The Effectiveness of Cognitive Behavioral Training Program in

Reducing the Risk of Diabetes among University Students

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Abstract

This study aimed to build cognitive training program of diabetes prevention of students who have risk elements of diabetes. The sample of the study which consisted of (26) university students was chosen regarding their results of the accumulative average of sugar in addition to their obesity indicator , glucose and cholesterol percent in blood . The sample of the study was divided into two experimental and control groups. The training program which consisted of (16) training sessions based on the cognitive behavioral theory. The results of the study showed that there were statistically significant differences between the two groups in risk elements of diabetes in favor of the experimental group, which its weight and sugar and glucose level in blood decreased. The study concluded that the training program that based on the cognitive behavioral theory was effective in reducing the experimental risk elements of diabetes. In addition, the study recommended carrying out further studies, which care of the guided and training programs of diabetics in different categories of age.

Keywords: training program, diabetes, risk elements.

1. Introduction

Diabetes is considered one of the common and dangerous disease in Middle East Area; where statistics showed that there were (27) diabetics with a percent of (7.7%) and this number of diabetics is expected to reach to (51.7) by the year 2030(International Diabetes Federation, 2012). Diabetes is a disorder Diabetes is a condition where the body fails to utilize the ingested glucose properly. This could be due to lack of the hormone insulin or because the insulin that is available is not working effectively (Nettina, 1996; World Health Organization, 1999; Standards of Medical Care in Diabetes, 2012 & Delahantyms, et al, 2008).

Jordan is considered one of the Arab countries that suffer from this disease. A study carried by the National Center of Diabetes in 2005 showed there is %23 who are in the age of 25 and above have one of the chronic diseases as diabetes (Ajlouni, 2005) and because of the shortage of Arabic studies that addressed training program for the students which based on the cognitive behavioral theory to reduce the possibility of having diabetes in Jordan and its scarcity in the Arab countries. Moreover, because prevention has direct effect on the students who have risk elements of Diabetes, this study seeks to reveal the effectiveness of a training program of reducing the possibility of having diabetes mainly with those who have risk elements as: overweight, cholesterols' and glucose increase in blood. In addition, the diabetics of the second type are in danger for its sequences as heart or stroke diseases. It is possible to reduce the possibility of having diabetes through practicing moderate physical activities, and it is possible to delay or avoid having the second type of diabetes (Hussein, et. al. 2006).

2. The problem of the study

The number of diabetics has increased recently in a remarkable way in the world among different categories of ages and this situation is considered as a horrible danger, which threatens life of millions of people. And It is expected the number of diabetic reaches to 230 million by the year 2010 in the world (Marzouki,2007) and those individuals do not have enough a awareness to distinguish the warning signs that showed the possibility to have diabetes and they do not have the ability to use the skills of primitive prevention based on this so this study came to develop the necessary skills which they need to know so as not to be affected by diabetes and to aware them of the diabetes disease and its types . More specifically the problem of this study is to investigate the effect of a training program based on the cognitive behavioral theory through increasing the awareness of risk elements that lead to this disease and changing those individuals' systems of life. This training program was applied on a sample of university students whose percentage of glucose was higher than the average level it is not enough to be diagnostic as diabetes disease after carrying the medial test.

3. Study Hypotheses

This study aimed to identify the effectiveness of a training program to reduce the possibility of having diabetes through testing the following hypothesis:

1- There were no statistically significance at the level of significance ($\alpha = 0.05$) in the level of awareness of diabetes between the experimental and control groups attributed to the training program.

2- There were no statistically significant differences at the level of significance ($\alpha = 0.05$) between the experimental and control groups attributed to the following up test.

4. Importance of the study

The theoretical literature pointed out that the diabetics suffer greatly from this disease which affect their heart physically and psychology, their academic achievement, and their social behavioral growth.

The diabetics suffer from depression, stress, feeling lonely, and low a achievement. In addition, it is noted that the number of diabetics in the world increased rapidly. The importance of this study emerged from the shortage of Arabic studies that addressed the importance of prevention from diabetes, and lack of the diabetics' awareness. Based on this, it is important to have training programs that reduce the spread of diabetes. And the results of the studies, which were carried out in USA, Europe and Asia, indicated that the person who has a case " Before Diabetes", and didn't start practicing physical exercises or   change his life's systems, the annual possibility to have his "case" developed towards diabetes is about 11% while the annual possibility to have diabetes decreased to those who reduce their weight and change their life's system is about 3%.   The following represent the importance of the study:

- Telling the doctors and the students how important it is to increase the degree of awareness ; the patient has to be aware of this readiness to have   diabetes , and the doctors have to study carefully the risk elements and examine those who are suspected to have diabetes in a try to avoid this disease before it starts .

