

## **Nutritional Balance and Its Relationship with Students' Ability to Concentrate**

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### **Abstract**

Several studies were carried out on the impacts of nutritional intake on students' mental abilities and study output. These studies include Muhammad Haider's study, Alan Lousky's study and Alex schuss's study. All of them confirmed the impacts of food on pupils' mental health and academic achievement. In addition, they also stressed the fact that food plays an important role in the formation of the brain's nervous signals that transmit through chemical substances called Neurotransmitters. Food also contributes to the success of its functioning, as it helps students in their studies, and gives them greater ability to concentrate, to think and to understand their lessons. The Algerian student spends about six hours a day at school, during which s/he consumes his/her intellectual effectiveness and kinetic energy. In this case, how can students study and keep active without getting their nutritional needs, which protects them from fatigue, exhaustion and sustains their mental capacity and helps them concentrate in their lessons and understand them well? This stresses the importance of food as a key factor affecting students' academic achievement.

**Keywords:** Nutritional Balance , Relationship ,Students, Ability, Concentrate

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### **Introduction**

A child is the youngest member in society, yet, he is the most important member of it. This is because today's children are tomorrow's youth who are considered to be the foundations upon which any country is built and with which nations rise, flourish and develop. Therefore, most societies work hard to meet all the basic needs of the child. Algeria is one of the striving nations to take care of children, especially those of school age, because of the importance of this period in building future figures. In fact, one cannot deny the noticeable

improvement and significant development witnessed in the Algerian education sector. This improvement covered several aspects, including those affecting educational systems and educational programs, and those related to the building, equipment and the conditioning of schools. Recently, Algeria became more concerned with providing all the basic needs of the student while s/he is in school, through caring for the departments' ergonomics, as well as providing caterings inside every school across the country. The aim is to facilitate the educational process, ensure its success, serve the interests of the students, maintain their

safety, to safeguard the integrity of their mental and physical health development, and assure their adaptation, concentration and to control any stimuli that may hinder their learning while studying. All of this takes part in the process of development and prosperity for which the Algerian state is working.

However, despite all the efforts exerted by officials on this sector and their endeavor to provide all the needs of the educated child, mismanagement always transforms the positive into negative. In this study, we focus on the mismanagement and misuse of school caterings, and consequently the student inability to benefit from them. The Algerian state provided school caterings at the level of all educational institutions. In addition, it allocated a financial budget estimated at 25,25 billion Algerian dinars in 2016, which is, in accordance to the instructions of the Minister of National Education related to the conduct of school caterings, expected to reach more than 20 billion dinars in 2017 (Albilad journal12-30-2016). However, in spite of these huge sums, leaving the freedom to school principals to choose between a hot meal and a cold meal spoiled the effectiveness of school caterings. As a result, the benefit that the higher authorities were programming for was not provided to the students. Protecting students from diseases and mental health disorders resulting from poor food balance, such as students fatigue and physical weakness, their inability to focus, keep up with the lesson and absorb it well,

were the higher authorities' unmet aspirations. This, thus, led to low academic attainment especially for students who live away from their schools or those with working parents, where their stay in school without nourishment does neither serve the family in particular nor the society in general.

#### **The problematic:**

This study is based on previous studies that demonstrated the two-way influence relationship between nourishment and the child's mental capacities and physical integrity. The researcher adopted the topic of the effect of nourishment intake within school caterings and the extent of its effect on students' concentration and on their academic attainment, starting from the following questions:

A - Are there statistically significant differences between students who get food in school caterings and between students who do not in terms of the ability to concentrate?

B - Is there a correlation between students' nutritional intake and their academic attainment?

#### **Research hypothesis:**

A- There are statistically significant differences between students who get nourishment in school caterings and between students who do not in terms of academic achievement in favor of the first group.

B- There is a correlation between students' nutritional intake and their academic attainment.

#### **Study Objectives:**

Students face several obstacles that hinder their academic excellence.

Among the most important obstacles are the problems affecting their physical and mental health. This study aims to shed light on one of the major causes of health, physical and mental problems: the nourishment that students get in school. In addition, it investigates the extent of its impact on their concentration and absorption ability, which, in case food is unbalanced, leads to low educational attainments.

The following study aims to illustrate the importance of school caterings and the need to provide balanced hot meals while students are within school. This is especially true for students who live far away from their schools, for an hour and a half is not sufficient for them to go home and return to school. Even if this is possible, their time will not allow them to get a balanced meal comfortably that helps them recover the energy and effort spent during studying and while walking, from, and back to school.

