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The role of anxiety and depression on acceptance and action, considering emotional schemas in diabetics of Birjand (Iran)

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Abstract

Background: Diabetes is one of the most common noncommunicable diseases around the world that accompanies assorted psychiatric disorders including anxiety and depression due to being chronic.
Objective: The aim of this study was to evaluate the effect of anxiety and depression on acceptance and action, considering emotional schemas of diabetics referring to diabetes clinics of health centers in Birjand, Iran.
Methods: This study was conducted in 2016 and was a correlational study with a structural equation modeling approach. The statistical population of this study were all men and women with type 2 diabetes in Birjand, with an active health record in health centers of this county. To collect data, Depression, Anxiety, and Stress Scale (DASS-21), Acceptance and Action Questionnaire-II (AAQ-II) and Leahy Emotional Schema Scale (LESS) were employed. Using SPSS19 and LISREL, data were analyzed via multiple regression and modeling at $p \leq 0.05$.
Results: In general, 350 subjects entered the study, most of whom were between 50 and 60 years of age and of whom, (47.7%) were women. Results show that depression has had a negative contribution in predicting quality of life ($p=0.0001$). In addition, results demonstrated the negative relation of anxiety and depression in predicting no emotional avoidance (flexibility) ($p=0.0001$). Anxiety and rumination had a positive effect and emotional unawareness had a negative effect on predicting no emotional avoidance ($p=0.0001$).
Conclusion: Results of this study showed that by reducing adaptive emotional schemas, emotions reduce psychological flexibility and increase emotional avoidance. In addition, by increasing non-adaptive emotional schemas, it increases no flexibility and emotional avoidance that finally reduces quality of life as well as acceptance and action.

Keywords: Diabetes Mellitus; Depressive Disorder; Anxiety Disorders

1. Introduction

Diabetes is a silent epidemic all over the world, including Iran, and imposes direct costs from 2.5 to 15 percent on the health budget, and direct costs several times of what is reported in statistics (1). Researchers have shown that psychological (i.e. mental issues), social (including social support), and biological (physical health status) issues interact with each other, and all these domains together determine the health status (2). In psychology, depression, anxiety and stress in life, reduce health. In the social domain, the amount of social support reduces or promotes health. On the other hand, social and psychological factors affect biological factors (3). Therefore, depression affects physical health in a way that in people with diabetes, depression leads to exacerbation of their disease and results in less self-care and low adherence to treatment and medication (4). On the other hand, stress plays a major role in physical diseases, and in most diabetics, it disturbs blood sugar control (5). Emotional schemas are those schemes, methods and strategies used by an individual in responding to emotions and in cases of attempting to avoid unpleasant thoughts and emotions (anxiety and depression) these thoughts and emotions will be experienced more

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frequently and severely as rumination (6, 7). In previous studies, based on the concept of emotional processing and inspired by the meta-cognitive model of emotions, the model of emotional schemas in diabetics was presented (8, 9). Considering that diabetes accompanies anxiety, depression and negative emotions, identifying emotional features, attitudes, basic schemas, acceptance and action patterns and the role of anxiety and depression in these patterns, are important in addition to strategies used by these people for emotion regulation (10, 11). Considering few studies or lack of studies conducted on some subjects including the relation of anxiety and depression with acceptance and action patterns, the role of emotional schemas on people's ability to control anxiety along with similar studies, this study was conducted to investigate the role of anxiety and depression in acceptance and action considering emotional schemas of diabetic patients. The major objectives of this study are: 1) to determine the relation of anxiety and depression with acceptance and action; 2) to determine the relation of anxiety, depression, and emotional schemas with acceptance and action; 3) to determine fitting of the presented conceptual model with data obtained in this study; 4) to determine the mediating role of emotional schemas in relation to emotions, acceptance and action; and 5) to determine the levels of anxiety and depression of diabetic patients referring diabetes clinics of health centers in Birjand.

2. Material and Methods

2.1. Type of Study and Population Under Study

This study was a correlational research. Statistical population were all men and women with type 2 diabetes in Birjand. Based on the statistics from health centers in Birjand, sample size was considered to be 3,000 subjects. Of them, 600 patients had active records in health centers with regular referring. Therefore, 600 diabetic patients referring to diabetes clinics in health centers of Birjand were selected as an accessible statistical population with inclusion and exclusion criteria who referred diabetes clinics in health centers of Birjand in 2016.

