



## The Relation between Anxiety, Depression and Sexual Dysfunction and the Level of Blood Glucose Control in Patients with Type 2 Diabetes Attending Endocrine Clinic of Taleghani Hospital

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### ABSTRACT

Diabetes, as a common disease, is one of the major health problems in countries all over the world. There has been evidence of an increase in the prevalence rate of psychological disorders such as anxiety and depression and sexual dysfunction in people with diabetes compared to other people. The study aimed to investigate the relation between blood glucose control and anxiety, depression and sexual dysfunction. For this purpose, 141 patients with type 2 diabetes attending to Endocrine clinic of Taleghani Hospital in Tehran were randomly selected. In order to assess the prevalence rate of anxiety and depression, the HADS questionnaire was applied, and ARIZONA questionnaire was used to assess prevalence rate of sexual dysfunction. The status of blood glucose control was assessed based on the HbA1c scale as well. According to the results of the present research, 93.9% of the subjects in the uncontrolled blood glucose group suffered from either anxiety or depression, or both of them, and 6.1% in the control blood glucose group. 77.2% of patients in uncontrolled blood glucose group had severe sexual disorder; while, 22.8% of patients in controlled blood glucose group had this problem. Based on the obtained results of data analysis, there is a significant relationship between the status of blood glucose control based on the HbA1c scale and the prevalence rate of anxiety, depression and sexual dysfunction.

**Keywords:** Diabetes, Anxiety, Depression, Sexual Dysfunction

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### INTRODUCTION

Diabetes is one of the worldwide prevalent chronic and debilitating diseases which has emerged as an epidemic of the third millennium. Due to several facts, including prevalence, severity, high mortality and treatment cost, it has drawn healthcare system attention [1]. The prevalence rate of depression among diabetic patients is estimated to reach from 3.8% to over 30% which is 3 times more than that of non-

diabetic population. In another study, the prevalence rate of depression in type 2 diabetic patients has been estimated to range from 8.5 - 14% and the probability of depression prevalence has been estimated to range from 11- 32.5% during their lifetime [2]. According to various studies, 15-32.5 % of diabetics suffer from depression [3-5]. Another available statistical result stated that the diabetic patients are definitely more likely to have depression compared to non-diabetics, that is, the prevalence rate of depression in these patients is estimated to be 28.5% during their lifetime. In fact, diabetic patients are likely to suffer from depression 2 to 3 times than normal individuals [6, 7]. So that, only

one out of three diabetic patients suffer from type of depression accompanied with functional impairments and diminished quality of life [8, 9]. On the other hand, as it mentioned, in diabetic patients with depression, control of blood glucose is more complicated and diabetic complications are higher [10]. Because they may have fewer adherence to take medications and follow a diet plan, which in turn leads to more undesirable glycemic control. Both diabetes, type 1 and 2 are sensitive to stress complications. Stress disrupts blood glucose control in many diabetic patients [11]. Stressful events cause patients to lose their motivation for self-care and health care behaviors; therefore, they delay to take insulin, they do not regularly check their blood glucose and do not care about exercise habits [12, 13]. As self-management behavior is important in diabetic patients, stress has negative impact on this behavior [14, 15]. On the other hand, Diabetes is a major source of stress in these patients as well. It makes a lot of changes in patients' lifestyle and imposes special dietary requirements; therefore, it entails doing repeated medical tests and patients should regularly control their blood glucose, all of these processes are difficult and Stressful [16, 17]. Diabetic patients often indicate changes in the central nervous system, leading to low cognitive function of depression and anxiety [18, 19].