This study also reveals the effect of poor nutritional balance on one of the most important mental abilities that a student needs in the processes of scientific assimilation: the ability to concentrate in the lesson. Concentration is one of the most important mental abilities a student needs for academic achievement.

**Significance of the study:**

- This study enriches the scientific aspect of school psychology, because it sheds light on the most important problems that hinders students' process

of academic attainment: their nutritional status that affects his health, physical, mental and cognitive state.

- It sheds light on students who suffer from nutritional imbalance during their presence in school. It, also, addresses their problems, that affect their physical health, educational process, behavior within class. Their inability to focus delays their absorption and thus obstructs the lesson, which may be disturbing for their peers and impeding to the whole educational process and the scientific development of society.

- The study enriches the pedagogical knowledge by educating those in charge and those responsible for the progress of the educational process about students' nutrition and its importance for the student's academic achievement. Nutrition is considered one of the most important factors that affect students' main capacities and capabilities in the educational achievement process. It affects, for instance, their health safety and their sanity. For children are the foundations upon which countries' development depends on, having a balanced nutrition ensures having a strong and healthy generation that keeps pace with the scientific and cognitive development.

- It shows parents how important it is to take care of children's nutrition and to ensure providing them with balanced and healthy meals for a sound growth. Healthy meals maintains students' integrity and grants them an effective learning and attainment that

benefits them, their families, their schools and society at large.

- It provides Algerian and Arab researchers with specialized doctors' measuring instruments, especially if their studies are meant to measure and reveal the food intake for children aged 8-14.

#### **The study's procedural concepts:**

**Nutritional balance:** According to this study, it is the nutritional intake obtained by students, whether while in or outside school. The researcher filled out a form that covers students' nutritional intake for 24 hours with the help of a group of specialized doctors.

**School caterings:** According to the study, it is a place in school where students eat hot or cold meals. The headmaster, who is responsible for food safety controlling, financial supervision of food prices and students organization when entering the catering, supervises it. In addition, it has a cooking crew who is keen to cook students' meals and the hygiene crew who is keen on cleaning the catering and the students' utensils. The aim is to supervise the food served inside the catering and to ensure its balance between vegetables, animal proteins, fruits, and other ingredients.

#### **The ability to concentrate :**

According to the study, they are students who do not have the ability to concentrate, and this applies to those who obtain scores less than average as measured by the ability to concentrate measure (Ismail abdefatah abdelkafi) applied in this study.

**Students:** They are a sample of pupils from the fourth year primary classes (2015-2016). Some of them belong to schools that offer hot meals, and the others belong to schools that do not provide any meal.

**Academic achievement:** It is the general academic average obtained from the three semesters.

#### **Theoretical framework of the study:**

##### **I) Nutritional balance**

##### **A- Linguistic definition:**

**1- Defining balance linguistically:** the Arabic dictionary defines it as moderation and equality, and losing equilibrium means its disturbance, confusion, or disruption.

**2- Defining nutrition linguistically:** nutrition, according to the contemporary Arabic lexicon, means the growth of the body as a result of the sufficient and beneficial foods and drinks.

**3- Defining balanced nutrition linguistically:** According to the glossary of Almaany, balanced nutrition means proportional quantities of carbohydrates, protein, fats, and vitamins, among others, that meets the living being's needs (WWW.ALMAANY).

##### **B- Idiomatic definition:**

**1- Balanced nutrition:** The nourishment that is able to meet the different needs of the body for building, restoring, energy and the ability to resist diseases. It contains all the essential nutrients such as proteins, carbohydrate, fat and mineral salts, in

addition to a sufficient amount of water to ensure a healthy life ( Randa Eldib and Ikram Eljoundi.2013. p:150).

**2- Sharifa Abu Al-Fotouh's (Charisa Abou elfoutouh) definition:** Good nutrition is the basis of a good health and every person needs four good nutrients:

Water	Proteins	Carbohydrate	Fat
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This is in addition to vitamins and minerals (supplements) (Charisa Abou elfoutouh.2006.p08).

**3- Dr. Joan Webster Gandhi's definition:** Having a balanced nutrition means following a well-balanced and complete nutritional approach .The latter includes five groups: the group of fruits and vegetables, carbohydrates groups such as bread, cereal, pastries, potatoes, and the group of animal proteins such as meat, fish, and alternative foods such as eggs and milk products group, then fat and sugars group (Joan Webster 2013, p. 73).

