indigenous people who lived in situations of poverty, he concluded that "poor socioeconomic conditions were determining and predominant in the biological and environmental deficiencies of the Indigenous population and its ecosystem."

The necessary vitamins and minerals that the body requires must be included in the diet to be considered adequate. The deficits that it possesses are ubiquitous and are the root cause of a variety of disorders. A decrease in the risk of death from measles can be achieved with the use of vitamin A. It is anticipated that the administration of this vitamin can reduce newborn mortality from measles by fifty percent. Additionally, it can reduce death from diarrhea by forty percent in people who are deficient in this vitamin. One can achieve a 23 percent reduction in the risk of newborn mortality. In

addition to oral supplementation, food fortification was one of the approaches that contributed to the formation of these numbers.

A lack of iron in children not only hinders their capacity to learn and develop their motor skills but also hinders their growth and causes harm to their immune system, making them more susceptible to diseases. The ability to work decreases with age in individuals. Iodine deficiency, which is the most significant preventable cause of brain injury in the world, is responsible for the damage that occurs to the neurological system. The capacity of youngsters to walk, as well as their hearing and the development of their cerebral capacities, might be negatively impacted by it. When compared to other children, children who are born with an iodine deficiency have an intelligence level that is at least ten points lower. Dysentery, ulcers, difficulty with wound healing, and hair loss are all symptoms that a zinc shortage can bring on. To prevent and protect youngsters from diarrhea for three months, zinc lozenges are utilized.

The understanding of the carer can have a significant impact on the nutritional content of the lunch boxes that are provided to preschoolers. In situations where there is a lack of understanding, there is a greater prevalence of industrialized foods, a higher carbohydrate content, and a lower prevalence of fruits and vegetables. We can't conclude that knowledge is the primary reason that determines this difference. It is also likely that other factors, such as economics, time, ease, and so on, also play a role in determining this difference. It is recommended that future research on lunch boxes in preschoolers include anthropometric measurements and more extensive evaluations of the carer and that the study be carried out longitudinally as part of epidemiological monitoring.

EATING HABITS

The diet of a school-aged child is influenced by several different elements, which also contribute to the formation of the child's eating habits. The socioeconomic situation of the parents and the educational level of the parents are two factors that are generally acknowledged to have an impact on the nutritional intake of the child. There is a correlation between the parents' degree of education and the social status of the family. This is because the socioeconomic status of the family is not only defined by the income of the family but also by the education and occupation of the parents. Several research studies have shed light on the connection between the educational level of the mother and the amount of food, energy, and nutrients that the child consumes.

In terms of the frequency with which they consumed food, preschoolers had a low frequency in the consumption of fruits, vegetables, and fats. On the other hand, the consumption of cereals, meats, and dairy items was consistently high in both genders. The foods that were consumed the most were sugar and sweets, which accounted for 19% of the category of miscellaneous foods. According to the findings of this research, in conjunction with the insufficient eating habits that were reported by a significant portion of the sample that was analyzed, these constitute essential risk factors for the development of these diseases. Therefore, it would be helpful to implement measures that encourage both an increase in the degree of physical activity, particularly in the female sex, and rectifying deficient eating habits. This would be advantageous in avoiding the formation of ECNTA from the early stages of life and preventing the appearance of diseases. Diseases of the cardiovascular system are the primary cause of illness and mortality in Venezuela and a significant number of other Latin American countries.

Continued breastfeeding and the promotion of adequate supplemental feeding are both necessary measures. Following the age of six months, infants require additional foods that are suited for them, in addition to breast milk, as these foods are essential for their development. In many regions of developing countries that are experiencing a shortage of food, children do not receive complementary foods at the proper age, they are not fed frequently enough, or the quality of the food that they are given is subpar—foods to be enriched. Vitamins and minerals that are necessary for human health are found in these foods. It is often required to incorporate these micronutrients into a variety of regional foods because these foods are not always readily available.