Since stress plays a significant role in the emergence, progress, prognosis and treatment of diabetes, in this regard conducting research is essential. On the other hand, as mentioned before, the prevalence rate of various sexual dysfunctions in people with diabetes is higher than the normal individuals. There are few studies on the treatment of psychological disorders and other related problems, including problems of family and marital relations, while there is no lack of research in physical therapy. Hence, regarding the impact of psychological disorders on the ability of patients to manage their diabetes effectively, conducting research in this area is extremely significant. Several studies have been conducted to investigate the correlation between HbA1C as an indicator of long duration of diabetes control and depression that indicated disparity and contradiction in results. Some researchers have found weak to moderate correlation between depression and inappropriate blood glucose control in patients with diabetes [20, 21]; while, other researchers have not found any correlation [22, 23]. Numerous studies have been conducted

in Iran about the prevalence rate of depression and the quality of life in diabetic patients as well [24]. Moreover, some limited studies have been conducted regarding sexual dysfunction of diabetic patients in Iran, which indicates the necessity of more attention and investigation in this area. According to the statistical estimation of the World Health Organization, the number of people with diabetes will double by 2030. So that the prevalence rate of diabetes increases from 28% in 2004 to 4% in 2030 in all age groups and the number of people with diabetes would rise from 170 Million in 2000 to 370 million in 2030. Another study estimated that the prevalence rate of diabetes in the world will increase from 4% in 1995 to about 4.5% by 2025, and the diabetic population would rise by 122%. The number of patients in developed countries will show 42% increase from 51 million to 72 million, but in developing countries with 170% increase, the number of patients will rise from 84 million to 228 million [25]. Thus, the prevalence rate of diabetes is expected to increase globally if any better solution is not suggested [26]. According to country studies conducted in 2001, the prevalence rate of diabetes in Iran was estimated to be 4.67% in population aged over 20 [27]. Furthermore, the statistics of the prevalence rate of diabetes in 2004 indicated there are 4 million diabetic patients in Iran and this number will triples every fifteen years according to international statistics [28]. Recent studies have demonstrated that 7.8% of the population in Iran aged 25-60 is diabetic [29]. In another study, the prevalence rate of diabetes in Iran in 2000 was 5.7% which is estimated to reach 6.8% by 2025 [30]. According to the World Health Organization (WHO) experts, the rate of diabetes type 2 in Iran, in 1995, 2000 and 2025 had been estimated 5.5%, 5.7% and 6.8% respectively. It has been estimated that the basis for the country's diabetic population in the aforementioned years will be 1692000, 197000, and 5125000, respectively [31]. Diabetes diminishes almost quality of all aspects of life and threatens the social physical psychological function of patients [32].

According to the American Diabetes Association (ADA), mellitus diabetes is one of the chronic diseases which leads to physical and psychological disorders in people. In general, cardiovascular diseases, retinopathy, neuropathy, nephropathy, male sexual dysfunction, infection and psychological disorders are the complications of

diabetes [33]. Some studies indicated that the emergence of chronic diabetic complications such as cardiovascular and retinopathy leads increase in the mortality rate of the first patient and the average life expectancy is only 61 months [34]. Today, Major Depressive disorder is the main cause of disability throughout the world, and was ranked as the fourth leading cause of disease burden worldwide. Depression is a mood disorder characterized by symptoms of low mood, loss of energy and interest, feeling of being guilty, difficulty in concentrating, lack of appetite, thoughts of death and suicide, insomnia or oversleeping, significant loss of weight, and functional impairment [35]. International studies without regarding to any particular country indicate that women are twice as likely as men to catch depression and the average onset age of depression is about 40. The prevalence rate of depression during life time is reported 15% for men and 25% for women. Since Patients with diabetes often are aware of short-term and long-term complications, and it is clear that they are imposed to accept a change in lifestyle; therefore, the appearance of mood disorders such as depression in these individual is not out of mind [36].

So that, the prevalence rate of depression obviously is higher in diabetic patients (8%-20%) than the normal population (33%) [37, 38] and various studies have noticed it two times more than normal individuals [39, 40]. According to other studies, the prevalence rate of depression in patients with diabetes has been reported to be between 24% and 30%, indicating a significant risk of depression in self-care [41]. Most psychological disorders of patients are due to imposed diabetic complications such as aggressive monitoring of sugar Blood, daily insulin injection therapy, chronic physical complications, special diet, low physical activity, hospitalization and shortening of life expectancy [42, 43]. The results of two meta-analysis of longitudinal studies indicated that depression is associated with an 12-97% increased risk of diabetes, and after controlling risk factors of diabetes such as the Body Mass Index (BMI), family history of diabetes, smoking, physical activity, diet and alcohol consumption, this association remained significant in these studies [44, 45].