**4- The medical definition "Larousse médical":** Poor nutritional balance is eating the inappropriate quantities of proteins and pulp, starches, sugars and vitamins. Its lack or increase may cause diseases such as thinness, obesity, osteoporosis, digestion disorder, rapid digestion, and the emergence of all kinds of infections and other diseases resulting from malnutrition (Stoppard, p 37).

**5- World Health Organization's definition:** natural nutrition is the set of operations that the living human body performs to preserve life, vitality, growth and proper functioning of the organs. However, poor nutrition or lack of nutrition for the child, is a satisfactory state of imbalance between

the child's body's need for food and the amount of energy and proteins it receives or spends. It is a term referring to insufficient, excessive or unbalanced consumption of food substances or ingredients (Fiona Wilcock 2003p23).

**C- Classifications of the nutritional balance for students:** The nutritional intake that the child must obtain is classified in terms of the number of meals and the components of each meal, i.e. in terms of quantity and type, so that the child of school age must obtain five regular meals per day, which are detailed as follows:

**1- Morning breakfast:** It is one of the most important meals that students get. According to related studies, children accustomed to going to school without eating breakfast, suffer from several issues within class, such as feeling tired, not being able to participate in the lesson, feeling hungry and focusing on food instead of focusing on the lesson. This, eventually, leads to poor absorption of information or misunderstanding it as in the study of

Ali Lev (Muhammad Nasir, 2008, p. 21).

Among the most important components that doctors advise to eat are the natural sugars found in fresh fruits and dry fruits or dates, as well as fats such as the ones found in milk, butter or cheese, in addition to water and starch that can be found in bread.

As Muslims we always return to our faith and the commandments of our noble Messenger and follow his steps. Our Islamic religion urges us to take care of children so that they grow up healthy, strong and active. The Messenger, peace be upon him, instructed us in his saying: "Feed your women dates, for if a pregnant woman ate dates, her son will be born with gentle manners." (Ibn Kaim, 2003, p:30).

Recent studies conducted by a team of scientists have proven that dates have many benefits for the human body and brain, especially when consumed in the morning on an empty stomach. In explanation of this, the neurotransmitters are those chemicals that contribute to the transfer of communications taking place deep in the brain, which enables the brain to issue its orders to all parts of the body. These studies showed that there is a substance in the brain called (Serotene). This substance reduces harmful emotions and pain and brings calmness to people who are suffering from anxiety and nervousness. It has been possible to increase (Serotene) by eating a piece of natural candy, such as dates or dry fruits.

According to a study conducted by Dr. (Alnor Hoyteni), the American

nutrition expert, the child's distraction and lack of concentration while studying and the anxiety attacks and nervousness is due to a lack of iron. This causes a deficiency of some brain enzymes that are related to the means of nervous transmission. Dates are among the most important components that contain a high percentage of iron (Habib boudour, 2000, p:40).

**2-Snacks:** It is like a second breakfast meal that the child gets to supply his body and mind with the needed energy to keep up with the activities s/he performs. One of its most important components is natural sugars and water.

**3- Lunch:** This is the meal that a person gets in the afternoon. It must include carbohydrates, proteins, vitamins, mineral elements, fats and water, and this is achieved by diversifying the sources of nutrition. The food that a person eats must be sufficient without excess or lack, especially for students, so that they can achieve academic success and excellence and to maintain their health and safety. Therefore, it is necessary to plan for having nutritious, appetizing, and balanced meals as a basis for proper nutrition by following the food groups system through the new globally agreed food pyramid. The latter is a balance between all the essential nutrients mentioned previously in one base. In the past, it was a pyramid whose base consists of carbohydrates that many individuals feed on and whose summit ends with the lowest percentage of ingredients in foods, which are fats, as well as some

of food components (carbohydrates, protein, fats, vitamins, fibers) (Nahla. 2008. p:56).

**4- The afternoon meal:** It is called the freedom meal for the child, and it should cover about 10% to 20% of the energy needs spent in different movements and sweating. It includes a product that provides calcium, a product from grains to provide slow sugars, a product of fresh fruits, a drink to compensate the lost amounts of water wasted in movements and sweat (Moustapha. 2010 p:118).

**5- Dinner meal:** It is equivalent to a lunch. It should be a light meal, which contains most of the essential food groups. Soft vegetables must be replaced with soup to facilitate digestion before going to bed. (Moustapha.2010 . p:123 ).

### **The needs of the Algerian child in schools:**

It is known that the Algerian child of school age will be aged between 6 to 12 years old, and he needs about 2,400 calories. The school catering is required to complete the nutrition children take in their homes, that is, half of it: 1,200 calories.

