



مجلة كلية التربية . جامعة طنطا
ISSN (Print):- 1110-1237
ISSN (Online):- 2735-3761
<https://mkmgt.journals.ekb.eg>
المجلد (٨٩) ابريل ٢٠٢٣م



**Educational Awareness to Raise Academic Achievement
Through Reducing Malnutrition Among Students of Primary
School in Turaif Governorate, Saudi Arabia**

Prpaerd

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Volume (89) April 2023



Abstract

Malnutrition and its symptoms and consequences have become a disease of the modern era, where ready-made meals, colored foods, carbonated water, and foods that depend on taste only attract consumers, especially children. Due to this malnutrition was observed among primary school students in Turaif Governorate, which resulted this study. In this study, a special educational program was applied to students in the primary stage. The program and its effectiveness were observed for 200 students (6-12 years), who suffer from malnutrition. Which resulted in their academic delay and reduction in their grades. The effectiveness of the program was evaluated by following up academic average for students per week, for over six consecutive weeks the results and statistics have proven the effectiveness of the educational program as a method for educating and guiding students about the importance of food and basic nutrients, important for a healthy body and healthy mind. Appropriate nutritional behaviors were explained during proposed program like methods of cleaning food, washing hands before eating etc. The proposed program resulted in an increase in students' grades and improvement in learning speed by up to 94.5% with improvement in grade point average up to 9.5% on the scale of 4. I advise schools, universities and other educational institutions to apply this proposed program to students suffering from malnutrition, so that to get good educational results.



The introduction

The problem of malnutrition has become one of the most important global problems faced by societies in general, and Arab world in particular. It is due to bad food habits. Children of all age groups are exposed to and affected by various problems caused by malnutrition. The child may not have bad food habits as it depends on society, circumstances and cultures. Islam is concerned about individuals' life and health, as Islam guides about both material and moral aspects of life. The importance of regulating food according to human nature is explained in Islam. In the Sunnah of the Prophet PBUH, there are instructions that point to the prohibition of excessive eating and negligence in consuming food and drink. He, Peace be upon him, said: "A human should not eat to full stomach. Instead one-third should be for food, one-third for water and one-third should be left empty".

Research Terms:

Malnutrition

This term refers to insufficient, excessive or imbalanced consumption of food items. Which causes different malnutrition disorders, depending on the deficiency or excess of nutritional components.

Academic achievement



Achievement means to accomplish, which means the student has obtained the required level. It indicates everything that an individual acquires from mental or skills perspective.

In this research we focus on academic achievement. some more definition is as below:

“It’s a specific level of achievement, competence, or performance in school or academic work, conducted by teachers or by means of standardized tests.

“Webcenter defines it as “a student’s performance in terms of quantity or quality.”

As for Dr. Al-Damanhour, he defines it as: "the accumulative average that a student obtains at a certain stage of study." He adds that it is the extent to which students absorb what they have learned from specific experiences in a prescribed course of study, and it is measured by the grades that student obtains in assesments.” (Al-Damanhour, 2006). Other researchers also see that it is “the results obtained by students after carrying out a specific academic activity, whether intellectual or non-intellectual.” Alternatively, It is success and excellence”.

It was also defined as: “the knowledge obtained by student through a school program in order to adapt him to the environment and school work.”

Therefore, the concept *of academic achievement was not limited to one meaning, as there are those who see it as everything that is*



achieved in terms of knowledge gained in school, and there are those who believe that it is the quantitative measure (marks) that a student should obtain during his education. It is also defined as multiple performance aspects of a student in various school subjects that can be evaluated and measured by grades, specific tests or teacher assessments (Al-Wafi and Saeed, 2004).

Previous Research on the subject:

Malnutrition in the Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia is one of the highest importers of food items, it is considered one of the large consumer societies. Many diseases linked to eating behavior of most individuals and groups of society have spread due to malnutrition, including chronic diseases such as obesity, heart disease, diabetes, And high blood pressure, cancer, tooth decay, thinness, anemia, and osteoporosis, which in turn lead to poor growth, especially in children, poor concentration and academic achievement. as a result of bad eating habits such as: consuming saturated fats, fast food, canned foods, and others. The researchers found many reasons for this, including the lack of nutritional awareness and health culture among children and adults alike, and also due to the high prices of food in the Kingdom (FAO, 2018).

