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## **"A nutritional and sports education program for diabetics and its effect on some biochemical and physiological variables".**

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### **Introduction and research problem**

Nutrition education is considered one of the important programs in the national plans for the prevention and control of nutritional problems. Countries need deliberate educational programs in order to raise the level of nutritional and health awareness of community members. (22)

Sport in general, and aerobic exercise in particular, are given great benefits to those who practice it, as it increases the flexibility of the body, improves blood circulation, stimulates it, reduces psychological burdens, and protects against many diseases, and it was found that diabetics who exercise regularly, are less likely to suffer complications Drunkenness was better for others who would not be exercising. (5:41)

Today, physical education is no longer limited to educational and sports sciences that are concerned with teaching and training in sport activities only. Rather, it has a prominent and effective role in prevention, rehabilitation and treatment, as a result of the increase in sports and health awareness, and the spread among all groups of society and in the various age stages in a way that led to The population pyramid reverses from a young base in which the proportion of young people rises to a broad peak that includes an increase in the elderly. (11:11)

The practice of aerobic exercise has a direct impact on the general health of the individual, as it increases the efficiency of the work of the various vital organs of the individual, and also leads to the prevention of obesity, which is one of the most important causes of human infection with many diseases of the age, and perhaps the most famous of them is diabetes Also, the exercise of aerobic exercise works to raise the level of physical fitness of the individual by developing its various elements; And improve the functioning of the functional organs in the body, increase the growth processes, and the mental, psychological, and social aspects, and thus raise the level of the health status of the individual, To become a good citizen, increase his efficiency in his work, increase his production and reduce his chances of being infected by increasing his natural immunity, and preventing him from diseases, and the practice of aerobic exercise is an essential pillar of the treatment of diabetes, by activating the various cells and systems of the body, and working to burn excess body fat Thus, we find that the practice of aerobic exercise is no longer a secondary matter for a person, but rather has become a basic and necessary matter, so a person must practice sports activity daily to maintain his physical, organic, and psychological health. (2:39)

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Medical treatment mainly aims to correct the deficiencies that afflicted the devices, by using drug therapy, while exercises use the movement of the body itself to upgrade all its vital organs, through rehabilitative therapeutic exercises, according to the capabilities of people with diseases and the degree of their injury. (19:35)

The danger of diabetes is represented in its many complications that can affect all organs and tissues of the body, directly or indirectly, so it is called diabetes (complications disease), considering that its risk is in the occurrence of complications, and the reason for the occurrence of diabetes is due to the presence of a defect in Hormonal System The hormonal system is considered one of the most important devices that regulate the rates of chemical activity of different cells and tissues of the body, and the hormonal system consists of endocrine glands that secrete hormones in the blood. (6:90)

By observing the researchers and visiting one of the centers and hospitals, as well as seeing the researchers about the references and research that were available, the researchers found a high percentage of diabetics, especially the second type, and they also found the dependence of diabetics on treatment by taking drugs, and from here the researchers see the importance of aerobic exercise And nutritional education for diabetics in accordance with the condition of each patient, as sport and food are two basic ribs of the treatment triangle, and the patient may dispense with medication on the condition that he follows an athletic and dietary regimen commensurate with his disease, where the deterioration of the condition of type II diabetes can be controlled And his passage to normal life, away from diabetes complications, Therefore, the researchers undertook this study under research entitled a nutritional and sports education program for diabetics and its effect on some biochemical and physiological variables.

**Importance and need for research:**

- 1-The proposed sports and nutritional education program helps in improving the biochemical and physiological variables of individuals suffering from type 2 diabetes.
- 2-Improving the sugar level of people with type 2 diabetes.
- .3-A change in the daily lifestyle of a type 2 diabetic patient to a better life.

**research aims:**

**The research aims to design an exercise program and nutritional education for people with type 2 diabetes and to know its impact on:**

- 1-Biochemical variants of type II diabetics.
- 2-Physiological variables for type II diabetics.
- 3-Blood sugar level for type 2 diabetics.