1- School food must supplement family nutrition

2 - This supplement should be selective and change according to the local lunch pattern

3- This supplement aims mainly to provide nutrients rich in protein and vitamins, which are the common components for all students benefiting from school caterings, where even

teacher's son has become worthy of benefiting from meals.

In order to apply the equilibrium ratios in calories, we do the following:

1) Of proteins =  $\frac{15 \times 120}{100} = 180$  calories / 4 = 45 grams

2) Scrubs =  $\frac{60 \times 120}{100} = 720$  calories / 4 = 180 grams

3) Of fats =  $\frac{25 \times 120}{100} = 300$  calories / 9 = 33 grams (.Elnaimi .2010.p:09).

### **II / Theoretical definition of ability to concentrate:**

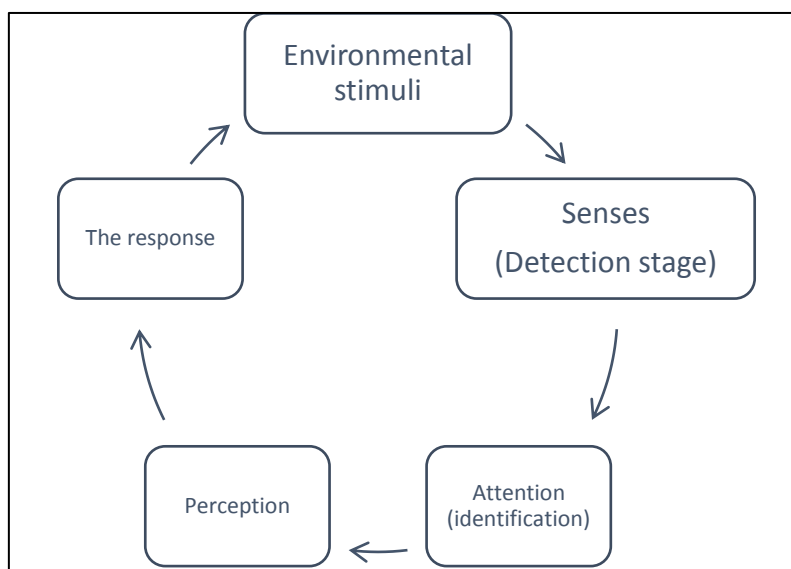
**1 / ( Dr. Mariam Selim) defines it:** as a concentrated response directed towards a specific stimulus that concerns the individual, which is the situation during which most of the learning processes occur, then it is stored in the memory and kept until the time it is needed.A

Attention is also the process of directing the feeling and concentrating it on something in preparation for observing it or performing it and thinking about it (Mariam2003,549).

**2/ The definition of Adnan Youssef):** Cognitive psychologists agree that attention is a cognitive process that we practice when dealing with stimuli in the sensory environment before perception. Here we will learn about the nature of stimuli available in the individual sensory system to determine which stimuli will be concerned with their treatment and perception (Adnan. 2014.p:73).

According to the previous definitions, it is clear that in order to concentrate;

the process must be carried out through the following stages:



*Scheme showing the stages of concentration according to (ELLIS AND HUNT; 1993)*

According to ELLIS AND HUNT, attention begins with the stimuli that stimulates one of the five senses, whether seeing, hearing, smelling, tasting, or touching. External stimuli affect primarily the concentration process, such as television or radio sounds, unknown external sounds, peers' noise within the class, smelling cooking odors that provoke a sense of hunger, pain that the body may feel such as abdominal or dental pain, or eye irritation because of dim or strong light. All of them are strong stimuli that cause specific sensations that give nerve impulses to the brain, which will contribute to the process of concentration or in impede it. This differs according to the uses of these

senses that turn eventually into responses (Adnan.2014.p:74).

**III/ Previous studies:** Many previous studies dealt with the topic of nutritional intake and its effect on the child's educational returns as well as on the functioning of his/her mental processes, including:

**1- (Sarah Al-Sibai) (2003):** The researcher dealt with a study on food and intelligence conducted on a group of children with low IQ between the ages of (8-13) years. The study lasted eight months, in which a group of them were given additional real meals that contains 8 salts and 11 vitamins, while the others were given a fake lunch. Results were as follows:

Intelligence rates increased to 25 degrees among groups that ate



additional foods. However, the intelligence levels decreased among children who received fake food by 3%, which indicates the effect of food on the level of intelligence, especially in the stages of development (Asem2008ص. P:45).