- Increasing the level of general awareness of diabetes to help recognize it better and encourage them to consult doctors earlier so that they can have pieces of advice regarding nutrition and sport programs.

- Encouraging researchers to carry out further studies according to the results of this current study.

5. Study Limitations

The results of the study are limited regarding   the following:

1. The sample of the study is limited to the students of BAU.

2. The results of the study are limited to nature of the medical test of the sample of the study, and the efficiency of the training program, which was developed by the researchers.

3. The general characteristics of the training program which were developed and applied on the student of BAU.

6. Literature review

Diabetes is considered as one of the common chronic diseases that affected both of the children and the young. It is one of the autoimmune diseases that resulted from the destruction of Bita cells, which leads to the shortage of Insulin. And although of this, many cases of children and young who are affected by other kinds of diabetes increased rapidly because of genetic (Unger . 2007) . Moreover, overweight is considered as one of the major reasons in the increase of diabetes (Type 2) at the children and the young. Many researches and studies, which were carried out in Germany, revealed high increase in the rate of the spread of this pattern of diabetes, especially when obesity is accompanied with other diseases as hypertension. (American Diabetes Association, 2007).

The estimated number of the diabetics in 1985 was 20 million, and in 1995, the number became 130 million, and according to the recent statistics of World Health Organization (WHO), the number of diabetics was nearly 177 million and this number will increase to 300-330 million in 2025. Recently, the researchers of (WHO) have revealed that the number of diabetics in the world is estimated about 190 million; it will increase in the developed countries with %45 and in the developing countries with %20. Moreover, in USA, there are 20.8 millions of diabetics and the experts of (WHO) attributed this number to the habits of nutrition, to obesity, to psychological stresses (Arab conference of Endocrine gland and Diabetes). In Jordan, a report issued by Ministry of Health in 2007 showed that the spread rate of diabetes among the category age 18 years and a above is 16%, while the total rate of spread is 23.8% and the percentage between males and females are very close to each other. And in the report of the National Center of Diabetes in Jordan , Ajlouni pointed out that annual increase in the diabetics is about 0.05% and the prevalence of this disease reached 30% where it is no more than 8% in the world concerning the prevalence of metabolic syndrome (diabetes, pressure , obesity and cholesterol) where its percentage among males in Jordan is (11.8%) and it is (9.4%) among   females who are aged between 25-29 (Ajlouni, 2005) .

Reviewing the previous literature concerning this subject, there are two type of diabetes:

The first: (depends on insulin for treatment) and it affects mainly the children and the adults who are less than 30 years old.

The second: (doesn't depend on insulin for treatment) and it usually affects the old who are more than 30 years but it becomes popular among the youth, because of the unhealthy style of life. There are four strategies for Prevention of diabetes:

1. Strategies regarding the individual level.
2. Strategies regarding the family level.
3. Strategies regarding the regional level.
4. Strategies regarding the universal level. (Institute for Clinical Systems Improvement, 2008).

Most of the previous literature concentrates on the first strategy which its target is the individuals who are in a critical situation, and this way in choosing the research's methods and its tools to evaluate the risk and   the early interference strategies so as to understand the factors that caused   Diabetes to make it possible to study diabetes scientifically and to put strategies for interference and prevention.

The method of evaluating the risk can be summarized as "Identifying the risk element for prevention of diabetes and studying the possible indicators of the problems' causes. (American Diabetes Association. 2007).

One of the reasons that encouraged us to study the prevention of Diabetes is the horrible results of this disease. Strategies of interference believed that the best effective method to reduce the possibility of being affected by diabetes is through the prevention and the early reveal of risk elements (Unger, 2007).

The training programs encourage the strength points of the individuals, which help to protect the individuals and enable them to face difficult and stressful situations by providing them with many skills to resist the diabetes through awareness programs with variety of techniques. Moreover, the techniques which include providing opportunities and low cost facilities to do some sport activities and follow up a healthy nutrition system that minimize the elements and which cause diabetes using different techniques, is considered as an ideal way for prevention.

Many studies addressed diabetes , the effect of weight loss and practicing exercising to avoid being affected by diabetes as the studies of (Slowie,1977) , (Wedman & Kahan ,1987) , (Camacho,2000) ,(Graff, & Holder man, 2001) and (Krucoff, & Krucoff , 2004) and the continuous interference in life style may prevent the second type of diabetes (Inzuchi,, et al , 2005) (Nicholas, et al , 2007).

The role of education in preventing diabetes in the society becomes a necessity mainly by organizing training programs for schools and, universities (Riccardi, et al, 2009).