2.2. Inclusion and Exclusion Criteria

Inclusion criteria in this study were as follows: having type 2 diabetes, having at least elementary education, speaking Persian, at least one year of suffering from diabetes, and being between 20 and 80 years of age. Exclusion criteria were: being over 80 years, having a concurrent disorder, not consenting to attend this study, being illiterate, having a disorder of consciousness and having no active record or regular referring.

2.3. Sampling Method and Determining Sample Size

Sampling was conducted using accessible multi-stage sampling method, such that center number four, was randomly selected among seven health centers in Birjand. Sample size in this study was selected to be 350 subjects using Krejcie & Morgan sample size table and considering the risk of loss. It is worth mentioning that about 200 subjects were selected from health center number 4 and 150 patients were diabetic patients referring to the Central Laboratory of Imam Reza Hospital with discrete records in other health centers.

2.4. Data Collection Method and Employed Questionnaires

In this study, data were collected using field method and LESS questionnaire as well as AAQ-II along with DASS-21 scale.

2.4.1. LESS (Leahy Emotional Schema Scale)

LESS scale includes 50 items that are scored using 5-point Likert scale. Eventually, the number of items were reduced to 33 and 16 schemas were reduced to 13 based on the culture of Iranian society. These 13 schemas are: being controllable (3 items), try to be logical (4 items), emotional self-awareness (4 items), being perceivable (3 items), rumination (4 items), agreement (2 items), emotional acceptance (3 items), approval seeking (2 items), premier values (3 items), emotional simplification (2 items), sin (3 items), emotional expression (2 items), and blame (2 items). This questionnaire was scored using a 5-point Likert scale, where scores are as follows: completely disagree=0, somewhat disagree=1, neither agree nor disagree=2, somewhat agree= 3, and completely agree= 4. Results from evaluating the reliability of this scale showed that reliability of this scale using test-retest method within two weeks has been obtained 0.78 for the total scale and within a range of 0.56 to 0.71 for subscales. In addition, internal consistency of the scale was 0.82 using Cronbach's alpha for the whole scale and in a range of 0.59 to 0.73 for subscales (12).

2.4.2. Acceptance and Action Questionnaire

AAQ-II measures the structure that refers to variety, acceptance, experimental avoidance and psychological flexibility (13). This questionnaire is based on a Likert scale that is scored from completely disagree=1 to completely agree=5. Psychometric properties of the original version are as follows: Mean alpha was 0.84, reliability of retest during 3 and 12 months was respectively 0.81 and 0.79, and Cronbach's alpha was 0.86 (14).

2.4.3. *Depression, Anxiety, and Stress Scales*

DASS-21 is composed of three scales of self-report to assess negative emotional states in depression, anxiety and stress. This scale is used to measure the severity of major symptoms of depression, anxiety and stress. To fill this questionnaire, the subject should specify the status of a symptom within the last week. Each DASS-21 subscale includes seven questions, the final score of which, is obtained via the total score of questions related to them. Each question is scored from zero (it is not true about me) to three (it is true about me). Since DASS-21 is the contracted form of the main scale (42 items), the final score of each one of these subscales should be doubled and then referring to the table of severity of subscales, the severity of symptoms could be determined (15). Alpha coefficient of tense factors, depression and anxiety were 0.97, 0.92 and 0.95 respectively (16) (17). Validity and reliability of this questionnaire in Iran were investigated where test-retest reliability for depression, anxiety and stress were respectively 0.80, 0.76 and 0.77 and Cronbach's alpha for depression, anxiety and stress scale were reported to be 0.81, 0.74 and 0.78 respectively (16).

2.5. Data Analysis

Using SPSS19 and LISREL, data were analyzed via multiple regression and modeling at $p \leqslant 0.05$.

2.6. Ethical Considerations

The Ethics Committee of Islamic Azad University of Birjand approved the study protocol in 2016, with the grant number of 1565, and written informed consent was obtained from all participants. All demographic data of patients were kept confidential and were only used according to the objectives of the present study. Any future use was subject to renewed permission.

3. Results

3.1. Demographic Data

In terms of age distribution, most patients were between 50 and 60 years of age (132 subjects, 38.9%). Of 350 samples participating this study, 47.7% of respondents were female (Table 1).