**2 –(Rida Mansour Al-Asif) (2003):** The study aimed to reveal the necessary nutrients for students. The study lasted 5 years and was conducted on 2090 male and female students (primary stage) in Kuwait. The researcher reached the following results:

What student eat determines the extent of their mental activity, the strength of their memory and the type of their creative and emotional energies, and that the lack of one of the nutrients is a significant factor in having memory disorders, lack of mental activity, and low level of absorption. The researcher stressed the necessity of providing some specific nutritional elements for the success of the academic achievement. Namely, foods that increase the students' IQ such as vitamins available in fruits and vegetables, iodine available in fish, and salt fortified with iodine. This is in addition to foods that contribute to stimulate intelligence such as garlic, onions, tomatoes, black honey, mint, walnut and peanut butter. Furthermore, foods that increase understanding and preservation, such as iron-containing foods are also essential. The study proved that students who suffer from iron deficiency are exposed, because of this, to having a lack of understanding, absorption and concentration when

studying if compared to their colleagues who get a sufficient amount of iron. The latter is found in green leafy and dried fruits. Besides making sure to get these necessary ingredients, students should strive for the integration and balance between all the food components (building foods, energy foods) (yousof Ibrahim .2003.p:34).

**3- (Hussein Saleh Qazaq) (2004):** The study explored the extent of the academic achievement affected by the nutritional status of students. It was conducted on 1182 Emirati male and female students (607 male and 575 female) through measuring their weight and height where the age and gender BMI was used to assess the nutritional status of students. The most important obtained result was that: after the comparison between obesity and thinness in terms of academic achievement, it was found that students who suffer from obesity and thinness are threatened with failure where their scores of all modules does not qualify them for success. This is due to their malnutrition resulting from either excessive or negligent unbalanced eating, which lead them to fail in obtaining the necessary nutrients for their safety and health growth. As a result, they start facing health problems and problems in the physical structure that hinder their movements and, thus, their ability to continuously follow lessons due to diseases and frequent absence, and consequently getting low levels of achievement (Fouad .p:54).

**4-( Najat Ali and Shadia Mahmoud Husseinà) (2008):** It is a study on

nutritional intake and its relationship to academic achievement and intelligence. The study was conducted on a sample consisting of 340 female students aged between 15 and 18 years at high school in Riyadh. Among the most important results of this study is that: 51,80% of them suffer from malnutrition, anemia, irritable bowel, and heartburn.

The same sample suffers from disturbances in the nutritional balance where they follow unhealthy eating habits. The most important of which is missing some basic meals, especially breakfast and lunch, which causes them fatigue, inability to focus, and consequently a low level of academic achievement (Najet Ali 2005.p:135).

**5- The National Authority for Health Promotion and Scientific Research Development "Forum" 2011:** it is a study that compares between the food consumed by the Algerian child and the European child. The study was conducted on 1500 child from different states in Algeria. It yielded the following results: 50% of the Algerian children suffer from malnutrition, and the average of protein consumed by the Algerian child does not exceed 18 grams per day. However, the European child consumes 80 grams of protein. The study found that 45% of the children have a weight that is so far from the international weight. In addition, more than 53% suffer from short stature and thinness and 33% suffer from malnutrition diseases (Majalat Ouloum. 2011.p:66).

**6- Schuss (2002):** It is a pilot study conducted in Richmond (Virginia) on

25 boys suffering from rapid fatigue, insomnia and inability to pursue lessons. The researcher noted that these children do not have a balanced diet in terms of quantity and quality, as they all follow a diet rich in chemical foods, preservatives, and canned foods. The researcher changed this diet with a balanced diet containing all the necessary food ingredients, including vegetables and fruits, animal proteins, natural sugars, and natural fats. He noticed a great change during a month, so that these children became full of vitality and activity, and the ability to follow lessons (Patrick .2001.p:76).

**7- Joseph Pali Ni (2004):** The researcher conducted a study on the topic of food and hyperkinetic activity on 56 children infected with hyperactivity and attention deficit. The researcher has developed a diet for these children that is free of coloring substances, flavors, artificial additives, preservatives, and refined sugars, whether in sweets, soft drinks, or processed juices. He also reduced the intake of food ingredients that increase hyperactivity such as orange, cow's milk, and the substances that contain (omega 6) found in vegetables and red fruits because they increase the activity in the body, and supporting them instead with fatty acids such as the ones found in fish and seeds. The researcher obtained the following results: Children who got this diet improved their behavior significantly at home and in school, and their ability to focus and learn has notably increased. (Jan. 2005 . p:10).