An industrialized society is characterized by an imbalance in the energy balance, which is caused by an increase in energy intake through food and a decrease in energy expenditure; an increase in the consumption of SFA, n-6 series

AGP, and trans-AG, and a reduction in the intake of n-3 series AGP, which results in an increase in the ratio of n-6 to n-3 to values that are very far from the 2-1/1 of the diet that might be appropriate. It has been observed that there is a decline in the consumption of complex carbs and fiber, as well as a fall in the consumption of fruits and vegetables, antioxidants, and certain minerals.

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Because of all of these factors, it is crucial to make changes to one's eating habits and adopt diets that are representative of a healthy eating pattern. It would appear that a return to the "traditional Mediterranean diet" would be suitable given the substantial body of scientific research that demonstrates the positive effects of the Mediterranean diet on human health. There is a nutritional profile that is determined by the Mediterranean diet, which is characterized by a high amount of total fat (30-40% of total energy) but a low content of saturated fat (≤ 7-8% of total energy). Our ability to achieve high levels of fiber, vitamins, minerals, and phytochemical products is made possible by our intake of plant products to a greater extent than our consumption of animal products to a lesser extent.

Food is one of the primary pillars of individual health, and it is even more relevant when we are talking about children because it is through food that they obtain the energy and nutrients that are necessary for their growth and development. It is primarily during childhood that lipids or fats, proteins, and carbohydrates are the primary sources of energy. Consuming an adequate amount of vitamins and minerals is also crucial throughout the growth process. This is because vitamins and minerals frequently serve as cofactors or catalysts in the process of cellular metabolism. In some cases, they also play a role in the growth of tissues (calcium, phosphorus, magnesium). It is for this reason that we need to pay particular attention to minerals like calcium and iron, as well as vitamins like A and D supplements. Changes in eating habits in children and adolescents are conditioned, first and foremost, by increasingly dominant family structure models such as one-child, single-parent, and divorced families; less family supervision of the food and drinks that the child consumes, both inside and outside the home; greater freedom of choice and economic availability for the child who buys them; and a combination of these factors. A significant portion of the decision-making process about meals is taken over by the influence of friends or the media rather than the family.

THE DE NUTRITION

When a youngster is malnourished, their ability to survive and maintain excellent health, as well as the functioning and development of their body, as well as their cognitive and intellectual capabilities, are all negatively impaired. The term "malnutrition" is distinct from the term "malnutrition," which encompasses both a deficiency in food and an abundance of food. The presence of infectious infections, inadequate care, and inadequate food intake (both in terms of quantity and quality) are the three primary factors that contribute to the development of malnutrition in children. Many underlying factors lie behind these direct causes. Some of these causes include a lack of access to food, a lack of health care, the utilization of unsanitary water and sanitation systems, and inadequate care and feeding habits. Among the fundamental causes that are at the root of all of this are social, economic, and political variables. Some examples of these elements are poverty, inequality, and inadequate education achieved by mothers.

The absence of access to food, inadequate nutrition (both in terms of quality and quantity), unsanitary water and sanitation, and the presence of infectious diseases are the factors that contribute to malnutrition, which is a pathological condition. The fundamental causes, which include social, economic, and political elements, such as poverty, inequality, or inadequate education of women, among other things, are the foundation of all of this. These variables are what define the growth of a nation, a community, and a family. The United Nations Children's Fund (UNICEF) reports that this

disease, which is prevalent in many parts of the world, is the leading cause of death among infants and young children in developing nations. It is responsible for the deaths of more than fifty percent of children under the age of five who are affected by it. Because of this, the World Health Organisation (WHO) has made the prevention of this disease a top priority.

The most significant nutritional issue that countries that are still developing face is malnutrition in terms of protein and calories. This results in a decline in both physical and intellectual activity, which in turn leads to a decline in health, which in turn leads to damage to the economic, political, and social order, an increase in the risk of diseases, and significant costs and investments made by the health system. 54% of deaths that occur in children are attributed to malnutrition.

