

## The Effect of the Psychomotor Program on Sugar Level in the Blood among the Elderly"

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### Abstract

**Background:** Psychology has also proven to be helpful in developing and evaluating diabetes prevention programs, aimed at helping persons at risk for diabetes to achieve lasting lifestyle changes. There are psychological and chemical advantages of doing physical exercise over eating. Nurses caring for patients with diabetes need to be working towards the same objectives, therefore determining priorities for managing their condition are important aspects of care. **Aim:** this study aimed to assess the effect of the psycho-motor program on sugar level in the blood among the elderly. **Setting:** the Internal Medicine and, Diabetes & Endocrinology of the University Hospital, Dar El-Khar & Baraka, Dar El-Halala Al-Ahmer and El- Noer & El-Amal in the Beni Suef Center at Beni Suef Governorate. **Subjects:** A sample of convenience of 150 patients of the diabetic elderly recruited from four places. **Tools:** Data were one tool consisting of three parts, socio-demographic questionnaire, the psychological pressures questionnaire and Life satisfaction scale. **The results:** The findings of this study indicated that, application of the program leads to reduced levels of fasting and cumulative blood sugar. **Conclusion:** Based on the findings of the present study, it can be concluded that, It shows that there were many statistically significant associations between, reduction of blood glucose level; reduce the duration of walking 2 km and life satisfaction.

**Keywords:** Psychomotor, Program, Sugar, Level, Blood, Elderly

### 1- Introduction

Diabetes is a common and a serious global health problem, currently affecting an estimated 8.3% of adults, 382 million people worldwide, and taking up 11% of international health expenditure (**International Diabetes Federation, 2013**). World Health Organization defines Diabetes mellitus as “a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body's systems, in particular the blood vessels and nerves”(WHO, 2010).

Diabetes is a psychologically challenging disease for patients and their family members (**Snoek, Kersch, & Eldrup, 20011**). It interferes with quality of life and is a risk factor for diabetes-related distress. Challenges accompanying the diagnosis of diabetes include an adjustment to the disease, adherence to the treatment regimen and psychosocial difficulties at both a personal and an interpersonal level (**Peyrot, Rubin, & Lauritzen 2005; and Goebel-Fabbri, Fikkan, & Franko, 2008**). Diabetes itself is an important cause, of psychological pressure in these patients. In fact, this disease involves lifestyle changes, diet, frequent medical examinations, drugs, serious complications. All these components affect the quality of life of diabetics (**Trovato et al., 2006**).

### 2. Significance of the study

Although chronic patients have longer life span compared to the past due to medical advancements, they simultaneously face adaptation problems more than before; therefore, despite the fact that the main concern in health and treatment was individuals' life preservation, the main challenge of the present century is to care about general health and a qualified and joyful life (**Strine et al., 2008**). Diabetic patients' mental health is a specific concern (**Zhao et al., 2006**). Research shows that psychological, social, and disabling problems such as feeling of tiredness, irritability, anger, depression, and anxiety are seen more in diabetic patients than other individuals (**Mahmodi, & Sharifi, 2008**). Concurrency of emotional problems such as depression and anxiety among diabetic patients is accompanied with reduction of quality of life, self-care defective behaviors, and reduction of blood sugar control among these patients. Management and control of diabetes can be disturbed by the existence of diabetes-related emotional problems such as fear of hypoglycemia, worrying about complications, or not accepting the disease. Psychological and social problems may be caused by diet and activity limitations, the need for precise and constant self-care, and the possibility of serious physical complications like renal, ocular, cardiac, and medullary problems. Individuals' acceptance of the disease to change their lifestyle based on that is not always easy (**Moser, Bruggen, & Widdershoven, 2006; and Ghazavi et al., 2015**).

