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Impact of Nutritional Health on Children's Achievement

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ABSTRACT: Growling stomachs, fatigue and brain fog: Every day, millions of kids around the world go to school on empty stomachs. For many, a school meal is the only food they have each day.

“We know that a hungry child cannot learn, a hungry child cannot grow and a hungry child cannot reach their full potential,” says World Food Program USA CEO Baron Segar. “It’s our responsibility to make sure that over 15 million schoolchildren, every single year, have a daily meal so that they can stay in school.”

Nutritious food is essential not only for a child’s healthy growth, but for their academic performance as well. For impoverished families around the world, school meals help keep children in the classroom rather than working at home or entering early marriages. Children can then continue their education and secure a future for themselves, their families and communities.

Let’s explore how school meals and the work of United Nations World Food Programme (WFP) help break the cycle of poverty.

KEYWORDS: nutrition, health, children, achievements, school, meals, education, poverty

I. INTRODUCTION

It takes a lot of energy to think. In fact, around 20% of our daily calories are used as fuel for our brains. Some studies tell us that more challenging cognitive work burns more calories.

For a child’s brain to develop, they need a host of essential nutrients, from the right balance of protein, fats and carbohydrates to vitamins, minerals and water. Micronutrients like iron, zinc, choline, iodine, folate, B12, and healthy fats are also vital to cognitive development and learning.[1,2,3]

Without the right nutrition, children’s healthy development is put at risk. Nutrient shortages can reduce brain cell production, impact cell size and complexity and even lead to less efficient communication between brain cells. This could result in slower language development, impaired fine motor skills and lower IQ, all of which causes negative impacts on a child’s life in and out of the classroom

The right balance of nutrients during the early stages of life is critical for brain development, promoting cognitive development long into adult years.

Today, 45 million kids are suffering from severe malnutrition. Without treatment, they could experience delayed cognitive development, which can hurt their academic performance in the years to come.

School meals are a vital intervention for children’s healthy development. Yet, 73 million children in primary school living in extreme poverty don’t have access to school meals.

When kids don’t have access to food at school, it leads to a vicious cycle of hunger, school absences and poverty. There are millions of children – particularly girls – who don’t go to school because their families need them to help in the fields, take care of siblings or perform domestic duties. In war-torn countries, kids are twice as likely to be out of school than their peers in stable countries. This rises to 2.5 times more likely for girls. When kids miss school, they miss out on important developmental milestones such as understanding basic math concepts or reading and writing skills



“A daily meal serves as a very, very strong incentive for families to keep sending their children to school,” Segar said. “But by providing those meals for kids, we see around a 9% increase in enrollment (12% for girls).”

Nutritious school meals can transform a child’s life. These meals help to combat hunger, malnutrition and poverty by providing vital nutrition, promoting school attendance and ongoing learning, and supporting long-term health and well-being. School meals also boost attendance and graduation rates by giving students the nutrition they need to stay healthy, strong and focused on their studies.

The U.N. World Food Programme helps keep millions of kids in the classroom and focused on their lessons by providing nutritious school meals, snacks and take-home ingredients. We’re the world’s largest provider of school meals, reaching more than 20 million children in 59 countries around the world.[4,5,6]

School meals: Increase school enrollment and attendance: In Bangladesh, nutrient fortified biscuits have improved school enrollment by 14.2% and reduced the probability of drop-outs by 7.5%. In Madagascar, attendance rates increased from 88% to 98% over two years after the introduction of take-home rations.

Improve children’s focus: In South Sudan, 13-year-old Joyce wants to be a pilot when she grows up. “I like going to school because I like to learn and be with my friends,” she says. “I like the food here because it helps me learn better.”

Reduce financial burdens: James is another student at Joyce’s school. He hopes to become a doctor one day. “I lost my father, and my family doesn’t have a lot of money,” he says. “So, I work as a boda boda (motorcycle) driver to pay for my education and support my family.” A daily school lunch for James and his siblings means one less meal for him to worry about paying for every day. School meals help to alleviate poverty and offset social norms that keep young girls out of the classroom. The value of a school meal is equivalent to about 10% of a household’s income. That means parents can save their money for other pressing needs. These savings also motivate parents to send their children, including girls, to school each day.

