

# Food Habits and Their Influence on Learning

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**Abstract---***Currently, it is necessary for students to receive a balanced diet, according to the different stages of their development that benefits school learning. The eating habits acquired by different social, economic and cultural factors, could favor or alter the intake of nutrients necessary for the intellectual development and nutritional status of the infant, especially in rural and peri-urban areas where the acquisition and consumption of food is limited. Especially in different developing countries. The objective of this work is to analyze eating habits and their influence on student learning in middle childhood. Bibliographic, inductive-deductive and analytical review methods were applied. It is concluded that adequate nutrition positively influences learning and that eating habits are built in the school stage being conditioned to socio-cultural and economic aspects of families.*

**Keywords---***Eating habits, balanced feeding, nutrient, nutritional status, school learning, socio - economic factors.*

## I. Introduction

Eating habits have had numerous modifications over time, significantly influencing the individual's diet and biological functions. Especially in school-age children, an important time in the advancement of learning, since the contributions of essential macronutrients and micronutrients have a fundamental role in activating knowledge. Furthermore, changes in children's diet involve various factors (De La Cruz, 2015). Among these are the socio-economic aspects, family, cultural, educational circles and food customs typical of each area or country in which the minor operates both at home and the educational unit he attends.

Similarly, these scenarios that surround the nutritional and educational field can create obstacles in the progress of teaching and learning of the student (Torres, Contreras, Lippi, Huaiquimilla, & Leal, 2019). They report that these barriers cause an imbalance in the acquisition of healthy eating habits, either due to ignorance of nutritional education or the socio-cultural environment. According to (unicef, 2019), middle or transition childhood is the time when children begin basic education and, together with social aspects, intervenes in the availability and selection of the food they consume. In developing countries, especially in rural or peri-urban areas, food consists of breads, cereals or tubers, leaving aside meat, dairy or vegetables that would provide them with the proteins, vitamins and minerals for their physical and intellectual development.

On the website (IBRD + ALF, 2018), it is described that more than 150 million children worldwide suffer from malnutrition because they do not have basic services, conditioned to the lack of health. Therefore, access to a balanced diet is minimal, impairing children's growth and cognitive development, which is limited by the absence of neonatal care by the mother and the lack of early stimulation. Consequently, the neural connections are affected by not receiving the essential nutrients for the synapse in the learning process, therefore it damages the school performance.

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In Spain, they consider that the adequate distribution of food provides the essential nutrients that intervene in the acquisition of knowledge (Cubero J., et al., 2017). In this case, a nutritionally balanced breakfast is made up of foods such as cereals, dairy products and fruits rich in macronutrients such as carbohydrates, proteins and fats essential in the processes of child growth, physical and intellectual development, as well as the micronutrients, vitamins and minerals that are the biological aids in the stimulation of learning and in the progress of intellectuality.

The middle childhood stage is characterized by the ability to select foods according to taste, availability of time, or socioeconomic or cultural conditions. (González, Trave, & Garcia, 2018). In this study, seven out of ten students surveyed decide on hypercaloric foods such as artificial juices, sugary soft drinks, sausages and snacks; such as cookies, chips, etc. Unhealthy food products triggered inappropriate eating habits, harming the nutritional and learning process throughout this stage of school.

Likewise, the nutritional status and intellectual process of boys and girls is affected by lack of food, be it due to socio-economic factors or lack of access to a balanced diet. Studies by the (ECLAC, 2018) mentions that the prevalence of malnutrition by contrast deficits in some countries, as the case of Argentina, Brazil, Chile and Jamaica where overall malnutrition fell 2.5% instead in other countries such as Guatemala, Guyana and Haiti, global malnutrition increases by 10%, causing an imbalance in the physical and mental health of children.

On the contrary, in Chile, the eating habits of some schoolchildren are related to personal preferences, beliefs and customs (Ruiz, et al., 2017). Some studies of the last thirty years, malnutrition due to excess has increased in the infancy stage, 34% in children younger than 6 years, with a predominance of hypercaloric diet; leaving aside foods such as vegetables, lean meats, skim dairy products and essential nuts, since they provide the essential macronutrients and micronutrients for brain development, an essential organ in the individual's learning processes, especially in the education stage basic.

