Journal of Fundamentals of Mental Health

Mashhad University of Medical Sciences

Psychiatry and Behavioral Sciences Research Center

Original Article

Comparison of anxiety disorders symptoms and related transdiagnostic factors in individuals with type 2 diabetes and healthy individuals

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Abstract

Introduction: Transdiagnostic models are important by focus on fundamental processes underlying multiple disorders and help to explain comorbidity among disorders as well as may lead to more effective assessment and treatment of disorders. Therefore, the aim of this study was compare of anxiety disorders symptoms and related transdiagnostic factors in individuals with type 2 diabetes and healthy individuals.

Materials and Methods: In an ex-post facto study, 63 individual with type 2 diabetes and 63 healthy individuals were selected by convenient sampling method. The participates completed generalized anxiety disorder scale (2006), severity measure for panic disorder-adult (2013), social phobia inventory (2000), cognitive avoidance questionnaire (2008), intolerance of uncertainty scale (1994), metacognition questionnaire (2004), acceptance and action questionnaire-II (2011) and cognitive emotion regulation questionnaire (2006). Data were analyzed using univariate analysis of variance (ANOVA).

Results: The results showed that there was significant difference between two groups in generalized anxiety (P=0.0001) and panic symptoms (P=0.009). However, no difference was observed between both groups considering the symptoms of social anxiety disorder (P=0.79). Also, there is significant difference between two groups in all transdiagnostic factors, namely cognitive avoidance (P=0.0001), intolerance of uncertainty (P=0.009), negative beliefs about worry (P=0.0001), maladaptive emotion regulation strategies (P=0.01), except experiential avoidance (P=0.22).

Conclusion: It seems that individuals with type 2 diabetes experience the symptoms of anxiety disorders and related transdiagnostic factors more severely than others. These results indicated the importance of transdiagnostic factors as well as the development of transdiagnostic psychotherapy programs along with therapeutic treatments for diabetic patients.

Keywords: Anxiety disorders, Transdiagnostic, Type 2 diabetes

Please cite this paper as:
Zardoshtian Moghadam V, Mansouri A. Comparison of anxiety disorders symptoms and related transdiagnostic factors in individuals with type 2 diabetes and healthy individuals. Journal of Fundamentals of Mental Health 2017 Jul-Aug; 19(4): 497-507.

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Received: Mar. 06, 2017
Accepted: May. 03, 2017

Introduction

Type 2 diabetes is a progressive chronic disorder recognized as one of the major health problems (1). Such a disorder is characterized by relative insulin deficiency (2), its prevalence is also rising worldwide, and its high-risk state prevalence is reported even to be at higher rates (3). It should be noted that increase in the prevalence and incidence of the given disorder is mainly due to a rise in obesity, high-energy diets, sedentary lifestyle, as well as aging (2,4). Moreover, it is estimated that the amount of type 2 diabetes infliction will reach to 642 million people in 2040 (2). Type 2 diabetes can be also accompanied by numerous complications and consequences including cardiovascular diseases, neuropathy, retinopathy, nephropathy, and even death (2,5,6). In this respect, anxiety disorders and their relevant transdiagnostic factors are similarly among the complications associated with type 2 diabetes. For example; in their meta-analysis, Smith et al. (7) found that infection with diabetes was accompanied by the probable rise in affliction with anxiety disorders as well as signs of chronic anxiety. According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), such disorders include separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder (social phobia), panic, market anxiety, and generalized anxiety disorder (GAD) (8). The existence of comorbid anxiety disorders and troubling levels of anxiety symptoms are also correlated with increased diabetic complications, pain, depression, high body mass index, decreased blood glucose levels, low quality of life, and more disabilities. The GAD and panic are thereby among the most important anxiety disorders associated with medical diseases and conditions such as diabetes (7,9). For example, 14% of individuals suffering from diabetes can experience GAD (10). In this respect, the results of a longitudinal study demonstrated that people with type 2 diabetes had high rates of anxiety disorders including GAD (0.12%) and panic (0.85%) (11). Furthermore, Sajjadi et al. (12) reported the prevalence rates of 6.25% and 3.75% for GAD and panic in people affected with type 2 diabetes, respectively.