In Cambodia, with clouds of red dust in their wake, 14-year-old Heng Ouy and her 12-year-old sister Sheya ride their second-hand bicycles to school every morning. Their parents had to put five months of savings towards buying each bike. Money is tight at home, so a school-provided breakfast Hengy Ouy and Shreya receive every day is of enormous help to their family. “I want to be a teacher when I grow up,” says Heng Ouy. “I want to help my parents, so they no longer have to struggle.” “Everywhere we implement school feeding, we see that disproportionately girls stay in school for longer,” says Carmen Burbano de Lara, director of the school feeding division at the U.N. World Food Programme’s headquarters in Rome. “The longer a girl stays in school, the less likely she is to marry or have children very early in life, which gives her a better start.”

School meals programs can strengthen local economies. Through the U.N. World Food Programme’s homegrown school meals program, the ingredients for school meals are sourced from small-scale farmers. This boosts economies and combats poverty by increasing farmers’ incomes. Every dollar invested in school meals yields up to \$10 in economic return for the communities we serve. Well-nourished and educated children are better equipped to grow up to find work, become leaders in their communities and raise their own families. By continuing their studies, staying in school and avoiding the irreversible effects of childhood malnutrition, kids develop the cognitive, physical and social abilities to build healthy and productive lives for themselves and their communities.[7,8,9]

With something as simple and crucial as school meals, we’re empowering the next generation of doctors, scientists, inventors, teachers, artists, leaders and more.

II. DISCUSSION

Normal brain development requires adequate nutrition. Nutrition is especially crucial during pregnancy and infancy, when the brain is developing and laying the groundwork for cognitive, motor, and socio-emotional skills throughout adulthood and childhood. As a result, nutritional deficiencies during pregnancy and infancy are likely to have an impact on cognition, behavior, and productivity throughout the school years and into adulthood. Concentrating on this early period for nutrient deficiencies prevention could have long-term and prevalent advantages for individuals and communities.

Good nutrition is essential for early childhood development. Discovering about nourishment and its role in early childhood development, the differences between healthy and unhealthy eating habits.



Nutrition refers to the meals that provide our bodies with the energy they require to function. The nutritional value of meals we consume is determined by the substances we consume. Somebody whose nutrition mainly consists of fast food and carbonated beverages, for instance, is not eating nutritious foods. In comparison, someone who consumes a well-balanced diet rich in fruits and vegetables are more likely to consume nutritious foods.

Consuming a balanced and nutritious diet is essential throughout our lives, but it is especially important during childhood. Pre-schoolers between the ages of 2 and 5 grow 6 to 9 inches and gain 12 to 15 pounds on average. Significant brain development also occurs. Establishing healthy eating behaviors and providing nutritious options is critical to ensuring normal development in a variety of areas, including:

- Cognitive development, also known as brain development. This includes children's ability to develop language skills, short and long-term memory, and to make connections.
- Physical development refers to a child's actual physical growth, including height and weight.
- Children's emotional and social development, or their ability to form relationships with others and mature.

Parents influence their children's eating habits in a variety of ways, including actively making food choices for the family, serving as role models for dietary choices and patterns, and using feeding practices to reaffirm the development of eating patterns and behaviors that they deem appropriate. The characteristics of the child, such as age, gender, weight status, and eating behavior, also influence parenting practices. As a result, parent and child influence and react to one another's eating habits. Furthermore, parenting practices are frequently developed in response to parents' perceived threats to their children's health and development.[10,11,12]