It has been observed that the prevalence of chronic malnutrition among the Embera-Katío child population is significant, surpassing the prevalence found in other indigenous groups as well as the prevalence of malnutrition among the kid population. Several factors are ultimately a consequence of the poverty that these indigenous people live in. These factors include diseases, inadequate nutrition, lousy husbandry practices, poor environmental cleanliness, almost no health care, parasitosis, and infections. The youngsters in question are suffering from malnutrition, which can have severe repercussions, both biological and social. According to reports, children who are malnourished have a lower immune response, which makes them more susceptible to severe forms of acute respiratory infections like pneumonia. This is because malnourished children have a lower immune response.

VARIETIES OF MALNUTRITION IN CHILDREN

The number of children under the age of five who pass away each year is estimated to be 7.6 million. There is a connection between malnutrition and one-third of these deaths.4. The malnutrition index is obtained through direct observation, which allows for the identification of children who are underweight or have bloated legs. Additionally, the height, weight, arm circumference, and age of the child are measured, and these measurements are compared with reference norms. Malnutrition can present itself in children in a variety of ways, including the following: • He is smaller than he should be for her age. • It weighs little for her height. • She weighs less than what corresponds to her age.

Specifically, each of these manifestations is associated with a different category of deficits. A person's weight is a sign of acute nutritional deficits, whereas their height is a reflection of long-term nutritional deficiencies. As a result, there are numerous classifications of malnutrition.

There are approximately 200 million children under the age of five who are affected by chronic malnutrition in the developing world. The consequences of this condition will be felt for the rest of their lives. Furthermore, almost thirteen percent of children under the age of five are reported to be suffering from acute malnutrition, a condition that necessitates prompt medical attention and treatment. Many factors contribute to the fact that malnutrition continues to be a threat to the survival and development of hundreds of millions of people. These factors include but are not limited to the lack of adequate attention, the fact that it is frequently invisible, the rise in the fundamental prices of food, conflicts that cause massive population displacements, drought, the absence of an equity approach, and the circle of poverty.

FACTORS RELATED TO SOCIETY IN NUTRITION

In Tezonteopan, a poor town in Mexico, Chávez and colleagues conducted a study that found that malnutrition was directly linked to the health, well-being, and educational prospects of the community. Furthermore, the study found that malnutrition was both the cause and the effect of limited opportunities for social and economic growth throughout the community (McAfee et al., 2012) in terms of the economy of the group. More than 52 million people in Latin America are still living in a situation of food insecurity, even though there has been some progress made in reducing the prevalence of malnutrition in the region. The most vulnerable groups, particularly children under the age of five, are without a doubt the ones who are most negatively impacted by the scarcity of food and the obstacles that prevent them from gaining access to it (Baker et al., 2010). The disparities in malnutrition, undernutrition, and hunger that have been caused by economic imbalances between the countries of the area and within each of them have brought about these disparities

(Greer et al., 2008). The fact that more than 4 million boys and girls are underweight and more than 9 million suffer from chronic malnutrition or growth retardation is detrimental to the development opportunities of future generations, as well as to the families of those individuals and society as a whole (Pietrobelli et al., 2017).

Based on the findings of the hematological evaluation, it appears that there is a public health concern over the existence of anemia among this particular group of youngsters. As a result of a comparison between the existence of anemia in children who were parasitized and children who were not parasitized, it was discovered that the group of children who were anemic had almost twice as many children who were infected with parasitosis. Children belonging to a lower socioeconomic stratum and with a lower level of education than their mothers exhibited considerably poorer anthropometric and hematological values than the rest of the children investigated, pointing to these traits. This is even though all children reside in areas that are considered to be poor because they are significant dietary risk factors (Rosales et al., 2009).

It seems that there is a general expectation that boys will have greater physical resilience than girls. Mothers may give girls feeding preference because they believe that girls are more fragile than boys and that they pay less attention to feeding males. After all, they believe that boys are more resistant to taking in food. Furthermore, the population in Tacopaya has a limited economy, which should bring our attention to the need to produce policies that allow for the maintenance or reduction of these indices. These indices, which are based on the fact that Tacopaya is a poor place, most likely demonstrate a history of malnutrition in early life and subsequent small stature. Examining the society in Tacopaya, it is sexist. When carrying out this job, it became clear that men have a stronger desire for controls and consultations, while women who attend consultations less frequently do not have this choice (Deoni et al., 2018).

