Original Article

Predicting Mental Well-being Based on Personality Dimensions and Emotional Intelligence Mediated Treatment Adherence in Diabetic Patients

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Abstract

Introduction: One of the biggest challenges of the 21st century for health systems around the world is the increasing burden of chronic diseases such as diabetes. Accordingly, the aim of the present study was to predict mental well-being based on personality dimensions and emotional intelligence mediated by adherence to treatment in diabetic patients.

Method: This research is a descriptive-correlational type, which has been analyzed using multivariate regression method. The statistical population of this study included all diabetic patients aged 30 to 60 years, who in the third quarter of the year 2019 referred to the office of endocrinologists, kidney and internal medicine specialist in 5 areas (north-south-center-east-west) of Tehran. Out of 714 people who referred to these centers, 267 people were selected as the sample by targeted sampling method and answered the Reef psychological well-being questionnaire, neo personality dimensions, shot emotional intelligence and following Modanloo treatment. SPSS software was used to analyze the statistical data.

Result: The results of multivariate regression showed that 70% of the variance of psychological well-being in diabetic patients is explained by the variables of neuroticism, emotional intelligence, conscientiousness, and extraversion, while the variables of openness to experience, pleasantness and adherence to psychotherapy did not have significant relation with psychological well-being.

Conclusion: The results of this study, which are largely consistent with other research findings, indicate that high levels of emotional intelligence, conscientiousness and extraversion, and low levels of neuroticism increase the psychological well-being of diabetic patients.

Declaration of interest: None

Keywords: Mental well-being, Personality dimensions, Emotional intelligence, Adherence to treatment, Diabetes.

Introduction

Diabetes, as one of the most common chronic diseases, has created many challenges for public health around the world (1). The disease is the fifth leading cause of death and the annual cause of 4 million deaths in the world, which is caused by a defect in insulin secretion or insulin function (2). According to the International Diabetes Organization in 2017, 8.8% of the adult population, about 425 million people had diabetes and their number will reach more than 629 million by 2045, of which 212 million are without diagnoses (3). Also, according to reports provided by the World Health Organization, the number of patients with diabetes in Iran by 2025 will reach more than 12 million (4). Diabetes is one of the chronic diseases that disrupts the normal lifestyle and can have important psychological consequences (5, 6); In fact, diabetes can be a part of psychosomatic illness and is directly due to some psychological features that in the long term increase the risk of progression and complications of the disease (7). Psychological well-being is defined as the development of a person's true talents and is an attempt to realize one's true potential (8). The Reef model is one of the most important models in the field of psychological well-being; in 1995, Reef introduced his model of psychological well-being with the goal of growth and development, in order to realize individual potential. Chronic illnesses, such as diabetes, present the person with challenges such as mastering the environment (mental well-being index) and adapting to different lifestyles, continuous monitoring and treatment, constant concerns about complications, and potential erosion of personal and professional relationships (9). Studies of patients with diabetes have shown that psychological well-being indicators (e.g., higher autonomy (10), greater mastery of the environment (9), self-acceptance, positive emotion, etc.) with better medical outcomes, including better blood sugar control and adherence to more health behaviors and reduced mortality have been linked (11). Also, a large epidemiological study showed that higher levels of pleasantness and life satisfaction are associated with a reduced risk of diabetes (12).

Psychological well-being is often strongly associated with enduring personality traits. With this in mind, many researchers pay special attention to understanding the relationship between personality and psychological well-being (13). Many theorists (14) have studied the role of personality as the first factor in promoting psychological well-being and believe that personality is one of the most important interpersonal factors affecting psychological well-being. Personality is the main psychological structure and a unique and organized set of relatively fixed and stable dimensions that help to differentiate people from each other (15). The five-factor personality model has been considered by many psychologists in recent years as a popular and powerful approach to study the dimensions of personality (16). The five-factor model of personality includes the components of neuroticism, extraversion, openness to experience, pleasantness, and conscientiousness (17). A study by Löckenhoff, Duberstein, Friedman and Costa in 2011, on 536 people using the NEO Personality Questionnaire found that both physical and mental health were negatively associated with neuroticism and positively correlated with extraversion and conscientiousness. (18). Patients with neurotic diabetes are more likely to suffer from illness and physical problems in stressful situations. Neurotics are more likely to be associated with smoking habits, alcohol consumption, lack of healthy diet, and poor therapeutic control (19). Deneve and Cooper, examined the components of life satisfaction, happiness,