Forms of malnutrition:

- Undernutrition, which leads to wasting (low weight-for-height), stunting (short stature-for-age), and underweight (low weight-for-age).
- Malnutrition related to microelements, which includes deficiency microelements (lack of important vitamins and minerals) or microelement excess.
- Overweight, obesity and diet-related noncommunicable diseases NCDs (such as heart disease, stroke, diabetes and some types of cancer)

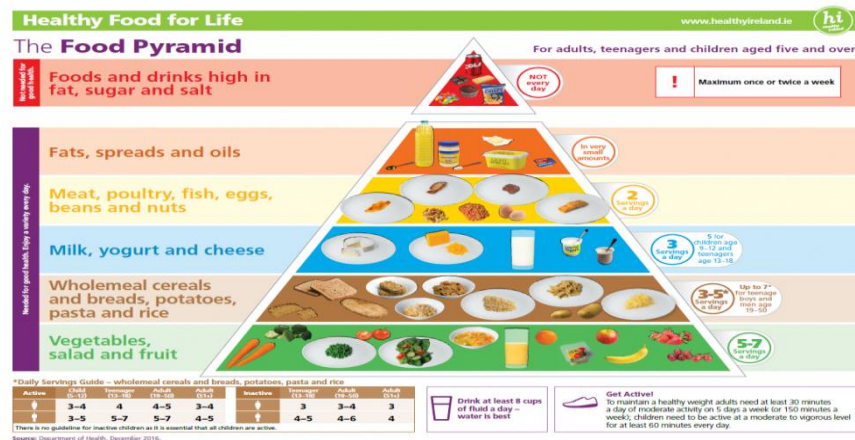


Figure 1: The Balanced Food Pyramid of Healthy Food for an Individual

Source: (<https://www.athboyfamilypractice.com/2016/12/guidance-on-the-revised-food-pyramid/>)



Various causes of malnutrition:

Lack of food and nutritional resources

There are four general patterns of malnutrition and their manifestations: wasting, stunting, weight loss, and vitamin and mineral deficiency. Lack of food leads to reduced immunity and exposure to death, especially for children.

Low weight for height is known as wasting. This usually indicates a recent poor weight loss, due to insufficient food or having an infectious disease, such as diarrhea, where a young child with moderate or severe wasting is exposed to an increased risk of infant death.

Short stature is known as stunting. It results from a lack of continuous health food intake, and is usually associated with poor economic conditions, poor maternal health, frequent illness, poor feeding of infants and young children as well as inappropriate care in the early stages of life. Stunting causes many physical and mental disabilities and thus the child's academic achievement is low. (Guan and Han, 2019)

Consequences of malnutrition

Malnutrition has countless consequences for everyone. lack of important food elements for the body and the physiology of the organs, leads to many diseases, organic deficiencies and psychological problems. As a result of these problems children are group of society that suffers the most. Consequently, a child my



get deprived of many activities which may cause him psychological problems (Naeini et al., 2008).

Mortality rates due to malnutrition were estimated at 58% of the total Number of deaths in 2006: about 62 million people expire annually worldwide from various causes. Altogether, one out of every twelve people worldwide dies from malnutrition. In 2006 alone, about 36 million people died as a result of starvation or diseases resulting from malnutrition (Zeigler, 2007.)

According to [Global Health Organization](#) malnutrition is the biggest cause of obesity Child mortality , which represents about half of all deaths . Deficiencies food elements, such as vitamin A and zinc deficiency, are also the cause behind the death of about a million children. The scientific newspaper The Lancet reported that malnutrition occurs in the first two years of a child's birth It is one of the most vital causes of death among children, Children who suffer from malnutrition are exposed to worse health problems during developmental stage and lower ability for academic achievement. Also, these children face stunted growth. Malnutrition was previously considered a disease Its effects are greater than the effects of serious diseases such as measles, acute pneumonia and diarrhea. However, malnutrition leads to exposure to some diseases as well, which in turn may be fatal (Zeigler, 2007).



The importance of good food for school going children.