Other studies have revealed that depression is associated with an increased risk of complications

and mortality in diabetic patients as well [46, 47]. Some studies have investigated the effects of depression on the level of function and quality of life in patients with diabetes. In these studies, depression is considered as a major factor in reducing the quality of life of diabetic patients [48, 49]. Numerous studies have been conducted in Iran regarding the prevalence rate of depression in diabetic patients, and the presented statistics vary between 36-66% [50, 51]. Other studies in Iran have reported the prevalence rate of depression in type II diabetic patients up to 84.1% [52]. In some diabetic patients Depression is a psychological response to the severe pain associated with neuropathy [53]. There is also evidence of the impact of plasma glucose concentration on diabetic patients' mood, so that depression in diabetic patients is associated with poor control of blood sugar and the level of hyperglycemia has a direct correlation with the severity of depression [54, 55]. Other studies revealed that patients with major depressive disorder do not have proper sugar control [56].

In addition, there is no connection between social class and depression, but recent immigrations may have a direct association with depression [57]. Depression epidemiology resulted from medical disorders is not known as well as diabetes, but it is likely to be common and often not diagnosed [58]. Some researchers suggested that depression can be recognized as a risk factor for the emergence of type 2 diabetes [59]; other studies suggested that depression often coincides with diabetes and sometimes Insulin resistance is observed in patients with depression [60]. Anxiety is one of the most common symptoms of depression (90%) which can be under the influence of diet plan and disorders such as diabetes, hypertension and chronic obstructive pulmonary disease [61]. Depression in comparison with anxiety has allocated less research, but it seems that anxiety level is higher in diabetic patients compared to the normal individuals [62]. On the other hand, sexual dysfunction is more common in people with diabetes of both sexes compared to normal population [63, 64]. This disorder is correlated with diminish in the quality of life of diabetic patients [65, 66]. Among different sexual dysfunctions in diabetic patients including hypoactive sexual desire, sexual arousal disorder (male erectile disorders and vaginal lubricant disorder) and orgasmic disorder, Sexual

dysfunction of stimulation phase is reported in one fourth of the patients. Sexual dysfunction of stimulation phase in diabetic people is as three times as the general population. A study has stated that the most common type of sexual dysfunctions in women with diabetes related to the stimulation phase [67, 68]. Diminished sexual desire has a high prevalence rate in diabetic patients; this sexual dysfunction is reported in more than 70% of women with diabetes [69]. An erectile disorder is related to an inability to attain or maintain an adequate erection that is satisfactory for coitus [70]. Erectile dysfunction is 3 times more common in diabetic patients compared to the general population of and is more likely to occur 5-10 years earlier in diabetic patients [71]. Despite the significance of erectile dysfunction in reducing the quality of life; however, it is simply ignored in the clinical care of diabetic patients [72]. Moreover, Research has indicated that cerebrovascular accidents and cerebral ischemia resulted from diabetes is often associated with depression [73]. In slight cases of diabetes, even without apparent cerebrovascular accidents and recurrent hypoglycemic attacks, there are some degrees of impairment of central nervous system function. This disorder initially appears as slight impairment and as time passes and severity increases, it changes to depression [74]. Visual impairment due to the retinopathy, repeated hospitalization and sexual dysfunction are another causes of depression in diabetic patients [75]. Mental disorders in diabetic patients have a negative effect on blood glucose control and can be improved by treating depression [76, 77]. On the other hand, it seems that depression in diabetic patients is more malignant than other patients. Consequently, more care and attention must be paid to the mood of diabetic patients and their treatment of depression [78].