**Research hypotheses:**

- 1-There are statistically significant differences between the pre-measurement and the post-measurement of the first experimental group in some biochemical and physiological variables and the blood sugar level of type II diabetics and the total axes of the nutritional education questionnaire.
  - 2-There are statistically significant differences between the pre-measurement and the post-measurement of the second experimental group in some biochemical and physiological variables and the blood sugar level of type II diabetics and the total axes of the nutritional education questionnaire.
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3-There are statistically significant differences between the pre-measurement and the post-measurement of the third experimental group in some biochemical and physiological variables and the blood sugar level of type II diabetics and the total axes of the nutritional education questionnaire.

4-There are statistically significant differences in the telemetry between the three experimental groups in some biochemical, physiological and blood sugar variables for type II diabetics and the total axes of the nutritional education questionnaire.

### **Search terms:**

#### **the program:-**

It is a group of structured experiences, set for a specific goal, and working to achieve it, linked to a specific time, and specific capabilities. (17:16)

#### **Nutritional education:-**

It is the process of helping community members to obtain the information and expertise necessary for them to make the appropriate choice of their food in order to maintain their health throughout their lives. (22)

#### **Aerobic exercise:-**

Aerobic exercise is the muscular work that depends mainly on oxygen, in the production of energy, and the source of energy is oxygen, so the muscular work is in the limits of low intensity that calls for the amount of oxygen necessary to complete and recover from a physical activity, without the presence of an oxygen debt. (1: 207)

#### **Diabetes Mellitus:-**

It is the body's inability to produce sufficient amounts of insulin to efficiently represent starches, fats, proteins and nutrients.(13:9)

### **Search procedures**

#### **Research Methodology:**

The researcher used the experimental method due to its relevance to the nature of the research by means of pre and post measurement on three experimental groups.

#### **Research areas:**

##### **Time domain:**

-The exploratory study was conducted during the period from 11/15/2019 to 11/29/2019.

-The basic study was conducted during the period from 1/12/2019 to 1/3/2020.

##### **Spatial domain:**

The research was applied at Al-Mualla Youth Center and a lecture hall at Al-Mualla Preparatory School and Al-Mumtaz Laboratory for medical analysis in Al-Mualla, Luxor Governorate.

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**The human domain:**

The research was carried out on a group of males with type 2 diabetes

Non-practicing sports in Luxor Governorate .

**Research community:**

The study population represents type 2 diabetes patients who are not practicing sports in Luxor Governorate .

**Find a sample:**

The research sample was deliberately chosen from men with type II diabetes, where the juveniles appear from (45: 55) years in terms of size (20) individuals divided into three groups (10) individuals of a first experimental group (sports program and nutritional education) and ( 5) Members of a second experimental group (a nutritional education program) and (5) members of a third experimental group (an exercise program) in exchange for the guidance of the treating physician.

**The homogeneity of the sample members:**

-Table (1) shows the relative distribution of the research sample from the total number

of the research sample.

**N = 20**

<b>Statistical connotations the sample</b>	<b>the number</b>	<b>percentage</b>
<b>First experimental group (sports program and nutritional education)</b>	<b>10</b>	<b>%</b>
<b>Second experimental group (nutritional education program)</b>	<b>5</b>	<b>50%</b>
<b>Third experimental group (sports program)</b>	<b>5</b>	<b>25%</b>
<b>Total</b>	<b>20</b>	<b>25%</b>

**Scientific transactions (consistency - honesty) for the nutritional education form:**

**First: - Stability**

- Table (2) shows the total Alpha Cronbach factor and the Spearman Brown factor for the nutritional education questionnaire. N = 20

The axes	Alpha Cronbach coefficient for the axis	Spearman Brown's Laboratories
The form as a whole	0.850 *	0.765 *

The value of (R) in the direction and limit of significance at the level of 0.05 = 0.369. Table (2) of the Alpha Cronbach coefficient and the Spearman Brown coefficient of the food education questionnaire indicate that the values of the Alpha Cronbach coefficient reached 0.850, and the Spearman Brown value was 0.765, and these values are greater than the value of the correlation coefficient. The tabular level is at 0.05 (0.369). This indicates the stability of the questionnaire.