When I was younger, a child who was overweight was considered to be healthy and capable of enduring the challenges of starvation and infection. Overweight, on the other hand, has emerged as a key health concern among children over the past ten years. This is primarily because of the detrimental repercussions, both social and clinical, that it brings about. Some of the factors that are taken into consideration include high blood pressure and hyperlipidemia, orthopedic issues that are related to weight (such as flat feet and scoliosis), skin disorders, psychological complications (such as emotional instability, introverted behavior, and low self-esteem), and even potential psychiatric sequelae. These factors are responsible for the fact that children who are obese constitute a population that is at risk. Additionally, this issue results in an increased likelihood of the occurrence of several difficulties in adulthood, such as chronic non-communicable diseases, which will lead to an increase in the risks of morbidity and mortality on a national and international scale (Iyengar & Nair, 2000).

In the first year of life, the transition from a dairy diet to the home's feeding scheme is a reflection of the variety of foods that are suitable for human consumption and the ways that are used to prepare them. From a diet consisting of dairy products that are shared by all cultures during the first year of life, we progress to a variety of diets that are set according to the culture to which the family group belongs for the subsequent years. In this way, the majority of the foods that adults consume and the methods by which they consume them have already been absorbed into the preschool age before they are even available (Naidoo, 2013).

HOW CHILDREN GROW AND DEVELOP OVER TIME

Parasitism is a process that is detrimental to the growth and development of the kid population. This is because it raises the likelihood of malnutrition by producing a loss of appetite, competing for nutrients, and causing diarrhea or malabsorption syndrome. To those mentioned above, there is also a high prevalence of malaria, which is a factor that plays a role in the malnutrition of children. It is common knowledge that infections hurt a child's nutritional condition. The severity of this impact varies depending on the child's age, the parenting style that is utilized, and the physical, social, and emotional environment that the child is surrounded by. One of the most immediate physical manifestations of the illness is a loss of weight; however, when the infections become recurrent and the episodes last for a more extended period, the pace of increase in height slows down, which ultimately results in an apparent decline in growth.

In many nations throughout the world, malnutrition and anemia in children under the age of five have been recognized as significant public health problems. These conditions have substantial effects on morbidity and mortality rates. Not only does malnutrition in childhood cause physical harm, but it also causes irreparable harm to a child's cognitive abilities. The term "developmental impairment syndrome" refers to a group of conditions that incorporate growth abnormalities, delays in motor and mental development (in addition to behavioral development), lower immunocompetence, and increased morbidity and mortality of the affected individuals.

Both hereditary and environmental factors influence the development of human height. If the genetic information is sufficient and the environment is favorable, the optimal conditions would be provided to achieve growth and development by the genetic potential of the family.

An environment is considered to be favorable when it offers sufficient nutrition in terms of both quantity and quality, as well as proper stimulation of the psychosensory and affective systems. When there is also good health and regular physical exercise, the genetic capacity for development is ultimately manifested. This is the case when there is physical activity.

A metric that is used to monitor children's well-being and health is the monitoring of their physical growth. At the individual level, growth curves comprise one of the most valuable, simple, and low-cost instruments that can be used to quantify the degree to which the child's care and fundamental requirements are satisfied. As a result, the proper interpretation of expected growth is highly dependent on the parameter that is utilized, which increases the likelihood of errors occurring when the parameter does not accurately represent physiological growth. To establish the nutritional situation of the child population, evaluate the effectiveness of interventions aimed at the prevention or treatment of growth problems, and provide support for decision-making in terms of public health policies, the utilization of global growth indicators and their respective curves of evolution constitutes a facilitating instrument at the population level.