Different theories and approaches have been also proposed for the etiology of anxiety disorders. However, in the early 21st century, more attention was drawn to the pathological processes which can play causal roles in multiple disorders or characterize various mental disorder processes i.e. the ones that have been often introduced as transdiagnostic processes (13-15). These models are of utmost importance owing to their focus on the underlying processes of multiple disorders and their help to explain comorbidity among disorders; thus, they can lead to more effective assessments and treatments of such disorders (13). Anxiety disorders are also correlated with a collection of transdiagnostic factors such as cognitive avoidance, intolerance of uncertainty, negative beliefs about worry, experiential avoidance, as well as emotion regulation strategies; the factors that cause individuals' susceptibility to anxiety disorders. Therefore, these common factors can bring about anxiety and they can be also associated with anxiety disorders (16).

In this respect, cognitive avoidance refers to a variety of strategies including suppressing worrisome thoughts, substituting neutral or positive thoughts for worries, using distraction as a way to interrupt worrying, avoiding situations that can lead to worrisome thinking, that lead to the avoidance of threatening cognitive and emotional content. Besides, intolerance of uncertainty is a cognitive bias that can affect the ways to perceive, interpret, and respond ambiguous situations in cognitive, emotional, and behavioral levels (17). In this regard, individuals who are intolerant to uncertainty describe uncertainty as negative, stressful and upsetting ones and make attempts to avoid such situations. Moreover, their functioning may also face difficulties if they are placed in such situations (18).

In addition, negative beliefs about worry refer to individuals' negative beliefs about uncontrollability and dangerous consequences of worry for physical, mental, or psychosocial functions (19). Experiential avoidance is similarly an active and automatic avoidance of threatening and negative inner experiences (thoughts, feelings, memories, images, bodily senses, etc.) (20). Finally, emotional dysregulation refers to individuals' problems in terms of awareness, understanding, and acceptance of emotions; control of impulsive

behaviors and behave in accordance with the desired goals when experiencing negative emotions; and ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands (21). Cognitive emotion regulation strategies are also be defined as the conscious, cognitive, mental strategies individuals use to cope with the intake of emotionally arousing information (22).

The results of the studies in this respect have suggested a relationship between these factors and anxiety disorders particularly GAD (23). Although the review of the related literature showed that no comprehensive study had so far examined transdiagnostic factors associated with anxiety disorders in people affected with diabetes, Rasmussen et al. (24) in their study revealed a difference between intolerance of uncertainty among individuals with type 2 diabetes with sustained high HbA1c and non-diabetic ones; however, no difference was observed between these patients and non-diabetics in terms of emotion regulation. Moreover, a difference was observed between people suffering from diabetes with sustained acceptable HbA1c and those without diabetes in terms of emotion regulation, but there was no difference between these individuals and non-diabetics considering the intolerance of uncertainty. In this respect; Hadlandsmyt, White, Nesin, and Greco (25) suggested that cognitive fusion and experiential avoidance could negatively affect diabetes management behaviors. Ghiyasvand and Ghorbani (26) also found that people with diabetes could gain higher scores on maladaptive cognitive emotion regulation strategies.

Given the high prevalence rate of diabetes and its relevant physical and psychological consequences, the role of transdiagnostic factors in clinical and non-clinical disorders, the importance of developing transdiagnostic treatments associated with chronic diseases along with a variety of pharmaceutical treatments, and considering the paucity of research in this context; the aim of present study was to compare the anxiety disorders symptoms and related transdiagnostic factors in individuals with type 2 diabetes and healthy individuals.

Materials and Methods

The present study was of basic research type adopting an ex-post facto (causal-comparative) design in terms of data collection method. This study was conducted following its approval by the Research Ethics Committee at Islamic Azad University of Neyshabur in Iran. To this end, the study sample included 63 individuals with type 2 diabetes and referred to clinics affiliated with Mashhad Diabetes Association in Iran in 2016 selected through convenient sampling method. The sample of healthy individuals also consisted of 63 normal people selected via convenient sampling method from patients' relatives as well as the staff of Parsian Clinic and Prophet Mohammed (PBUH) Clinic affiliated with Mashhad University of Medical Sciences. The groups were matched in demographic characteristics with together. The ethical considerations of this study included obtaining informed consent to participate in this research study, emphasizing confidentiality of data, and avoiding any damage or harm to the study participants. The inclusion criteria in this study were infliction with type 2 diabetes, informed consent to participate in the research study, and lack of physical disabilities including blindness. On the other hand, the exclusion criteria were type 1 diabetes infection, lack of informed consent to participate in the present study, and incomplete answers to the study questionnaires. Besides, the data of this study were analyzed through the SPSS version 22 software using descriptive statistics and one way analysis of variance (ANOVA). The significance level was 0.05.