Likewise in Ecuador, inadequate food practices are generating malnutrition due to deficit and impaired cognitive abilities that intervene in the learning process (Ministry of Public Health, 2018), states that approximately 27 thousand students would repeat some school year due to malnutrition Childhood chronic, that is, 33% of students nationwide repeat the academic year due to the effects of chronic malnutrition caused by an unbalanced diet in nutrients essential for educational performance.

In the same way, in the Cascol Parish of the Paján canton, Ecuador, in a rural school the relationship of eating habits and learning in students was identified. (Reyes, 2019) describes that 43% do not have adequate eating habits, while learning 41% is at an average level of educational performance, conditioned by the psychological-social, demographic and economic environment that surrounds students. These alterations in food intake would affect the contributions of macronutrients and micronutrients essential for biological functions related to cognitive aspects, triggering an imbalance in the process of teaching and learning for children at school age. The objective of this research is to analyze eating habits and their influence on learning in middle childhood students.

## **II. Materials and methods**

The updated bibliographic character or bibliographic review is the starting point of the present investigation, where the previous knowledge of theoretical-practical investigations of the subject was based (Gomez, Navas, Aponte, & Luis, 2014), the The most relevant contents of the research through bibliographic documents, among which are

articles in indexed journals, theses, books, manuals and updated institutional data with a period of antiquity of 5 years, together with old documents or books that are the fundamental basis of all research science.

Likewise, the analytical method allowed to deepen the opinions, descriptions and results of the various scientific articles, theses, documents accredited by institutions or educational manuals for the development of research (Lopera, Ramírez, Zuluaga, & Ortiz, 2010), facilitating the analysis of the content and the emergence of new contributions to the investigated topic. The inductive-deductive method was also used, which allowed investigating information from broad contents to the construction of meaningful knowledge (Hernández, Fernández, & Baptista, 2010), which made it possible to investigate eating habits and their influence on learning.

### **Eating habits**

They are considered as customs or practices that are acquired from childhood to adulthood and are involved in feeding. According to (WHO, 2018) these eating practices start from the first months of the child's life, lactation period until school and adulthood. The latter influence the choice, preparation and intake of food. On the other hand, it is essential to point out that dietary routines are conditioned by social, cultural and economic circumstances.

Also, some changes in current lifestyle have an erroneous impact on eating routines (Sayán, 2018), such as long working hours, limited time to prepare food, sedentary lifestyle; adding the excessive publicity of the media that induces the consumption of pre-cooked, canned or fast food products; aimed at wrong food selection in addition to harming the dietary practices of society. It should be mentioned that this kind of habits interferes with eating behavior. Which forms a dynamic duo between the individual with the choice of food (Ávila, Gutiérrez, Martínez, Ruíz, & Guerra, 2018), the family has a great impact on the routine and selection of these; mainly in the school stage where the infant already has the decision-making capacity when consuming.

Food choices are becoming stronger in the school environment, which depends on the nutritional education that is promoted in some educational units (Piaggio, Concilio, Macedra, & Dupraz, 2011), some bars or school canteens have no control in the sale of food, predominantly snacks made with saturated fats, simple sugars, among others, producing an imbalance in the distribution of nutrients that affect the biological functions of the infant. On the other hand, healthy eating habits are strengthened with nutritional training and the application of intervention programs (UNESCO, 2017), contributing to the strengthening of balanced eating habits to strengthen the nutrition and lifestyle of infants, benefiting both to the school environment and home where the learners operate.

Likewise, for the child to acquire correct feeding practices it will depend on a procedure that demands tolerance, equitable agreements and mutual support from both parents and community trainers. (Gay, 2016) specifies that eating habits learned and practiced correctly from childhood will influence the selection of healthy foods in the adolescence and adulthood stage. In short, the eating habits that the infant developed reflects them in the diet of his daily life. Ideally, it should be complete, balanced, sufficient and adequate (Saltos, 2012), indispensable for the activation and progress of brain functions that favor school learning.

### **Balanced**

Diet Biological and voluntary process that consists of the intake of food groups in a balanced way in order to obtain the indispensable chemical substances called macronutrients and micronutrients for the physiological functions of the organism. (Moreno & Galiano, 2015) reports that in the school stage, the infant needs to consume the food groups in an equitable way to favor the growth and development of the intellectual capacities that intervene in learning.