It was noticed that the group of children between the ages of 12 and 23 months had the lowest prevalence of underweight, while the age group between 36 and 47 months had the highest prevalence of underweight. This was determined by analyzing the behavior of the nutritional status of the children from the perspective of their age. With a prevalence of 2.9%, The girls showed higher percentages of low weight in the initial age group and also, albeit very quietly, in the final two groups; however, no occurrences of this scenario were detected in the ages of 6 to 11 and 12 to 23 months in this sex. This was the case in both groups.

Affectation of height for age was the most common deficient condition, with percentage values that remained at figures that varied between 3.3 and 4.9%. The only group that did not belong to this category was the 48 to 60-month group, in which the prevalence of short stature was only 1.0%. When it comes to weight for height and body mass index (BMI) for age, the percentages of children who had moderate to severe wasting showed very low figures. The only group that broke this trend was the 36 to 47-month group, which reached a figure of 3.4%, both in terms of weight for height and BMI for age.

According to these more recent findings, the predominance of low weight for age in the initial years of life is primarily a response to short stature and not to wasting. There is a great variety of factors that are unique to each individual, such as environmental influences that occur during children's development. These factors have the potential to either stimulate or inhibit children's natural and spontaneous exploration and movement. One of the most important goals that should be prioritized in physical education programs is the development of psychomotor abilities. This should be viewed from the perspective of appropriate practice at the level of child development. In recent years, there has been a notable decrease in the amount of physical activity that children and adolescents engage in. This lack of physical activity has become one of the primary factors contributing to the rise in body weight and the decline in motor competence among children.

It is a set of abilities that the kid acquires from birth, and during the first two years of life, it is primarily intensive. It is composed of the sensory, motor, and mental systems, as well as a connection between language and the social area of the child. Psychomotor development is described as the set of skills that the child acquires. The development of the kid

as an individual is a process that involves ongoing change. During this process, the child begins to master increasingly sophisticated levels of movement, thought, and connections with other people, objects, and the environment.

Practice is the foundation of learning, and according to Schmidt, motor learning is defined as the internal processes associated with practice that cause relatively permanent changes in motor ability. These changes occur as a result of adequate stimulation for a relative and permanent improvement in the performance of motor skills. All of the actions that are performed, from the most basic ones performed by children to the most complicated ones performed by elite athletes, are the product of a process of skill acquisition that is progressive. Motor learning is not a process that progresses erratically and randomly; instead, it is a process that takes place in an ordered and linear manner, following several phases or stages that may be characterized as being common to all individuals. This underscores the fact that all new learning is organized sequentially and progressively, incorporating the structures that have been learned into the different structures that are developed.

ASSESSMENT OF THE CURRENT NUTRITIONAL STATUS

Because of the influence that deficiency states have on newborn morbidity and mortality, nutritional evaluation in pediatrics has traditionally been focused on the identification and classification of deficiency states. This is understandable, given the relationship between these two factors. The individual case, on the other hand, requires the application of a stringent diagnostic procedure to identify not only malnutrition but also overweight and obesity, the incidence of which has dramatically increased over the many years that have passed. When using international references for the evaluation of the nutritional status of the children who were studied, according to the Z score of weight for height, height for age, and weight for age independently, the majority of children were classified as falling within the range of normality. The number of people who were malnourished was not alarming. One of the most significant discoveries was the percentage of overweight children that was discovered, which coincided with the worldwide trend towards obesity in young children.

Weight for height, height for age, and weight for age are the three anthropometric indices that have been utilized most frequently for their measurement. Weight-for-height deficit, also known as acute malnutrition (AD), is characterized by a reduction in body mass and is typically the result of an acute bout of viral sickness or a significant decrease in the amount of calories consumed that are consumed. Deficit in height for age, often known as chronic malnutrition (CD),5 indicates a reduction in linear growth over time. For population research, the weight deficit for age, also known as global malnutrition, is more imprecise and may or may not include Alzheimer's disease and chronic fatigue syndrome. The restriction of "-2 standard deviations" is utilized as a cut-off point in every situation; children who go below this limit have a nutritional deficit. This study includes an analysis of the first two indices. The analysis is based on the latest WHO references, which provide us with a credible foundation upon which to make comparisons.