**Second: honesty**

- Validity coefficients by the terminal comparison method for the sum of the axes and the total sum of the questionnaire

- Table (3) shows the terminal comparison between the upper and lower quadrants in the sum of the axes and the grand total For the nutritional education form under investigation. N = 20

Statistical connotations The axes	The top quadrants N = 5		Minimum quadrant N = 5		The difference between The medians	Value (T)	Factor of honesty
	S	p ±	s	p ±			
The first axis: food culture	10.00	0.00	4.60	0.89	5.40	*13.50	0.98
The second axis: food habits	9.40	0.55	5.20	0.45	4.20	*13.28	0.98
The total number of the form	19.20	0.45	9.80	1.30	9.40	*15.25	0.98

Significant at (0.05) = (2.31) \*

It is clear from Table (3) for the differences between the upper and lower quadrants in the sum of the axes and the total sum of the food education questionnaire under investigation to find the validity coefficient of the form, that there are statistically significant differences where the calculated value of (t) ranged between (13.28 to 15.25) and these values Greater than the tabular value of (t) at the level of (0.05) = (2.31), while the values of the validity coefficient in it reached (0.98), which confirms the validity of the whole axes of the questionnaire and the total total of the nutritional education questionnaire under discussion.

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**Devices, methods and tools used to collect data:**

- 1-Expert opinion survey form on used aerobic exercise and food education program.
- 2-An expert opinion survey form to determine the axes of the aerobic exercise program.
- 3-Sample data collection form .
- 4-Food education forms.
- 5-A medical scale to measure weight in kilograms .
- 6-A stopwatch for calculating time.
- 7-The Rostameter to measure the length .
- 8-Test tubes to analyze the blood sample .
- 9-Plastic syringes size 3 cm for single use .
- 10-White alcohol for disinfection + medical cotton .
- 11-Montor device to measure respiratory rate and pulse rate .
- 12-Gluco Star Blood Glucose Meter .
- 13-Measuring body mass index.
- 14-A pressure device to measure systolic and diastolic pressure.
- 15-Computer and screen display.

**Basic experience:**

The researchers conducted the proposed aerobic exercise program and nutritional education on people with type 2 diabetes in the period from 1/12/2019 to 1/3/2020 at the Mualla Youth Center in Luxor Governorate, and the researcher trained himself and assisted the assistants after training them on the proposed program. To assist in conducting exercises, educational lectures, and measurements specified for the study, and the measurement of sugar levels during the implementation of the program was followed up by the specialist doctor.

**Steps of basic study procedures:**

**Pre-measurements:** The researchers performed pre-measurements of the variables under investigation from 1/12/2019 to 2/12/2019 for the experimental group in question.

**Dimensional measurements:** Dimensional measurements were made after the end of the week (12) of the application of the program in the period from 2/28/2020 AD to 1/3/2020 AD, and all measurements were applied as was done in the pre-measurement of the variables under consideration and in the same manner .

**Statistical processors:** The statistical processors were found using the SPSS version 20 program, as follows:

- SMA . Mean .
  - Standard Deviation.
  - Mediator. Median.
  - coefficient of torsion. Skewness .
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-Flattening coefficient. Kurtosis.

-Test (T) the differences for the pre-dimensional measurements. Paired Samples T test .

-One way Anova variance.

-Percentage.

-Change rate %.

-The equation of the percentage change% = (post measurement - pre measurement) ÷ pretest x 100 .

**Display results:**

**Analysis of the discrepancy between the first, second and third experimental groups in the anthropometric, physiological and biochemical measurements and the total axes of the Nutritional Education Questionnaire.**

- Table (4) shows the significance of the differences between the three groups (experimental first - experimental second experimental third) In anthropometric measurements in telemetry. N = 20

Statistical connotations Measurements	The source of the contrast	sum Squares	Degree Of freedom	Average Squares	Values (V)	Indication level
the weight	Between groups	137.81	2	68.91	0.84	0.45
	Within groups	1391.93	17	81.88		
	Total	1529.74	19			
Body mass index	Between groups	6.41	2	3.21	0.52	0.61
	Within groups	105.30	17	6.19		
	Total	111.71	19			

Significance at 0.05 = (3.59) \*

It is evident from Table (4) that there are no statistically significant differences at the level of 0.05 between the three groups in the anthropometric measurements under study, as the value of (V) calculated in them was (0.84, 0.52) and these values are less than The tabular (V) value is at 0.05 (3.59) and the significance level value is greater than 0.05.