Improving child nutrition is of paramount importance to human development and also its one of basic human rights, as stated in documents like, the Second International Conference on Nutrition, the Sustainable Development Goals, the Zero Hunger Challenge, and the United Nations Conference on Action on Nutrition 2016–2025. While The focus was originally on health from initial pregnancy stages until the second year of the child birth. Nutrition in the first thousand days, which are important stages of rapid growth, such as the period of growth during puberty, during which need for nutrients increase (2010, Victoria; Das et al., 2017) According to the latest edition of Priorities for Disease Control, the 7000 days following the second year of a child provide opportunities to support children in achieving their developmental needs. (2017, Bundy)

Studies have shown that most countries suffer at least one form of malnutrition (IFPRI, 2016) Children suffer greatly from several types of malnutrition, ranging from lack of food to micronutrient deficiencies, and the school provides an opportunity to prevent and treat these different types of malnutrition to contribute to the development of educational outcomes. (Caniello et al., 2016; and Drake et al., 2016) Students who participated in school feeding activities could also act as influencers, for their families and



younger siblings, hence potentially reducing the number of malnourished children starting school.

And it matters Important Knowing the multiple benefits of using the school as a main factor for food and nutrition interventions, such as school meals. To invest in school meals exceeds by a large extent, the benefits associated with health and nutrition for students, as it includes raising the possibility of access to education and social protection. Numerous studies have shown the contribution of school meals to increasing school enrollment and attendance rates in some environments and academic achievement, as school meal programs can protect students at risk and escape from school. Such as Bundy girls (and others, 2009) and these features are considered one of the most important benefits of school and school meals and the evaluation of school food programs for students in many schools.

Research has shown that there is a need to re-evaluate and develop role of school in order to improve Health and nutrition for children. The results prove that schools provide an excellent opportunity to achieve multiple benefits regarding students, similarly it can help set goals for students' development. The school can also have an impact over students that goes beyond the students' physical health, and become basis for teachers, parents and many community members participation (Kleinman et al., 2002). This collaboration can stimulate community development, achieve



community protection and economic empowerment, influence agricultural production systems to provide nutritious foods, develop healthy eating habits in the long run, and contribute to solving health issues along with education and basic hygiene. This can be achieved by providing a better, healthy and living environment, which has the potential not only to improve education, but also to develop basic nutrition activities in local communities and to promote child development (Patton et al., 2016).

Academic achievement and balanced nutrition

The relationship between academic achievement and nutrition is vital. More balanced and healthier the diet, higher the cognitive rates, comprehension, achievement and concentration. I have pupils (Ali et al., 2013). Despite this scientific fact, many people do not have sufficient awareness, as I explained Numerous studies observed students at different educational level consume unhealthy food, which negatively affects their abilities. Although there are several factors for decline in academic achievement rates among students (Daboné et al., 2011) for example:

internal factors

- The student's mental development and physical health
- Student's gender
- Student intelligence level (IQ)
- Student mental health



- Student preparations, individual differences, and student s ' abilities (Martha, 2009)

External factors

- family
- School
- Teacher
- Social environment and friends circle

Previous studies and comment on them

1. A study was carried out on a group of private school students, and it included 50 students from the fifth grad, 70 students from second grade preparatory school, and 30 students from the first grade of secondary school. At department of Nutrition in National Research Center, a questionnaire was conducted about different dietary habits, their focus of academic achievement, health status, and weight gain. A general clinical examination was performed, anthropometric measurements were taken, and a questionnaire was conducted to assess the average academic achievements while keeping in mind their dietary and social habits of research participants. The results revealed that most of the students do not take breakfast and do not take sufficient amounts of vegetables, fruits, milk and brown bread. It was also found that 85% of the students eat while watching



television, which is a wrong habit that leads to over eating. It was also found that student intake unhealthy food items like crackers, sugars, and coronated water. The result of the study showed that 40% of the students have a high rate of obesity, especially among boys at the secondary level. Girls excelled over boys in adhering to better nutritional methods, which leads to No discrimination in their academic achievement as compared with boys.

The results of the studies proved the existence of a statistically significant correlation between the food habits of students and academic achievement and weight gain as well as their health status. The various diseases such as dizziness, lightheadedness, and difficulty in breathing along with pale skin and weakness in concentration and attention. Study also revealed that students do not take sufficient sleep as per their age. Results of study recommended the necessity of creating programs to raise awareness of social and healthy eating habits for age groups in which it can affect their mind and health (Ross, 2010).

Studies prove the existence of a direct relationship between the physical health and mental health. As healthy and sound nutrition has an important role in societies, It dictates the extent of students well-being and attendance, and has a major role influencing the growth of children, mental development, academic achievement,



and concentration (Corcoran et al., 2016 and Jackson et al., 2017). In general, nutrition plane is a set of actions through which a person receives elements necessary to save his life and help him to do all his work and his activities. This diet plan contains protein substances "which represent the basic part of the body cells and necessary for tissues and organ growth. Carbohydrates, which are vital sources for generating thermal energy for body activity, in addition fatty substances that include many vitamins and fatty acids important for brain growth. Vitamins that carry out the metabolism, combustion processes, and energy generation in the body. Mineral salts and elements such as iron, which affect the process of muscle contraction and blood clotting, in addition to the formation of some digestive juices and oxygen transfer from the lungs to body cells carried out by hemoglobin (Taras, 2005).

