

## Comparing the Suicidal Ideation in Diabetic Patients Receiving Insulin with Oral Medication

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### Abstract

**Objective:** Diabetes is one of the chronic diseases which can be accompanied with suicide. The study was conducted to assess and compare the prevalence of suicidal ideation in diabetic patients receiving insulin and oral medication treatment.

**Materials and Methods:** In this cross-sectional study, 2000 patients with diabetes supported by diabetes institute of Rafsanjan in 2017. After giving conscious permission, the patients filled in a demographic checklist and Beck suicidal ideation questionnaire. The data were analyzed using SPSS-16.

**Results:** Prevalence of suicidal ideation in patients with diabetes receiving insulin was 3.2% (n=32) and in people receiving oral medication treatment was 3.1% (n=31). There were no association between suicidal ideation and the method of diabetes treatment. Suicidal ideation was more prevalent in illiterate people; however, no significant relationship was seen between suicidal ideation and education level. Also, there was no significant relationship between marital status and suicidal ideation. There was no relationship between suicidal thoughts and the method of treatment (*P*-value: 0.05).

**Conclusion:** Suicidal ideation is more prevalent in diabetic patients, but there were not differences between two group under insulin therapy and oral anti-diabetic agents.

**Keywords:** Diabetes, Insulin, Suicidal ideation, Oral medications

### Introduction

Diabetic patients are at risk of suicide. It may be 11 times the suicide rate more in comparison with general population (1). Completed suicide due to insulin overdose

as accidental mortality or death due to another etiology can be misdiagnosed and it is statistically challenging (2). Among the oral anti-diabetic agents receive in lethal

overdoses, sulfonylurea were concomitant with deaths (likely due to the more number of type 2 diabetics, who represent 80% of diabetics), whereas insulin created the greatest absolute number of complications that were categorized as serious or chief (3).

The findings of a study in Africa showed that depression and suicidal behavior may be comorbidity with diabetes and essential hypertension (4). In a survey, about diabetic patients, 16% had overdosed by oral diabetic medications (2,5). Various studies have shown that diabetes cause mostly psychological complications (5). Diabetes complications, decline in life expectancy and mortality resulting from it impose an economic burden on the individual, family, and the society and influences the quality of life of the individual and his/her family (3). In a study on 100 patients with type 1 and type 2 diabetes which patients filled the Beck hopelessness, SF-36 health survey, self-efficacy and suicide score scales, They showed more hopelessness and suicide thought than internal-medicine outpatients. Low quality of life was related to low self-efficacy, more hopelessness, and suicidality (6).

Suicidal ideation as life threatening act which is a psychiatric emergency and is seen more in people with diabetes compared with normal people. However, limited studies have been conducted to investigate suicide rate in people with diabetes. Psychiatric disorders like suicide ideation in people with diabetes may have a negative effect on blood sugar control (7). In a study, Diabetic patients type I had 61% more for risk of suicide versus general population (8).

As a result, since diabetes is an important and common disease and various studies have suggested that diabetes cause increase in complications and psychiatric issue as well as the fact that depression is a threatening disease (7,9) because it leads to suicide and will increase the risk of disease and deaths resulting from it, understanding the relationship of depression and/or suicidal ideation with complications of diabetes can

help us learn more about its complications. It also helps get a better understanding of decline in burden of mental and economic disorders as well as costs imposed. These are not merely financial issue; rather they are invisible costs including pain, anxiety, sadness, headache, inability, stress, depression, infection, amputation, and nutritional problems. Effects of the disease influence on social and relationships as well as family can make the patient feel depressed. As a result, in accordance with the large population of people with diabetes in Rafsanjan city and the fact that little psychiatric researches conducted on this population and this problem has not been investigated in Rafsanjan yet, the current study was carried out to compare the frequency of suicidal ideation in people with diabetes receiving insulin and oral medication treatment.

## Materials and Methods

In this cross-sectional study, 2000 patients with diabetes aged between 15-90 years old selected and visited in diabetes institute of Rafsanjan in 2017.

### Beck scale for suicidal ideation (BSSI):

Questionnaire was been used to reveal and measure the intensity of attitudes, behaviors and to develop a scenario for committing a suicide. This three- point scale (0, 1, 2) questionnaire include 19 questions whose questions consisted of subjects such as death wish, tendency to actively and passively commit suicide, duration and frequency of suicidal ideation, feeling of self- control, inhibiting factors of committing suicide and how much the individual was ready to commit suicide (10). This scale has a high reliability and validity to investigate suicidal ideation and its standardization has been done in Iran. The results obtained from the study carried out by Anisi et al. (2005) suggested that concurrent scale concurrent validity of Beck suicidal ideation with general health questionnaire was 0.76 and its reliability using Cronbach's alpha was 0.95 (11). In an internal

psychometric study for assess validity and reliability of BSSI, Cronbach's alpha coefficient for the screening section and the whole scale was 0.83 and 0.84 (12).