Therefore, the aim of treatment is to manage blood glucose levels to alleviate short term symptoms and prevent or delay the development of long-term complications. Raised glucose in the blood, known as

hyperglycemia, can initially be controlled by lifestyle management, such as changes to diet and exercise (McBain et al., 2014). Regular physical exercise represents an essential pillar in the treatment of diabetes and counteracts many of the detrimental effects of insulin resistance. They improve glucose control and blood lipid levels, they increase blood flow and vascular function, they improve fitness, reduce the risk of heart disease and may ease weight loss. Proper nutrition and physical exercise are the basis of treatment in diabetes, the more sustained physical exercise, and the better the results. Aerobics and Fitness are both means of physical education and education for a healthy lifestyle (Dinciu, 2015).

Diabetes mellitus is a chronic illness, and its associated complications in Egypt and requiring a lifetime self-management behavior. Because diet, physical exercise, and physical and emotional stress can affect diabetic control, patients must learn to balance these factors to avoid fluctuations in blood glucose levels. They must be knowledgeable about nutrition, exercise, preventive strategies, and medication adjustment. Given the increasing incidence of DM, its chronic nature with no cure, and the associated potential complications. Medical and nursing care and physical exercise for patients with diabetes need to be working towards the same objectives, therefore, target-setting and determining priorities for managing their condition are important aspects of care. Every one of the team members has a main role in patient care and everyone completed the role of the other. The physician describes the medical regimen, but the nurse has important roles will develop, these will include interpreting what the information means to people individually and to their friends and relatives, and creating forums for discussions about how to put the advice into action. The specially psychiatric nurse has an important role to improve diabetic patients' mood; psychological status and the consequence improve global health for diabetic patient. Our study has important role in delivering good and comprehensive patient care and can save the money by reducing the length of hospital stays, facilitating early discharge, reducing hospital admissions and preventing long-term complications and positive impact on the quality of diabetic patients' lives.

### 3.0 Aim of the study

The aim of this study was to investigate the effect of implementing a psycho-motor program on sugar level in the blood among the elderly.

### 3.1 Specific objectives

- Assess psychological pressure among the diabetic elderly.
- To design a psycho-motor program on sugar level in the blood among the elderly.
- To implement the psycho-motor program on sugar level in the blood among the elderly.
- To evaluate the effect of the psycho-motor program on sugar level in the blood among the elderly.

### 4. Hypothesis

- There is a reduction of psychological pressure among the diabetic elderly after program implementation.
- There is positive effect of implementing a psycho-motor program on sugar level in the blood among the elderly.

### 5. Subjects and methods

#### 5.1. Research design

Quasi-experimental research design was utilized in this study, with pre/post and follow-up assessment to evaluate the effect of implementing health, psycho- motor program concerning reduce level of sugar in the blood among the elderly.

#### 5.2. Research setting

The study was conducted in four places; Dar Al Khair & El-Baraka for the elderly in the eastern Nile, Dar El-Halla El-Ahmar in Salah Salem, Al-Nour and Al-Aml Charity, University of Beni-Suef Hospital Clinics of (Internal Medicine - Sugar and Endocrine) in Beni Sueif Center in the Beni Sueif Governorate.

#### 5.3. Subjects

A sample of convenience of 150 patients of the diabetic elderly (50 patients who treated with insulin and 100 patients who treated with oral drugs), from the above mentioned setting was recruited for the study following inclusion criteria:

- \* Both sexes were included.
- \* Between 45 - 66 years old and above.

#### 5.4. Instruments

**5.4.1- Medical instrument:-** Pressure Apparatus, Sugar Apparatus, Sugar Analysis "fasting glucose, 2 hours postprandial, and Cumulative sugar HbA1c". Blood test for glucose level occurred before the program and after three months of the program.

**5. 4. II- Sport instrument:-** Scale for Height and Weight, Measuring the Thickness of Fat Apparatus and Stop Watch.

**5. 4. III- Psychiatric tools**

- Literature review after modifying them to simple Arabic language for the diabetic elderly to suit their level of understanding.