### Feeding of learners in middle childhood

In the stage between 6 and 12 years, food intake should provide enough energy for the biological and physiological progress of the infant (Ros & Ros, 2007), especially, the strengthening of nutritional status and cognitive functions, Figure 1 shows the food groups and the ration at the school stage.

Table 1. Food groups and the ration in the school stage

Food group	Description	Rations
Grains and their derivatives	Wheat, corn, quinoa, rye	4-6
	Breads, pasta, rice, potato,	Rich in carbohydrates.
Tubercles	banana, cassava	Integral preference
Fruits and vegetables	Banana, apple, orange,	2-3
	pineapple, etc.	Contains carbohydrates,
	Tomato, carrot, spinach, etc.	vitamins and minerals.
Dairy products and derivatives	Milk, yogurt, cheese	2-3
		Fat, proteins, vitamins and minerals
Meat, egg, legume, nuts	Red meat, chicken, fish, etc.	2
	Lentils, chickpeas, beans, peanuts, walnuts, etc.	Proteins, fat, vitamin, minerals Lean
Oil	Sunflower, olive, corn, soy, canola	Few quantities
Fats and sugars	Margarine, butter, sweets, pastries	Limited

In addition, the food groups intervene in the biological activities of the organism (Arismendi, 2009) mainly in cellular metabolism, tissue construction, regulation of the immune system. In some cases, the nutritional enrichment of food products is chosen, mainly when the needs of the infant warrant it.

### Healthy diet at school stage

It is the set of foods that the child eats during the day and must meet the energy requirement necessary for the activities of his daily life (Escott-Stump, 2011), the total calories of infants from 4 to 8 years old are 1742 kcal /day. On the other hand, for boys or girls between 9 to 13 years old, the caloric requirement ranges from 2071 to 2279 kcal / day. In addition, the caloric distribution of the diet is made in 5 meals or intakes daily (Atie, et al., 2012), which are breakfast, mid-morning, lunch, mid-afternoon and dinner. It depends on the physical activity and the nutritional status of the scholar increases or decreases the energy distribution.

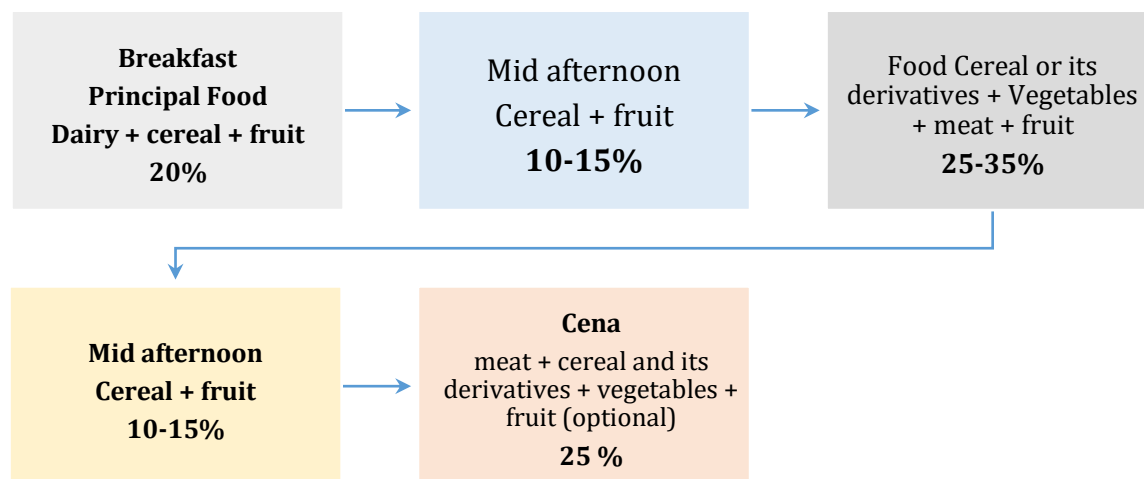


Figure 1. Distribution of the daily intake in school age

Nutrients are chemical substances obtained from food intake, also involved in different metabolic processes (Carvajal, 2013), explains that these nutrients are essential, the body needs to obtain them through balanced nutrition. The absence or decrease of this cause malnutrition due to deficit or excess. These biological substances are divided into macronutrients and micronutrients. The former has the main functions (Medina & Panama, 2017), provide a large amount of energy and intervene in metabolism and cell renewal. On the other hand, micronutrients are considered metabolic aids, facilitating chemical reactions linked to anabolism and catabolism of the body's biological and physiological processes. Table 2 shows the macronutrients, caloric distribution in schoolchildren, and micronutrients.