positive emotion and negative emotion, evaluated the psychological well-being of individuals and found that neuroticism is strongly negatively related to life satisfaction, happiness and emotion. While extraversion and agreement are strongly associated with psychological well-being (20). According to Francis, there is also a positive relationship between extraversion and well-being (21). The results showed that among the five personality dimensions of extraversion components, openness to experience and adaptation to psychological well-being are directly related and among them, extraversion has the most relationship with mental well-being (22). In 2015, Soto examined the relationship between personality traits and psychological well-being and concluded that conscientiousness is associated with greater emotional stability, higher life satisfaction, more positive emotions, and less negative emotions (21). Based on the theoretical framework proposed by Salovi and Meyer in 1990, it can be assumed that higher levels of emotional intelligence can enhance mental health. People with high emotional intelligence experience higher levels of psychological and mental well-being (especially in the areas of personal growth, positive interpersonal relationships, and self-acceptance). Because they are able to understand and control their emotions, they behave more rationally when faced with problems, perceive everyday problems as less stressful, find themselves more efficient in the face of negative emotions, and receive more social support from others (23). The results of studies in this field show that emotional intelligence can act as a shield against negative life events, including chronic diseases. These people are more optimistic about life and more resistant to stress and have more progress and resistance in life. People who are unable to understand and express their emotions and regulate them, do not have good control in stressful situations, experience stress with greater intensity, have less psychological adjustment and experience more pain (24).

Emotional intelligence was also significantly associated with self-management and mental well-being in the face of chronic obstructive pulmonary disease (25). There are strong reasons why emotional intelligence is a powerful factor in managing diabetes and its emotional consequences (26). Emotional intelligence is associated with healthier behaviors (27, 28), better health (as evidenced by less medication), reduced doctor visits and hospitalizations, and fewer negative emotions such as anxiety, depression, or distress in facing adversity (24). Also, lack of adherence to diet and treatment and lack of self-care lead to a decrease in mental well-being in patients with diabetes (29). Addressing these psychological aspects including components of psychological well-being (30), personality dimensions (31) and emotional intelligence (29), help a person overcome psychological barriers to treatment and self-care in the treatment process; Identifying and supporting patients prone to psychological problems at the onset of diabetes may promote psychosocial well-being and their ability to regulate or take adequate responsibility for adherence to diabetes treatment (32). Because it is often difficult for many diabetics to accept that they have to take medication throughout their lives and therefore have poor adherence to treatment and self-care (33). Considering the mentioned cases and the evidence on the effect of psychological well-being components and personality dimensions as well as emotional intelligence on the degree of adherence to treatment in diabetic patients, it seems that a more detailed study to understand the relationship between these components and improve the treatment process is needed. Lack of sufficient information about the effect of personality dimensions and emotional intelligence on the mental well-being of diabetic patients leads to

inability to measure the impact of factors disrupting the treatment process or identifying people at risk and thus disrupting the professional role of physicians and treatment team in improving patients' health and will increase the costs and burden of treatment for the society. Finally, the main purpose of this study is to examine whether the data obtained from this study can predict the psychological well-being of diabetic patients based on the dimensions of personality and emotional intelligence and adherence to treatment.

