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Comparison of Suicidal Ideations and Self-injurious Behaviors in Patients with Complicated and Non-complicated Type 2 Diabetes

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ABSTRACT

Introduction: Psychiatric problems like suicide, self-harm, and injurious behaviors are important and common in chronic diseases like diabetes. This study aimed to compare suicidal ideations and self-injurious behaviors in patients with type 2 diabetes with and without complications referring to diabetes research center in Yazd, 2017.

Methods: In this case-control study, simple random sampling was used. The data were collected using standard questionnaires. Beck Scale for Suicidal Ideation (BSSI) was used to investigate suicidal ideations and Sanson questionnaire was used for self- injurious behaviors. Finally, the collected data were entered into SPSS version 19. Also, t-test was used to compare the means and Chi-square test was used to compare the frequency distributions.

Result: A total of 360 patients were studied in two groups of 180 (complicated and non-complicated). Of these patients, 189 (52.5%) were male and 171 (47.5%) were female. Moreover, only 1 patient (0.3%) had self-injurious thoughts and 1 patient (0.3%) had high suicidal ideations. There was no significant difference between the frequency distribution of self-injurious thoughts and suicidal ideations in the two groups (p=0.371). There was no significant difference between the frequency distribution of self-injurious thoughts and suicidal ideations in the two groups according to the gender (p=0.285, p=0.432).

Conclusion: The results showed that the frequency of self-injurious thoughts and suicidal ideations in type 2 diabetes mellitus patients is low and the complications of the disease do not affect this abundance.

Keywords: Diabetes Mellitus, Type 2, Suicidal Ideation, Self-injurious Behavior

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Introduction

Nowadays, 1.5 million people have diabetes in Iran. When there are complications, such as retinopathy, nephropathy, and neuropathy, diabetes can provide numerous psychological and behavioral complications that extensively affect the quality of life in patients (1). It can appear due to diet changes, permanent dependence on medicine, various short-term or long-term complications of the disease, and their related costs. Depression is one of the most common psychiatric disorders in patients with diabetes. The prevalence of depressive disorder in patients with type 2 diabetes (NIDDM) is 8.5-12% and the probability of being morbid with the disease is 11-32.5% during the lifetime. Depression is one of the main reasons of suicide in patients. The probability of suicide incidence in patients with depression is 30-45%. During the lifetime, the probability of depression incidence in diabetic patients is meaningfully greater than non-diabetic patients, so that the probability of being depressed during the lifetime is estimated to be 28.5% in diabetic patients (2). Depression is a mood disease appeared by low mood symptoms, energy and interest reduction, feeling guilty, some problems in concentration, anorexia and most importantly, death and suicide ideations. Considering these conditions, the probability of suicide incidence is higher in such people. Evidence has represented that plasma glucose concentration affects the mood of diabetic patients. So that depression in diabetic patients is accompanied with the low blood sugar control and the hyperglycemia level has a direct relationship with the severity of depression, which can make suicide susceptible in patients and more patients will have a death wish. Furthermore, research studies have also presented that the brain vascular involvements and brain ischemia caused by diabetes are often associated with depression, which can provide very important conditions for the suicidal ideations in people (3).

Pompii et al. designed a systematic review about suicide and diabetes and concluded that suicide thought is more prevalent in diabetic patients rather than general population (4). In fact, hopeless about outcome of illness might be associated with an increased risk of suicide, denial of health care, and lack of motivation to comply with medical approach (5).

Given the depression prevalence in patients with diabetes and considering diabetes as a chronic and long-term disease with different psychological challenges, other mental disorders caused by depression, such as suicide, harmful actions, etc. may appear in these patients (6). This study aimed to investigate and compare the suicidal ideations and self-injurious behaviors in patients with type 2 diabetes mellitus with and without complications referring to diabetes center in 2017.

