Status of Psychological Adjustment and Associated Factors in Patients with Type 2 Diabetes in Zanjan University of Medical Sciences - 2019

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Abstract

Background: Diabetes is one of the major health issues worldwide and a challenge for health care providers.
Objectives: The aim of this study was to determine the status of psychological adjustment and associated factors in patients with type 2 diabetes in Zanjan University of Medical Sciences.
Methods: This descriptive cross-sectional study was carried out on 350 patients with type 2 diabetes referred to Vally-e-Asr Medical Center in Zanjan and Special Endocrinology Clinic in 2019. These patients were included in the study by the Poisson distribution method. Demographic and clinical factors questionnaires and valid Diabetes Adjustment Assessment Scale (DAAS) were used in this study. Data analysis was conducted using SPSS22 software. Also, Pearson correlation coefficient, independent t-tests, and analysis of variance were applied.
Results: The mean of total adjustment in this study was 162.79 ± 18.06. The highest mean of adjustment was related to advanced self-management (4.15 ± 0.84) and the lowest mean of adjustment was about the initial imaging of illness (3.23 ± 0.67). Patients' adjustment had a statistically significant relationship with hospitalization history, family history of diabetes, HbA_1C level, history of physical, psychological, and social problems caused by diabetes, place of residence, marital status, education, occupation, age, duration of illness, and income.
Conclusion: In this study, patients had an acceptable adjustment. Because adjustment varies among individuals and is influenced by demographic, clinical, and social factors, it is recommended that diabetic caregivers include individual-oriented diabetes education and promotion of adjustment to the disease in their program.

Keywords: Type 2 diabetes, adjustment, related factors

Introduction

Diabetes is one of the most challenging and severe chronic diseases and a major worldwide health issue in the 21st century [1]. In 2015, 415 million people with diabetes between the ages of 20-79, 5 million deaths from diabetes, and $ 673 billion total global health costs from diabetes were estimated. Three-quarters (75%) of people with diabetes lived in low- and middle-income countries. It is predicted that by 2040, the number of people with diabetes in the age group of 20-79 will reach 642 million [2]. The prevalence of diabetes in Iran in 2016 was reported to be about 10.3% [3,4]. Diabetes is the seventh leading cause of death in the world [5] and causes complications such as, retinopathy, nephropathy, diabetic foot, amputation, and depression in the cardiovascular, cerebrovascular, peripheral and nervous systems

[4,6]. Diabetes management requires the inclusion of complex medical tasks in an individual's daily life and imposes significant psychological and behavioral demands on patients and their families [7]. Diabetes causes problems and complications that result in changes in patients' lives, and patients and their families attempt to adapt to these changes [8]. Living with diabetes has been described as a dynamic personal transitional adjustment based on the reconstruction of perceived experience of the disease and its management [1,9]. In other words, the term psychological adjustment refers to the re-establishment of a healthy balance by patients with their new condition. Most patients eventually reach a state of good mental adjustment, yet, for some patients, the adjustment phase has been long and sometimes unsuccessful [10,11].

Better psychological adjustment is associated with more education. It positively highlights a greater interest in working with achievements in the education of diabetics, patient's own facilitation for growth, self-cohesion, and resilience [9]. To promote psychological adjustment, patients should be encouraged to express their feelings so that they can control and manage their lives [10]. Diagnosing diabetes not only changes lifestyle, but also brings with it thousands of feelings, including denial, depression, anger, shame, and acceptance that are difficult to express or deal with. The key point is that these feelings are normal and in general it is better for a person with diabetes to be more aware of how to deal with this disease and its effects [12]. Compatibility with diabetes is affected by many factors concerning the disease, treatment, and the individual. These factors include personal characteristics such as age of diagnosis and years affected by diabetes, as well as patients' perceptions of health and disease, age, sex, occupation, etc. [13]. Evidence suggests an association between individual adjustment and improved control of the patient's metabolic status [12,14], so it is important to examine the extent of adjustment as well as the factors that may affect a person's adjustment to diabetes.