The previous studies agreed on the risk of diabetes so the individuals should be motivated to keep themselves away from this disease especially those who have previous readiness to get such disease. Moreover, this study's agrees with the previous studies in the importance of the topic, which is prevention of diabetes and its related elements as self-control. This study is characterized by applying a training program based on the Cognitive Behavioral Theory, which depends on the following:

1. The individual realizes his behaviors and be aware of them.
2. Using Inner – speech.
3.   The   change   that   happens   in   the   individuals'   Inner-   Speech   before   treatment (Meichenbaum, 2001).

The most important thing that characterized the cognitive behavioral therapy is its educational effect that is felt during the therapy sessions where knowledge and behavior are connected with each other. (Lundervold, et. Al, 2008) (Klinger, et. al, 2005). Every trainer is taught some new skills, and re-forms his false cognitive structure to have his behavior compatible with new cognitive ideas according the risk of this problem.

7. Research methodology

The current study employs the experimental approach, which depends on testing hypotheses. (26) Student of BAU was selected purposefully out of 125 students who have risk elements of diabetes. The researchers noticed that the obesity element was obvious seen in the sample of the study which the training program was applied on. The sample of the study was distributed randomly into two groups (experimental and control) where each of includes 13 male and female students.

7.1. Research procedures

The importance of the current training program is represented by its techniques and skills and its efficiency in treating the individuals who are expected to have diabetes so this program is a preventive procedure that gives the diabetics effective training to solve their problem to enable the students understand the relation between the cognitive and behavioral and physical aspects of the risk of having diabetes disease. In addition, this program allows discovering the cognitive distortions, correcting wrong ideas and supporting positive and logic thinking. Every student learns this during the sessions and they encouraged doing daily sport activities and having nutrition balance. The training program depends on the cognitive behavioral attitudes   through the training on following the skills: making decisions, problems solving, self-control, resisting pressure, and communication, and this program includes 12 sessions as follows:

* The first session: Introduce the cognitive behavioral theory to the students.

* The second and the third: justify logically the program and give information about diabetes, its definition, types, reasons and results.

* The fourth and the fifth : Identify the risk elements which may cause diabetes as overweight and blood pressure ,family medical history , age , level of cholesterol in blood , infections of diabetes through pregnancy and the inactive styles of life .

* The sixth and the seventh: Identify and define the disease symptoms and the treatment methods used before and after having diabetes.

* The eighth and the ninth : Distinguish between the good and the bad behaviors in eating , improve the general satisfaction and the feeling of efficiency and the psychological satisfaction which should be achieved through friendships , family relations , and communication skills to prevent obesity .

* The tenth: Distinguish between active and inactive styles of life through the communication skills and the strategy of self-management.

* The eleventh and the twelfth: focus on the individuals' responsibility of their body and educate them the elements that prevent diabetes using the communication skills and self-awareness.

* Thirteenth and fourteenth: know the situations, which are possible to cause diabetes as daily or chronic pressure through   playing the role and self-control.

* Fifteenth: Train the sample of the study to deal with situations of stress that may cause diabetes through training them the strategy of avoiding the pressure and the strategy of problem solving.

* Sixteenth: train the sample of the study on virtual situations for the   prevention of diabetes through playing the role.

8. Results and Discussing

The current study aimed to identify the effect of a training program for preventions of diabetes of the students who have diabetes' risk elements. Moreover, it tried to change the students' systems of life and to answer the main hypothesis of the study. The means of the performance of two groups of the study were calculated on the application where the difference between the two means was (1.65), as it illustrated in table (1). Moreover, to make sure if the difference between the means of the two groups of the pre and post application has statistical significance at the level of significance ($\alpha = 0.05$), T-test was used as it illustrated in table (1).

Table1. Results of T-test for the difference between the means of the two groups' performance.

Group	Mean	SD	D. F	T value	Sig
Experiment	6.25	2.23	24	0.475	0.915
Control	4.60	1.35			

The previous table showed that there were no significant differences at the level of significance ($\alpha = 0.05$) between the performance of the control and the experimental groups on the pre-measure where (T) value was (0.475) and it is not statistically significant. In addition, because the values of the two means of the groups were close, it is considered as an indicator for the two groups' equivalence before starting the training program of prevention of diabetes. And to answer the first hypothesis which is: "There is no statistically significance at the level of significance ($\alpha = 0.05$) in the level of the awareness of diabetes between the experimental and control groups," the means, standard deviation and standard error of the performance of the two groups on the post application were calculated, table (2) illustrates the results:

Table 2. Means, Standard deviation, Standard Error of the two groups' performance on the post measure.