Children can also gain knowledge about food by watching the eating habits of others. For example, studies show that watching adults consume fruits, vegetables, and milk increases children's intake of those foods. When children observed their peers' eating habits, the effect was similar in that vegetable selection and consumption increased. Thus, positive social modelling is an indirect but effective method of encouraging children to eat healthier. Concerned parents may try to limit what and how much food their child eats, pressure their child to eat a healthier diet, or reward their child for eating healthy foods, all of which may have unintended consequences. Excessive restriction of children's access to and consumption of highly palatable foods can lead to increased preference for, and overconsumption of, those restricted foods when they are available. Children who are severely restricted have poorer self-regulation of energy intake, which is associated with greater weight gain throughout childhood. Similarly, studies show that encouraging or pressuring children to eat more fruits and vegetables is associated with lower fruit and vegetable intakes and higher dietary fat intakes. Furthermore, using food as a reward may have unintended consequences in that rewarding child for eating healthy foods results in a decreased preference for those foods. These findings suggest that, regardless of why parents control their children's eating habits, excessive control may have a negative impact on child food intake and weight status.

Nutrition Impact on Child's Academics

While proper nutrition is essential for proper achievement, many of the commonly accessible and popular foods in schools today actually hinder children's learning abilities. Many popular menu items are loaded with sugars, caffeine, chemicals, and sodium, leaving children tired, unfocused, jittery, and sick—which not only affects students' grades and performance, but also influences their behavior and moods.

Unhealthy nutrition can lead to :

- Lack of energy and focus: The effects of glucose and sugars in higher-fat foods are one of the theories that explain the link between saturated fats and brain power. Essentially, glucose is derived from carbohydrates, and while glucose is required for energy, foods high in glucose actually cause a drop in energy levels. As glucose is consumed, the body produces insulin to process the newly acquired foods. Normally, after a healthy meal, glucose levels should rise slightly, and the body should feel energized.
- Malnutrition: Malnutrition/malnourishment is defined as a lack of proper food intake, and it implies more than just a lack of food; malnutrition also indicates a lack of nutrients. Researchers recently discovered that one-third of surveyed adolescents reported poor eating habits, chronic illnesses, and lower academic achievement. While foods are frequently readily available for children, they actually hinder their development. Not only have unhealthy foods been shown to have an impact on academic performance, but research also shows that a poor diet has an impact on a child's attitude and behavior, both in and out of school. Outside of school, parents should provide their children with smaller meals and snacks every three to four hours to promote healthy eating and brain function. According to



studies, a nutritious snack or meal can reduce feelings of fatigue and stress in as little as thirty minutes. Providing children with healthy glucose increases their energy and improves their focus.[13,14,15]

- Healthy nutrition can lead to
- Increased brain functionality: Several studies have found that nutritional status has a direct impact on mental capacity in school-aged children. Iron deficiency, for example, can reduce dopamine transmission, affecting cognition even in the early stages. Other vitamins and minerals, particularly thiamine, vitamin E, vitamin B, iodine, and zinc, have been shown to impair cognitive abilities and mental concentration. Supplementing with amino acids and carbohydrates can also improve perception, intuition, and reasoning. A number of studies have also shown that nutrient intake improvements can influence the cognitive ability and intelligence levels of school-aged children.
- Improvement of behavior and learning: Children who eat well arrive at school ready to learn. Even though better nutrition allows children healthier, they are more likely to miss fewer classes and attend more frequently. According to research, malnutrition causes behavioral issues, and sugar has a negative impact on child behavior. These effects, however, can be mitigated if children consume a well-balanced diet rich in protein, fat, complex carbohydrates, and fiber. As a result, students will have more time in class and fewer interruptions to their learning throughout the school year. Furthermore, students' behaviour may improve and cause fewer disruptions in the classroom, resulting in a better learning environment for all students.
- Positive school outcomes: Sociologists and economists have studied the impact of a student's diet and nutrition on academic and behavioral outcomes more closely. In general, researchers find that a higher quality diet is associated with better exam performance, and that programmes aimed at improving students' health also show modest improvements in students' academic test scores. Other studies have found that improving the quality of students' diets leads to more students being on task, higher math test scores, possibly higher reading test scores, and higher attendance. Furthermore, replacing soft drinks in school vending machines with other drinks had a positive effect on behavioral outcomes such as inattentiveness and disciplinary referrals.
- When a child is well-nourished from conception to infancy, the essential energy, protein, fatty acids, and micronutrients required for brain development are available during this foundational period, laying the groundwork for lifetime brain function. A well-nourished child can also interact with his or her caregivers and environment in a way that provides the experiences required for optimal brain development. Children who are malnourished are more likely to fall short of their developmental potential in cognitive, motor, and socioemotional abilities. Academic achievement and economic productivity are strongly linked to these abilities.
- Natural fruits and vegetables, whole grains, and lean proteins such as chicken, fish, nuts, and eggs should be included in healthy meals and snacks. Specific vitamins can also be included to target specific functions. Individuals should invest in foods high in lecithin, such as peanuts, soy beans, and wheat germ, for example, to improve memory. [16,17,18]Potassium, which is found in oranges, bananas, apricots, avocados, melons, peaches, and nectarines, also helps with energy and brain function. Avoiding processed foods and incorporating more natural foods into one's daily diet will result in a healthier body, behavior, and brain power.