Table 1. Demographic data of patients under study

Variable	Status	Absolute frequency	Percent of frequency
Gender	Female	167	47.7
	Male	183	52.3
Marital status	Single	12	3.4
	Married	338	96.6
Education	Under diploma	231	66
	Diploma	50	14.3
	Associate diploma	18	5.1
	Bachelor's	47	13.4
	Master's	2	0.6
	Not answered	2	0.6
Age (year)	20-30	13	3.8
	30-40	47	13.9
	40-50	79	23.3
	50-60	132	38.9
	60-80	68	20.1
	Not answered	11	
HbA1C (%)	<7	47	13.4
	7-10	145	41.5
	10-13	119	34
	13-16	39	11.1
Duration of disease (years)	<5	84	24
	5-10	165	47.1
	10-15	60	17.2
	15-20	28	8
	>20	13	3.7

3.2. Statistical Description of Acceptance and Action, Anxiety and Depression and Emotional Schemas in Patients Under Study

Mean of No Experiential Avoidance in diabetic patients was obtained as 3.12±0.58 from five possible scores. Among components of emotional schemas, component of try to be logical and being perceivable obtained the highest and lowest mean scores respectively (Table 2).

3.3. The Role of Depression and Anxiety in Predicting Quality of Life and No Experiential Avoidance

Coefficients of a predictive model of quality of life, based on independent variables of depression and anxiety showed that at confidence interval of 95%, depression predicts the dependent variable of quality of life. Finally, linear regression equation was presented as $Y=3.53-0.30x_1$, such that depression had a negative contribution in predicting quality of life (depression (x_1) and quality of life (y)) (Table 3). When investigating coefficients of predictive model of No Experiential Avoidance based on independent variables of depression and anxiety, results show that at confidence interval of 95% with significance level of less than 0.05, the regression model of $Y=3.56-0.20x_1-0.17x_2$ [anxiety (x_1), depression (x_2) No Experiential Avoidance (y)] shows the negative relation of anxiety and depression in predicting No Emotional Avoidance (flexibility) (Table 4).

3.4. The Role of Depression, Anxiety and Emotional Schemas in Predicting Acceptance and Action

The model of predicting No Emotional Avoidance (flexibility) based on anxiety, depression and emotional schemas, showed that anxiety and rumination have a positive effect and emotional unawareness has a negative effect on predicting No Emotional Avoidance (Table 5).

Table 2. Descriptive indices of acceptance and action, anxiety and depression, and emotional schemas

Components		Number	Mean±SD	Interval
Acceptance and action	No experiential avoidance	350	3.12±0.58	1.29-4.71
	Quality of life	350	3.25±0.70	1-5
Anxiety and disorder	Anxiety	350	1.79±0.40	1-3
	Depression	350	1.65±0.44	3-1
Emotional schemas	Being controllable	350	3.23±0.64	1.33-5
	Try to be logical	350	3.53±0.56	1.5-5
	Emotional unawareness	350	3.13±0.56	1-5
	Being perceivable	350	2.74±0.67	1-5
	Rumination	350	3.33±0.62	5-1.25
	Agreement	350	2.78±0.89	1-5
	Accepting emotions	350	3.52±0.65	1-5
	Approval seeking	350	3.21±0.65	1-5
	Premier values	350	3.27±0.58	1.67-5
	Emotional simplification	350	3.37±0.67	1-5
	Embarrassment and guilt	350	3.09±0.55	1.33-5
	No emotional expression	350	3.33±0.73	1.5-5
	Blame	350	3.30±0.73	1-5

Table 3. Coefficients of predictive model of quality of life based on independent variables of depression and anxiety

Model	Non-standard coefficients		Standard coefficients	T	Significance level
	B	Standard deviation	B		
Constant	3.53	0.09	-	37.77	0.000*
Depression	-0.30	0.05	-0.28	-5.51	0.000*

* It was significant at $p\leq0.05$.

Table 4. Coefficients of predictive model of no experiential avoidance based on independent variables of depression and anxiety

Model	Non-standard coefficients		Standard coefficients	T	Significance level
	B	Standard deviation	B		
Constant	3.56	0.14	-	25.18	0.000*
Anxiety	-0.20	0.09	-0.14	-2.18	0.03*
Depression	-0.17	0.08	-0.13	-2.05	0.04*

* It was significant at $p\leq0.05$.