- Data were collected through using one tool which includes 3 main parts as follows:

- \* **The First Part Sociodemographic Questionnaire** of the patient and her family. It was developed by the researchers. This questionnaire includes patient's name, and age, level of education, years of diabetes, as well as types of diabetes (Questions 1-12).
- \* **psychological pressure among the diabetic patient questionnaire**, the questionnaire is designed to provide an overview of a patient's symptoms and their intensity of psychological pressure among the diabetic patient. It was developed by the researchers, the researchers review the Literature & was adapted it from the Psychological Pressure in Women with Breast Cancer questionnaire (**Mohamed, El-azzab, & Osman, 2015**). It consists of 30 questions. Responses were measured in 3- point Likert Scale, where the highest score indicated the highest level of symptom intensity, ranging from "1 to 3" as: 1 never, 2 sometimes, 3 often; all statement follow this consequence (positive statement); accept the 17<sup>th</sup> & 24<sup>th</sup> statement (negative statement) as: 3 never, 2 sometimes, 1 often. The range of possible score is from "30"to "90". There are three levels of psychological pressure, from 30 - 49 lower level; from 50 - 69 moderate level; from 70 - 90 severe level of psychological pressure, and proved to be reliable (Cronbach's  $\alpha = 0.88$ ); and (Guttman Split-Half Coefficient = 0.92).
- \* **Satisfaction with life scale**, the scale was designed for assessing the degree of life satisfaction. It was developed by **Desouki (2013)**. It consists of 29 questions. Responses were measured in 5 point Likert Scale, where the highest score indicated the highest level of life satisfaction, ranging from "0 to 4" as: 0 does not apply Never, 1 does not apply, 2 in between, 3 apply, 4 Fully applicable. The range of possible score is from "29"to "116". There are three levels of life satisfaction, from 29 - 57 lower level; from 58 - 86 moderate level; from 87 - 116 high level of life satisfaction. The scale was quoted and codified (Validity and Reliability) to the Egyptian culture by **Desouki**.

**5.5. Administrative and ethical considerations**

Necessary approvals to conduct the study were secured using official channels. The Scientific Research Developing Unit, Beni-Suef University approved the protocol. At the initial encounter with each patient, the researchers explained the aim and the process of the work and its benefits to obtain an informed oral consent. Each patient was informed about the rights to refuse or withdraw at any time, and about the confidentiality and anonymity of any obtained information. No harm could be anticipated from any maneuver in the implementation of the study; on the contrary, the intervention had potential beneficial effects on participants.

**5.6. Field work**

Agreements were taken from the directors of the four places, to select and collect patient who were met in specific days with the researcher, to explain the questionnaires and observe them when filling in the tools. Each patient took about 25 - 30 minutes to complete the questionnaires.

- 1- The researcher analyzed the scientific literature and studies that have shown interest in studying the healthy, psychological and social aspects put the program in the initial image .
- 2- Display the program for (10 experts) of the professors in the field psychiatric nursing, psychology, and education, physician of internal medicine, and physical sports, to determine the number of sessions per week and the time of each session, has been making the necessary modification in the proposed program and based on expert opinion as follows :
- 3- The number of sessions (8) sessions with 2 sessions each week, the time of the meeting defined to two sessions, each one 20 minutes and 10 minutes in between for breaks. One session for identification between the researchers and patient, and conducting the pre test. Six sessions to apply the program to deal with the diabetic elderly patients to define diabetes, types, identify healthy food, diabetic foot care, a complication of diabetes, teaching the patient new skills to deal with psychological pressure, explain the relationship between the mind and the body and its effects on resistance chronic diseases such as diabetes, and how to satisfy with daily living, use physical exercise as life stye to deal with diabetes. Final session after complete the application of the program, for interviewing with the patient to answer any question, and conducting the immediate post test. In addition, follow-up sessions after the program by three months.
- 4- The assessment of data took two weeks to collect. Each place took four weeks to apply the program for each group, every group includes 15 patients. The actual field work was carried out at the beginning of October (2015) to the assessment of data beginning of December (2015) to apply the program, the program was implemented in four places in parallel and follow-up of the program beginning of April (2016). After

collecting data done, the statistical tests and statistical analysis done.