## MATERIALS AND METHODS

The present study is cross-sectional in terms of purpose. It conducted on 140 patients selected by simple random sampling method among diabetic patients type 2 with type 2 attending Taleghani Hospital in the third trimester of 2017. Practically, 141 patients participated in the study, of which 73 members were involved in the controlled blood glucose group and 68 members were involved in the poor controlled blood glucose group. After patients consented to participate in the research with awareness, an interview-based questionnaire

containing demographic characteristics (including the age, education, occupation and marital status) and the data on diabetes (including duration of the disease and type of diabetes treatment) was completed based on patients' full medical record of folders available in diabetes clinic. Additional information was collected from the each patient through an interview. For more assurance, the patients were asked about the absence of diabetes complications, previous record of depression and other physical disorders. In addition to measurement of demographic variables, HADS and ARIZONA scales, the rate of glycated hemoglobin in patients was recorded as well. It should be noted that HbA1c glycated hemoglobin is a fraction of hemoglobin, which is gradually formed by hemoglobin and glucose during the non-enzymatic process, and its level depends on the direct concentration of glucose in the blood. Thus, in this study, according to the American Diabetes Association, the normal range of glycated hemoglobin is 4-6 %, for the healthy individuals, below 7% for the proper control of diabetes in patients and over or equal to 7% for poor blood glucose management [79]. Data were analyzed using SPSS 21 software. Data related to the patients and their disease was evaluated using descriptive statistics methods. Chi-square test was used for statistical analysis, with a significance of  $P < 0.05$ .

## Data Collection instruments

### *The Anxiety and Depression questionnaire*

The Hospital Anxiety and Depression Scale (HADS) was developed by Zigmond and Snaith (1983). HADS is a fourteen item scale which is designed to measure the level of mood changes, especially anxiety and depression. The questionnaire consists of 14 items which are divided into two sub-test 7 of the items relate to depression and 7 relate to anxiety. This questionnaire has been applied in Iranian research on psychological disorders in physically challenged patients. Each item is scored from 0-3. In each sub-test the obtained score from 0-7 indicates lack of disease (normal), from 8-10 indicates mild anxiety or depression and a score of 11 and above is considered as clinical condition (moderate to severe). High scores on the depression scale indicate that in addition to therapies coping with anxiety other therapies should be applied as well. The maximum score of each sub-test is 21; the score of the total scale is

42 [80, 81]. Questions were asked by the observer from illiterate patients and those who were unable to read the questionnaire due to any reason.

**Sexual Dysfunction Questionnaire**

To measure the extent of sexual dysfunction, the ARISONA (ASEX) Arizona Sexual Experience Scale (ASEX) was applied. ASEX is a short 5-item rating scale that evaluates sexual stimuli, arousal, orgasm, ability to achieve orgasm during the coming week. It is easy to apply ASEX, a tool for evaluating sexual dysfunction resulting from medication side effects in patients with depression or anxiety disorder. ASEX is applicable to lesbian or gay populations as well. This questionnaire is designed by one of the Psychiatric professors at the University of Arizona, it contains five items and has capability to assess the five elements of sexual function (sexual desire, sexual arousal, vaginal lubrication in females / erection in males, ability to achieve orgasm and satisfaction with orgasm in both groups of women and men, it has designed for two different groups of males and females and the difference is only in one question). Each item has 6 options and is scored from 1 (activeness) to 6 (passiveness). The total score is from 5 to 30. Scores between 5 and 10: Low sexual problem, between 10 and 18: The average sexual problem, above 18: The serious sexual problem. McGahuey has proven that this questionnaire has a good reputation and its options have relatively proper connection with options of other instruments, such as the diminished sexual performance index. It has been indicated to have a Cronbach's reliability of 90%, internal consistency and test-retest reliability.

**RESULTS**

In this study, total of 141 patients were investigated, 70 patients without depression disorder (49.6%), 19 patients in cut-off point (13.5%) and 52 patients with clinical depression (36.9%). 65 (92.8%) of 70 people without depression disorder were in the controlled blood glucose group and 5 (7.7%) were in uncontrolled blood glucose group. 6 (31.5%) of 19 cases of the cut-off point were In the controlled blood glucose group, 13 (68.4%) were in the uncontrolled blood glucose group. However, 50 (96.1%) of 52 depressed were in the uncontrolled group and 2

(3.8%) were in the controlled group, which is clinically significant as well (Table 1).

