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Effects of a proposed nutritional educational program on physiological and physical variables among students with diabetes in the primary school

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Abstract: Students face several problems that hinder their academic excellence, the most important of which are the problems that affect his physical and mental health and one of the most important objectives of this research is to highlight one of the causes of health, physical and mental problems, which is the food obtained by the student and the extent of its reflection on his physical structure and academic achievement and his ability to focus in the event that this food is unbalanced. The article aims to identify the effect of the proposed program on some physiological variables (diastolic blood pressure - systolic blood pressure - pulse rate - hemoglobin - blood sugar). Physical variables (long jump – push up - kinetic speed) and level of blood sugar among students. The sample was selected intentionally from students at the Sinai Bank Elementary School, North Sinai Governorate, Arish Educational Administration, where the researcher works, from the fifth and sixth grades of both genders suffering from diabetes. The total number of the sample was (14) students, including (4) students who underwent the exploratory experiment, (10) students for the main experiment, and they were divided into two groups (5) students in the experimental group, (5) students in the control group. Results indicated that statistically significant differences between the average measurements (pre-dimensional) of the experimental group in (physiological variables) under research and in favor of the post-measurement. statistically significant differences between the average of the two measurements (pre-dimensional) of the group Experimental in (physical variables) under research and in favor of pre-measurement. statistically significant differences between the average dimensional measurements of the experimental and control groups in (physical variables - physiological variables) under research in favor of the average dimensional measurement of the experimental group. The proposed nutritional educational program applied to the experimental group led to reaching the normal level of blood sugar, where there are differences in the statistical function in favor of the dimensional measurement of the experimental group. The proposed nutritional educational program has a positive impact on the students at the school, which leads to improving their physical and physiological abilities

Keywords: *nutritional educational program, physiological and physical variables, diabetes in the primary school.*

Introduction

Artel (2003) explains that the tremendous and amazing technological progress in the modern era in all different fields has led to a lack of human movement and thus a lack of physical and physiological efficiency, which has

made him vulnerable to many diseases called diseases of lack of movement (such as heart and arterial diseases, obesity, lower back pain, diabetes, high blood pressure, cholesterol, etc.).

Christine et al. (2010) adds that diabetes is a chronic disease that may occur for genetic or environmental reasons and is due to an absolute or relative deficiency in the secretion of the hormone insulin from the pancreas, which results in high blood sugar and urine and a disturbance in the oxidation of nutrients (sugar, fats, proteins). The danger of this disease lies in its serious complications. Diabetes is divided into two types: the first type is called insulin-related, and the second type is called non-insulin-related.

Ammar Hadi (2009) states that diabetes causes complications and symptoms in the arteries, as there is a confirmed association between diabetes and hardening of the arteries, and diabetes may lead to hardening of the arteries and the appearance of serious symptoms at an unusually early age. Such as angina pectoris or coronary artery thrombosis or hardening of the arteries of the brain or kidneys, as well as leading to pain in the extremities. It is known that peripheral nerve inflammation is a complication and symptom of diabetes, and the sensation of it varies from one person to another. The most famous of these symptoms are skin-related, such as boils and fungal infections between the fingers and between the thighs.

Despite the progress made in nutritional awareness programs at the present time, there are some societies that have not given these programs sufficient attention and have not changed their lifestyle. Therefore, the poor nutritional status of individuals is reflected on the entire society. There is no doubt that our society suffers from malnutrition, and its giving is not good, but on the contrary, productivity is low and does not achieve the desired development in the educational, educational, economic and social fields. Therefore, it was the state's duty to seek to evaluate the nutritional status among its citizens and improve it to promote public health and prevent diseases. Continuous research must be conducted to improve the nutritional status of society's groups and introduce nutritional programs to schools, intermediate institutes and universities. Developing students' eating habits and behaviors requires a lot, most notably knowing the daily nutritional needs, choosing the right food, knowing the body's energy needs, in addition to knowing and maintaining body weight. Nutrition experts have agreed that the effective way to determine the body's nutritional needs is to carefully consider the body's length.

The International Nutrition Association suggests that there should be a balance between the calories consumed and the calories expended to compensate for them, as it is possible to estimate the quantity and size of energy intake, which are carbohydrates, proteins and fats, with what is taken from them and what is expended. Good nutrition is that which contains a certain percentage of the main nutrients that meet the functional needs of the organs, and carbohydrates, proteins, fats, vitamins, water and salt are considered the most important elements, and the percentage of carbohydrates is usually higher than the percentage of fats and proteins in the meal and is estimated at about (55%) of calories, fats (30%) and proteins (15%). For example, if an athlete eats an amount of food in one meal estimated at (1) kg of food, the amount of carbohydrates is supposed to be (550) g, fats (300) g and protein (150) g, while the percentage of vitamins and salts is the least and the need for them is estimated at (1%) daily, while we need at least (8) g of water daily.

The researcher noticed through her undergraduate and master's studies the presence of diabetes among students. She also noticed that students practiced some unhealthy habits, the most prominent of which was eating fast food in large quantities, especially those that contain high calories. She also found that students do not pay any attention to the type of food, but rather prefer certain foods. The researcher also noticed that most students are not health-educated and not health-conscious, as students are aware of the negative impact of fast food on health, but they still eat it. All these matters were among the reasons for conducting this study and researching the levels of nutritional culture among students and working to improve it through the proposed educational program and through the reference survey of previous studies. The research found the importance of using the nutritional educational program and standardized nutritional programs on diabetics because of their multiple effects from the therapeutic, physiological, social and psychological aspects.

Sample.