### 5.7. Steps to implement counseling psycho-motor program

#### \* First, medical program

- The number of sessions (5) sessions, the time of the meeting 20 minutes.
- One session for identification between the researchers and patient, and 3 sessions to define diabetes, types, the importance of medical treatment and, the effectiveness of treatments and healthy food, diabetic foot care and complications of diabetes.
- Final session after complete the application of the program, for interviewing with the patient to answer any question, and conducting the immediate post test.

#### \* Second, psychiatric nursing program:

- The number of sessions (5) sessions, the time of the meeting 20 minutes.
- One session for identification between the researchers and patient, 3 sessions, to explain the relation physiological and psychological variables for older people with diabetes, how to reduce associated with diabetes and mental disorders, explain the importance of mental health for diabetics, diabetes causes of stress, definition of the psychological factors associated with diabetes, and explain the importance of controlling psychological aspect, the beginning of psychological treatment for diabetes, clarify how to deal with diabetes.
- Final session after complete the application of the program, for interviewing with the patient to answer any question, and conducting the immediate post test.

#### \* Third, physical exercise program:

- The program comprised of (8) sessions, the time of the meeting 20 minutes.
- One session for identification between the researchers and patient, 6 sessions for exercise patients' softer joints and walking.
- Final session after complete the application of the program, for interviewing with the patient to answer any question, and conducting the immediate post test .
- The time of the meeting at the beginning of the program (15 minutes) and ranging up to (20 minutes)

### 5.8. Pilot study

A pilot study was conducted on 10 % of the study sample (15patient) Internal Medicine clinic in Beni-Suef University Hospital of Beni Suef City. The pilot settings, selected in this study were included in the main study sample, but the pilot sample was not included in the main study sample. The aim of the pilot study was to test clarity of language, applicability of items, and time consumed for filling in the tools' items. According to the results of the pilot study, no modifications were made on the questionnaires.

### 5.9. Statistical design

The collected data were organized, revised, stored, tabulated and analyzed using the number and percentage distribution, statistical analysis was done by a personal computer (PC). Proper statistical tests were used to determine whether there was a significant difference or not, using the statistical package for social science (SPSS), version 20, as follows :

- Description of quantitative variables as mean, SD and range
- Description of qualitative variables as number and percentage
- Fisher exact test was used instead of chi-square when an expected cell <5
- ANOVA (test) was used for differences between means Analysis of Variance.
- Pearson correlation was used for relationship between continuous variables.
- Probability (p-value) was considered as follows :

\* P value >0.05 insignificant      \* P<0.05 significant      \* P<0.01 highly significant

**6. Result:-**

**Table (1): Distribution of the studied samples as regards socio-demographic data and history of diabetes mellitus (DM).**

Variable	N	%
<b>Age</b>		
45- 54 years	41	27.3
> 54-63 years	56	37.3
> 63 years	53	35.3
<b>Education</b>		
Cannot read or write	37	24.7
Can read and write	25	16.7
Primary	31	20.7
Secondary	34	22.7
University	23	15.3
<b>Occupation</b>		
Not working	59	39.3
Manual	51	34.0
Clerical	17	11.3
Professional	5	3.3
Managerial	18	12.0
<b>Residence</b>		
Rural	59	39.3
Urban	91	60.7
<b>Marital status</b>		
Single	47	31.3
Married	76	50.7
Divorced	10	6.7
Widow	17	11.3
<b>Number of individuals in family</b>		
3-5	95	63.3
6-7	55	36.7
<b>Number of rooms</b>		
Two	26	17.3
Three	115	76.7
Four	9	6.0
<b>Crowding index</b>		
1-1.5	25	16.7
1.6-3	125	83.3
<b>Monthly income</b>		
Enough	50	33.3
Not enough	100	66.7
<b>Type of DM</b>		
Insulin dependent	50	33.3
Non-insulin dependent	100	66.7
<b>Duration of having DM (in years)</b>		
≤ 3	31	20.7
>3-6	53	35.3
>6	66	44.0
<b>Family history of DM</b>		
Yes	98	65.3
No	52	34.7
<b>Who is the one that has DM in your family?</b>		
None	52	34.7
One of the parents	50	33.3
One of the offspring	4	2.7
One of the siblings	21	14.0
Husband/wife	23	15.3

The distribution of the studied samples as regards socio-demographic data and history of diabetes mellitus (DM) is presented in a table (1). It shows that the diabetic patient reported that, age ranged from 45 to more than 63 years, 44% were not working, 50.7% were married, 66.7% were not enough monthly income, 44% have had diabetes more than sixth years, 65.3% were having a family history of diabetes.