**Table 1: Comparison of frequency and depression severity in two groups of patients with type 2 diabetes attending endocrine clinic of Taleghani Hospital with controlled and uncontrolled blood glucose levels**

The status of depression disorder	The status of control of the blood sugar level			
	Controlled Blood Glucose grope	Un-controlled Blood Glucose group	Total	
Without depression	Number	65	5	70
	Percent	92.8	7.1	100
Cut-off point	Number	6	13	19
	Percent	31.5	68.4	100
Clinical depression	No.	2	50	52
	Percent	3.8	91.6	100
Total	Number	73	68	141
	Percent	51.7	48.2	100

*Chi-square= 98.261; df=2; p < 0.001*

**Table 2: Comparison of the frequency and severity of anxiety in two groups of patients with type 2 diabetes attending endocrine clinic of Taleghani Hospital with controlled and uncontrolled blood glucose levels**

The status of mood disorder of depression	The status of control of the blood sugar level			
	Controlled blood glucose grope	Uncontrolled blood glucose group	Total	
Without depression	Number	64	13	77
	Percent	83.1	16.8	100
Cut-off point	Number	5	21	26
	Percent	19.2	80.7	100
Clinical depression	Number	4	34	38
	Percent	10.5	89.4	100
Total	Number	73	68	141
	Percent	51.7	48.2	100

*Chi-square=67.217, df=2, p < 0.001*

Chi-square test was applied for statistical analysis. As a result, there was a significant correlation (P <0.001) between the frequency and severity of depression with the control of blood glucose (HbA1C) based on HbA1C. In addition, from the total number of 141 examined patients, 77 number without anxiety disorder (54.6%), 26 patients were in the cut-off point (18.4%) and 38 patients with clinical anxiety (27.0%). 64 (83.1%) Of 77 patients without depression, were in the controlled blood sugar group and 13 (16.8%) were in uncontrolled blood sugar group. Also, 5 (19.2%) of 26 patients in cut-off point position were in the controlled blood sugar group, 21 patients (80.7%) were in uncontrolled blood

sugar group. However, 34 (89.4%) of 38 depression patients were in uncontrolled blood sugar group and 4 (10.5%) were in the controlled blood sugar group, and this difference was clinically significant as well (Table 2).

Regarding the anxiety variable, there is a significant difference between the percentage of anxiety in the two groups of controlled and uncontrolled blood sugar. To find out whether there is statistically significant correlation between the frequency and severity of anxiety, and the rate of Blood glucose control based on HbA1C, Statistical analysis was carried out by chi-square test. As a result, there was a significant correlation between the frequency and severity of anxiety and the control of blood glucose according to HbA1C ( $P < 0/001$ ). 72 of total number of 141 patients were without anxiety or depression (51.1%), 20 (14.2%) and 49 patients were suffering from either anxiety or depression, or both of them (34.8%). 65 (90.2%) of 72 subjects without disorder were in the controlled blood glucose group and 7 (9.7%) in the uncontrolled blood glucose group. 5 (25.2%) of 20 patients of the cut-off point were in the controlled blood glucose group and 15 patients (0.7%) in the uncontrolled blood glucose group. 46 (93.8%) of 49 patients in the uncontrollable blood glucose group, and 3 cases (1.6%) of patients with either one of these two disorders or both, were in the uncontrolled blood glucose group, and 3 (6.1%) were in the controlled blood glucose group.

**Table 3: Comparison of frequency and severity of anxiety or depression in two groups of patients with type 2 diabetes attending endocrine clinic of Taleghani Hospital with controlled and uncontrolled blood glucose levels**

The status of depression disorder	The status of control of the blood sugar level		Total
	Controlled blood glucose grope	Uncontrolled blood glucose group	
Without depression	Number	65	72
	Percent	90.2	9.7
Cut-off point	Number	5	20
	Percent	25	75
Clinical depression	Number	3	49
	Percent	6.1	93.8
Total	Number	73	141
	Percent	51.7	48.2