Then, the selected individuals were provided with necessary explanation regarding the study's objective. At first, demographic information and the type of treatment were obtained from the selected patient's medical records. Then the participants filled in the demographic information and Beck suicidal ideation questionnaire and they were assured that their information would be kept confidential. The participants were asked to fill in the questionnaires in half an hour. Then the questionnaires were given back to the researcher. The responses listed in the questionnaire were entered into SPSS version 16 in the form of special codes and were analyzed using appropriate statistical tests. All statistical analyses were conducted in the software SPSS version 16 and the data were analyzed at a significant level ( $P$ -value < 0.05).

### **Ethical considerations**

This article is part of a doctoral research project approved by the Islamic Azad University and has a code of ethics (1346507) from Islamic Azad University of Ali-ebn-Abitaleb branch of Yazd.

### **Results**

Prevalence of suicidal ideation in patients with diabetes receiving insulin was 3.2% ( $n=32$ ) and in people receiving oral medication treatment was 3.1% ( $n=31$ ). The  $p$ -value was not significant ( $P$ -value > 0.05) indicating that the two groups of patients with diabetes undergoing treatment with insulin or oral medication were not different in terms of their frequency of suicidal ideation.

Prevalence of suicidal ideation in male patients undergoing insulin treatment was 4.6% ( $n=13$ ) and in individuals undergoing oral medication treatment was 3.5% ( $n=11$ ). Chi-square test results suggested that there was no significant difference among male patients undergoing insulin and oral

medication treatment in terms of their frequency of suicidal ideation ( $P$ -value > 0.50). The same was true for women with diabetes ( $P$ -value > 0.80). Therefore, it can be concluded that the patients' sex did not affect the relationship between suicidal ideation and the type of treatment for individuals with diabetes.

Chi-square test results showed that in illiterate people group, no significant difference was seen in people undergoing insulin and oral medication treatment in terms of their frequency of suicidal ideation ( $P$ -value > 0.84). The same held true for people with middle school degrees ( $P$ -value > 0.96) and people with diploma degrees ( $P$ -value > 0.60) and people with academic education ( $P$ -value > 0.23). As a result, it can be concluded that education has no effect on the relationship between suicidal ideation and the type of treatment for people with diabetes.

Prevalence of suicidal ideation in single patients insulin treatment was 18.9% ( $n=10$ ) and in people undergoing oral medication treatment undergoing was 12.2% ( $n=6$ ). Therefore, no significant difference was seen in patients undergoing insulin and oral medication treatment in terms of their prevalence of suicidal ideation ( $P$ -value > 0.36). The same was true for married individuals ( $P$ -value > 0.29) and divorced individuals ( $P$ -value > 0.49). Thus, it can be concluded that marital status does not affect the relationship between suicidal ideation and the type of treatment (Table 1).

The score range of Beck suicidal ideation is 0-38. The mean score of suicidal ideation was in people with diabetes receiving insulin therapy was 13.27 ( $\pm 2.9$ ) and in people undergoing oral medication treatment was 12.17 ( $\pm 2.8$ ). The difference in the mean score of suicidal ideation was tested using T-test. The results suggested that the difference in the mean scores of the two groups was not significant (0.685), meaning that the mean score of the two groups was equal and was not associated with the type of drugs being used. Based on the results in table 2, the prevalence of suicidal

**Table 1. Prevalence of suicidal ideation in people with diabetes receiving insulin and oral medication based demographic variable**

Variable	Without Suicidal ideation N (%)		With suicidal ideation N (%)		P-value
	Insulin	Oral medication	Insulin	Oral medication	
<b>Sex</b>					
Men	283 (95.4%)	314 (96.5%)	13 (4.6%)	11 (3.5%)	>0.50
women	712 (97.3%)	691 (97.1)	19 (2.7%)	20 (2.9%)	>0.80
<b>Education</b>					
Illiterate	397 (96.5%)	398 (96.7%)	14 (3.5%)	13 (3.3%)	>0.84
Middle school	360 (97.8%)	368 (97.8%)	8 (2.2%)	8 (2.2%)	>0.96
Diploma	189 (94.7%)	193 (95.9%)	10 (5.3%)	8 (4.1%)	>0.60
Bachelor	49 (100%)	46 (95.7%)	0 (0%)	2 (4.3%)	>0.23
<b>Marital status</b>					
Single	53 (81.1%)	49 (87.8%)	10 (18.9%)	6 (12.2%)	>0.36
Married	854 (98.6%)	871 (97.9%)	12 (1.4%)	18 (2.1%)	>0.29
Divorced	88 (88.4%)	85 (91.8%)	10 (11.6%)	7 (8.2%)	>0.49
<b>Job</b>					
Jobless	17 (82.7%)	10 (90%)	3 (17.3%)	1 (10%)	>1.0
Farmer	77 (96.1%)	93 (94.6%)	3 (3.9%)	5 (5.4%)	>0.73
Housekeeper	638 (97.8%)	616 (97.4%)	14 (2.2%)	16 (2.6%)	0.64
Retired	87 (98.9%)	83 (98.8%)	1 (1.1%)	1 (1.2%)	1.0
Freelance	84 (96.4%)	103 (99%)	3 (3.6%)	1 (1.0%)	0.33
Student	30 (98%)	27 (92.6%)	6 (2.0%)	2 (7.4%)	0.26
Worker	2 (100%)	8 (100%)	0 (0%)	0 (0%)	1.0
Employee	55 (96.4%)	65 (92.3%)	2 (3.6%)	5 (7.7%)	0.45
<b>Range of Age</b>					
16-44	222 (93.7%)	215 (93.5%)	14 (6.3%)	13 (6.5%)	0.91
45-54	224 (98.2%)	241 (98.3%)	4 (1.8%)	4 (1.7%)	1.0
55-64	265 (98.3%)	314 (98.4%)	8 (1.7%)	5 (1.6%)	1.0
65-86	235 (96.2%)	240 (95.8%)	9 (3.8%)	10 (4.2%)	0.85