Group	Mean	SD	M	SE
Experimental	4.80	3.77	4.848	1.062
Control	4.60	2.67	4.747	1.062

The previous table showed that the adjusted mean of the experimental group's performance on the post measure was less than the mean of the control group's performance on the pre-measure, where the difference between the two means was (0.20) , and to be sure if this difference is statistically significance , ANCOVA was used and the adjusted means were calculated; the adjusted means of the experimental group's performance on the post measure was less than the mean of the control group's performance on the post measure after neutralizing the effect of the pre-measure .And the difference between the means was (1.101) and the results of ANCOVA were illustrated in table (3)

Table 3. Results of ANCOVA of the difference between the means of the two groups on the post measure regarding the group variable.

Source of variance	Sum of Squares	D. F	Mean of squares	F. value	Sig
Pre application	1.084	1	6.084	0.860	0.472
Groups	129.445	1	129.445	18.30	*0.003
Error	190.916	23	7.07	-	
Total	332.300	25	-		

* Significance at the level of ($\alpha = 0.05$)

Table (3) illustrated that the calculated "F" value of the difference between the means of the two groups on the post measure according the group variable was (18.30) and it is statically significant which indicates that there were significant difference at the level of significance ($\alpha = 0.05$) between the mean of the experimental group's performance and the mean of the control group's performance on the post measure after confirming the pre test effect and the difference was in favor of the experimental group . And to make sure of the training program efficiency on the experimental group, the researcher calculated the means of the experimental group's performance on the pre and post performance .the mean of the experimental group's performance on the post measure was less than the mean of the same group performance on the pre-measure where the difference between the means was (0.30) as it illustrated in table (4). And to make sure if the difference between the two means of the pre and post measures of the experimental group have any statistically significance at the level of significance ($\alpha = 0.05$), T test was used , and table (4) showed the results:

Table 4. Results of T-test of the difference between the pre and post measure of the experimental group:

Application	Mean	SD	F	T. value	Sig
Pre-measure	5.10	2.29	24	7.052	0.000
Post – measure	4.80	3.80			

 Table (4) showed that there is a statically significance difference at the level of significance (α = 0.05) between the means of the pre and post measure of the experimental group when T value was (7.052), and this result indicates that the experimental group get benefit of the proposed training program of prevention of diabetes. In addition, this showed the importance of the training program and benefits to those who have risk elements of diabetes and its positive influence on controlling sugar level in blood. It is also showed the effective role of nutrition education regarding the type of the food and its system to those who have risk elements of diabetes. In light of their experience with the sample of the study, the researchers believe that the training program and nutrition diet met the real needs of diabetics which are considered as a basic element in achieving the programs' objectives and creating happy expertise through sport of walk which to be practiced in the evening preferably from 6-8 and this period of time is a good one for training and the commitment to the nutrition diet regarding to the results of the following results: Slowie's (1977), Wedman & Kahan (1987) and Camacho (2000). The training program and the nutrition diet have effective role in controlling the sugar level in the blood of the students who have risk elements of diabetes and this refers to "sport" and "walk" which increase the activity of blood circulation and provide the cells with a big amount of sugar that motivates the blood to consume sugar in blood and maintains the sugar's level in blood. So based on what is mentioned previously, the hypothesis is accepted. In addition, concerning the results of the second hypothesis, which is "there are statistically significant differences   at   the   level   of   significance (α = 0.05) between the experimental and control groups on the following up test," the means of the two groups' performance on the following up test were calculated, and table (5) illustrated the results.

Table 5. the means and standard deviation of the performance of the experimental and control groups on the following up test according the group variable

Group	Mean	SD
Experimental	27.80	3.55
Control	23.10	2.18

Table (5) showed that the mean of the experimental group's performance of the following up test was higher than the mean of the control group's performance; the experimental group's mean was (27.80) while it was (23.10) for the control group's. In addition, the difference between the two means was (4.70). To make sure that this difference was statistically significant at the level of significance (α = 0.05), T test was used, and table (6) illustrates this.

Table 6. Results of T-test of the difference between the performances of the two groups.

Group	Mean	SD	F	T value	Sig
Experimental	27.80	3.55	24	4.564	0.000
Control	23.10	2.18			

Table (6) showed that there were statistically significant difference in the level of significance (α = 0.05) between the means of the two groups' performance on the following up test where the T value was (4.564) and it is considered significant and this indicates efficiency of the following up test in favor of the experimental group which means that the sample of the study continues the sport of walking and nutrition diet after the training period of time was over and this assured that the second hypothesis is correct.

8.1. The Recommendations
- Carry out comparative studies of more than one behavioral and cognitive training program of the diabetics to know which one in more effective.

- Organize workshops to provide services of cognitive behavioral therapy to the students who have risk elements to help them to reduce the chance of having such disease.
- Strengthen the relations among the family members and provide them with psychological support and social assistance to reduce the chances of having such disease.

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