Research instrument

A) Generalized Anxiety Disorder (GAD-7) Scale: It is a research instrument developed by Spitzer, Kroenke, Williams, and Lowe (27) for the diagnosis of GAD and assessment of the severity of clinical symptoms. It includes 7 items whose contents are scored on a four-degree scale from 0 (not at all) to 3 (nearly every day). The reliability coefficient of this scale measured via internal consistency and test-retest methods have been also reported 0.92 and 0.83, respectively. Compared with Beck Anxiety Inventory and the anxiety sub-scale of Brief Symptom Inventory, the convergent validity of this scale was similarly

equal to 0.72 and 0.74, respectively. In addition, it was reported that the GAD-7 Scale was endowed with acceptable construct, criterion, factorial, and procedural validity (27). Naeinian, Shaeiri, Sharifi, and Hadian (28) also reported the reliability of this scale calculated through test-retest and internal consistency methods equal to 0.85 and 0.48, respectively. The Cronbach's Alpha coefficient obtained for its first half was reported 0.81, such a value for the second half was 0.68, and the correlation between the two halves was equal to 0.65. Furthermore, the correlation coefficient between this scale and the state-trait section of the State-Trait Anxiety Inventory developed by Spielberger as well as the anxiety sub-scale of Brief Symptom Inventory was reported 0.71, 0.52, and 0.63; respectively. Furthermore, examining discriminant or differential validity of the given scale showed that this scale could distinguish individuals affected with GAD from the non-infected ones. In this study, the reliability of the test using the internal consistency method was equal to 0.90.

B) Social Phobia Inventory: It is a 17-item research instrument developed by Conner et al. (29). The given test is scored based on a five-point Likert-type scale ranging from 0 (not at all) to 4 (extremely) and it also consists of three sub-scales of fear (6 items), avoidance (7 items), and physiological arousal (4 items). The internal consistency of the given inventory for patients with social anxiety disorder and a control group has been also reported from 0.82 to 0.94 (29). The reliability of the given test in Iran calculated through internal consistency method was also reported 0.88, the Cronbach's alpha coefficient for the first and the second half of the questionnaire was also equal to 0.81 and 0.77, respectively. Moreover, the correlation coefficient between the two halves was 0.77 and its reliability coefficient using the Spearman Rank-Order Correlation test was reported equal to 0.87 (30). In this study, the reliability of the test calculated via internal consistency method was 0.93.

C) Severity Measure for Panic Disorder-Adult: It is a 10-item instrument scored based on a five-point Likert-type scale and ranged from 0 (never) to 4 (all of the time) (31). In this study, the reliability of the test measured through internal consistency method was equal to 0.87.

D) Cognitive Avoidance Questionnaire: It a 25-item questionnaire developed by Sexton and Dugas (32). The given questionnaire consists of five subscales or cognitive avoidance strategies including thought suppression, thought substitution, distraction, avoidance of threatening stimuli, and transformation of images into thoughts. This is a questionnaire scored based on a five-point Likert-type scale and in a range from 1 (not at all typical) to 5 (completely typical). The validity of the given questionnaire using internal consistency method (0.95) and test-retest method (r=0.85) was reported at a desirable level. Bassaknejad, Moini and Mehrabizadeh-Mehrabizade (33) also reported the reliability of the test using internal consistency method for the total score of cognitive avoidance, thought suppression, thought substitution, distraction, avoidance of threatening stimuli, and transformation of images to thoughts equal to 0.91, 0.90, 0.71, 0.89, 0.90, and 0.84; respectively. In this study, the reliability of the test using the internal consistency method was equal to 0.93.

E) Intolerance of Uncertainty Scale: It a 27-item research instrument used to assess emotional, cognitive, and behavioral reactions among individuals in uncertain situations. The contents of the given questionnaire are scored based on a five-degree scale from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The internal consistency of the given test has been also reported 0.91. In addition, it is significantly correlated with Penn State Worry Questionnaire (r=0.63) and the anxiety dimension of Four-Dimensional Symptom Questionnaire (r=0.57) (34). In this study, the reliability of the test calculated via internal consistency method was 0.92.