Methods

This was a case-control study. The statistical population of this study was all patients with type 2 diabetes with and without complications referring to diabetes research center in Yazd in 2017. The simple random sampling was performed for this study and 360 patients with type 2 diabetes were considered for this study divided into two groups of 180 (with and without complications) and the patients with type 1 diabetes as well as the patients who were not satisfied with the study were excluded from the study. According to the random method, two groups were divided.

The complications included renal (creatinine > 2), eye (laser therapy history), heart (history of being hospitalized in CCU or angioplasty), neuropathy (nocturnal pains in the palm and sole), and cutaneous (foot ulcer or amputation). After obtaining the relevant licenses and referring to diabetes research center archive of Yazd, some information of people, such as age, gender, education, duration of illness, duration of treatment, and HbA_1C level were extracted using the file information and recorded in a pre-prepared form. Afterwards, the patients were asked to write their suicidal ideations and harmful behaviors using the relevant questionnaires.

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The inclusion criteria included patients with type 2 diabetes and the complications included renal disease, creatinine more than 2, cardiovascular disease, previous history of cardiac surgery, angiography, retinal laser therapy, neuropathy, limb amputation, and diabetic sore.

The exclusion criteria included patients with type1diabetes and patients without consent.

The instruments and questionnaires included Beck inventory used to investigate the suicidal ideations and Sansone questionnaire used to investigate the harmful behaviors. Beck Scale for Suicidal Ideation (BSSI) was developed in 1961 by Aaron Beck (5). This scale has 19 questions. This questionnaire is a combination of three factors, including willing to die, being ready for suicide, and willing to actual suicide. The reliability and validity in Persian form of this questionnaire was calculated in the study (5). The scores of this questionnaire were divided as follows: having suicidal ideations-Low (0-5), being ready for suicide-High (6-19), willing to actual suicide-Very High (20-38). Cronbach's alpha coefficient was 0.829 and 0.837, respectively. Esfahani et al. reported that the psychometric properties of BSSI can be in research fields (6). Sansone questionnaire was developed in 1998 consisted of 22 questions investigating direct and indirect self-injurious behaviors. A high score represents the higher severity and frequency of the self-injurious behaviors. The scoring is in the form of Yes/No with cut of point 5. It can recognize 85% of patients with borderline personality disorder (7). Different studies have supported the reliability and validity of this tool. In some studies, this tool has been used to measure the direct and indirect self-injurious and evidence of its psychometric features is acceptable. In the study by Tahbaz et al., validity and reliability were acceptable with alpha Cronbach 0.74 (8). The data were entered into SPSS 19 software and descriptive statistics methods such as mean, standard deviation, tables, and frequency distribution graphs were used to analyze the data. Moreover, t-test was used to compare the means and Chi-square test was used to compare the frequency distributions. The significance level was considered less than 0.05.

Results

In this study, 360 patients were investigated in two groups of 180 (with or without complications). The results of studying the education level of patients with type 2 diabetes represented that 143 patients (39.7%) were illiterate, 120 patients (33.3%) had primary school education, 53 patients (14.7%) had junior high school degree, 29 patients (8%) had diploma, 10 patients (2.8%) had the associate's degrees, 4 patients (1.2%) had the bachelor’s degrees, and 1 patient (0.3%) had the master’s degree. The results of studying the frequency distribution of suicidal and harmful thoughts in two investigated groups are represented in Table 1. Based on Chi-square test, Table 1 reveals that there was no significant difference between the frequency distributions of harmful thoughts and suicidal ideations in the two groups. According to the results, the absence of harmful thoughts refers to people whose total score in Sansone questionnaire was equal to 0 and the presence of harmful thoughts refers to people whose total score in the questionnaire was equal to 4. In this study, 189 patients (52.5%) were male and 171 patients (47.5%) were female, and also 191 patients (53.1%) aged between 30-60 years and 169 patients (46.9%) aged over 60. The mean age in patients was 61.33 ± 9.66, the mean A1C was 6.72 ± 0.61, the mean illness duration was 8.67 ± 5.01, and the mean treatment duration was 8.66 ± 4.99. The results of Sansone questionnaire scores represented that 359 patients (99.7%) did not have harmful thoughts and only 1 patient (0.3%) had harmful thoughts. By studying the frequency distribution of Beck questionnaire score, the results represented that 359 patients (99.7%) were in the low level of suicide risk and only one patient (0.3%) had a high suicide risk.