In their study, Türten Kaymaz et al. (2016) reported the psychological adjustment of patients with type 2 diabetes using a self-report psychosocial regulation questionnaire with a disease scale of 45± 19.1 at a moderate level (35-51) [13]. Feqhi et al. (2013) reported the average total score of psychosocial adjustment to diabetes as 1.28 ± 0.43 (average level 1-2) [15]. In the study, Tol et al. (2012) reported the mean cognitive adjustment score as 125.08 ± 11.31 (in the range of 39-195) and was moderate [16]. In the study by Bonab et al. (2013), diabetic men and non-diabetic women had poorer adjustment than non-diabetic men [10]. The results of the study of Feqhi et al. (2013) indicated that with higher education, the mean score of total psychosocial adjustment and components of family and social environment as well as psychological disorders in patients increase significantly, yet with increase in years affected by diabetes, psychosocial adjustment decreases in the components of work environment, sexual relations, and social relations of patients [15]. In the study of Tol et al. (2013), gender, marital status, years affected by diabetes, occupational status, level of education, positive family history of diabetes, age groups, income status, underlying diseases along with cognitive adjustment to diabetes treatment were statistically significant [16]. Given that the compatibility with diabetes in different patients varies according to their demographic and clinical characteristics, and considering that no similar study has been conducted in this regard in Zanjan; the aim of this study was to determine the status of adjustment and associated factors in patients with type 2 diabetes in Zanjan University of Medical Sciences in 2019.

Methods

This study was descriptive and cross-sectional. The target population was patients with type 2 diabetes admitted to Vally-e-Asr Medical Center in Zanjan and Shafiye Special Endocrinology Clinic in 2019. This study has been approved by the code (A-11-485-5) of the Research Council and the Ethics Committee (IR.ZUMS.REC.1398.308) in Zanjan University of Medical Sciences. Data were collected by referring to the research environment, and after obtaining informed consent from the participants by the self-reporting method. In the case of illiterate patients, questions were read to them and their answers were entered in a questionnaire. Participants were assured that the questionnaires would be anonymous and that the information collected in the study would remain confidential. The characteristics of the participants in this study

were: clinical diagnosis of type 2 diabetes by an internal medicine specialist or endocrinologist, age 18 years and older, duration of diabetes more than six months, ability to communicate appropriately, lack of other chronic diseases and known mental retardation based on the patient record. The sample size was determined as 350 individuals according to the population ratio and also considering the study of Baradaran [17] with an accuracy of 0.05 and alpha of 0.05. Sampling was carried out by Poisson-time distribution method until the number of samples reached the specified sample volume.

In this study, questionnaires with demographic and clinical characteristics and adjustment questionnaire were used. The demographic and clinical questionnaire included information about gender, age, marital status, education, average monthly income (USD), place of residence, occupation, duration of diabetes, history of hospitalization for diabetes, history of diabetes in family and relatives, the type of treatment received was HbA_1C and a history of physical, psychological, and social problems caused by diabetes. Diabetes Adjustment Assessment Scale (DAAS) designed by Ebrahimi et al. (2016) [1] and its psychometric properties confirmed in patients with type 2 diabetes were applied to assess the status of adjustment to diabetes. This scale has 43 questions in eight areas; reshape (11 questions), seek to acceptance of illness (7 questions), normal life with the disease (6 questions), initial self-management (2 questions), comparing (4 questions), initial imaging of illness (4 questions), return to resources (3 questions) and advanced self-management (6 questions), which are measured by Likert with five options. The range of the total compatibility score was from 43 to 215. The range of 43 to 100.33 was considered as poor compatibility, the range of 100.34 to 157.67 as moderate compatibility and more than 157.67 as well compatibility. A higher score in this questionnaire indicated better adjustment.

This scale was developed by Ebrahimi et al. (2016) and its preliminary validity, including internal stability, content validity, exploratory factor analysis, reliability, and clinical utility were evaluated for type 2 diabetic patients. Quantitative content validity with 10 experts was acceptable in the range (CVR= 0.59 and CVI= 0.79). The internal consistency reliability of the questionnaire was obtained by calculating Cronbach's alpha coefficient for the whole instrument (0.75) [1]. As this scale was validated in the Ebrahimi's study of the Iranian community, the validity of the instrument was not examined in the present study and only the internal consistency of the questionnaire was obtained by calculating Cronbach's alpha coefficient for the whole instrument of 0.848.