**Table (2): Distribution of the studied samples as regards pulse, body characteristic and sport measurement, before and after three months from application of the program.**

Variables	Before		After 3 months		X <sup>2</sup>	P
	N	%	N	%		
<b>Weight</b>						
60 -75	32	48.5	34	51.5	13.319	.004*
76 -90	56	40.9	81	59.1		
91 -110	53	66.3	27	33.8		
≥111	9	56.3	7	43.8		
Mean ± SD	87.87±15.615		83.79±12.863			
<b>Height</b>						
≤ 160	98	50.0	98	50.0	No difference	
≥161	52	50.0	52	50.0		
Mean ± SD	159.96±14.772		159.96±14.772			
<b>Pulse</b>						
≤80	99	47.1	111	52.9	2.286	.166
≥81	51	56.7	39	43.3		
Mean ±SD	78.58±3.390		77.47±3.600			
<b>Time of walking 2 Kilometers</b>						
≤ 25 min	85	38.8	134	61.2	37.215	.000*
>25.1	61	79.2	16	20.8		
Mean ±SD	78.58±3.390		77.47±3.600			

\*significant < 0.05

\*\* highly significant at P ≤ 0.001

The distribution of the studied samples as regards pulse, body characteristic and sport measurement, before and after three months from application of the psycho-motor program is shown in a table (2). It reveals that there were many statistically significant associations between application of the program and reduce weight (p, .004\*\*), time of walking two kilometers (p, .000\*\*).

**Table (3): Distribution of the studied samples as regards blood sugar analysis, before and after three months from application of the program.**

Variables	Before		After 3 months		X <sup>2</sup>	p
	N	%	N	%		
<b>Fasting blood sugar</b>						
70-100	66	44.3	83	55.7	10.637	.014*
101-125	31	52.5	28	47.5		
126-150	7	33.3	14	66.7		
>151	46	64.8	25	35.2		
Mean ±SD	145.66±98.337		117.19±58.470			
<b>Random blood sugar</b>						
<140	76	47.2	85	52.8	5.590	.133
140-200	29	46.8	33	53.2		
201-260	21	50.0	21	50.0		
>261	24	68.6	11	31.4		
Mean ± SD	176.07±103.966		150.83±60.794			
<b>Cumulative blood sugar</b>						
<5.7	56	44.4	70	55.6	12.982	.005*
5.8-6.8	46	46.0	54	54.0		
6.9-7.5	17	51.5	16	48.5		
> 7.6	31	75.6	10	24.4		
Mean ±SD	6.37±1.307		5.96±.945			

\*significant < 0.05

\*\* highly significant at P ≤ 0.001

The distribution of the studied samples as regards blood sugar analysis, before and after three months from application of the psycho-motor program are displayed in a table (3). It demonstrates that there were many statistically significant associations between application of the program and reduce levels of blood sugar; fasting

(p, .014) cumulative (p, .005\*).

**Table (4): Distribution of the studied samples as regards the impact of psychiatric nursing program on diabetic patient.**

Variables	Before	After	After 3 months	F	p
	M±SD	M±SD	M±SD		
Psychological pressure questionnaire	71.66±8.18	63.56±6.20	67.85±4.94	56.929	.000*
Life satisfaction scale	37.26±8.60	61.34±5.28	57.24±4.67	603.122	.000*

\*significant < 0.05

\*\* highly significant at P ≤ 0.001

The table (4) notices that highly statistically significant association of psychological pressure questionnaire and life satisfaction scale (p, .000\*\*), this means that positive impact of psychiatric nursing program on diabetic patient.