F) Metacognition Questionnaire: The given questionnaire is used to examine negative beliefs about worry (35). This questionnaire was designed to test the metacognitive theory of mental disorders especially the role of metacognitive beliefs in the pathology of emotional disorders. The given questionnaire consists of 30 items in which an individual shows their degree of agreement on a four-point Likert-type scale from 1 (do not agree) to 4 (agree very much). The questionnaire is also comprised of five subscales including cognitive confidence,

positive beliefs about worry, cognitive self-consciousness, negative beliefs about uncontrollability of thoughts and danger, and beliefs about need to control thoughts. The reliability of this test was calculated through internal consistency method for the subscales and its values ranged from 0.72 to 0.93. Examining the reliability via test-retest method for total scores after a period of 22 to 118 days was also reported to be 75%. In addition, the reliability of the given subscales was from 0.59 to 0.87 (35). In this respect, Shirinzadeh Dastgiri, Goodarzi, Rahimi and Naziri (36) found in their study that the internal consistency of the total score and its subscales ranged from 0.59 to 0.73. The reliability of this test and its subscales calculated through split-half method (from 0.69 to 0.90) and test-retest method (from 0.59 to 0.83) was also reported at a desirable level. Thus, the five-factor structure of the metacognitive questionnaire was confirmed. Finally, it was reported that the given questionnaire was endowed with a good concurrent and discriminant validity.

G) Cognitive Emotion Regulation Questionnaire: It is an 18-item research instrument developed by Garnefski and Kraaij (37) to measure cognitive emotion regulation strategies adopted in response to stressful and threatening life events. This questionnaire is scored on a five-point Likert-type scale ranged from 1 (almost never) to 5 (almost always). It also contains 9 sub-scales including self-blame, acceptance, rumination, positive refocusing, refocusing on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others. Garnefski and Kraaij also showed that these strategies could be divided into adaptive (i.e. positive reappraisal, refocus on planning, positive refocusing, and acceptance) and maladaptive (self-blame, blaming others, rumination, and catastrophizing) categories. The reliability of the test using internal consistency method for the sub-scale of self-blame was equal to 0.67 and it was reported from 0.73 to 0.81 for the rest of the subscales. Moreover, the questionnaire was endowed with acceptable validity (37). The internal consistency of the Persian version of the subscales of self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming gathers within this test were reported 0.78, 0.89, 0.83, 0.89, 0.91, 0.88, 0.85, 0.92, and 0.93; respectively. Examining the reliability of the sub-scales of the given questionnaire through the test-retest method for its subscales within two to four weeks was also equal to 0.70, 0.81, 0.74, 0.77, 0.83, 0.76, 0.78, 0.72, and 0.80; respectively. Furthermore, this questionnaire had desirable content, convergent, and discriminant validity (38).

H) Acceptance and Action Questionnaire-II: It was developed by Bond et al. (39) as a 7-item questionnaire. It is scored on a 7-point Likert-type scale in a range from 1 (never true) to 7 (always true). The given questionnaire evaluates acceptance, experiential avoidance, and psychological flexibility. The average reliability of the test calculated through internal consistency method (Cronbach's alpha) and test-retest method (within 3 to 12 months) was equal to 0.84 (from 0.85 to 0.88) and 0.81 and 0.79; respectively. Abasi et al. (40) also reported the reliability of the test through internal consistency and split-half methods among university students residing in Tehran and people affected depression and GAD from 0.71 to 0.89. They also showed that the given questionnaire was endowed with desirable discriminant validity. In this study, the reliability of the test measured through internal consistency method was equal to 0.70.

Results

The mean ages of individuals suffering from type 2 diabetes and healthy people were 50.16±12.58 and 46.42±10.82 years, respectively. In addition, the results of the independent samples t-test showed no significant difference between the mean age of both groups (P>0.05, df=124, t=1.85). Moreover; 2, 59 and 2 people affected with type 2 diabetes as well as 7, 53 and 3 healthy individuals were single, married, and divorced; respectively. In terms of education status; 17, 25, 10, 7, 2 and 2 individuals with type 2 diabetes and 9, 19, 10, 14, 6 and 5 healthy people had secondary high school education, diploma, associate's degree, bachelor's degree, master's degree, and PhD; respectively. Considering the employment status; 16, 15 and 32 participants with type 2 diabetes and 24, 18 and 21 healthy individuals were employed, unemployed, and retired; respectively. Finally, the social class of 6,