III. RESULTS

Early childhood is the crucial time for a child's general, mental, physical, and logical development. We give them the best possible access to a quality life through right nutrition, best education, extracurricular activities, and resources. Children have a right to a nurturing, safeguarding environment as well as wholesome food and essential medical care to keep them healthy, foster growth, and support development. let's talk about Importance of health and nutrition in children. Getting enough calcium, iron, and vitamins A, C, and D through proper nutrition is guaranteed. If a teen participates in sports, follows a particular diet, has an eating issue, they may require even more nutrients.

“Adolescents need more nutrients than adults because they gain at least 40 percent of their adult weight and 15 percent of their adult height during this period. (Jacob and Nair 2012).1”

Inadequate nutrition during the first 1000 days of a child's life can also result in stunted growth, which is linked to cognitive impairment and poorer performance in school and the workplace.

Importance of health and nutrition in children:

- it boosts a child's ability to fight off infectious diseases,
- promotes healthy brain and other organ development, and
- enhances their level of activity and cognitive ability.



As per WHO, “In the first 2 years of a child’s life, optimal nutrition fosters healthy growth and improves cognitive development. It also reduces the risk of becoming overweight or obese and developing noncommunicable diseases later in life. Advice on a healthy diet for infants and children is similar to that for adults, but the following elements are unique to infants and children.”

Healthy eating during for a healthy childhood:

- Parents and other adults who are responsible for children should set a good example for healthy eating, drinking, and physical activity.
- Provide fruit, vegetables, low-fat dairy, lean proteins, water, and sugar-free refreshments as well as healthful snacks and beverages.[17,18,19]
- Schedule family dinners.
- Encouraging your child to help with meal preparation, grocery shopping, and cooking.

How to promote a healthy diet?

According to WHO, “Diet evolves over time, being influenced by many factors and complex interactions. Income, food prices (which will affect the availability and affordability of healthy foods), individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape individual dietary patterns.”

The measures of healthy eating habits:

The ideal eating routine for a child’s growth and development takes into account the child’s age, level of activity, and other factors.

Nutrient rich food is defined as having little to no added sugar, saturated fat, or salt and is high in nutrients. Children can acquire the nutrients they require while consuming fewer calories overall by focusing on nutrient-dense foods.

The diet should include nutrient-dense foods:

- Dairy: Inspire your child to consume fresh dairy products like milk, yogurt, and cheese. Dairy products also include fortified soy beverages.
- Protein: Select lentils, beans, peas, soy products, seafood, unsalted nuts and seeds.
- Fruits: A variety of fresh or dried fruits should be consumed by your youngster. Try to consume fresh juices and freshly cut fruits. Remember that one serving of fruit equals 1/4 cup of dry fruit. And it is advised to soak dry fruits before consumption.
- Vegetables: Several fresh veggies should be offered. Each week, select peas or beans together with green vegetables. Use vegetables that are lower in salt when making your selection or add less salt to the prepared curries.
- Grains: Choose whole grains like oatmeal, popcorn, quinoa, brown or red or locally sourced brown rice, whole-wheat or multigrain chapatis, porridge etc.
- Aim to limit your child’s calories from:
 - Processed sugar: Sugar that occurs naturally, including those in fruits and milk, is considered as natural sugar. eatforhealth.gov.au/.../n55f_children_brochure.pdf
 - Saturated fats: Look for ways to substitute vegetable and nut oils, which include important fatty acids and vitamin E, for saturated fats when cooking. Consume fried and junk food infrequently.
 - Salt: Iodized salt is beneficial for health, however processed foods with high salt content, such as pizza, pasta dishes, and soup, can harm the body and weaken the bones.