Chi-square= 89.392, df=2,  $p < 0.001$

On the other hand, according to Table 4, 5(3.5%) of total number of 141 investigated diabetic patients had low sexual dysfunction, 57 (40.4%) had moderate sexual dysfunction, 79(56%) excessive sexual dysfunction. total 5 people with low sexual dysfunction, were in the controlled blood glucose group (100%), and there wasn't any patient with low sexual dysfunction in uncontrolled blood glucose group (0/0%). 50 (87.7%) of 57 patients with moderate sexual dysfunction were in controlled blood sugar group, and 7 (12.3%) were in poor blood glucose control group. As it is observed, this difference is clinically significant. 61 cases (77.2%) of 79 patients with severe sexual dysfunction had poor control of blood glucose and 18 (22.8%) had controlled blood sugar (Table 4). This difference was clinically significant. Therefore, to find out whether this difference is statistically significant, statistical analysis was performed using Chi-square method and as a result, there was a significant correlation between the frequency and severity of sexual dysfunction and the status of blood glucose control according to HbA1C ( $P < 0/001$ ).

**Table 4: Comparison of frequency and severity of sexual dysfunction in two groups of patients with type 2 diabetes attending endocrine clinic of Taleghani Hospital with controlled and uncontrolled blood glucose levels**

The status of depression disorder	The status of control of the blood sugar level		Total
	Controlled blood glucose grope	Uncontrolled blood glucose group	
Without depression	Number	5	5
	Percent	100	0
Cut-off point	Number	50	57
	Percent	87.7	12.3
Clinical depression	Number	18	79
	Percent	22.8	77.2
Total	Number	73	141
	Percent	51.8	48.2

Chi-square=56.414, df=1,  $p < 0.001$

## DISCUSSION AND CONCLUSION

The aim of this study was to investigate the correlation between the level of depression, anxiety and sexual dysfunction and (controlled and uncontrolled) blood sugar levels based on HbA1c index in type 2 diabetic patients attending Taleghani Endocrin Clinic. The results of the study indicated that the severity and frequency of anxiety and depression and sexual dysfunction

had meaningful relation with the status of blood glucose control based on HbA1c index. First, in the discussion of depression and anxiety disorders, the findings of the present study regarding depression, was consistent with the findings of the studies by Grandinetti *et al.*, and Venice Richardson *et al.*, So that, Grandinetti's studies on 574 diabetic patients in the Hawaiian region, revealed people with higher hemoglobin levels are more likely to have depression [82]. The results of the Richardson and colleagues' research indicated that the level of hemoglobin in diabetic patients with depression was higher than diabetic patients without depression [83]. In Fort Man and colleagues' study, the better self-care control and less depression level was associated with more management in blood glucose control [84]. Another study which confirmed the results of present study was Cooper and colleagues' research, which has stated a higher rate of glycated hemoglobin type 2 diabetic patients with depression compared to those who did not show mood disorders [85]. Hesham Abuhegzy *et al.*, studied on 172 diabetic patients and found out HbA1c level were significantly higher in depressed people compared to non-depressed ones [86]. Among Iranian confirmatory studies on anxiety and depression, Hamid Dehghani and colleges' study On 240 diabetic patients attending Yazd Research Center in 2016, can be mentioned. It noticed that there is a significant correlation between anxiety and depression on one hand, and HBA1c on the other hand ( $P = 0.008$ ) [87]. In Surwit's *et al.*, study, Stress management instruction resulted in a significant reduction in the amount of glycated hemoglobin, which was consistent with the results of present study as well [88]. In confirmation of this case, studding on 64 Samoan American, Alstad noticed that an increase in the environmental, cultural, family and personal stress also increases blood glucose levels [89]. However, several studies have achieved contradictory results. According to Nejati Safa *et al.*, There was no significant relation between depression and the rate of glycated hemoglobin [90]. Georgiads and colleges' research didn't revealed any change in the level of HbA1c and fasting blood glucose in Type 2 diabetic patients before and after depression therapy [91]. In De Groot's *et al.* study, diabetic Patients type 1 with a long-term major depressive disorder obviously revealed worse glycemic control compared to patients without any mental disorder. However, patients with type 2 diabetes with a long-term

major depressive disorder had no weaker glycemic control compared to patients without psychological disorders [92]. This disparity of findings can be attributed to differences among assessment criteria in various researches.