2. Abdel-Gawad and Ali (2011) conducted a study to identify child ability to read pictures and shapes to measure health culture among kindergarten students, in the age group (5–6) years. The study sample consisted of 80 male and female kindergarten students, the results of the study showed the importance of using pictures to arouse and develop the child's attention. It indicated that health awareness has a constructive role in the development of the child's personality, and the



development of many skills and factors that work to develop the child's healthy culture.

3. Al- Abad and Hassan (2008) conducted study to know the different nutritional patterns of children in the pre-school, and their association with physical and mental growth while some external factors effects, such as:

The family's economic level, education level and nutritional knowledge of mother. Informing mothers about the nutritional pattern is required for children and role of the mother and school in educating children in the field of nutrition is also important. The sample consisted of 236 children aged between (5-6) years and 16 female teachers. In the food pyramid guide, it was also found that (20.4 %) of the children get two meals a day only, and (39.01 %) do not eat breakfast. A correlation between the children 's dietary pattern and some factors (family economic level, education, and the nutritional knowledge of the mother) was created. 100% of the female teachers agreed that children understand nutritional information and apply it in their daily behavior. El-Gamal (2004) also carried out a study to know the extent of its effectiveness Implementing programs to educate children, mothers, and kindergarten and school supervisors in poor cities about healthy food and its impact on improving the children abilities to focus. Results of the study showed the superiority of the experimental group over the control group, which proved the effect of the



program in developing the healthy food awareness of kindergarten students and increasing their ability to focus and academic achievement (Al-Jammal 2004).

Research problem

The research problem lies in the academic deficiency and delay in academic achievement among some children who are malnourished due to their infection with intestinal worms, as these children suffer from a lack of nutrients and vitamins that are important for the body health, mind and focus on learning among school students. The problem is manifested in the lack of students' and their family's awareness about importance of healthy food and elements necessary for student's growth, Performance improvement and academic achievement, as well as hygiene rules and the food protection from contamination and ways to avoid infection.

Research process and method

1. Research Methodology

The experimental approach following the experimental design of one group through the pre and post measurement of the basic research group. The nutritional program (Specific dietary plan) was applied to them over a period of six weeks from January 26, 2020 to March 2020.

2. The study community

Primary school students in Turaif Governorate schools.



3. The study samples.

200 primary school students in Turaif Governorate, with ages varying between 6–12 years, suffering from academic delay resulting from malnutrition due to intestinal worms among primary school students. Hanbal 36 students, Nimr Bin Abdulaziz School 35 students, and Abu Dhar Al-Faqari School 27 students.

Research aims

The research aims to implement an educational awareness program for students in the primary stage, through:

1. Educating schoolchildren about the importance of food and the causes of malnutrition
2. Educating students about the importance of personal hygiene and food and drink hygiene.
3. Improving children's health and increasing their physical abilities
4. Increasing academic achievement and concentration of malnourished children.

The applicable educational program for the students under observation.

The research study was based on the application of an educational program consisting of theoretical and practical approach through participation of teacher to introduce and educate students about the importance of healthy food and important basic food elements, as well as ways to maintain safe and clean food free of contaminants,



and finally, how to avoid infection and diseases transmitted through contaminated food route.

Determine and design the educational program:

To determine the educational content in light of the educational and mental needs of primary school students, which are related to nutrition and health, the following steps were taken:

1. Examination of psychology references to identify the characteristics and nature of sick students and their nutritional needs.
2. Examine books, references and studies on nutrition, health and malnutrition diseases.

The applied program contained several important topics and key lessons, including:

First Lesson

- Useful food for children in the primary stage to build muscles and brain cells (carbohydrates – protein – fats)

Second lesson

- The relationship of useful food to the proper growth of the child's body and mind
- Anemia
- Emaciation
- Poor focus and attention



Third lesson

- Nutrition and wrong eating habits of the child in Arab and Saudi society

Fourth Lesson

- Types of essential and non-essential nutrients (minerals and vitamins)

Fifth Lesson

- Malnutrition and its causes

Sixth Lesson

- Obesity and skinniness in children

Seventh Lesson

- Malnutrition and its association with how to choose healthy food and food hygiene

Eighth Lesson

- Types of worms that infect the intestines especially in children

Ninth Lesson

- Protect food from contamination

Tenth Lesson

- Prevention of intestinal worms and infections

Eleventh Lesson

- Methods and means of personal hygiene (washing hands properly).