The sample was selected intentionally from students at the Sinai Bank Elementary School, North Sinai Governorate, Arish Educational Administration, where the researcher works, from the fifth and sixth grades of both genders suffering from diabetes. The total number of the sample was (14) students, including (4) students who underwent the exploratory experiment, (10) students for the main experiment, and they were divided into two groups (5) students in the experimental group, (5) students in the control group.

Sample selection conditions:

- The sample members must have the desire and motivation to participate in the tests.
- Parental consent
- Considering the safety of the sample from any diseases other than diabetes.

Basics of the proposed program:

- Considering individual differences.
- Considering the students' social and academic circumstances.
- Considering security and safety factors.
- That the program helps improve students' efficiency.

General framework for implementing the program:

The proposed nutritional education program was implemented over (8) weeks, with (2) educational courses per week, equivalent to (8) courses per month and (16) courses throughout the program implementation period for all students, provided that (2) full courses are implemented throughout the week, and educational workshops are held and educational tools are used such as (food board - models - video presentation - drawing workshops) to facilitate the process of obtaining information for the student as shown in the nutritional education program, with follow-up with parents during the rest of the week.

Points considered during the implementation of the program:

1. That the proposed nutritional education program is suitable for the characteristics of the age group that suits the sample members.
2. That the proposed nutritional education program achieves the goals for which it was established.
3. That the program is flexible so that it can be modified if necessary.

Statistical processing:

The statistical analysis plan for this study included:

- Arithmetic mean
- Standard deviation
- Skewness coefficient
- Correlation coefficient
- T_test to measure the significance of differences between averages
- Wilcoxon test
- Mann-Whitney test

Results.

Table (1) The significance of statistical differences using the Mann-Whitney test in the post-measurement between the experimental and control groups in the physical and physiological variables under study

Variables	Groups	Rank			Significance of differences	
		Number	Average Rank	Total Rank	Z	Sign.
Diastolic blood pressure	Experimental	5	3	15.00	2.643	0.008
	Control	5	8	40.00		
Systolic blood pressure	Experimental	5	3	15.00	2.694	0.007
	Control	5	8	40.00		
Pulse rate	Experimental	5	3	15.00	2.660	0.008
	Control	5	8	40.00		
Hemoglobin	Experimental	5	3	15.00	2.635	0.008
	Control	5	8	40.00		
Blood sugar	Experimental	5	7.80	39.00	2.440	0.015
	Control	5	3.20	16.00		
Long jump	Experimental	5	3.20	16.00	2.432	0.015
	Control	5	7.80	39.00		
Push-ups	Experimental	5	3	15.00	2.660	0.008
	Control	5	8	40.00		
Running in Place	Experimental	5	3.50	17.50	2.095	0.036
	Control	5	7.50	37.50		
50m Run	Experimental	5	3.50	17.50	2.095	0.036
	Control	5	7.50	37.50		

The previous table shows that the values of (Z) for the Wilcoxon test, which are significance levels less than (0.05), indicating the existence of statistically significant differences between the pre- and post-measurements on the physiological variables. Thus, the null hypothesis is rejected, and the alternative hypothesis is accepted, i.e., there are statistically significant differences at a significance level of (0.05) between the average ranks of the scores of the students of the experimental group in the pre- and post-measurements on the physiological variables, and these differences are in favor of the post-measurement.

Discussion.

The researcher attributes this progress in the post-measurement over the pre-measurement for the experimental group to the application of the proposed nutritional education program that contains information on correct nutritional awareness and all the nutritional elements that were designed according to the research requirements. Therefore, nutritional education and the advancement of cognitive awareness of students about healthy food are of great importance to the child, as its effect was reflected in the physiological variables of the students. The researcher attributes this improvement to the nutritional education program, which includes in its content some components that lead to the development of diastolic blood pressure, systolic blood pressure, pulse rate, hemoglobin level and a decrease in blood sugar level, as the improvement in physiological variables is due to the use of the educational program that included the importance of nutritional elements for students, correct and healthy eating habits and the correct proportions for each meal through activities, nutritional workshops and the educational curriculum of the Ministry of Education, which helped the members of the experimental group maintain their sugar level, pulse rate, systolic blood pressure, diastolic blood pressure and hemoglobin level. Therefore, the proposed program contributed to the superiority of the experimental group over the control group under study.

Mervat Ismail and Nafisa Eid (1995) indicate that the positive impact of the course in all its educational points and the improvement was clear in the nutrition of special groups followed in the order of healthy and unhealthy eating habits. Therefore, the study recommends paying attention to repeating these courses to increase nutritional awareness among mothers of children.

While the Special Nutrition Conference (1990) announced a positive relationship between the home environment and the suitability of food for the needs of the children under study.

Iman Ghallab (1987) mentioned that the nutritional status of urban children is better than rural children and the percentage of normal children in urban areas is 77% compared to 58% in rural areas and the percentage of children with severe malnutrition in urban areas is 3% compared to 7% of rural children.

The study by Suhad Hassib (2015) also confirms that the use of school nutrition and sports had a significant impact on the experimental group between the pre- and post-tests and in favor of the post-test in some immune blood components.

Taha Nasr El-Din (2001) also mentioned that one of the most important results of the study in using a physical training program and a proposed diet to treat diabetes led to a reduction in blood sugar levels.

Magdy Khafagy (2000) indicated the most important results about the lower level of nutritional culture of students compared to their parents and there was a significant impact of the level of nutritional culture of parents on the measurements of the students' physical composition and a high correlation was found between the educational and cultural level of parents and the level of nutritional culture.

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