**Table (5): Relation between blood sugar analysis and before; after three months of psycho-motor program.**

Variables	Before		After 3 months	
	r	p	r	p
<b>Fasting Blood Glucose</b>				
Duration of walking 2 km	-.075	.362	-.166	.042*
Psychological pressure questionnaire	.118	.151	-.042-	.612
Life satisfaction scale	.079	.334	.259	.001**
<b>Random Blood Glucose</b>				
Duration of walking 2 km	-.040	.626	-.221	.007**
Psychological pressure questionnaire	.108	.187	-.040	.630
Life satisfaction scale	.070	.395	.233	.004**
<b>Cumulative Blood Glucose</b>				
Duration of walking 2 km	-.018	.829	-.099	.227
Psychological pressure questionnaire	.193	.018*	.061	.459
Life satisfaction scale	.090	.274	.229	.005**

\*Correlation is significant at the 0.05 level (2-tailed). \*\*Correlation is highly significant at the 0.01 level (2-tailed).

The relation between blood sugar analysis and psycho-motor program is presented in a table (5). It shows that there were many statistically significant associations between, fasting blood glucose and duration of walking 2 km (p, .042\*), life satisfaction scale (p, .001\*\*); random blood glucose and duration of walking 2 km (p, .007\*\*), life satisfaction scale (p, .004\*\*); cumulative blood glucose and life satisfaction scale (p, .005\*\*).

**Table (6): Relation between psychiatric nursing and sport programs.**

Variables	Duration of walking 2 km			
	Before		After 3 months	
	r	p	r	p
Psychological pressure questionnaire	.004	.958	-.058	.480
Life satisfaction scale	.043	.605	-.252	.002**

\*Correlation is significant at the 0.05 level (2-tailed). \*\*Correlation is highly significant at the 0.01 level (2-tailed).

The relation between psychiatric nursing and sport programs are described in a table (6). It points that there is a statistically significant association between duration of walking 2 km and life satisfaction (p, .002\*\*).

## 7. Discussion

The present study showed that, the age ranged from 45 to more than 63 years, which is the most age between more than 54 to 63 years. This result is consistent with **Rydén et al. (2014)** and **Zam et al. (2015)** who pointed out that the age ranged between 37 and 75 years, with a median 55 years, which is the age with the highest prevalence of DM. And well as in Egypt (**Taha et al., 2011**).

At the post-intervention phase of the current study, there was significant reduction in the patient's blood sugar level, and this persisted during the follow-up. This improvement could be attributed to the guideline's content, which was based on patients' needs, as well as its process where adult learning methods with active participation was used. The effect of the educational intervention guidelines was confirmed by the lab investigation, which determined the intervention as a main independent predictor of the improvement of knowledge and skills to deal with psychological pressure. The finding is in agreement with **Abdo and Mohamed (2010)** in Egypt and **Borhani et al. (2015)** in Iran, who reported a similar success of an educational intervention for DM patients. Also in line with the current study results, **Lewis et al. (2015)** in a study in the

United States revealed a retention of the post-intervention improvement in patients' at follow-up testing.

The apparent effect of low mood on glycemic control is both short-term and long-term. **Skaff et al. (2009)** who found that mood changes were acutely associated with higher blood glucose value. In their study, a daily negative mood was associated with high fasting blood glucose values the very next day. Psychological stress, deficient social supports and negative attitudes toward diabetes can impact on self-care and glycemic control (**Fisher, & Glasgow, 2007; Malik, & Koot, 2009; Zhang, Tse, & Ye, 2009; Hampson, Tildesley, & Andrews, 2010; and Luyckx, Seiffge-Krenke & Hampson, 2010**).

In this respect **Richardson et al. (2008)** reported a significant longitudinal relationship between depression and glycemic control and concluded that depression is associated with persistently higher HbA1c levels over time. In stark contrast, **Fisher et al. (2010)** reported that there is no concurrent or longitudinal association between depressive symptoms with HbA1c, whereas both concurrent and time-concordant relationships were found between diabetes distress and HbA1c.