-Table (5) shows the significance of the differences between the three groups (experimental first - experimental second - experimental third) In biochemical measurements, in telemetry. N = 20

Statistical connotations Measurements	The source of the contrast	sum Squares	Degree Of Freedom	Average Squares	Values (v)	Indication level
The proportion of fasting sugar is lower From 100 mg / dL	Between groups	3598.95	2	1799.48	1.17	0.33
	Within groups	26163.60	17	1539.04		
	Total	29762.55	19			
The proportion of sugar after eating is less From 140 mg / dL	Between groups	1293.60	2	646.80	0,19	0.83
	Within groups	58949.20	17	3467.60		
	Total	60242.80	19			
Total cholesterol Less than 200 mg / dL	Between groups	41.80	2	20.90	0.15	0.86
	Within groups	2412.40	17	141.91		
	Total	2454.20	19			
Cholesterol More dense From 40 mg / dL	Between groups	26.80	2	13.40	1.01	0.39
	Within groups	226.00	17	13.29		
	Total	252.80	19			
Cholesterol Less low density From 130 mg /dl	Between groups	41.62	2	20.81	0.10	0.90
	Within groups	3469.86	17	204.11		
	Total	3511.48	19			
The percentage of triglycerides Less than 150 mg / dL	Between groups	8.55	2	4.27	0.06	0.94
	Within	1178.40	17	69.32		
	Total	1186.95	19			

\*Significance at the level of 0.05 = (3.59)

It is evident from Table (6) that there are no statistically significant differences at the level of 0.05 between the three groups in the biochemical measurements under investigation, where the calculated value of (P) ranged between (0.06 to 1.17) and these values are less than the value of (Q) The tabular is at 0.05 (3.59) and the significance level value is greater than 0.05.



**-Table (6) shows the significance of the differences between the three groups (first experimental - second experimental - third experimental) In physiological measurements, in telemetry. N = 20**

Statistical connotations Measurements	The source of the contrast	sum Squares	Degree Of Freedom	Average Squares	Values (V)	Indication level
Systolic blood pressure	Between groups	1.65	2	0.83	1.24	0.31
	Within groups	11.30	17	0.66		
	Total	12.95	19			
Diastolic blood pressure	Between groups	0.85	2	0.43	1.18	0.33
	Within groups	6.10	17	0.36		
	Total	6.95	19			
Pulse rate	Between groups	46.95	2	23.48	*7.98	0.00
	Within groups	50.00	17	2.94		
	Total	96.95	19			
Respiratory rate	Between groups	4.45	2	2.23	*4.45	0.03
	Within groups	8.50	17	0.50		
	Total	12.95	19			

\*Significance at 0.05 = (3.59)

It is evident from Table (5) that there are statistically significant differences at the level of 0.05 between the three groups in the physiological measurements (pulse rate - respiratory rate) under consideration, as the value of (q) calculated (7.98 to 4.45) and these values are greater than the value of (q) tabular At the level of 0.05 (3.59) and the value of the significance level is less than 0.05. , While there are no statistically significant differences in the rest of the physiological measurements under investigation, as the calculated (P) values were less than the tabular (P) value at (the level of (0.05) = 3.59, and the value of the level of significance was greater than (0.05).

Table (7) shows the significance of the differences between the three groups (experimental first - experimental second - experimental third) in the total axes of the dietary education questionnaire in the post measurement. N = 20

Statistical connotations The axes	The source of the contrast	sum Squares	Degree Of Freedom	Average Squares	Values (v)	Indication level
The first axis: food culture	Between groups	81.80	2	40.90	*86.91	0.00
	Within groups	8.00	17	0.47		
	Total	89.80	19			
The second axis: food habits	Between groups	45.10	2	22.55	*27.19	0.00
	Within groups	14.10	17	0.83		
	Total	59.20	19			
The total number of the form	Between groups	248.10	2	124.05	*76.13	0.00
	Within groups	27.70	17	1.63		
	Total	275.80	19			

\*Significance at 0.05 = (3.59)

It is evident from Table (7) that there are statistically significant differences at the level of 0.05 between the three groups in the total axes of the food education questionnaire under investigation, where the value of (q) calculated ranged between (27.19 to 86.91) and these values are greater than the value of (q) table at the level of 0.05 (3.59) The significance value is less than 0.05.