Teacher explains the lessons and presents them in a practical and applied manner, in order to clarify the idea in the minds of the students easily.

Writing research topics to present them to specialists and psychology counselors:

scientific material was written in a logical sequence in an easy and interesting manner supported by pictures and diagrams for the child. The topics also deal with many educational activities and provide different types of foods as examples of healthy food.

Study hypothesis

The study assumes the implementation of an educational and awareness program for students who suffer from malnutrition as a result of infection with intestinal worms, which caused a delay in their academic achievements. Use of visual, audio and practical applications to guide students in a way to get attention to hand hygiene Especially when eating the food and fruits consumed by students to reduce the chances of infection with intestinal worms.

Analysis of Results

After I applied the scientific program to 200 primary school students who were proven through medical examination that they suffer from general emaciation and physical weakness accompanied by a decrease in academic achievement. Malnutrition among these students was due to their infection with intestinal worms. Effectiveness of the program is evaluated for students by

monitoring their academic achievement rates during 6 consecutive weeks of applying the program, as the achievement rates are calculated through the final total, which vary between (1–4) GPA. And as shown in Figure (1), which shows the students' school rates after applying the proposed scientific program and educating the students , the students' rates were mostly below the average (1.5), as the number of students who obtained it reached 70 students, and those who obtained the average (1.0) were 40 students, while it happened 31 students achieved the average (2.0), and only 7 students attained the highest average (4.0) .

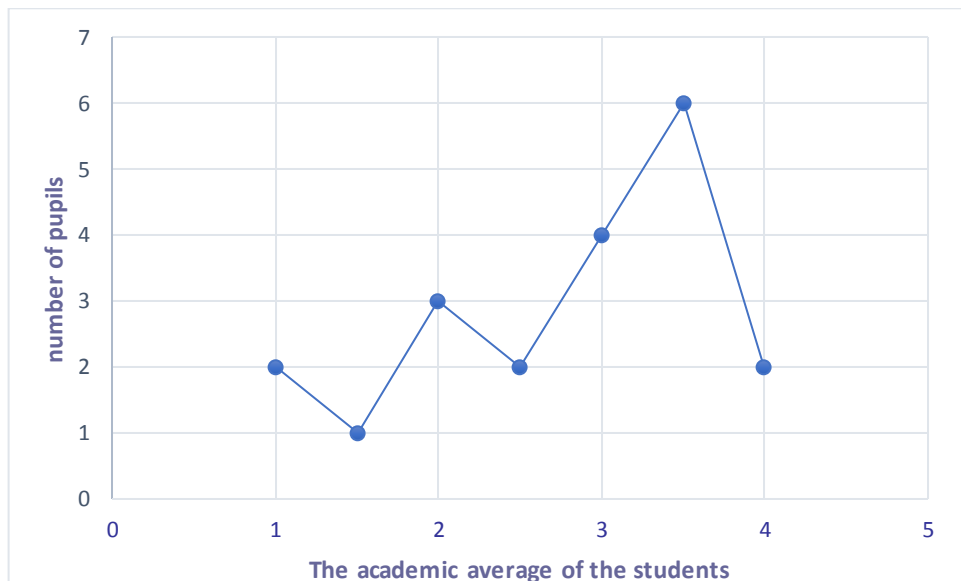


Figure (1) A figure showing the students' academic average during the first week of the program

While Figure (2) shows the students' school rates after two weeks of applying the scientific program, as the number of students who obtained the average (1.0) decreased to 37 students (which is an ineffective result), while the number of students with the average (1.5) decreased to 55 students by 21.5% (which is an impressive decrease). On the other hand, the number of students obtaining averages (2, 2.5, 3, 3.5, and 4) increased in order, which indicates an improvement in the level of students' averages and an increase in their academic achievement as a result of the application of the program.