**Table 2. The mean score for the suicidal ideation in patients with diabetes undergoing insulin and oral medication**

Type of treatment	N	Mean of suicidal ideation score	Standard deviation	Minimum	Maximum
Insulin	32	13.27	2.9	6	17
Oral medication	31	12.17	2.8	7	16
Total	63	13.12	2.83	6	17

P-value=0.685

ideation in people with diabetes receiving insulin and oral medication treatment was not any different. Consequently, according to the type of treatment for these individuals, no judgment can be made as to the frequency of suicidal ideation.

## Discussion

In the present study, suicidal ideation existed in 3.2% of patients, however, this prevalence in individuals undergoing insulin and oral medication treatment had no significant difference. Myers showed that the prevalence of committed suicide was 10% in people with diabetes (13). Ferrio et al. (14) showed that young individuals with diabetes do suicide attempt 3 times as many as those without diabetes.

Ferrio et al. showed through their worldwide studies that people having diseases such as Asthma, diabetes, and Crohn are 36% as likely to commit suicide as other people. In another study, they showed that risk of suicide is highest when young people having chronic disease (14). In the present study, the groups of patients with diabetes undergoing insulin and oral medication treatment were not different in terms of their prevalence of suicidal ideation. It showed that 9.7% of patients recently diagnosed with diabetes tried to committed suicide. Myers and et al suggest that all patients with diabetes must screen for the risk of progression depression and suicide, doing this help identify these patients and support them before they commit suicide (13).

After diagnosis a chronic disease for first time, the physician should give a bad news to patient and his/her family. Some patients have poor coping mechanisms or unsuitable condition. Therefore, they may find suicide ideation or attempt for it. But, by passing time they will adjust themselves with disease. In some cases, death caused by overdosing on insulin is considered accidental and, as a result, the argument over suicide is ignored. Researchers believe that they need new methods to distinguish these two phenomenon from one another among patients who are in serious danger of developing depression and suicide (2,15).

The results of this study showed that there was no relationship between the frequency of suicidal ideation and the type of treatment men's group. This relationship was not significant in women with diabetes' group either. Past research showed that depression in women with diabetes was more prevalent than men with diabetes; the difference was not significant though (16,17). Depression is a strong predictive factor for suicide, hopelessness, helplessness, non drug adherence and drug misuse. Instrument availability for suicide is an important factor. Therefore, availability of insulin or oral anti-diabetic agents may prone patient for suicide.

The present study's results indicated that the frequency of suicidal ideation was more prevalent in low-educated and illiterate people with diabetes; this difference was not significant though. In past studies, it has shown that poly therapy and older age can predict suicidality (6). In our study, it wasn't shown. Of course, poly pharmacy can decline drug compliance about diabetes. Therefore, the patient refuse oral medication or insulin injection that can cause worse diabetes and complication even psychiatric problem and prone him/her to depression and suicide. Diabetic patients with depression and suicide ideation may feel negative emotions that they can effect on eating status and blood sugar control. Emotional complications and psychological stress play a significant role for

control the blood sugar. Mental stress can change the blood sugar level. This change occurs in two ways. Firstly, the patients having psychological stress does not take care of themselves properly. They do not have a healthy food habits and do not exercise often. Secondly, stress hormones can directly cause a change in the patient's blood pressure level.

In a cohort study in Denmark on men diabetic patients, it was been shown that risk of suicide was high (18). In the present study, in terms of sex, the relationship between the suicidal ideation and the type of treatment diabetic patients receives was not significant, but, the depression in married individuals with diabetes was higher in a study conducted by Afrasiabi (19). Suicide ideation and attempt is more prevalent in female and other hand with chronicity of disease, depression will be more prevalent and severe. Therefore, suicide will be more prevalent in female and illness with more chronicity. But completed suicide will be more prevalent in male sex. Patients should understand that diabetes is a progressive disease beginning from the illness. So, providing patient-centered education will help overcome the barriers faced primarily such as women, the illiterate and married patients (20).

## Conclusions

It can be concluded that like other chronic diseases, suicidal ideation is been detected more in individuals with diabetes, but there isn't difference between two group under insulin therapy and oral anti-diabetic agents.

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## Conflict of Interest

No conflict of interest was declared.

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