Data were analyzed by SPSS software version 22 using Pearson correlation coefficient, independent t-test, and one-way analysis of variance.

Results

In this study, 350 patients with diabetes with a mean age of 58.58 years were studied. Most patients were female (58.9%), married (81.7%) and housewife (53.4%) (Table 1).

Table 1: Demographic and clinical characteristics of patients with type 2 diabetes

Demographic variables		Number	Percentage	Clinical variables		Number	Percentage
Gender	Male	144	41.1	**History of hospitalization due diabetes**	yes	181	51.7
	Female	206	58.9		no	169	48.3
Marital status	single	8	2.3	**Diabetic history among family and relatives**	yes	242	69.1
	married	286	81.7		no	108	30.9
	widow	56	16.0				
Education	illiterate	148	42.3	**History of physical, psychological, and social problems due to diabetes**	yes	176	50.3
	reading and writing	100	28.6				
	Third-grader	42	12.0				
	diploma	37	10.6				
	Academic education	23	6.6		no	174	49.7
Occupation	employee	15	4.3	**Place of residence**	city	277	79.1
	freelance	35	10.0				
	retired	47	13.4				
	student	1	0.3				
	housewife	187	53.4		country	73	20.9
	unemployed	36	10.3				
	others	29	8.3				
Quantitative variables							
variable	satndard deviation ± mean		minimum		maximum		
Age	58.58±11.85		22.00		86.00		
Average monthly income	1852971.43±1454043.37		100000		10000000		
HbA$_1$C	8.34±2.41		4.00		17.10		
Years affected by diabetes	9.87±7.70		1.00		40.00		

The mean adjustment of patients with type 2 diabetes was 162.79 ± 18.06. This indicates the patients' adjustment in this study is at a good level. The scores were divided, to equalize the range of scores of the areas and the total adjustment score, by the number of questions in each area and also in the case of the total adjustment score by the total number of questions to allow comparison of scores in the range 1 to 5. The highest mean of adjustment was related to advanced self-management, and the lowest mean of adjustment was about the initial imaging of illness (Table 2).

Table 2: Adjustment status and its subscales in patients with type 2 diabetes

Variable	Standard Deviation ± Mean	Standard Deviation ± Mean in the range 1-5
Reshape (11questions)	41.99±5.19	3.81±0.47
Seek to acceptance of illness (7 questions)	26.92±3.48	3.84±0.49
Normal life with the disease (6 questions)	21.98±4.92	3.66±0.82
Initial self-management (2 questions)	7.86±1.81	3.92±0.90
Comparing (4 questions)	14.34±2.83	3.58±0.70
Initial imaging of illness (4 questions)	12.94±2.70	3.23±0.67
Return to resources (3 questions)	11.85±2.44	3.95±0.81
Advanced self-management (6 questions)	24.95±5.06	4.15±0.84
Total adjustment (43 questions)	162.79±18.06	3.78±0.41

In this study, the mean of total adjustment had a significant positive correlation with a family history of diabetes (P≤0.001), place of residence (P = 0.001), marital status (P = 0.009), level of education (P≤0.001), and job status (P≤0.001).

There was a significant inverse correlation between the mean of total adjustment and history of hospitalization (P≤0.001) and the history of physical, psychological and social problems caused by diabetes (P≤0.001) (Table 3).