Height for age and weight for height are the two components that make up the global malnutrition indicator. As a result, the indicator categorizes children into groups that may be normal or extremely thin. Since a child who is short for their age for causes that are either genetic or secular may give the impression of being malnourished without actually being malnourished, this indicator is not remarkably accurate. Additionally, children who are of standard height but have a low weight for their height may go unrecognized. Consequently, the weight/age index is less relevant than the other indicators in cross-sectional studies such as this one. On the other hand, it is more valuable in the clinical sector and individual follow-up examinations. Because severe cases of malnutrition in the community are, in general, less frequent than cases of mild or moderate malnutrition, and because severe cases of malnutrition cannot be easily detected in a single evaluation without having previous references for each child, the relatively low values that were found in this study could be the result of this.

An evaluation was conducted on a group of forty-one children using anthropometric (weight for height), biochemical (hemoglobin, serum iron, and serum vitamin A), and nutritional indicators (a semi-quantitative consumption frequency survey). At the same time, the percentages of adequate food intake of calories, protein, and the majority of vitamins were

high. On the other hand, iron and vitamin A presented an unfavorable situation, as 44 and 22 percent of children did not reach 70 percent of the required daily intake, respectively. Among the children, it was discovered that 14.7% of them had anemia, and 55.2% of them had serum iron values that were lower than 13 μmol/L. It is possible that the consumption of fortified milk and the fact that 67% of the children were supplemented with multivitamin preparations that contained vitamin A were related to the fact that all of the children had serum vitamin A values that were within the normal range, even though their intake was low. As of the tenth, 2% of the children were considered to be underweight, while 18% were considered to be overweight. It is strongly suggested that the family physician develop educational initiatives about nutrition, particularly those that focus on dietary patterns that are abundant in iron and vitamin A.

CONCLUSION

In its most fundamental form, the nutritional status of children is inextricably linked to the process of growth and development that occurs throughout the many phases of life. It is an internal condition of the individual that relates to the availability and utilization of energy and nutrients at the cellular level. When the genetic information is sufficient, and the environment is favorable, ideal conditions are created to achieve growth and development by the genetic potential of the family. These factors include the provision of enough nutrition in terms of both quantity and quality, as well as appropriate psychosensory stimulation.

During the process of developing the study procedure, it was discovered that beginning at the age of six months, infants require additional foods that are suitable for eating in addition to breast milk. These foods are essential for their growth and development. When children reach the right age, they should be given complementary foods, which will allow them to incorporate vitamins and minerals into their diet through the consumption of food. According to the information that we have, food is one of the key pillars in the health of children. This is because children obtain the energy and nutrients that are necessary for their development through the consumption of food. In many instances, proteins, carbohydrates, lipids, or fats serve as cofactors or catalysts in the metabolic process, which enables them to supply energy, which is required during childhood, as well as vitamins and minerals that are essential for growth. Cells and other elements, such as calcium, phosphorus, and magnesium, are involved in the development of tissues. It is for this reason that the supplementary feeding of newborns should place a strong emphasis on the incorporation of minerals like calcium, iodine, zinc, and iron, as well as vitamins like A and D.

In conclusion, it is possible to conclude that the nutritional quality of preschool lunch boxes is dependent on the knowledge of the caregiver. However, in recent times, there has been an increase in the presence of industrialized foods, an increase in the amount of carbohydrates, and a decrease in the amount of fruits and vegetables. This is because the person who is responsible for their care has a low level of knowledge.