**III / The Applied part:**

**A- The pilot study:** During 2015-2016 academic year, the pilot study was applied in the School of Edda Benouda Oran to a sample containing 30 pupils from the fourth year of primary school. The aim of the study is to ensure the validity and reliability of (the measure of the ability to focus) by Dr. Ismail Abdel-Fattah Abdel-, and the nutritional intake form.

**1- The measure of concentration ability:**

**A-The validity of the measure:** The measure was presented to a group of psychology professors who had agreed on it 100%.

**B - The consistency of the measure:** consistency was calculated by the split-half and by using the Pearson correlation coefficient between the odd and even items. Its value was  $R = 0.60$ , and then it was corrected by the Spearman Brown equation, where the stability factor became equal to  $S = 0.65$ , which indicates that the measure is constant and is offset and applicable in the basic study.

**2- Food intake form:**

**A- The validity of the measure:** The researcher chose the authenticity of the arbitrators to ensure the validity of the scale, as their number reached six (06) arbitrators, all of them are experienced and specialized doctors.

**B - The consistency of the measure:**

Since the form is semi-medical, and since the indicators of children's malnutrition are the same globally, and the methods and steps for measuring them are standardized with a global standard defined by the World Health Organization, because the determinants and requirements for the growth of children are the same all over the world, and because these standards are also reliable in Algeria, the form does not need to measure stability.

**C- The description of the nutritional intake measure:**

The researcher built the measure after reviewing a set of measures, including a tool for measuring intake of nutrition for Daniel Kieffer (8-15 years) in 2001. She also used a tool for measuring the availability of integrated nutritional values for Dr. Francois Bacless (2006), and a form for measuring nutritional habits and malnutrition at the same time by( Dr. Afaf Hussein Sobhi) (2004).

After following the guidance and suggestions of the arbitrators and the supervising professors, and deleting the questions posed about the forbidden foods, the measure of food intake now includes general information about sex, height and weight, and 6 divisions, each division has a set of proposed questions and answers, which are shown in the following table:

Divisions	The number of questions in each division	Number of answers and suggestions
Breakfast	2 questions	1) two suggestions

		2) 10 suggestions
<b>Snacks</b>	3 questions	1) two suggestions 2) an open answer 3) two suggestions
<b>Lunch</b>	4 questions	1) 9 suggestions 2) two suggestions 3) one suggestion
<b>After lunch</b>	2 questions	1) one suggestion 2) an open suggestion
<b>Dinner</b>	1 question	One suggestion
<b>Questions about dietary habits</b>	15 questions	15 answers, where every answer has a number of suggestions
<b>Total</b>	27 questions	47

A table showing the number of divisions, questions, answers and suggestions in the final form.

According to the table, the form contains 28 questions, the first question is about the physical structure (gender, height, weight), and 27 other questions that are divided into 6 parts, each part contains a set of questions, and a set of suggestions. The first five divisions contain 12 questions and 32 suggestions. Their aim is to identify students' main meals per day and their content, and to identify, through them, the nutritional values and calories obtained by each one. The last division contains 15 questions, the aim of which is to identify the eating habits of each student, and the number of meals everyone takes.

**B- Basic study:**

**Sample descriptions:** The study was conducted on a sample consisting of 70 pupils in Hassi Bonif, and it was divided into two sections:

- The first section (Rabihi Jilali School): it consists of 36 students: 14 males and 22 females.
- The second section (Male School 1): consists of 34 students: 17 boys and 17 girls.

**Study methodology:** The sample was intentionally selected. The students of the first section belong to a school where a catering is available and they can get a hot lunch. The students of the second section, however, do not have a catering and do not get lunch.

**Presentation of the study results:**

**A - The first hypothesis:** There are statistically significant differences between students who get food inside the school and those who do not get food in terms of the concentration ability.