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## Discussing the results:

**Discussion of the discrepancy between the first, second and third experimental groups in the anthropometric, physiological and biochemical parameters, and the total subjects of the Nutritional Education Questionnaire.**

**A) Discussion of the significance of the differences between the three groups (first experimental - second ) experimental - third experimental) in anthropometric measurements in telemetry:**

It is evident from Table (4) that there were no statistically significant differences between the three groups in the anthropometric measurements under study.

1- With regard to body weight (kg): There were no significant differences in the measurements between the three experimental groups.

2- With regard to body mass index (BMI) kg / m<sup>2</sup>: there were no significant differences in the measurements between the three experimental groups.

The researchers attribute these results to the positive effect of the sports program and the nutritional education program on weight and body mass index, as the practice of aerobic exercise in general is a call for the continuation of public health, weight loss and physical fitness gain and maintenance, and the pursuit of improving it . (4: 5)

**B) Discussion of the significance of the differences between the three groups (experimental first - experimental ) second - experimental third) in biochemical measurements in telemetry:**

It is evident from Table (5) that there are no statistically significant differences between the three groups in the biochemical measurements under investigation.

1- With regard to the proportion of Fasting sugar: There were no significant differences in the measurements between the three experimental groups.

2- With regard to the proportion of sugar after eating: There were no significant differences in the measurements between the three experimental groups.

In terms of the positive effect of sports activity on the level of blood sugar, these results are consistent with the findings of Muhammad Ahmad Abdu (1995) (15), Mustafa Muhammad Nour (1995) (18), Khaled Jabir Abdul Hamid (1998) (8) ,Salwa Abdel Hadi Shakib(1997)(10),Taha al-Sayyid Nasreddin (2001) (12), Ammar Hamza Hadi al-Husseini (2009)(14), Muhammad Abd al-Wahhab Muhammad Hassan (2013) (16), Baghdadi Syed Hassan Ahmad (2014) (4).

The researchers explain that these results are due to the effect of the sports program and nutritional education in terms of muscle receptor response to insulin, increased sugar burning through sports activity and nutritional education, as well as increased sensitivity of receptors to insulin, and also due to the improvement of the efficiency of the respiratory circulatory system, which leads to an increase in the amount of blood paid and increased efficiency Muscles in sports activity and as a result of burning sugar inside the muscle cells, therefore, the oxygen content inside the cells decreases, and as a result, glucose passes from the blood into the cells and therefore blood sugar decreases, and accordingly the need for the energy source to continue in the sports activity increases, which leads to the consumption of an amount A large amount of blood sugar in addition to that increase the awareness of nutritional health The identification of what is forbidden and permitted from food for a type II diabetic is under research, and is due to the effect of the nutritional education program on the level of fasting sugar by increasing health awareness and nutritional education and identifying the prohibited and permitted food for a type II diabetic under research, and it is due to the effect of the program Athlete in terms of muscle receptor response to insulin and increased sugar burning by athletic activity.

3- Regarding total cholesterol: There were no significant differences in the measurements between the three experimental groups.

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4- As for HDL cholesterol: There were no significant differences in the measurements between the three experimental groups.

5- As for low-density lipoprotein cholesterol: There were no significant differences in the measurements between the three experimental groups.

6- With regard to the percentage of triglycerides: There were no significant differences in the measurements between the three experimental groups.

These results in terms of the positive effect of sports training on the level of total cholesterol in the blood, the level of high-density lipoprotein (HDL), the level of low-density lipoprotein (LDL) and blood triglycerides are consistent with the findings of Lamb Mann and Stengart (1991) (20), Sankhlez and Akhron (1992) (21), Muhammad Ahmad Abdo (1995) (15), Mustafa Muhammad Nour (1995) (18), Salwa Abd al-Hadi Shakib (1997) (10), Taha al-Sayed Nasreddin (2001) (12), Bazzar Ali Jokal (2007) (3), Ammar Hamza Hadi al-Husseini (2009) (14), Muhammad Abd al-Wahhab Muhammad Hasan (2013) (16).