REFERENCE

- Baker, R. D., Greer, F. R., & Nutrition, C. o. (2010). Diagnosis and prevention of iron deficiency and iron-deficiency anemia in infants and young children (0–3 years of age). *Pediatrics*, *126*(5), 1040-1050.
- Cunha, A. J. L. A. d., Leite, Á. J. M., & Almeida, I. S. d. (2015). The pediatrician's role in the first thousand days of the child: the pursuit of healthy nutrition and development. *Jornal de Pediatria*, *91*, S44-S51.
- Demmer, E., Cifelli, C. J., Houchins, J. A., & Fulgoni III, V. L. (2018). The pattern of complementary foods in American infants and children aged 0–5 years old—a cross-sectional analysis of data from the NHANES 2011–2014. *Nutrients*, *10*(7), 827.
- Demmer, E., Cifelli, C. J., Houchins, J. A., & Fulgoni, V. L. (2018). Ethnic disparities of beverage consumption in infants and children 0–5 years of age; National Health and Nutrition Examination Survey 2011 to 2014. *Nutrition journal*, *17*, 1-9.
- Deoni, S., Dean III, D., Joelson, S., O'Regan, J., & Schneider, N. (2018). Early nutrition influences developmental myelination and cognition in infants and young children. *Neuroimage*, *178*, 649-659.

Duggan, C., Watkins, J. B., Koletzko, B., & Walker, W. A. (2016). *Nutrition in pediatrics: basic science, clinical applications* (Vol. 1). PMPH USA, Ltd.

Ertem, G., & Ergün, S. (2013). Traditional practices and beliefs regarding nutrition of children in the 0-5 age group in western Turkey: A qualitative study.

Greer, F. R., Sicherer, S. H., Burks, A., Nutrition, C. o., Allergy, S. o., & Immunology. (2008). Effects of early nutritional interventions on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. *Pediatrics*, *121*(1), 183-191.

Iyengar, G. V., & Nair, P. P. (2000). Global outlook on nutrition and the environment: meeting the challenges of the next millennium. *Science of the Total Environment*, *249*(1-3), 331-346.

McAfee, A. J., Mulhern, M. S., McSorley, E. M., Wallace, J. M., Bonham, M. P., Faure, J., Romain, S., Esther, C., Shamlaye, C. F., & Watson, G. E. (2012). Intakes and adequacy of potentially essential nutrients for cognitive development among 5-year-old children in the Seychelles Child Development and Nutrition Study. *Public health nutrition*, *15*(9), 1670-1677.

Michaelsen, K. F. (2000). *Feeding and nutrition of infants and young children: guidelines for the WHO European region, with emphasis on the former Soviet countries*. WHO Regional Office Europe.

Naidoo, S. (2013). Oral health and nutrition for children under five years of age: a pediatric food-based dietary guideline. *South African Journal of Clinical Nutrition*, *26*, S150-S155.

Nurliyana, A. R., Mohd Shariff, Z., Mohd Taib, M. N., Gan, W. Y., & Tan, K.-A. (2016). Early nutrition, growth and cognitive development of infants from birth to 2 years in Malaysia: a study protocol. *BMC Pediatrics*, *16*, 1-7.

Organization, W. H. (2019). Essential nutrition actions: mainstreaming nutrition through the life course.

Pietrobelli, A., Agosti, M., & Group, M. (2017). Nutrition in the first 1000 days: Ten practices to minimize obesity emerging from published science. *International Journal of Environmental Research and Public Health*, *14*(12), 1491.

Riley, L. K., Rupert, J., & Boucher, O. (2018). Nutrition in toddlers. *American Family Physician*, *98*(4), 227-233.

Rosales, F. J., Reznick, J. S., & Zeisel, S. H. (2009). Understanding the role of nutrition in the brain and behavioral development of toddlers and preschool children: identifying and addressing methodological barriers. *Nutritional neuroscience*, *12*(5), 190-202.

Saavedra, J. M., & Prentice, A. M. (2023). Nutrition in school-age children: a rationale for revisiting priorities. *Nutrition Reviews*, *81*(7), 823-843.

Weker, H., Barańska, M., Riahi, A., Strucińska, M., Więch, M., Rowicka, G., Dyląg, H., Klemarczyk, W., Bzikowska, A., & Socha, P. (2017). Nutrition of infants and young children in Poland–PITNUTS 2016. *Journal of Mother and Child*, *21*(1), 13-28.

Wu, T.-C., & Chen, P.-H. (2009). Health consequences of nutrition in childhood and early infancy. *Paediatrics & neonatology*, *50*(4), 135-142.