The difference	The sample	The average	The standard	“T” value	Degree of	Level of acceptability	Accept ability
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between groups			deviation		freedom		of differences
Students who receive food inside the school	36	19,54	8,23	0.49	69	0.05	Acceptable
Students who do not receive food inside the school	34	20,35	7,61				

**1- Interpretation and discussion of the results of the first hypothesis:**

According to the results shown in the table, it is clear that there are statistically significant differences between students who get food inside the school and those who do not get food in terms of the ability to focus in favor of the first group. This means that whenever a student does not get a balanced diet as well as some kind of nutritional value necessary for the body does not enjoy a high rate of health and fitness, s/he cannot focus his attention on his/her lessons for a long period of time. Because s/he feels exhausted, and tired for the least effort s/he exerts, s/he soon gets distracted and loses the ability to follow the teacher’s explanation of the lesson and fails to understand anything. Consequently, s/he cannot perform his homework or review previous lessons, and thus, s/he fails in his/her score in comparison to his colleagues who enjoy a high level of general health. Besides malnutrition, many other factors lead students to fail in their studies. Several diseases, for instance, including those that cause them pain, such as having osteoporosis and weak immunity that may cause rapid infection is one reason students fail in their classes. In addition, parasites that cause skin irritation or allergies that cause red eyes, sneezing and runny nose, including diseases that makes the person feels tired and dizzy are also key factors of failure in academic achievement. Energy loss such as anemia or lack of one of the vitamins in the body, or a lack of protein and energy in the body are all diseases that hinder the student's concentration in class due to his inability to withstand the troubles of studying, the inability to solve exercises, exams and homework. Another factor that causes the inability to focus class is the feeling of hunger that a malnourished get, either due to lack of food or excessive eating. The lack of food makes students feel hungry, and the excessive eating makes them voracious and always feeling hungry,

where in both cases the hunger will cause an obstacle to the student's ability to focus in the classroom, so that his focus is on the time of eating, and what s/he will eat.

According to the results of previous studies dealing with the same topic, such as the study "JOSEPH PALINI" (2004) and the study of "GESH" and the study of "JHON HIANG" (2001) that demonstrated a persistent relationship between the nutritional imbalance and behavior disorders such as hyperactivity and committing misdemeanors such as aggression, violence. All of these are reasons that make students with malnutrition unable to focus in the lesson, and focus instead on his excessive activity or aggression towards others, his behavioral deviation, and his lack of concentration during the lesson. Thus, students' lack in lessons comprehension leads to an academic delay. Therefore, malnutrition distracts students because of either the diseases it causes, hunger, or increase in activity and aggression. Hence, they will be unable to obtain knowledge and science well, as was confirmed by the study of "Abdullah bin Ibrahim Al-Sad Han," 2000, and the study of "Bushra Ahmed Jassim" (2006).

**2- The second hypothesis:** There is a statistically significant correlation between the nutritional intake of the learner and his academic achievement:

The correlation	The sample	R value	Degree of freedom	Level of significance	Significance of differences
Food intake and academic achievement	70	-0.64	69	0.01	Significant

**Interpretation and discussion of the second hypothesis:** There is an inverse correlation between the malnutrition balance of the learner and his academic achievement where the value of  $R = -0.64$  which is statistically significant. That is, the greater the malnutrition, the weaker the academic achievement becomes. Students suffering from malnutrition are those who do not obtain balanced food between the nutritional components necessary for the safety of their growth, physical and mental health. Regardless of the economic level of the family, the researcher noticed throughout her

study that there are families who are financially comfortable, but do not provide their children with the nutritional elements necessary for their age, due to ignorance or poor food education. The unbalanced food a student gets is that food that does not contain the balanced nutritional values that provide his body with the needed energy (calories) in order to carry out various activities, whether physical or mental. The non-integrated food does not provide the child with the proper nutrients, nor does it maintain his health and prevent diseases. Therefore, children who suffer from diseases are

exposed to many other health problems such as rapid fatigue, anemia, osteoporosis, high cholesterol level, weak immunity, exposure to infectious and parasitic diseases, to mention but a few. These diseases lead the student to be frequently absent, and consequently delaying classes compared to his/her healthy colleagues who do not suffer from malnutrition. Eventually, this student will get a low level of academic achievement. This is confirmed by the following percentages: the students who suffer from nutritional balance have a low or very weak achievement at an estimated rate of 68.57 %. However, students who get a balanced diet have a high level of achievement, and an excellent rate of 65.71%. These results indicate the extent of the malnutrition's relationship with academic achievement, where malnutrition affects children's intelligence and their mental abilities, which is confirmed by the study of "ALAN LOUSKY", "Sarah Al-Sibai" and "Sana Abdul Aziz". If the student gets a complete and qualitative food, s/he will grant a proper growth of the brain and thus the integrity of the mental abilities contributing to the achievement of cognitive, scientific and good academic attainment. This is according to what was confirmed by all studies that dealt with the topic of the relationship between food intake and academic achievement, including "Najat Ali and Shadia Mahmoud 's" study (2008), the study of "Hussein Saleh Qazaq"(2004), and the study of "Muhammad Haider" (2000). In their

studies, they affirm that malnutrition causes many diseases and disorders that hinder the development and proper maturity of the student structurally, healthily, and mentally, which thus affects his/her academic attainments.