Table 2. Macronutrients, caloric distribution in schoolchildren and micronutrients

Macronutrients			Micronutrients	
Carbohydrates	Proteins	Fats	Vitamins	Minerals and trace elements
4 kcal / gram	4kcal / gram	9kcal / gram	mg / ug small amount	m / ug small amount

of total Calories	45 to 65% of total calories	10 30% of total calories	25 to 35% of total calories	Vit C, B complex (Water soluble); Vit A, D, E, K  (Fat soluble)	Ca, Fe, Zn, F, P, K, Mg, Na, I, Se, Mn
function	Energy l	Structura	Reserve, insulator and lubricator	Biological regulators in the metabolism cho, pro and a. Fatty  Antioxidant	Bone and tooth structure, muscle contraction and relaxation  Neuromuscular activity,
fuel (brain)	Cellular tissue, bone and skin attachments, blood vessels	Muscle	Reserve energy.  Delays water loss	absorption of calcium, iron, calcium.	Maintain hemoglobin, cognitive function, attention or learning
proteins	Saving of rs of hormones and enzymes	Regulato	Protectiv e armor of the organs It	intervenes in the formation of DNA,  Vision It	intervenes in the synthesis of proteins and nucleic acids

Nutritional state, is the physical condition of the individual related to food consumption and the use of nutrients in the body, this nutritional balance depends on some socio-economic factors (Dutan, 2019), which influence insufficient or excessive intake of nutrients, which conditions malnutrition due to deficit or excess. In school-age children, mainly in areas where health conditions are not ideal and access to certain food groups is restricted, it leads to the appearance of malnutrition due to energy-protein deficiency together with alterations of vitamins or minerals (Naik, Itagui, & Patil, 2015), causing negative changes at the academic level, which conditions that the organism does not receive the energy and the metabolic regulators that participate in the processes of physical and intellectual growth. Nutritional alteration due to excess intake of hypercaloric foods plus the decrease in energy expenditure, triggers overweight or obesity in infants (Machado, Gil, Ramos, & Pirez, 2018), especially in middle childhood where they develop the ability to choose foods, which is directed more to personal preferences or tastes than nutritional benefit.

### **School learning and nutrition**

The brain is the great biological machine of our organism and needs energy for neurophysiological activities, glucose is almost the biological fuel that enables the activation of cognitive functions that lead to the construction of learning (Oates, Karmilof, & Johnson, 2012) with the participation of carbohydrates, proteins, fats, vitamins and minerals, which are part of the synaptic functions that involve the uptake, compression, memory and oral or written expression, especially in middle childhood, period between 6 to 12 years where the learning processes operate (Cordero, 2017) as reading-writing or logic-mathematics, which are essential knowledge in elementary basic education.

### **Construction of learning**

The neural connection or synapse is the fundamental basis for the formation of knowledge (Ortega & Franco, 2010), these interconnections are activated by a stimulus of mental or motor origin, for example: listening to a song, watching a movie, visiting an interesting place etc. When the impulse enters, the neurons pick it up and transfer it to the thalamus, from there it is sent to the hippocampus where they transmit various signals to the different parts of the brain. On the other hand, neurons are the main protagonists for the transfer of stimuli and need the help of micronutrients such as sodium and potassium to send nerve impulses through dendrite cell bridges or nerve branches of neurons (Sampedro, 2016), These neuronal actions intervene in the neurotransmitters or biomolecules found within the axon, driving the nerve impulse to the dendrites of the neighboring neuron.