Table 3: Adjustment status in terms of clinically and demographically associated factors in patients with type 2 diabetes

Variable		Standard deviation ± Mean	Statistical test	
			t	P-value
History of hospitalization	yes	158.60±17.95	-4.601	0.000**
	no	167.29±17.11		
History of diabetes in the family	yes	165.33±17.91	4.01	0.000**
	no	157.06±17.11		
history of physical, psychological and social problems caused by diabetes	yes	157.86±16.88	-5.272	0.000**
	no	167.72±17.89		
Gender	male	163.19±18.87	0.343	0.432
	female	162.51±17.50		
Place of residence	city	164.34±18.05	3.20	0.001**
	country	156.70±16.85		

Variable		Standard deviation ± Mean	Statistical test	
			f	P-value
Type of treatment	Oral	164.11±18.20	1.277	0.279
	Insulin	159.18±17.52		
	Diet	165.75±19.20		
	All three	160.44±16.52		
	Oral and insulin	163.61±18.26		
Marital status	Single	165.63±17.81	4.732	0.0009**
	Married	164.04±17.71		
	Widow	156.59±16.32		
Education	Illiterate	156.59±16.32	12.074	0.000**
	reading and writing	163.88±18.44		
	third-grader	171.66±16.00		
	Diploma	165.38±19.24		
	Academic education	177.22±11.52		
Occupation	employee	175.87±13.58	5.265	0.000**
	freelance	165.97±16.20		
	retired	166.53±19.15		
	housewife	161.70±17.72		
	unemployed	152.17±15.09		
	others	162.81±18.08		

Also, in this study, there was a significant inverse correlation between the adjustment and duration of diabetes (P≤0.001 and R= -0.204), HbA$_1$C (P= 0.025 and R= -0.121), and age (P≤ 0.001 and R= -0.270). Moreover, there was a significant positive correlation between income and adjustment (P≤0.001 and R= 0.267) (Table 4).

Table 4: Correlation between adjustment and some clinical and demographic characteristics of patients with type 2 diabetes

		Years affected by diabetes	HbA$_1$C	Age	Income
Adjustment	R	**-0.204	*-0.121	**-0.270	**0.267
	P-value	0.000	0.025	0.000	0.000
	Number	346	346	350	345

Discussion

The aim of this study was to determine the status of adjustment and associated factors in patients with type 2 diabetes in Zanjan University of Medical Sciences in 2019.

The results of the present study revealed that the mean adjustment score in patients with type 2 diabetes is 162.79 ± 18.06 in the range of 43-215, which indicates good adjustment of patients with type 2 diabetes. Other studies have evaluated the adjustment of diabetic patients at a moderate level. One example is the study by Türten Kaymaz et al. (2016) in Ankara, which examined the psychological adjustment of patients with type

2 diabetes with the Psychosocial Adjustment to Illness Scale (Self-Report) reporting 45 ± 19.1 at a moderate level (35-51) [13]. Feqhi et al. (2013) in their study reported the average total score of psychosocial adjustment to diabetes as 1.28 ± 0.43 (average level 1-2) [15]. In the study of Tol et al. (2013), the mean cognitive adjustment score was 125.08± 11.31 (in the range of 195-39) and was moderate [16]. The difference between the results of these studies and the present study can be related to the differences between the studied populations. Successful adjustment is significant not only for the optimal management of a chronic condition, but also for adequate physical, emotional and quality of life [11,18].

In the present study, total adjustment with some clinical and demographic factors exhibited a significant relationship. There was a significant positive correlation between family history of diabetes and adjustment, meaning that individuals with a family history of diabetes had a better adjustment to the disease. This seems to be due to experiences gained by living with people who previously had diabetes or a disease. In the study of Tol et al. (2012), a positive family history of diabetes was statistically related to cognitive adjustment in following diabetes treatment. According to Tol et al. (2012), exposure to this disease by other family members strengthens healthy lifestyle physically and psychologically [16]. Ramkisson et al. (2017) considered family in the treatment of diabetic patients highly significant [19].

In this study, a significant inverse correlation was observed between HbA$_1$C and adjustment. It seems that people with lower HbA$_1$C have better adjustment. Low HbA$_1$C is a sign of better control of blood sugar and the adjustment to the disease. In the study of Tol et al. (2013), HbA$_1$C was significantly associated with cognitive adjustment in following diabetes treatment [16]. In the study by Ramkisson et al. (2017), although participants were satisfied with their level of support, they reported low adjustment and high mean scores on GHQ and high levels of HbA$_1$C [19].