When the diabetic patient, is a restriction diet, by definition unpleasant, to be avoided, and lead to many psychological pressure, but this doesn't only burn lots of calories, but may be motivated to make better food decisions. When the nurse caring for patients with diabetes need to be working towards the same objectives, therefore determining priorities for managing their condition are important aspects of care. If the nurse understands the psychology of the diabetic patient, the nurse can get the patient to eat a healthy diet, help the patient to practice physical exercise, can give comprehensive care for diabetes & it's complicated, and improve all aspects of patient life.

Case management by a nurse working with the patient's primary care physician and providing guideline-based, patient-centered care resulted in improved glycated hemoglobin (HbA1C), and depression scores (**Katon, Lin, & Von Korff, 2010**). People with psychological pressure and diabetes have higher levels of inflammation markers in their blood. High levels of stress hormones, which are often found in people who are depressed, can lead to problems with glucose and blood sugar metabolism increased insulin resistance and an accumulation of stomach fat all risk factors for diabetes (Carson, & Vanderhorst, 2014). Diabetes management strategies ideally incorporate a means of addressing the psychosocial factors that impact on individuals and their families (**Gonzalez, Peyrot, & McCarl, 2008; Gonzalez, Safren, & Delahanty, 2008; and Egede, Grubaugh, & Ellis, 2010**).

The current study indicated that there were many statistically significant associations between blood sugar analysis and psycho-motor program this meant that the program was more effective for the elderly diabetic patient. The program was comprehensive and contains all the information to the medical, psychological and physical sport, needed by the diabetic patient, for supporting and improving health and lower blood sugar and this is the main objective of our research. In this respect, **Lorig and Holman (2003)** showed that the goal is more comprehensive interventions that can be used to deal with any behavioral/psychosocial problem presented to diabetes clinicians. A variety of research reviews have identified commonly used and successful behavior change interventions designed to improve health outcomes. In addition to information and homework/skill rehearsal (often defined as educational interventions), the more common interventions include goal setting, motivational interviewing, problem-solving and coping skills training, environmental change (barrier reduction), behavioral contracting, self-monitoring, use of incentives/rewards, and social support (**Hardeman et al., 2000; Hill-Briggs, 2003; and Grey et al.2000**). These interventions can be linked to the key targets of behavior and behavior change (**Hardeman et al., 2005**).

Motivational interventions, (**Egede et al., 2010; Osborn, & Egede, 2010; and Maindal et al., 2011**), coping skills, self-efficacy enhancement, stress management (**Attari et al., 2006; and Soo, & Lam, 2009**) and family interventions (**Keogh, Smith, & White, 2011; Wysocki, Harris, & Buckloh, 2008; and Wysocki, Harris, & Buckloh, 2007**) all have been shown to be helpful. Individuals with diabetes distress and/or psychiatric disorders benefit from professional interventions, either some type of psychotherapy or prescription medication (**Feltz-Cornelis, Nuyen, & Stoop, 2010; and De Groot, Doyle, & Kushnick, 2012**).

In a review by **Plack, Herpertz, and Petrak (2010)** summarizing the effects of interventions on metabolic control and other medical variables, as well as diabetes self-management and psychological outcomes it was concluded that behavioral interventions are effective in diabetes treatment, especially in patients with a high level of DM, difficulty in coping, or insufficient blood glucose awareness.

We cannot deny the importance of the role of physical exercise in our daily lives and what they offer to us; especially diabetic patient, sport has many benefits on all body systems, brain, cardiovascular, lung, muscular skeletal and endocrine. The finding of our study revealed that there were statistically significant associations between blood sugar analysis and reduction on duration of two kilometers walk. The diabetic elderly patient has a lot of muscular skeletal complications, but when he/she used to physical exercise as therapeutic regimen all the body functions improved including insulin.

As well as, this finding confirmed by **Alexander (2011)** found that just six weeks of exercise are enough to change both brain chemistry and body chemistry for the better; diets alone don't have the same effect.