21, 28, 5, 3 individuals with type 2 diabetes and 3, 11, 32, 14 and 3 healthy people were at low, moderate-low, moderate, moderate-high, and high levels; respectively. The results of the Chi-square test also revealed no significant difference between both study groups in terms of marital status (χ^2=3.30, *P*>0.05), employment status (χ^2=4.16, *P*>0.05), social class (χ^2=8.65, *P*>0.05), and level of education (χ^2=8.89, *P*>0.05). Accordingly, Table 1 illustrated the descriptive results (mean and standard deviation) of the study variables. To examine the normal distribution of data and homogeneity of variance, Shapiro-Wilk test and Leven's test were similarly used. In this respect, the results of the Shapiro-Wilk test were not significant for any of the study variables (*P*=0.001). Therefore, it was concluded that the study variables were normally distributed. The Levene's test results also indicated that the variance of all the study variables between the two study groups were not significantly different (*P*>0.05); thus, the assumption of homogeneity of variance was accepted. To address the hypothesis of this study, an ANOVA was conducted (Table 2).

Variables	Group				Variables	Group			
	Type 2 diabetes		Healthy			Type 2 diabetes		Healthy	
	Mean	SD	Mean	SD		Mean	SD	Mean	SD
GAD symptoms	9.65	5.59	6.28	5.49	3. Unexpected events are negative and should be avoided	15.17	3.77	12.91	3.85
Social anxiety disorder symptoms	14.68	12.29	14.16	11.74	4. Being uncertain about the future is unfair	10.14	3.05	8.74	3.30
1. Fear	4.31	4.77	4.27	4.46	Negative beliefs about worry	14.65	3.31	12.51	3.85
2. Avoidance	7.06	6.05	6.65	5.31	Experiential avoidance	19.24	7.70	17.61	8.12
3. Physiological arousal	3.82	3.71	3.23	3.10	Adaptive cognitive emotion regulation	35.59	6.98	33.41	7.13
Panic symptoms	10.24	7.05	7.4	7.36	Maladaptive cognitive emotion regulation	22.51	6.69	19.62	6.88
Cognitive avoidance	77.70	20.07	63.91	20.89	1. Self-blame	4.60	2.51	4.54	2.16
1. Thought suppression	13.71	4.33	11.09	4.44	2. Acceptance	6.76	2.16	6.44	2.29
2. Thought substitution	13.49	4.97	11.39	4.90	3. Rumination	7.13	2.07	5.81	2.32
3. Distraction	17.11	5.72	13.45	5.04	4. Positive refocusing	6.48	2.45	5.72	2.13
4. Avoiding of threatening stimuli	16.54	5.52	12.65	5.19	5. Positive refocus on planning	7.41	1.98	7.35	1.98
5. Transformation of images into thoughts	16.84	4.29	15.33	4.80	6. Positive reappraisal	7.54	2.21	7.20	2.08
Intolerance of uncertainty	74.76	19.53	64.13	20.71	7. Putting into perspective	1.41	1.68	1.14	1.43
1. Uncertainty leads to the inability to act	24.43	7.46	20.55	7.41	8. Catastrophizing	5.43	2.63	4.65	2.01
2. Uncertainty is stressful and upsetting	25	8.30	21.93	8.46	9. Blaming others	5.35	2.64	4.62	2.29

Table 2. Results of ANOVA associated with the severity of anxiety disorder symptoms and related transdiagnostic factors