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Table 1. Frequency distributions of suicidal ideations and harmful thoughts in the two groups

Variable		Group		P-value
		With complications	Without complications	
Harmful thoughts	No	179(99.4%)	180(100%)	0.317*
	Yes	1(0.6%)	0(0%)	
Suicidal ideations	Low	179(99.4%)	180(100%)	0.317*
	High	1(0.6%)	0(0%)	

*Chi Square test

The results of studying the frequency distributions of harmful thoughts and suicidal ideations in the two groups are presented in Table 2 for both genders. Table 2 reveals that there is no significant difference between the two groups ($p>0.05$).

Table 2. Frequency distributions of suicidal ideations and harmful thoughts in the two groups for both genders

Variable		Group/Gender			
		Male		Female	
		With complications	Without complications	With complications	Without complications
Harmful thoughts	No	100(100%)	89(100%)	79(98.8%)	91(100%)
	Yes	0(0%)	0(0%)	1(1.3%)	0(0%)
P-value		……..		0.285	
Suicidal ideations	low	99(99%)	89(100%)	80(100%)	91(100%)
	high	1(1%)	0(0%)	0(0%)	0(0%)
p-value		0.432			

Chi-Square test was used to analyze the results of studying the frequency distributions of harmful thoughts and suicidal ideations based on the education level in the two groups. The results indicated that there was no statistically significant difference between the frequency distributions of harmful thoughts (p-value= 0.142) and suicidal ideations (p-value = 0.231) in terms of education level in the two groups.

The results of studying the mean of HbA_1C, age, duration of treatment, and duration of illness in both groups are represented in Table 3. The table shows that there was a significant difference between the mean age, treatment duration, and illness duration in both groups ($p<0.05$). So,the mean age, duration of illness, and duration of treatment were significantly greater in patients with complications compared to patients without complications.

Table 3. Mean HbA_1C, age, duration of treatment, and duration of illness in both groups

Variable	Group		p-value
	With complications	Without complications	
HbA_1C	0.54 ±6.82	0.69±6.62	0.412
Age (year)	10.20 ± 67.93	9.12±54.73	0.035
Duration of illness (year)	6.70 ± 11.54	3.33±5.80	<0.001
Duration of treatment (year)	6.68±11.53	3.33±5.80	<0.001

A t-test was used to analyze the mean score of both Sansone and Beck questionnaires in terms of age and the results showed that there is a significant difference between the mean score of both questionnaires in terms of age, so that the mean score of both questionnaires was significantly greater in people older than 60 compared to people with the age of 30-60 years (Sansone score in terms of age with p-value= 0.033 and Beck score in terms of age with p-value = 0.031).

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Discussion

Although diabetes, suicide, and self-harm behaviors are serious global health issues, there is no significant evidence or knowledge about them as well as the relationship between these two conditions. Psychiatric disorders are more prevalent in patients with type 2 diabetes compared to the general population. However, it is not mostly attended or diagnosed by physicians and the psychological problems are improperly attributed to the physical diseases (11). In this study, the frequency of suicidal ideations and harmful thoughts in patients with type 2 diabetes was investigated. Bidaki et al. in Rafsanjan reported that among 180 patients, 66 patients (36.7%) were male and 114 patients (63.3%) were female. The mean age of the patients was 56.98 ± 14.28 and its range was from 14 to 88. The mean illness duration was 9.25 ± 6.15. The mean HbA_1C of the patients was 8.4 ± 2.8. (12). About this study, the number of women as well as the HbA_1C level were greater than the results of the present study. In the study of Mazloumi et al., 100 patients with type 2 diabetes were selected for the study, 71 patients of whom were female and 29 patients were male (13). In the study of Parham et al., 116 patients were selected for the study, 31% of whom were male and the others were female (14).