Table 5. Coefficients of predictive model of no emotional avoidance (flexibility) based on variables of depression, anxiety and emotional schemas

Model	Non-standard coefficients		Standard coefficients	T	Significance level
	B	Standard deviation	β		
Constant	2.42	0.22	-	16.26	0.000*
Anxiety	0.31	0.09	0.23	3.82	0.000*
Rumination	0.16	0.04	0.16	3.14	0.002*
Emotional unawareness	-0.13	050	-0.13	-3.14	0.002*

* It was significant at p≤0.05.

3.5. The Role of Depression, Anxiety and Emotional Schemas in Predicting Quality of Life

The regression model shown in Table 6 is for being logical, emotional unawareness, approval seeking, depression and quality of life such that variables of trying to be logical and approval seeking have a positive contribution in predicting quality of life and emotional unawareness, and depression have a negative contribution in predicting quality of life. Therefore, hypothesis of the study was accepted (Table 6).

3.6. Fitting of Conceptual Model with Data

In this study, Root Mean Square Error of Approximation (RMSEA)=0.054, X^2=2, and Goodness of Fit Index (GFI)=0.9, Comparative Fit Index (CFI)=0.9 and Normed Fit Index (NFI)=0.9. Emotions path toward adaptive emotional schemas was significant (β=0.28, P=0.06), and the path of adaptive emotional schemas (premier values, approval seeking, being blameless, control and try to be logical) toward no acceptance was significant too (β=-0.3, P=0.05). Negative emotions result in increased no acceptance and action (β=0.49, P<0.06) via increasing non-adaptive emotional schemas (shame, emotional unawareness, no emotional expression, emotional simplification, and rumination) (β=0.42, P=0.05) (Figure 1).