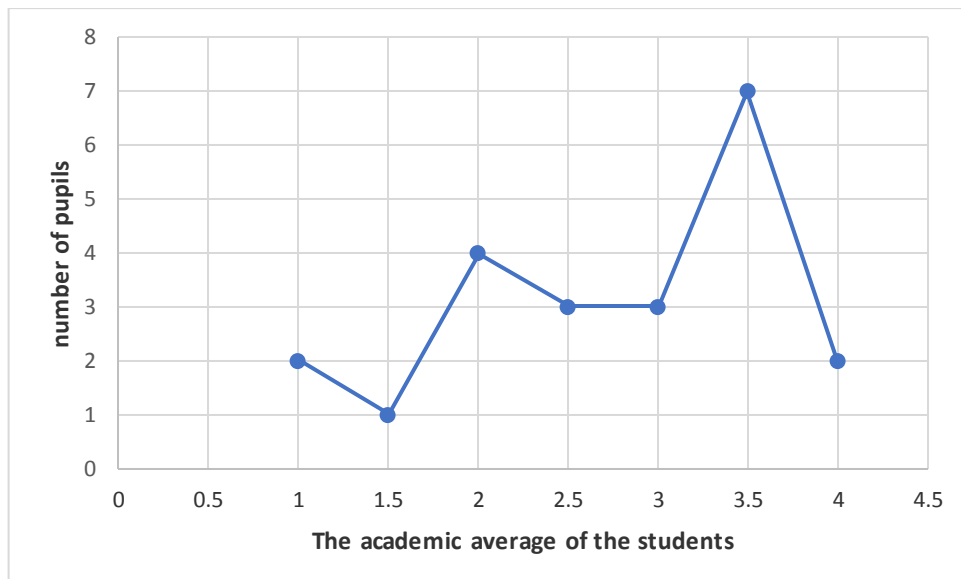


Figure (2) A figure showing the students' academic average during the second week of the program

After third week the students' averages, as shown in Figure (3), showed a continued decrease in the number of students obtaining

the lowest averages (1, 1,5) , while the number of students obtaining averages (2, 2.5, 3, 3.5, 4) increased from the previous ones in the week. The number of students who obtained an average of 3 reached 32 students, who obtained an average of 3.5 out of 21 students, while 11 students obtained an average of 4, which is considered the highest.

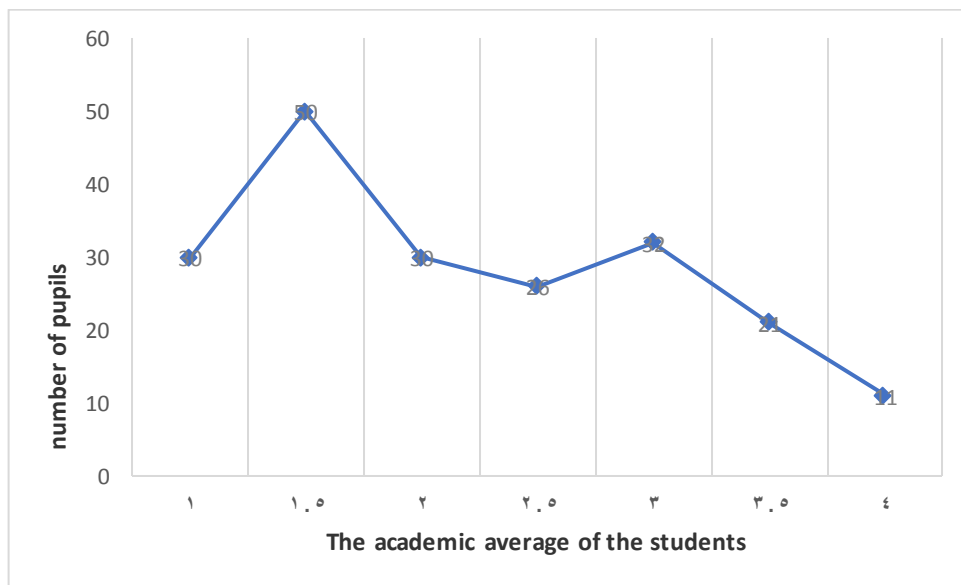


Figure (3) A figure showing the students' academic average during the third week of the program

Figure (4 and 5) shows the school averages of the students in the fourth and fifth week of applying the educational program, as the number of students who obtained poor averages decreased (in an impressive way), so only 11 students obtained average 1 after five weeks, while 24 students obtained the average (1.5) , while 36 students obtained the average 2.5 and 45 students obtained the average 3, while the number of students who obtained the average

4 increased to 14 students, which indicates the efficiency and effectiveness of the applied educational program.