The researchers indicate that these results are due to the effect of the sports program, nutritional education, nutritional education program, and sports program on the rate of improvement in the level of total cholesterol in the blood, the level of high-density lipoprotein (HDL) cholesterol, and the level of low-density lipoprotein (LDL) cholesterol and blood triglycerides for the sample of the research.

### **C) Discussion of the significance of the differences between the three groups (first experimental - second experimental - third experimental) in the physiological measurements in the telemetry:**

Table (6) shows that there are statistically significant differences between the three groups in the physiological measurements (pulse rate - respiratory rate) under consideration, while there are no statistically significant differences in the rest of the physiological measurements (systolic pressure - diastolic pressure) under study.

1- With regard to pulse rate: There are significant differences in the telemetry in favor of the first experimental group.

The researchers attribute these differences to the positive effect of the sports program and nutritional education on the pulse rate more than the satisfied program and more than the nutritional education program.

The pulse rate reflects the amount of heart work that must be worked out to meet the increasing demands of the body during the exercise of physical exertion, and the average pulse rate during rest ranges from (60) to (80) beats per minute in the average age of a healthy adult individual, and this rate may increase in some individuals Lovers of rest and sitting, and a little movement, as it reaches about (100) beats / minute, and if this person is trained on endurance exercises per week for a period of (12) weeks, we notice that the heart rate will decrease by about one pulse / minute every week, and this means that continuous moderate endurance training will Helps lower pulse rate (9: 78)

2- Regarding respiratory rate: there are significant differences in the telemetry in favor of the first experimental group.

During physical exertion, breathing increases in depth, in the frequency of the respiratory rate, and thus in the volume of ventilation, and when the individual stops exerting physical exertion, breathing rates return to normal. (7: 17)

The researchers explain that the resulting change in respiration rate between measurements in favor of the first experimental group is a result of adaptation of the respiratory circulatory system to increase the demand for oxygen, i.e. when performing a physical load that requires energy production, and that the respiratory rate is related to pulmonary ventilation, which in turn increases to ensure oxygen access to the lungs.

3- As for systolic pressure: There were no significant differences in the post measurement between the three experimental groups.

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4- With regard to diastolic pressure: There were no significant differences in the telemetry between the three experimental groups.

The researchers conclude that these changes are the result of the impact of sports activity on the respiratory circulatory system to fulfill its requirements for the various body systems, the increase in the need for the skin and other tissues for blood to maintain the temperature and the completion of metabolic processes, and that the high temperature of the air affects the volume of fluids in the body, which leads to no Ventricular fullness and this factor in turn affects cardiac impulse and blood pressure.

**D) Discussion of the significance of the differences between the three groups (first experimental - second experimental - third experimental) in the total axes of the nutritional education questionnaire in the telemetry:**

Table (7) shows that there are statistically significant differences between the three groups in the total axes of the food education questionnaire under investigation.

1- With regard to the first axis (food culture): there are significant differences in favor of the second experimental group.

The researchers attribute these differences in results to the application of the nutritional education program, which resulted in an increase in health awareness, nutritional education, identification of the elements of food and their importance to the human body in general, and the identification of prohibited and permissible foods for type 2 diabetes under study.

It is well known the importance of the effect of food on health, and attention should be paid to nutritional education and the spread of food culture among members of society, with a focus on girls and women, given that they are responsible for preparing family food and managing its affairs in general, and women's awareness of safe food leads to improving the health level of the family and society. (22)

2- With regard to the second axis (food habits): there are significant differences in favor of the first experimental group.

The researcher attributes these differences in results to the application of the sports program and nutritional education, which resulted in an increase in health awareness and nutritional education, identifying the elements of food and their importance to the human body in general, and identifying the forbidden and permissible of food for type 2 diabetes under study.