Change sources	Sum of squares	DF	F	Significance level	Change sources	Sum of squares	DF	F	Significance level
GAD symptoms	410.54	1	13.39	0.0001	3. Unexpected events are negative and should be avoided	186.23	1	12.77	0.0001
Social anxiety disorder symptoms	9.70	1	0.06	0.79	4. Being uncertain about the future is unfair	71.09	1	6.95	0.009
1. Fear	0.08	1	0.004	0.95	Negative beliefs about worry	186.23	1	12.77	0.0001
2. Avoidance	5.65	1	0.17	0.68	Experiential avoidance	95.70	1	1.51	0.22
3. Physiological arousal	12.59	1	1.10	0.30	Adaptive cognitive emotion regulation	301.03	1	6.49	0.01
Panic symptoms	371.15	1	7.09	0.009	Maladaptive cognitive emotion regulation	171.25	1	3.42	0.06
Cognitive avoidance	548.25	1	19.25	0.0001	1. Self-blame	0.14	1	0.03	0.87
1. Thought suppression	248.40	1	12.85	0.0001	2. Acceptance	3.86	1	0.77	0.38
2. Thought substitution	160.15	1	6.57	0.01	3. Rumination	62.59	1	12.69	0.0001
3. Distraction	485.76	1	17.02	0.0001	4. Positive refocusing	20.82	1	4.02	0.04
4. Avoiding of threatening stimuli	548.26	1	19.26	0.0001	5. Positive refocus on planning	0.13	1	0.03	0.85
5. Transformation of images into thoughts	72.70	1	3.91	0.05	6. Positive reappraisal	4.17	1	0.91	0.34
Intolerance of uncertainty	71.08	1	6.95	0.009	7. Putting into perspective	2.67	1	1.12	0.29
1. Uncertainty leads to the inability to act	543.48	1	9.82	0.002	8. Catastrophizing	22.10	1	4.17	0.04
2. Uncertainty is stressful and upsetting	314.15	1	4.83	0.03	9. Blaming others	19.05	1	3.18	0.08

According to the results in Table 2, there was a significant difference between people with diabetes and healthy individuals in terms of symptoms of GAD and panic (P<0.05). However, no difference was observed between both groups considering the symptoms of social anxiety disorder and its components (P>0.05). In addition, the findings revealed a significant difference between individuals with diabetes and healthy ones in terms of transdiagnostic factors of cognitive avoidance, intolerance of uncertainty, negative beliefs about worry, and maladaptive cognitive emotion regulation strategies (P<0.05). Nevertheless, there was no significant difference between both groups in terms of the transdiagnostic factors of experiential avoidance (P>0.05). According to the results obtained, it was argued that there was a significant difference between individuals with diabetes and healthy people in terms of the severity of the symptoms of anxiety disorders and related transdiagnostic factors.

Discussion

The purpose of the present study was to compare the anxiety disorders symptoms and related transdiagnostic factors in individuals with type 2 diabetes and healthy individuals. In this regard, the results showed that individuals with type 2 diabetes could experience symptoms of the anxiety disorder more severely. In other words, the results demonstrated a significant difference between individuals with type 2 diabetes and healthy ones in terms of the severity of symptoms of GAD and panic; thus, those with type 2 diabetes could undergo the symptoms of GAD

more severely. However, no difference was observed between both groups in terms of the symptoms of social anxiety disorder. The findings of the previous studies also suggested that GAD and panic disorder were among the most important anxiety disorders associated with medical diseases and conditions (7). Therefore, the results of the present study were consistent with the findings of several investigations in the related literature (7,10-12,41,42) which showed that patients with type 2 diabetes could experience the symptoms of the anxiety disorder including GAD and panic more severely. In contrast, the findings of the present study were not in line with the results of some other previous investigations (12,42,43) showing no significant difference between individuals with type 2 diabetes and normal ones in terms of the symptoms of social anxiety disorder including fear, avoidance, and physiological symptoms.