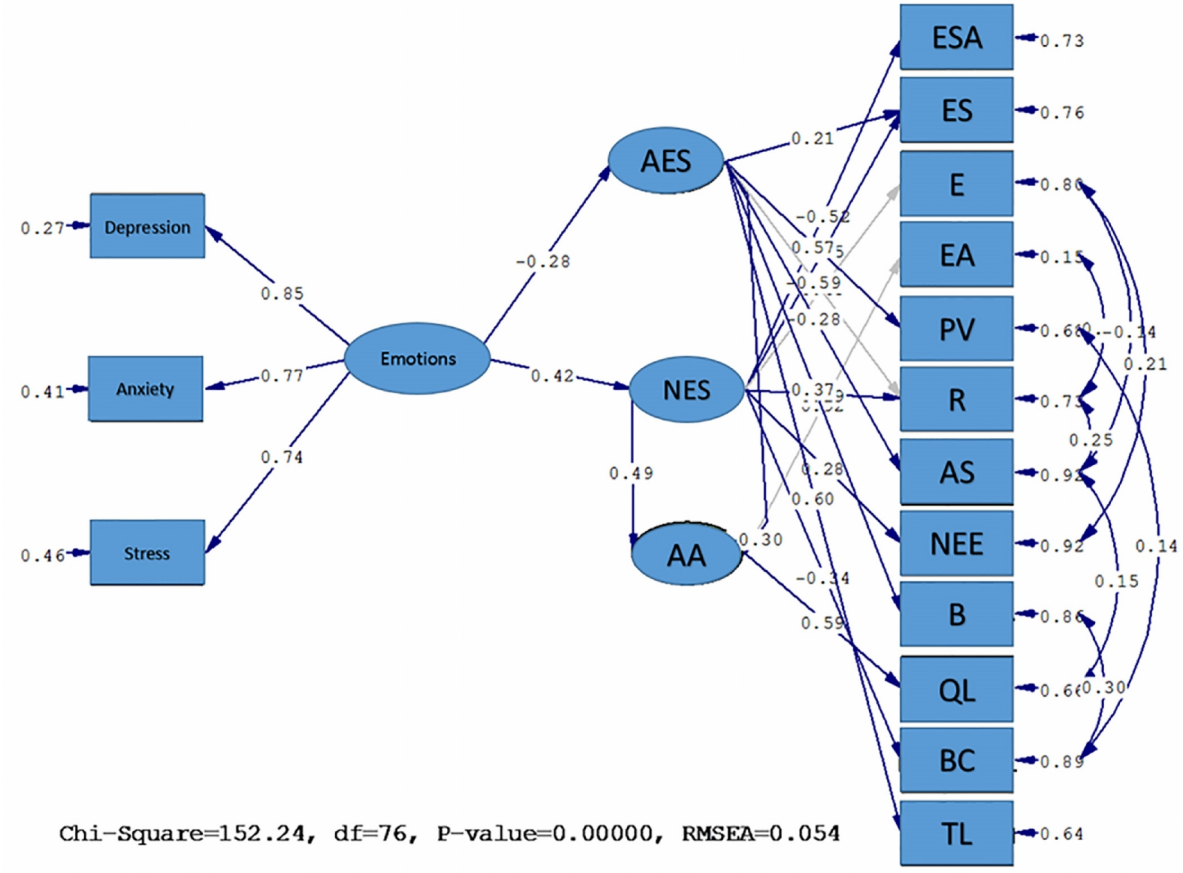

Figure 1. Standardized path coefficients. AA: acceptance and action, AES: adaptive emotional schemas, AS: approval seeking, B: blameless, BC: being logical, E: embarrassment, EA: emotional avoidance, ES: emotional simplification, ESA: emotional self-awareness, NEE: no emotional expression, NES: non-adaptive emotional schemas, PV: premier values, R: rumination, TL: try to be logical, TL: tendency to be logical, QL: quality of life

Table 6. Coefficients of predictive model of quality of life based on variables of depression, anxiety and emotional schemas

Model	Non-standard coefficients		Standard coefficients	T	Significance level
	B	Standard deviation	β		
Constant	2.55	0.26	-	9.81	0.000*
Try to be logical	0.17	0.04	0.21	3.91	0.000*
Emotional unawareness	-0.12	0.04	-0.14	-2.60	0.010*
Approval seeking	0.07	0.03	0.15	2.77	0.006*
Depression	-0.12	0.05	-0.12	2.28	0.023*

* It was significant at p≤0.05.

3.7. Level of Anxiety and Depression in Diabetic Patients Referring to Diabetes Clinics of Health Centers in Birjand in 2016

Level of anxiety and depression in patients was lower than average, i.e. at intended level (respectively mean=1.79, p=0.04 and t=-9.58 with CI=95% and mean=1.65, p=0.03 and t=-14.79 with CI=95%) (Refer to Table 7).

Table 7. Level of anxiety and depression in diabetic patients using one-sample t-test

Variable	Mean	Standard deviation	Degree of freedom	T	Significance level
Anxiety	1.79	0.40	349	-9.58	0.000*
Depression	1.65	0.44	349	-14.79	0.000*

* It was significant at p≤0.05.

4. Discussion

The aim of this study was to determine the role of anxiety and depression on acceptance and action, considering emotional schemas of diabetics referring to diabetes clinics of health centers in Birjand. Results show that components of try to be logical, no emotional self-awareness, approval seeking, and depression play a significant role in predicting quality of life. In the study by Mirzaee et al., it was shown that in being perceivable schema, of patients with social anxiety disorder and Obsessive-Compulsive Disorder (OCD) compared to normal group, emotions are interpreted such that their anxiety increases. Bayazi et al. showed that there is a positive significant relation between logical emotional schemas and problem-oriented coping strategy, and there is a negative significant relation between blame emotional schema and problem-oriented coping strategy. Premier values are the reverse predictor of emotion-oriented coping style, being logical was the reverse predictor of avoidance-oriented coping style, rumination was the predictor of anxiety and numbness was the predictor of depression. In this study, results showed that adaptive emotional schemas increase acceptance and action via reducing anxiety and depression and non-adaptive schemas predict reduced acceptance and action via increasing anxiety and depression. In another study, results showed that emotional schema therapy has been effective in reducing no acceptance emotional responses, difficulty in doing purposeful behaviors and weakness in strategies of emotional regulation in post-test and follow-up stages. While, this impact on no emotional transparency in post-test and difficulty in impulse control were verified at follow-up stage (20). In communication skills, members of the case group showed a significant increase in emotional management in post-test stage relative to the control group. In addition, emotional schema therapy will result in reduced simplification emotional schema and increased acceptance of emotions at post-test and follow-up stages. This impact on reducing sense of guilt, increasing the universality of emotions in post-test stage and increasing emotional perception at follow-up stage, verified that findings are somehow in line with the results of the present study (20). In another study, it was specified that dispositional mindfulness has a significant correlation with psychological flexibility. All fourteen dimensions of emotional schemas had a high correlation with psychological flexibility and dispositional mindfulness (6). In addition, results of this study showed that emotional self-awareness and positive (adaptive) emotional schemas increased psychological flexibility by reducing negative emotions. In another study, Leahy et al. showed that a model composed of some factors of LESS, i.e. rumination and low emotional acceptance, along with dispositional mindfulness have been the cause of most changes occurring in psychological flexibility. Rumination has been at the first stage of the model. Then, there was low emotional acceptance and finally dispositional mindfulness (6). Therefore, emotional schemas play a major role in predicting acceptance and action, and this complied with results of the present study on the effective role of positive and negative emotional schemas on increasing and decreasing acceptance and quality of life respectively. Noorbakhsh Amiri et al. demonstrated that Initial non-adaptive schemas have a negative and significant relation with quality of life. While flexibility has positive and important effects on quality of life. Turning to the results of this study, non-