Nutrition education is one of the most important topics that we must pay great attention to in order to spread nutritional health awareness, and for food education to be effective, it must be based on the latest discoveries in nutrition sciences, and food education programs need to take into account developments in our understanding of nutrition and behavioral changes. These programs must include several basic points, including the definition of the importance of good nutrition, the quantities of food that we must eat and sufficient for our activity, the preparation of good family meals, and the preservation of food safe and clean. (22)

3- With regard to the total number of the questionnaire: There are significant differences in favor of the second experimental group.

Nutrition education is the process of helping community members to obtain the information and expertise necessary for them to make the appropriate choice of their food in order to maintain their health throughout their lives. Enjoying good health and thus their ability to work and develop society in all fields. (22)

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## **Conclusions:**

**Based on what the research results showed and in light of the objectives and assumptions of the research, the methodology and the measurements used and within the limits of the research sample and its characteristics, and depending on the results of statistical treatments of the data extracted from the experiment, the researchers reached the following conclusions:**

**The effect of the nutritional and sports education program has a positive effect on developing and improving the biochemical and physiological variables of type 2 diabetes patients, as this research showed improvement in the following variables:-**

### **Anthropometric variables:**

Where the results showed a percentage of improvement by decreasing both (weight - body mass index) among the subjects of the research sample, and the percentage ranged between (6.57%, 6.69%) as a result of applying the sports program and nutritional education on type II diabetics.

### **Bio-chemical variants:**

Where the results showed an improvement rate with a decrease in (fasting blood sugar - fatty sugar - total cholesterol - low density cholesterol - triglyceride percentage) and an increase in (high density cholesterol) among the subjects of the research sample, and the percentage ranges between (6.39%) , 20.33%) as a result of applying the sports program and nutritional education to type 2 diabetics.

### **Physiological variables:**

Where the results showed a percentage of improvement in (systolic blood pressure - diastolic blood pressure - pulse rate - respiratory rate) among the subjects of the research sample, and the ratio ranged between (1.30%, 15.89%) as a result of applying the sports program and nutritional education on type II diabetics.

### **Variables of the total axes of the nutritional education questionnaire:**

Where the results showed a rate of improvement and change for the better in (the first axis: food culture - the second axis: the nutritional habits) of the individuals of the research sample and the percentage ranges between (168.75%, 235.71%) as a result of applying the nutritional education program on the second experimental group of type II diabetes patients.

## **Recommendations:**

**In light of the research results and within the limits of the research sample and its procedures, the researchers recommend the following :-**

- The application of the sports program and nutritional education for its effectiveness in improving the anthropometric, physiological and biochemical variables of type II diabetes patients.
  - Spreading awareness among community members about diabetes, its causes and methods of prevention, with clarification of the role of sports practice and nutritional education as one of the means of preventing various diseases, including diabetes and various heart diseases.
  - The need to conduct more studies to contribute to treating or delaying the onset of complications for diabetics.
  - Conducting more research and studies on other dental stages.
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## References