**Conclusion and recommendations:**

Through this theoretical and field study, it is evident that the nutritional intake of schoolchildren may cause several diseases and special disorders in the stages of development if it lacks the most important nutritional components. Poor nutritional balance is one of the most serious problems affecting children, as it limits their proper physical, mental and psychological development. In addition, it makes them suffer from diseases that threaten their lives, and hinder them from carrying out all activities such as other ordinary children.

As the results of our research have proven, the low level of achievement of a child who suffers from malnutrition is due to either health problems, or poor physical and mental development, or because of the inability to focus and keep up with the lesson, and this is what makes the researcher provides a set of suggestions as follows:

- In this study, the researcher recommends the importance of adopting a national strategy that aims to reduce the number of students affected with malnutrition, through providing food inside school caterings and providing specialized frameworks to ensure the provision of quantitatively and qualitatively

integrated meals for students. This is in addition to changing students' lifestyle, improving their dietary habits, through increasing their nutritional awareness to ensure their safety from diseases, which will positively affect their academic achievement.

- Sensitizing and educating parents on the importance of nutritional balance for children, and the necessity of monitoring their children's food inside and outside the home, and guiding them on how to choose the necessary foods and avoid the harmful junk food through media such as television, radio and the internet.

- Programming a food education course in schools to teach students about the importance of balanced and quantified foods.

- The necessity of paying attention to the issue of children's food by the Algerian researchers, given its importance in providing health and general safety for the student, and thus ensuring a good scientific and knowledge development.

#### **References:**

1. Ibn kaim al jouzia(3003) Prophetic Medicine. Publishing House Elkitab Alhadith. Investigated and studied by Dr. Abdel Salam Mohamed, Egypt  
2 Patrick Holford (2001): Getting rid of health problems without medication, translated by Abeer Munther, Dar Al Farasha for printing, publishing and distribution, Beirut.  
3- Belqis Abed (2001): Nutritional Therapy, Dar Al-Qadab Al-Sukaria, 1st edition.  
4- Jean-Marc Robin (2005): Food for the Development of Intelligence, Dar

Al Farasha for printing, publishing and distribution, Lebanon.

5- Joan Wester Gandhi (2013): Food and Nutrition, Dar Al-Muthal for Distribution.

6. Habib Bodour (2000): Nutrition is the basis of health, Dar Al-Maalem for printing and distribution, 2nd edition, Syria.

7- Sana Abdel Aziz (1999): The relationship between iron deficiency and both intelligence and behavior, Master's degree, Faculty of Medicine, Tanta University.

8- Sharifa Aboul Fotouh (2006): Healthy Nutrition and a Healthy Body, Atlas for Publishing and Media Production, Cairo, 1st Edition.

9- Asim Al-Rashdan (2008): Food and Intelligence, Science Magazine, April, Issue 5

10- Adnan Yousef Al-Atoum (2014) Cognitive Psychology, Dar Al-Masira for Publishing and Printing, 4th edition.

11- Fouad Zaidan (2001): Food and Healing, 4th Edition, Dar Al-Karmel for Publishing and Distribution, Jordan.

12- Muhammad Nasser (2008): Keep the breakfast for your son, Kuwaiti Knowledge Magazine, Issue 5, Kuwait.

13- Maryam Salim (2003), The Psychology of Learning, Dar Al-Nahda Al-Arabiya.

14- Mustafa Al-Omari (2010): Food and Study, Knowledge Magazine, September 2nd issue, Jordan

15- Najat Ali and Shadia Mahmoud (2005): Dietary intake and its relationship to academic achievement



and intelligence, master's thesis, King Faisal University, Riyadh.

16- Nahla Khaled (2008): Prevention is better than cure, 2nd edition, Dar Al Uloom for Publishing and Distribution, Syria.

17- Yusor Kazem (2009): The importance of food for mental development, a research in the Nutrition Department of the National Research Center, Dar Al-Hilal Foundation.

18- Youssef Ibrahim (2003): Student Food, Elaph Magazine, Issue 6, Syria.

19 Algeria Science Journal (2011), National Authority for Health Promotion and Scientific Research Development.

**20-** Miriam Stoppard, Guide Médical du bébé et de l'enfant, Larousse. entreprise nationale du livre.

21 - Fiona wilcock (2003), l'alimentation de la femme enceinte, first editions, paris