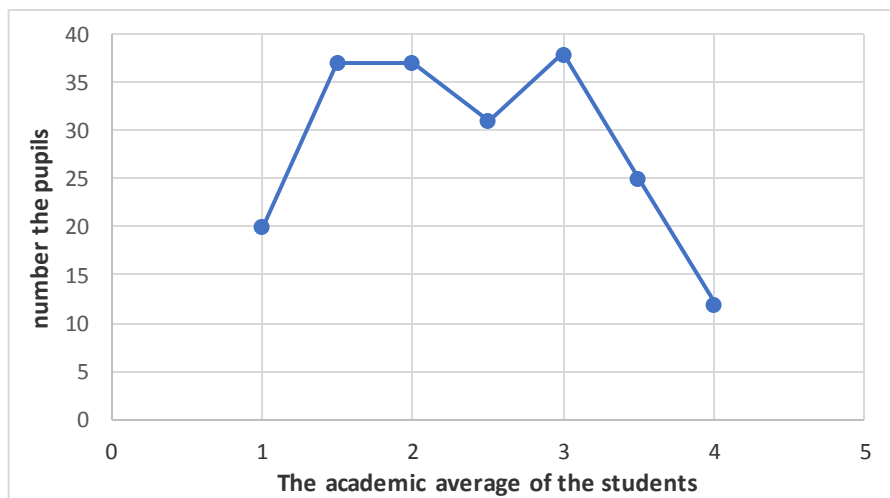


Figure 4: the students' academic average during the fourth week of the program

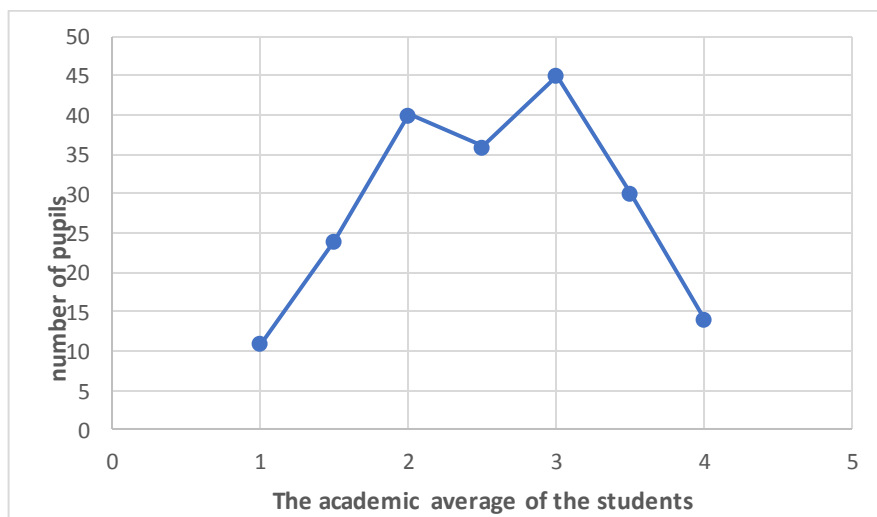


Figure 5: the students' academic average during the fifth week of the program

Figure (6) shows the rates of students in the sixth and last week of applying the educational program, where a decline was recorded in number of students who obtained the average 1, to 5 students only, and those who obtained the average 1.5, to 11 students only, which is an influential decrease, while the number of students who obtained 2.5, raised to 42 students, as well as those who obtained the average of 3, raised to 50 students, while 35 students obtained the academic average of 3.5, and 17 students obtained the highest average of 4, which is an impressive result that shows the success special educational program for students suffering from malnutrition and health issues. The proposed program increases the rates of academic achievement and the development of their intelligence, physical and mental abilities.