In the present study, 34.8% of the total patients have either one of the two disorders (anxiety and depression) or both of them, of which 55.1% were female. 83.6% of patients with anxiety and depression aged 50 or over (41% of patients in this group had either anxiety and depression or both of them, while in the patients less aged than 50 years the number of cases was 19.5%). The highest level of Anxiety or depression related to illiterate people (85.7%) and then to the individual with the degree of less than diploma (44.4%). All those who were divorced had anxiety or Clinical depression; while, 71.4% of widows had one of these two disorders. The level of anxiety and depression in single and married people was clinically different (57.1% in single individuals and 30.6% in married ones). The highest percentage of mood disorders related to the patients with more than 11 years of diabetes duration (47.8%). 45.5% of the patients received insulin therapy suffered from clinical mood disorder, while the percentage of patients with diet treatment was 27.9%. regarding the findings of present study, it can be concluded that anxiety and depression mostly appear in older ages, long diabetes duration, lower level of education, more insulin intake and unsettled condition of marital life. It can be justified that the reason of the higher rate of depression symptoms is the psychological effects of applying an invasive method, such as insulin injections or biochemical effects of exogenous insulin. This affair has been confirmed In Sepehrmanesh's *et al.* research In Kashan in 2003. On the other hand, as it is expected, the chronicity of a disease is an effective factor in depression and anxiety, which can be due to the complications that these patients suffer in long term duration. The results of the present study are consistent with the results of a Taziky, *et al.*, so that Kendzur and colleges in a study on Mexican Americans with diabetes demonstrated that participants with clinical depression or anxiety were older than those without depression and anxiety. Most women who were less educated are likely to take diabetic drugs. Major depressive disorder and anxiety accompanied with poor behavioral management of diabetes (BMI and more waist circumference, less physical activity)

and weaker glycemic control, namely, higher levels of fasting glucose and HbA1c [93]. In this study, females allocated a greater percentage of anxiety or depression than males (55.1% vs. 44.9%), while reference books reported women with about two times more depression than men. But in the present research this rate was 38.6% for men and 32.1% for women. In an investigation by Lloyd and colleagues in the United Kingdom, they stated that there is a significant relationship between sex and depression symptoms in patients, and depression is more likely to be prevalent in women. This result can be attributed to the fact that women are exposed to social stress more than men. While, in the study of Kovak *et al.*, Depression was not related to sex. Though, in the present study, the percentage of depression or anxiety was higher in diabetic patients with more than 11 years diabetes duration, but there was no linear relationship indicating that the longer disease duration leads to the clinical increase of percentage of mood disorder. However, in the Gardeneau's *et al.*, study, the results indicated that the prevalence rate of depression in diabetic patients is related to the sex and duration of the disease. Regarding the above findings, it can be concluded that most people who suffer from depression and anxiety have inadequate control over their blood glucose levels and unsatisfactory diet, and take their medicine improperly with delay. For this reason, this faulty cycle worsens the status of blood glucose control, and a poor control of blood glucose level increases anxiety and depression in patients. Therefore, in order to prevent depression and anxiety in patients, in addition to controlling diabetes (given the positive relationship between reducing symptoms of mood disorders and decreasing HbA1C), psychiatric and therapeutic examinations to educate the patient about depression and ways of reducing stress factors in daily life is essential. On the other hand, with the high prevalence rate of sexual dysfunction among diabetics and the significant correlation between metabolic control and the severity of sexual dysfunction, it can be concluded that this disorder is due to vasculopathy or neuropathy, or both. Hence, as preventive actions, screening and treatment for other complications of diabetes, such as nephropathy and retinopathy, and ... should be done, these measures should be taken into consideration for sexual dysfunction in people with diabetes.

In the end, it should be mentioned that while the major attention of clinical center staffs is to the physical problems of diabetic patients and their psychological problems are ignored, the treatment of depression, anxiety and sexual dysfunction can have noticeable effects on improving their quality of life. It is suggested that besides regular visits of physician, it is important to give further attention to the patients' psychological problems and improvements in their quality of life. The solution to this problem is to integrate mental health services into other services that these patients receive. However, metabolic controls should not be considered as the only measure in such research, and it is better to consider other factors such as mental health and quality of life which are more sensitive to the effects of social-psychosocial interventions.

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