Given the results, it was assumed that diabetes is a stressful emotional event which brings about physical and psychological changes or consequences which interfere with the individual functions, causes sustained anxiety, and raises the symptoms of anxiety disorders including GAD and panic in the infected individuals. Moreover, factors such as complications originating from diseases including eye diseases and disorders, skin problems, kidney diseases, brain problems, and cardiovascular diseases; as well as history of repeated insulin injection, hospitalization, amputation in some cases, loss of physical functioning, changes in relationships between individuals and their family and friends, variations in social roles along with disrupted social functions, lack of familial and social supports, inability to concentrate, disturbed sleep, and intrusive thoughts about the future, disease recurrence (relapse), and death can have their impacts on experiences associated with the symptoms of anxiety disorders. Diabetic patients especially those with type 2 diabetes have also difficulty in terms of coping with stress. No difference between people with diabetes and normal individuals considering the symptoms of social anxiety disorder (fear, avoidance, and physiological symptoms) also reflected that although individuals suffering from type 2 diabetes are influenced by the complications and consequences of their own diseases, they have no fear of establishing relationships with others and their evaluations given the high prevalence of such a disease. Furthermore, the results of the present study showed that individuals with type 2 diabetes could undergo transdiagnostic factors i.e. cognitive avoidance, negative beliefs about worry, intolerance of uncertainty, and maladaptive cognitive emotion regulation strategies more severely. However, no difference was found among these individuals in terms of their experience with transdiagnostic factors of experiential avoidance. Even though the review of the related literature did not reduce to a comprehensive study examining transdiagnostic factors associated with anxiety disorders in diabetic individuals, the results of the present study were consistent with the findings of some investigations (24-26) in this respect. Based on the given results, it was concluded that transdiagnostic factors could lead to further exacerbation and maintenance of diseases and also bring about psychological problems including anxiety disorders through different processes. In this regard, cognitive avoidance can help people to evade the threatening cognitive and emotional contents of their diseases via their worry (17). Therefore, people with type 2 diabetes are likely to make use of different strategies including worry to avoid this cognitive and emotional contents associated with their diseases. Such avoidance can also paradoxically lead to increased symptoms of the disease and consequently cause anxiety disorders. Negative beliefs about worry can also involve beliefs in which worry is considered out of control and it is damaging and dangerous both for the body and soul and for physical, psychological, or psychosocial functioning (19). Individuals with type 2 diabetes are thereby directed towards a flawed sustained cycle and inflexible processing of negative thoughts and emotions about their diseases due to these negative beliefs about worry; a factor that ultimately increases the sense of threat and anxiety symptoms and thus aggravates and maintenance their diseases.

Intolerance of uncertainty is also a cognitive bias that can have effects on perception, interpretation, and response to ambiguous situations in cognitive, emotional, and behavioral levels (17). Therefore, it was concluded that diabetes and its complications and consequences

as stressors can cause a sense of uncertainty in individuals with this disease. Accordingly, individuals with type 2 diabetes describe uncertain situations as tension-provoking, negative, upsetting and stressful ones and make attempt to avoid such situations because they cannot tolerate uncertainty. Moreover; these individuals may suffer from impaired functioning if they are placed in such situations due to increased bias in terms of information processing, faulty assessments, and thereby increased worry associated with intolerance of uncertainty. Cognitive emotion regulation strategies are also be defined as the conscious, cognitive, mental strategies individuals use to cope with the intake of emotionally arousing information (22,37). The greater use of maladaptive cognitive emotion regulation strategies by individuals affected with type 2 diabetes such as rumination (thinking about the feelings and thoughts associated with the negative event or emotional experience) and catastrophizing (thoughts of explicitly emphasizing the terror of an experience) show their significant deficits in terms of experience and regulation of emotions; a factor that brings about anxiety and worry and also leads to exacerbation and maintenance of their existing diseases. Despite the fact that no difference was found between individuals with diabetes and healthy ones in terms of experiential avoidance, the evidence suggested that both people with diabetes and healthy individuals make attempts to avoid from the experience of inner threatening or negative experiences actively and automatically although the subjects or contents of such inner experiences can be different. It should be also noted that some of the limitations of this study were related to its generalizability. The main limitations of this study included small sample size, its design as a cross-sectional research type, lack of random sampling, and the use of self-report instruments to examine the given variables. Since this study was conducted on a group of individuals suffering from type 2 diabetes, its generalizability and implications for other populations must be handled with care. Thus, conducting further studies with a larger sample size as well as longitudinal research studies are of utmost importance in this respect. Ultimately, it was suggested to review and investigate the effects of transdiagnostic therapies along with the use of theraputic medications on individuals with type 2 diabetes.

Conclusion

Individuals suffering from type 2 diabetes can experience the symptoms of anxiety disorders especially GAD and panic more severely. They also undergo transdiagnostic factors including cognitive avoidance, intolerance of uncertainty, negative beliefs about worry, and cognitive emotion regulation strategies in a severe manner. Thus, the results of this study indicated the importance of transdiagnostic factors as well as the development of transdiagnostic psychotherapy programs along with theraputic treatments for people with diabetes and also the examination of their effectiveness.

Acknowledgement

This study was derived from a Master's Thesis fulfilled by Ms. Vajihe Zardoshtian following its approval by the Research Ethics Committee at Islamic Azad University of Neyshabur. This study was conducted without any financial supports granted by a particular organization and there was no conflict of interest among authors. We hereby express our gratitude to Mashhad Diabetes Association, Parsian Clinic, Prophet Mohammad (PBUH) Specialized Clinic, and all the participants in this study for their cooperation.

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