Also, these neurotransmitters are excitatory as glutamate or inhibitory (gamma-aminobutyric) that are activated at the moment the stimulus produces an electric current causing excitation or inhibition from the axon of the neuron towards the dendrites of the cell nervous neighbor, forming connections; which favors the emission of neural messages, strengthening interneuronal communications that will participate in the student's learning process. Furthermore, these neural connections allow the development of neuroplasticity, which transforms the structure and function of the brain; mainly the stimuli it receives from the environment. (Barrios, 2016) describes how the neural intercommunication ability, which reorganizes information from the outside, modifies it through cognitive and emotional processes, thus strengthening new acquired knowledge. Therefore, the construction of learning depends on the interaction of the body's cells with the nutrients obtained through food (Calceto, Garzón, Bonilla, & Cala, 2019) forming a biological-functional relationship for intellectual development. On the other hand, the deficit or excess of energy nutrients or biological regulators (vitamins, minerals and trace elements) could cause imbalance in the motor and cognitive functions of the students.

### **Eating habits and socio - economic factors.**

Eating habits are mediated by various social environments, one of the main ones is the family (Anaya & Alvarez, 2018) considered as the fundamental pillar in learning the behaviors, rules, and traditions that govern both the family environment and food preferences. In middle childhood, children develop decision-making capacity, especially in nutrition. In some cases it becomes a capricious compartment at the time of choosing and consuming food products; it is for this reason that the family must be a reflection of healthy dietary practices, benefiting the nutritional status of all members.

On the other hand, the ignorance of an adequate infant nutrition and the psychological changes at this stage, could lead to the appearance of nutritional alterations on (Castrillón & Giraldo, 2014), such as excessive intake of hypercaloric foods or nutrient deficiencies that are not It is obtaining through a balanced diet, triggered the increase in adipose tissue in the body or the decrease in muscle mass. In some cases, micronutrient modifications affect

hemoglobin levels, growth, and cognition in middle childhood. The economic and social changes in Latin America have been in the eye of the hurricane due to unstable governments, corruption, and social inequality, which causes an increase in unemployment and poverty, affecting the pocket of the population. Likewise, the limited access to basic services such as health and food (Lacunza, 2010), which causes an increase in the energy-protein alterations of the youngest in rural and peri-urban areas, impacting on the intellectual abilities that affect negatively in learning.

On the other hand, the pandemic due to the Covid 19 virus affects the social and economic context worldwide, which triggers a decline in food security (Vergara, Diaz, Lobato, & Ayala, 2020), this situation of health catastrophe is a agent that is harmful not only to health but also to economic stability due to the increase in unemployment due to the closure of sources of work, both formal and informal, which damages production and access to basic food needs. (ECLAC, 2020) emphasizes that the well-being of children and adolescents is at nutritional risk, if the actions of food programs worldwide are limited, causing an increase in child malnutrition and malnutrition due to excess, damaging the health of future generations.

For these aspects, the socio-economic factor is part of the progress and development of the community's lifestyle (Gonzalez & Exposito, 2020), which allows access to health, food and education services; fundamental activities for personal development and progress of the population. Table 3 shows the description of eating habits and their influence on the learning of students in middle childhood by various authors.

Table 3. Analysis of different authors of eating habits

Year	Subject	Author	Study place	Interpretation
2019	Eating habits and academic performanceeating habits instudent  IEPFranklin D. Roosevelt, Comas, 2017	Reyes, E	Lima, Peru	The intervention of in preadolescent nutrition and academic development
2018	behavior and habits in school students	Ávila, H., Gutiérrez, G., Martínez, M . d., Ruíz, J., & Guerra, J.	Matamoros, Tamaulipas-Mexico	Food practices and the behavior of schoolchildren when selecting food.
2011	EatingInfant feeding in the school environment	Piaggio, L., Concilio, C., Macedra, G., & Dupraz, S.	Buenos Aires, Argentina	Influence of school, family environment on eating habits



2012	Study of the incidence of eating habits in feeding school performance	Saltos, M.	Cantón Milagro, Guayas-Ecuador	The repercussions of eating routines on the nutritional status and academic performance of basic education.
2015	Child, preschool, school and adolescent	Moreno, J., & Galiano, M.	Madrid, Spain	Physical and cognitive strengthening through healthy eating.

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In table 3, according to the criteria of various authors, eating habits in middle childhood is a key stage for food selection according to personal preferences, the influence of the family and school environment when adapting practices nutritional with repercussion in the feeding, which is reflected in the nutritional and intellectual state of the students. In addition, it describes the impact of food on the physiological and biological processes for strengthening child development.

Figure 2 shows the description of eating habits and their influence on the learning of students in middle childhood by several authors.