Children need to eat more as they grow. A child should include:

Ages 2 to 4: Daily guidelines for girls

Calories	1,000 to 1,400, depending on growth and activity level
Protein	2 to 4 ounces
Fruits	1 to 1.5 cups



Vegetables 1 to 1.5 cups

Grains 3 to 5 ounces

Dairy 2 to 2.5 cups

Ages 2 to 4: Daily guidelines for boys

Calories 1,000 to 1,600, depending on growth and activity level

Protein 2 to 5 ounces

Fruits 1 to 1.5 cups

Vegetables 1 to 2 cups

Grains 3 to 5 ounces

Dairy 2 to 2.5 cups

Ages 5 to 8: Daily guidelines for girls

Calories 1,200 to 1,800, depending on growth and activity level

Protein 3 to 5 ounces

Fruits 1 to 2 cups

Vegetables 1.5 to 2.5 cups

Grains 4 to 6 ounces

Dairy 2.5 cups

Ages 5 to 8: Daily guidelines for boys

Calories 1,200 to 2,000, depending on growth and activity level

Protein 3 to 5.5 ounces

Fruits 1.5 to 2 cups

Vegetables 1.5 to 2.5 cups

Grains 4 to 6 ounces

Dairy 2.5 cups

Ages 9 to 13: Daily guidelines for girls

Calories 1,400 to 2,200, depending on growth and activity level

Protein 4 to 6 ounces

Fruits 1.5 to 2 cups

Vegetables 1.5 to 3 cups

Grains 5 to 7 ounces



Dairy 3 cups

Ages 9 to 13: Daily guidelines for boys

Calories 1,600 to 2,600, depending on growth and activity level

Protein 5 to 6.5 ounces

Fruits 1.5 to 2 cups

Vegetables 2 to 3.5 cups

Grains 5 to 9 ounces

Dairy 3 cups

Ages 14 to 18: Daily guidelines for girls

Calories 1,800 to 2,400, depending on growth and activity level

Protein 5 to 6.5 ounces

Fruits 1.5 to 2 cups

Vegetables 2.5 to 3 cups

Grains 6 to 8 ounces

Dairy 3 cups

Ages 14 to 18: Daily guidelines for boys

Calories 2,000 to 3,200, depending on growth and activity level

Protein 5.5 to 7 ounces

Fruits 2 to 2.5 cups

Vegetables 2.5 to 4 cups

Grains 6 to 10 ounces

Dairy 3 cups

- 2 to 3 years: 1 serve of fruit; 2½ serves of vegetables; 4 serves of grains; 1 serve of meat/poultry; 1½ serves of dairy
- 4 to 8 years: 1½ serves of fruit; 4½ serves of vegetables; 4 serves of grains; 1 ½ serves of meat/poultry; 1½ to 2 serves of dairy
- 9 to 11 years: 2 serves of fruit; 5 serves of vegetables; 4 to 5 serves of grains; 2½ serves of meat/poultry; 2½ to 3 serves of dairy
- 12 to 13 years: 2 serves of fruit; 5 to 5 ½ serves of vegetables; 5 to 6 serves of grains; 2 ½ serves meat/poultry; 3 ½ serves dairy

IV. CONCLUSION

A balanced diet is essential for children’s growth and development during these years. It aids in laying a strong foundation for good eating habits and preserving health in the child from an early age as it prepares them for a lifetime of maintaining a healthy and balanced lifestyle, appropriate nutrition for children is crucial. [20]



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