Physical exercise is important for all of us. Physical conditioning is one of the most important qualities of life factors that we can actually improve, thus contributing to a longer and healthier life. In addition to lowering the risk of heart disease in diabetic patient, exercise helps to decrease the chances of developing diabetes. This can be especially important for those with pre-diabetes. The risk of developing diabetes was reduced by 24% (based on an energy expenditure of 2000 calories per week through exercise). The mechanism for this benefit is that exercising muscles are more sensitive to circulating insulin. They thus take up blood sugar more easily and use sugar more effectively. Research has shown that even short term aerobic exercise improves the sensitivity of muscles to insulin.

The results of the current study revealed that statistically significant associations between follow-up of the program and reduce weight ( $p, 0.004^{**}$ ). This may be when the patient practice physical exercise on regular style in his/her daily base, thus improves circulation, reduce fat and body mass index. Insulin is regulated in muscle and control blood glucose level. Although dietary intervention in combination with physical exercise is effective for the prevention and treatment of diabetes, lifestyle improvements based on diet and exercise.

The findings are consistent with, the Diabetes Prevention Program (DPP), **Knowler et al. (2002)** showed that half of the patients in the lifestyle-intervention group achieved the goal weight loss of 7% or more by the end of the 24-week curriculum, and that 38% of them had weight loss of at least 7% at the time of the most recent visit to the clinic; the proportion of participants who met the goal of performing at least 150 minutes of physical activity per week, assessed on the basis of logs kept by the participants, was 74% at 24 weeks, and 58% at the most recent visit to the clinic. Similar to the results of the DPP, in the current study the exercise therapy implementation rate was 52.3%.

Exercise may increase body's response to intrinsic insulin, by multiple mechanisms including increasing the amount of transporters of glucose into the muscle cells (GLUT-4), increasing of insulin receptor substrates (IRS) and last but not least, increasing the muscle mass, given that more than 75% of the glucose uptake in response to insulin is by the muscular tissue. The fatty acids released from adipose tissue, concentrate inside the myocytes and reduce the GLUT-4 transportation onto the cell membrane. Exercise, however, will reduce the fatty acid accumulation within the myocytes, by oxidizing them. Therefore a life style modification, by focusing on the weight loss and increase in the physical activity, may prevent progression toward frank diabetes in people who have an impaired glucose tolerance test (**Bonen, Dohm, & van Loon, 2006; Praet et al., 2006; and Verity, 2006**).

The combination between psychiatric nursing and motor program, the more effective this make the patient more satisfied with their life and they had positive subject, they practice it every day, and add more harmony mind and body, this removes many of disturbance in the body.

The finding of this study is in agreement with **Dinciu (2015)** which mentioned that data, the link between mental health and physical health should be equally analyzed. It is known that the energy and emotional imbalances are accompanied by functional disorders of organs, which favor the occurrence of diseases. The fact that Aerobics and Fitness bring their significant contributions to the harmonization of an individual's emotional and energy sphere allows us to appreciate that they can improve a person's health by changing and improving mental states, by changing the affective and perceptive mood towards the human self and psyche, in other words having a positive, optimistic attitude.

## 8. Conclusion

Based on the findings of the present study, it can be concluded that, It shows that there were many statistically significant associations between, reduction of blood glucose level; reduce the duration of walking two kilometers and life satisfaction.

## 9. Recommendations

Based on the results of the study, the following recommendations can be deduced:

- 1- Individuals with diabetes should be regularly screened for subclinical psychological distress and psychiatric disorders (e.g., depressive and anxiety disorders) by interview or with a standardized questionnaire.
- 2- Application of a comprehensive educational program for diabetic patient is needed and nurses should be helping patients to understand the nature psychological aspect of disease and improving their skills toward dealing with diabetes and it is complicated.
- 3- Psychiatric nurses should be designed training program for families and newly diagnosed patient on specific skills related to improving their skills to making the patient more satisfy and deal with his/her daily living activities.
- 4- The researchers recommended types of exercise are aerobic exercises that use muscles throughout the body, such as walking, jogging, stationary bicycle exercise, and swimming.

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