The results of the current study about the frequency of suicidal ideations and harmful thoughts in patients represented that only 1 patient (0.3%) had high risk of suicidal ideation and only 1 patient (0.3%) had harmful thoughts. There was no statistically significant difference between the frequency distributions of harmful thoughts and suicidal ideations in both groups with and without complications. Furthermore, the variables of gender and education level were not effective on the frequency of suicidal ideations and harmful thoughts in both groups; however, the mean score of suicidal ideations and harmful thoughts was significantly higher in people aged above 60. Bidaki et al. investigated the suicidal ideations in the diabetic population referring to Rafsanjan diabetes center and its relationship with the status of blood sugar control and HbA_1C(12).

The data were collected using Beck depression inventory and Beck suicidal ideation assessment. Among 180 patients, 66 patients (36.7%) had a history of depression and 114 patients (36.3%) did not have any history of depression. In general, the results of this study represented that the prevalence of suicidal ideations in the diabetic population of Rafsanjan was lower than the general population and other studies. There was no significant relationship between the suicidal ideations and the age, gender, HbA_1C level, duration of diabetes, and history of depression (12). The results of this study are in line with the results of the present study respecting the lower suicidal ideations in diabetic patients and also the ineffectiveness of the gender on the suicidal ideations. However, regarding the ineffectiveness of the age, it was not in line with the results of the present study, in which the mean suicidal score in people older than 60 was significantly higher. One of the most important and prevalent causes of suicide is depression. The patients may not have significant depression or some of them may not express it and may commit self-disclosure suicide due to stigma or cultural and security issues.

In the study by Lee et al., the prevalence of suicidal ideations was more in females than males, but there was no significant relationship between gender and suicidal ideations, which is consistent with the present study (15). In the current study, none of factors, including age, sex, education, and duration of disease did not affect suicide thoughts and self-harm behaviors in both groups of complicated and non-complicated diabetes.

In the Diabetes Study of Northern California (DISTANCE), 5805 patients with diabetes aged over 60 years, the depression score of ≥10 was recognized as PHQ-8, that self-injurious or thoughts was evaluated from PHQ-9, was high in patients (16). However, detailed information in this field is limited, but it seems complications such as nephropathy and GFR decline or elevation of creatinine predispose the patient to depression, suicide or self-injurious behavior, which is not in line with the present study. It could be due to limitations of study and sample size. Some studies

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have reported more suicide risk in diabetic patients (17,18), which is not consistent with the present study. It could be due to type of questionnaires, sample size, self-report, and cultural and social barriers and issues.

Some patients had no co-operation due to low resiliency and tolerance and low knowledge about the importance of the study. Moreover, some of patients' cards were incomplete and data missing was considered. There were also cross-sectional design and causal relationship between the progression of diabetic complications and the increased risk of depression, self-injurious and suicidal thoughts. Given that this study was conducted at a single university research center, its results cannot be generalized to the whole patients with diabetes.

Conclusion

Based on the results of this study, it was concluded that the frequency of harmful thoughts and suicidal ideations in the patients with type 2 diabetes mellitus was low. Moreover, the complications of the disease did not have any effects on the frequency of harmful thoughts and suicidal ideations in patients with type 2 diabetes mellitus.

It is recommended to conduct a longitudinal cohort study to assess suicide ideation and self-injurious behavior in type 1 , 2 diabetes mellitus with and without complications, in large sample size and to evaluate psychiatric comorbidities.

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Authors' contribution

GHD supervised the study, MR helped collect the data in Diabetes research center and supervised it. MJY helped collect the data. RB designed the study, wrote the first draft, supervised and discussed and revised it, and MSH wrote and submitted the article.

Conflict of Interest

The authors declare that there is no conflict of interest.

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