In this study, there was a significant inverse correlation between the duration of diabetes and the adjustment of patients with type 2 diabetes. In the study of Tol et al. (2013), the chance of cognitive adjustment following diabetes in individuals in the group with years of diabetes 5-10 years was 2.23 times higher than individuals with years of diabetes more than 10 years, and it was 1.79 times higher than the group with less than 5 years and this was statistically significant in the group of 5-10 years. Tol et al. expressed this finding as a result of enhancement in access to and use of information in the early years of diabetes, the emergence of late-onset complications of diabetes, and decreased sensitivity with increasing years of diabetes over ten years [16]. The findings of the present study were not consistent with the results of the study by Türten Kaymaz and Akdemir (2016). There was not a relationship between years affected by diabetes and the adjustment score in the study by Kaymaz. The researchers attributed the lack of relationship between years of diabetes and psychological adjustment score to the non-acute nature of the disease. The majority of participants was more than 16 years old with diabetes and lived with diabetes [13], while the average years affected by diabetes was 9.87 ± 7.70 in the present study. This difference in the year of the disease in the study population could be the cause of a significant difference between the two studies.

In the present study, there was a significant inverse correlation between age and adjustment. It means the older one gets, the less adjusted one has. Contrary to the results of the present study, adjustment to age groups was highly significant in the studies of Tol et al. [16,20]. Also, not significant correlation was reported between age and adjustment in the study of Feqhi et al. (2014) and the study of Türten Kaymaz and Akdemir (2016). Tol et al. stated that the reason for the significant relationship between age and adjustment was due to the process of socialization and development in the experiences of diabetic patients, because the family history of diabetes is positive and exposure to this disease by other family members may result in a healthy lifestyle physically and mentally [21]. In the present study, the probable cause of the inverse correltaion of adjustment with age could be due to disease complications and their impact on a person's life.

In this study, there was a significant relationship between marital status and adjustment. It indicates the mean adjustment of married and widows was significantly different, but the mean adjustment of married and single individuals was not significantly different. While in the study of Tol

et al. (2013), cognitive adjustment following diabetes in married people was 2.4 times more than single individuals and this was significant statistically [16]. The results indicate that there was a positive significant relationship between income and adjustment. As, the more individuals earned, the more adjusted they were with diabetes. In line with the present study, Tol et al. (2013) and Tol et al. (2016) also reported a significant relationship between income and adjustment [16,20]. Individuals in the upper social classes also seem to have access to more information and support resources. However, in the study of Türten Kaymaz and Akdemir (2016), the mean of adjustment at different income levels was not significantly different [13].

Also, in this study, a significant difference was observed between the mean of adjustment and place of residence, so that people living in the city had better adjustment. The probable cause of this problem could be the convenient access to the resident of the city to information resources, support, and treatment.

In this study, there was a significant difference in adjustments at different levels of education. The results of the post hoc test showed that this significant difference was due to the difference between the mean adjustment of illiterate people with those with tertiary and university education. Although the mean adjustment of individuals with tertiary education was higher than those with diplomas, yet this difference was not significant in the post hoc test. In general, it seems that the higher the level of education, the better the adjustment among individuals. In line with the results of the present study, several studies reported a statistically significant relationship between education and adjustment [13,15,16, and 20]. In this study, it was found that the mean of adjustment at different job levels was significantly different. Employees seem to be better adjusted for diabetes than the unemployed and housewives. This finding is in line with some studies [13,16] and contradicts the findings of some other studies [20].

Conclusion

In this study, patients had good adjustment. Adjustment also varied from person to person and was influenced by demographic, clinical, and social factors, so it is recommended that planners and policy-makers consider person-centered training about diabetes in order to promote adjustment to the disease in their program. Descriptiveness of the study, use of a questionnaire, and limitation of study to Zanjan were the limitations of this study. It was attempted to control limitations using a valid questionnaire, applying the Poisson distribution method of time sampling, and sampling of hospitalized and outpatient individuals in order to include all levels of patients in the study.

It is recommended to conduct other types of studies to evaluate the adjustment status of diabetic patients in Zanjan in order to find out the causal relationships between the factors affecting the adjustment of diabetic patients.

Conflict of interest

This study had no conflict of interest for the authors.

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