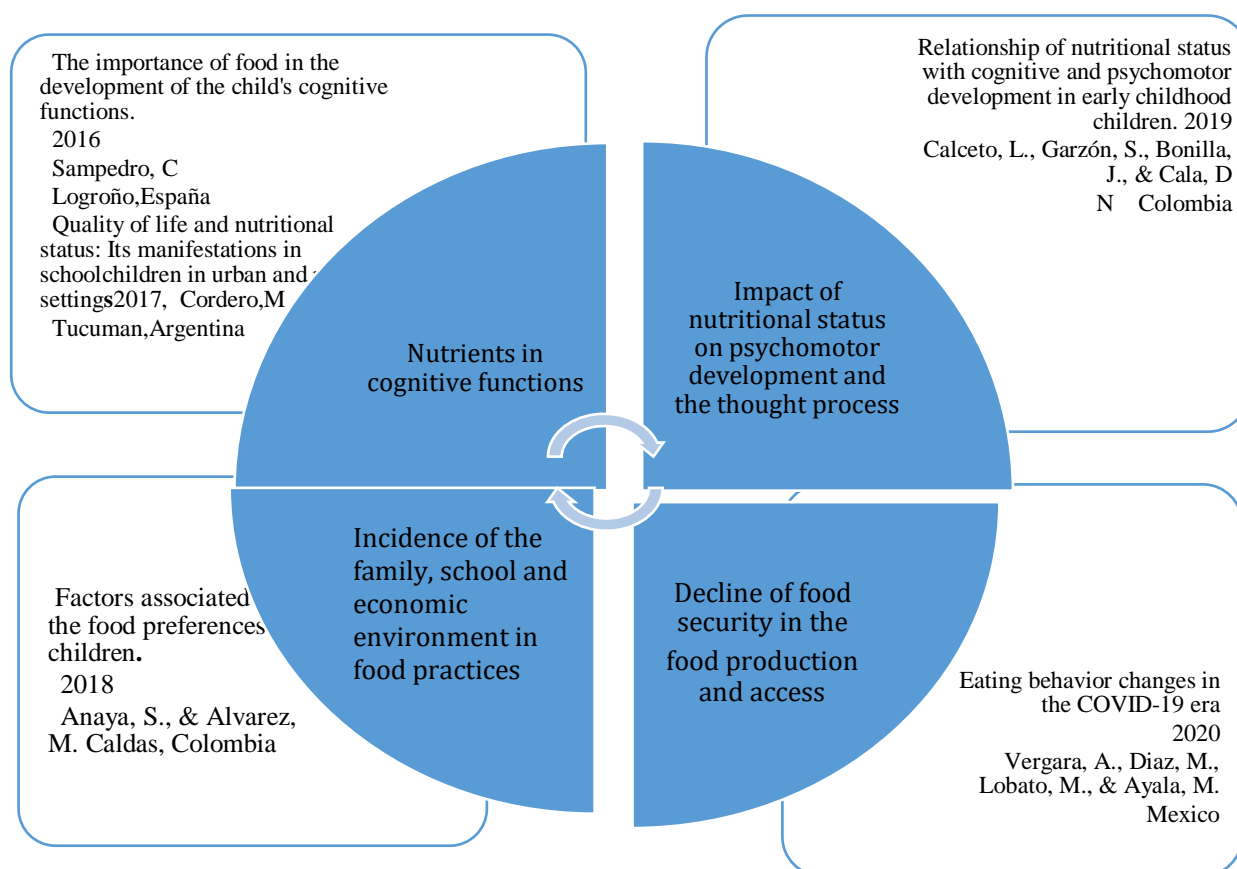


Figure 2. Description of eating habits

Shown According to the researchers' appreciation, they analyze the interaction of macro and micronutrients in the processes of knowledge construction. On the other hand, the socio - economic factors that indicate the behavior and food security are observed, having a positive or negative impact according to the environment where the population lives.

### III. Conclusion

The school stage is the ideal period for learning and establishing healthy eating habits that affects the selection of food, the nutritional and intellectual condition of the infant, and is also conditioned by various social-economic environments which are part of the progress of society's food security; also inadequate dietary practices lead to malnutrition due to excess and deficit, causing biological and physiological imbalances, mainly in the physical development and educational performance of the student.

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