adaptive schemas and flexibility have a determining role in diabetics' quality of life (21). Therefore, they showed that since flexibility has a significant positive correlation with quality of life and negative schemas reduce flexibility, they would subsequently reduce the quality of life that, to some extent, complies with results of the present study on the role of emotional schemas in predicting acceptance and action. In the results of this study, the fitted model showed that emotional schemas are the major mediators of diabetics' behavior such that emotions will result in increase in no acceptance (no flexibility) via reducing adaptive emotional schemes. In addition, results showed that emotions would not directly prevent flexibility and emotional avoidance; rather, they increase emotional avoidance and no flexibility by weakening adaptive schemas and strengthening non-adaptive ones. As Leahy stated, emotions will not accompany flexibility by themselves (no emotional avoidance); rather, depending on emotional processing and analyzing negative emotions in a positive way, they will result in flexibility (approval seeking, try to be logical, control). However, patients with negative emotional experiences and negative emotional schemas, who process their negative emotions using embarrassment and sense of guilt, reduce flexibility (no emotional avoidance) and make conditions of life control difficult for themselves.

Studies are conducted in this regard, that can represent the mediating role of emotional schemas in relation to emotions (anxiety and depression), acceptance and action. In the study by Bagheri Nejad et al., hierarchical regression analysis showed that after controlling the effects of age, gender and amount of anxiety, rumination significantly predicts 30% of changes in variance of depression. Despite cultural and social differences, previous findings on the relation of rumination and depression were also verified in the Iranian sample (22). Therefore, they showed that rumination, which is a non-adaptive schema, increases depression. Since, in this study, it was shown that depression reduces psychological flexibility, it can be inferred that negative emotions (anxiety and depression) can reduce flexibility, acceptance and commitment with non-adaptive schemas as mediators. In another study, Callot showed that emotional misbehavior committed by parents and parents' counterparts, alone or when interacting with mood, predicts the tensity of initial non-adaptive schemas. In addition, initial non-adaptive schemas in fact, predict an increase in the symptoms of social depression and anxiety in adults (23). Therefore, it can be inferred that due to the mediating role of initial non-adaptive schemas, emotions increase anxiety and depression, and this complies with the results of the present study. Bamlis et al. showed that patients who were under schema therapy showed less anxiety and depression disorder and in later follow-ups, they reported better social and public performance (24). In line with results of the present study, it can be inferred that schema therapy will result in better performance of subjects by reducing anxiety and depression. As the results of this study showed, emotional schemas play the mediating role in relation with emotions and quality of life.

5. Conclusions

Results of this study showed that by reducing adaptive emotional schemas, emotions reduce psychological flexibility and increase emotional avoidance. In addition, by increasing non-adaptive emotional schemas, they increase no flexibility and emotional avoidance that finally reduce quality of life as well as acceptance and action. Limitations of the present study were, the study being cross-sectional and using self-report tools where there is the possibility of error and incorrect and inaccurate and incomplete information. Considering the importance of the effect of anxiety and depression in quality of life and no emotional avoidance, it is recommended to hold training classes for anxiety and stress management and therefore to reduce emotional avoidance and increase the quality of life.

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Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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