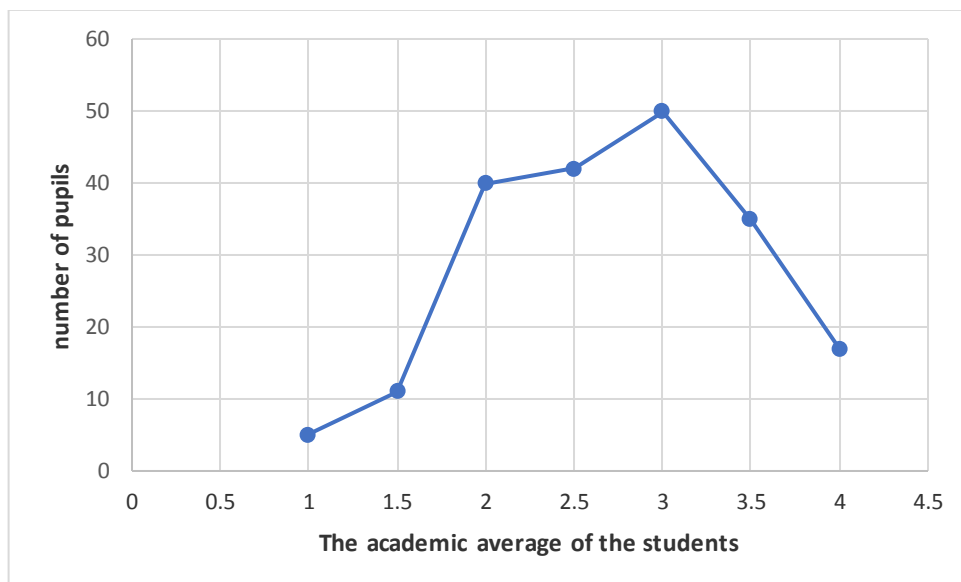


Figure 6: The students' academic average in the sixth week of the program

Regarding academic achievement, We used the (T) test to calculate the differences between the average scores for the pre and post application, it is depicted in following table.

Table 1: A table showing the value of (t) and the differences between the pre and post application of proposed program in achievement, (n) =

Significance level	Tabular		Calculated value	Standard deviation	Percentage	Average	Number	Application
	.01	.05						
Function in favor of the post application	2.71	2.02	21,149	3,177	40,952	25,800	200	Tribal
				7,614	74,514	57,975	200	Remote

We attribute the existence of these differences the growth in the academic achievement for the research sample of students as a result of proposed program. The students interacted successfully with the content of the program and its topics, as it is closely related to the students' needs. It raised their efficiency in self-learning and taking into account the individual differences. The large number of examples within the content and diversity between visual, audio and application have an effective impact on the students' interest, as well as diversity of activities accompanying the aspects of program and assigning students to various tasks of cooperative learning between different groups and individual roles



for each individual within the group. The program contains some drawings and illustrations that are suitable for the educational level (i.e. elementary) led to the enrichment of program and increased students' motivation. Inquiries about some concepts, which raised their efficiency in the educational goals (cognitive, skill and knowledge), Less than 2. At the end, the number of students who obtained an average of 2 or less became (39) students only out of the total (200) students, who were suffering academically, learning difficulties in one or two courses or a general academic delay as a result of bad food and health practices. Therefore, we advise those in charge of education to include the course of nutrition and sound health practices in the primary school curricula, especially the initial grades, so that students acquire good health habits and practices. It will be reflected in their ability to achieve positively throughout their academic career.

Summary and recommendations:

From previous results and analysis, the importance of healthy food and important nutrients in developing the child's physical and mental abilities is vital, and the importance of raising awareness of good food, personal hygiene, and food safety from contamination is also evident. Their school averages during six consecutive weeks of proposed program. The results of this study are similar to many previous studies (Al-Jammal ,2004), (Hassan et al. 2012), (Khaled and Yahya 2009) and (Al-Abad and Hassan 2008).



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ISSN (Print):- 1110-1237

ISSN (Online):- 2735-3761

<https://mkmgt.journals.ekb.eg>

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Recommendations:

1. Attention to children's food, especially in the early school stages should be paid.
2. Attention to educating the child and the family about the importance of healthy, balanced food should be paid.
3. Attention to food hygiene and the child's personal hygiene should be paid.
4. Teachers need to pay attention to children who are behind in school, to know the reasons for delay and to work to treat them through application of special programs for them



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Attachments

1– List of Excellencies arbitrators of the program

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1	Prof. Dr. Follett Fouad Ibrahim	Professor, Department of Psychology, Faculty of Education, Ain Shams University
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3	Dr. Hamdi Ali Al–Faramawi	Professor, Department of Psychology, Faculty of Education, Menoufia University
4	Dr. Madiha Salim Mansour	Professor, Department of Psychology, Faculty of Education, Al–Azhar University
5	Dr. Emad El–Din Mohamed El–Sukkary	Associate Professor of Educational Psychology, Faculty of Education, Menoufia University
6	Dr. Mohamed Abdel Raouf Abed Rabbo Mohamed	Associate Professor, Department of Psychology, Faculty of Education, Menoufia University