### **- First, Arabic references :-**

- 1- Abu Al-Ela Ahmed Abdel-Fattah, Ahmed Nasr El-Din Syed :** Physiology of Physiology, The Arab Thought House, Cairo, 2003
  - 2 - Ahmed Fathy Al-Zayat , Osama Riad :** Sports Health , Arab Thought House , Cairo , 1997 AD .
  - 3 - Bazarali Jokul:** Treatment of Diabetes with Exercise. 1, (Amman, Dergla for Publishing and Distribution,2007 AD.
  - 4 - Baghdadi Syed Hassan Ahmed :** The effect of an aerobic exercise program on obese and type II diabetes sufferers, published master thesis, College of Physical Education, South Valley University, 2014 AD.
  - 5 - Bahaa El-Din Ibrahim Salama :** Biochemistry in the Mathematical Field, Dar Al-Fikr Al-Arabi, Cairo, 1990 AD.
  - 6 - Bahaa El-Din Ibrahim Salama:** Sports health and the physiological determinants of sports activity, Arab Thought House, Cairo, 2002 AD.
  - 7 - Bahaa El-Din Ibrahim Salama:** Physiology of Exercise, Arab Thought House, Cairo, 2009 AD.
  - 8- Khaled Jabir Abdel-Hamid:** The effect of using the kinetic activity of a proposed aerobic treatment on the level of the hormone insulin and glucose for diabetics "Unpublished Master Thesis, Faculty of Sports Education, Helwan University, 1998 AD.
  - 9 - Radwan Muhammad Radwan :** The effect of physical exertion on the concentration of thyroid hormones in the blood, Unpublished Master Thesis, Faculty of Physical Education, Helwan University, 1994 AD.
  - 10 - Salwa Abdel Hadi Shakib :** The effect of an aerobic program with diet on some biochemical and physiological variables and weight control for diabetic patients in the age group (25-30) years, theories and applications, First Issue, College of Physical Education for Boys, Alexandria University, 1997 AD.
  - 11 - Tariq Ali Ibrahim Rabie :** Physiology of Senior Citizen Sports: Between Theory and Practice, Dar Al-Wafa for the World of Printing and Publishing, Alexandria, 2008 AD.
  - 12 - Taha Al-Sayed Nasr El-Din :** The effect of a proposed physical exercise program and diet for treating "diabetics, "Unpublished Master Thesis, Faculty of Physical Education, Tanta University, 2001 AD.
  - 13 - Abd al-Fattah Muhammad Atta, Muhammad al-Sayed Arnaout:** The Book of Medical Day, No. 84, Akhbar Al-Youm Foundation, Cairo, 1998 AD.
  - 14 - Ammar Hamzah Hadi Al-Husseini:** The effect of programming sports and nutritional exercises on some physiological variables among people with diabetes, Journal of Physical Education Sciences, University of Babylon, Iraq, First Issue, Volume Two, 2009 AD.
  - 15- Mohammed Ahmed Abdo Khalil :** Study of the effect of a proposed physical training program for diabetics and its relationship to the given insulin dose and blood sugar control, published research, Scientific Journal, Issue 22, January, Zagazig University, 1995 AD.
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**16 - Mohammed Abdul Wahab Mohammed** : The Effect of a Sports Recreation Program on Glucose and Triglyceride Level for Diabetics in Qena Governorate, PhD Thesis, Faculty of Physical Education, Minia University, 2013 AD.

**17 - Muhammad Al-Hamami and Amin Al-Khouly** : The foundations of building sports programs, Arab Thought House, Cairo, 1990 AD.

**18 - Mustafa Muhammad Nour** : The effect of neuromuscular compatibility exercises on improving the functional and psychological state of diabetics, unpublished master thesis, College of Physical Education for Boys, Alexandria University, 1995 AD.

**- Second, foreign references:**

**19- Fox,Cairgo :-** to The role of in sulin the metabo lie Resson se exercise Diabetic moon , Iabetec suppl, 1999 AD .

**20- Lampman,R.-M Schteingart, D- E:-** Effects of exercise training on glucose controlLipid metabolism, and insulin sensitivity in hyper triglyceride mia and non insulin dependent diabetes mellitus " medicine and science in sports exercise 23,1991 AD. (6) : 703 – 7112.7112.

**21- Sanchez , ugo and lizette:-** program on blood lipids,blood pressure and The effects of diet and exercise (diabetes indices relation to body fat and body fat distribution diabetes mellitus) . Dissertations Abstracts international,1992 AD .

**- Third International Internet information network references:**

**22- <https://www.al-mstba.com>.**

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## Research Summary

**"A nutritional and sports education program for diabetics and its effect on some biochemical and physiological variables".**

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**The aim of the research is to design a nutritional and sports education program for people with type 2 diabetes And know its impact on:**

- Biochemical variants of type II diabetics.
- Functional variants of type II diabetes.
- Blood sugar level for type 2 diabetics.

The researchers used the experimental approach, using three experimental groups, and a (pre-post) measurement of the variables under study was performed. The research sample was deliberately chosen from men with diabetes of the second type and the sample size was 20 individuals of the age of (45-55) years divided by The three experimental groups.

**Results :**

The effect of the nutritional and sports education program had a positive effect on the improvement of all biochemical and physiological variables in type II diabetes patients, the improvement of blood sugar in type II diabetics, and the improvement of the health and psychological status in general of the research sample under study.

**Recommendations :**

Applying the nutritional and sports education program because of its effectiveness in improving the biochemical and physiological variables of type 2 diabetes patients.

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