Method

Descriptive correlation was utilized in this study. For data analysis, multivariate regression was used by stepwise method and for data calculation, SPSS software was used. The statistical population of the present study included all diabetic people aged 30 to 60 years who referred to the office of endocrinologists, kidney and internal medicine specialists in 5 districts of Tehran in the third quarter of 2019. Purposeful sampling method was used to select the research sample. In order to select the sample, people aged 30 to 60 years who had been diagnosed with diabetes for at least one year and were referred to one of the centers for treatment were considered. Out of 714 people who referred to these centers, 267 people were selected by available sampling. Inclusion criteria for this study include people aged 30 to 60 years with a diagnosis of type 1 diabetes and type 2 diabetes (at least one year after diagnosis of diabetes), receiving voluntary and informed consent from individuals, willingness to participate in research, having a minimum education of 6th grade of primary school, not suffering from severe mental illnesses such as psychotic and sensory disorders, not taking psychotropic drugs or substance abuse at the moment, not suffering from severe complications of diabetes such as kidney failure and dialysis leading to hospitalization. Exclusion criteria included not being interested in completing the questionnaire, not completing the questionnaire correctly. In order to comply with ethical issues in the research, the consent of all individuals received written information about the research and participated in the research if they wished; Participants were assured that all information are confidential and would be used for research purposes; for privacy reasons, participants' first and last names were not registered. To collect data, four questionnaires of Reef psychological well-being, neo-personality dimensions, shot emotional intelligence and adherence to Modanloo treatment were used. To fit the psychological well-being, a short version (18 questions) of the Reef Psychological Well-being Scale was used. This questionnaire was designed by Reef in 1989 and revised in 2002. This version measures 6 factors: independence, mastery of the environment, personal growth, positive communication with others, purpose in life and self-acceptance. The sum of the scores of these 6 factors is calculated as the total score of psychological well-being. This test is a kind of self-assessment tool that is answered in a 6-point continuum from "Strongly Agree" to "Strongly Disagree" (one to six), with a higher score indicating better psychological well-being. The correlation between the short version of the Reef Psychological Well-Being Scale and the main scale ranged from 0.7 to 0.89. To evaluate the dimensions of personality, the revised version with 60-questions form of Neo personality was used. The studied indicators include five personality factors: neuroticism, extraversion, openness to experience or accepting experience, acceptability or compatibility, and conscientiousness, each of which is measured by 12 questions. All questions in this questionnaire are answered in five Likert scale. The Shot

Emotional Intelligence Questionnaire was used to measure emotional intelligence. This scale is a 33-item test developed by Shot et al. in 1998 based on the Meyer and Salovi Emotional Intelligence Model. The test questions assess the three components of emotional intelligence, including emotion regulation, emotion productivity, and the evaluation and expression of emotions on a five-point Likert scale from a score of 1 to 5. Modanloo treatment adherence questionnaire was used to measure the adherence to the treatment. This questionnaire was designed and psychometric in 2013 by Modanloo for patients with chronic diseases. This questionnaire contains 40 questions. 9 questions in the areas of concern in treatment, 7 questions about the desire to participate in treatment, 7 questions about the ability to adapt, 5 questions about integrating treatment with life, 4 questions about sticking to treatment, 5 questions about commitment to treatment and 3 questions about doubts about the implementation of treatment. The reliability of the treatment adherence instrument was measured using the retest method and the correlation coefficient was 0.875.

Results

The results showed that the mean age of patients were 38.13 and the standard deviation was 8.12. The mean duration of the disease was 5.15 and the standard deviation was 2.13. Table 1 presents the descriptive findings of the research variables.

Table 1. Mean and standard deviation of research variables

Variables	mean	Standard deviation
Neuroticism	22.22	8.01
Extroversion	28.86	7.15
Openness to experience	25.62	4.85
Being pleasant	30.14	4.57
Conscientiousness	34.73	6.63
Adherence to treatment	151.18	18/02
Emotional Intelligence	106.23	10.58
Psychological well-being	80.15	8.43

As can be seen in Table 2, except for the variable of openness (r = 0.04), all variables of neuroticism, extraversion, conscientiousness, emotional intelligence and treatment adherence had a significant relationship with psychological well-being. Other correlation coefficients are also presented in Table 2.

Table 2. Correlation coefficient between research variables

Variables	1	2	3	4	5	6	7
1- neuroticism	1						
2-Extroversion	0.54*-	1					
3-Openness to experience	0.12*-	0.03	1				
4- Being pleasant	0.35*-	0.26*	0.22*	1			
5- Conscientiousness	0.32*-	0.43*	0.03	0.23*	1		
6-Adherence to treatment	_0.18	0.23*	0.05	0.16*	0.41*	1	
Emotional Intelligence 7-	_0.29*	0.52*	0.18*	0.32*	0.71*	0.47*	1
Psychological well-being 8-	_0.56*	0.54*	0.04	0.26*	0.53*	0.34*	0.54*

*P<0.5

Table 3: Multiple regression results by simultaneous entry of psychological well-being by personality traits, adherence to treatment and emotional intelligence

The criterion variable	Predictive variables	B	S. E	B	T	P
	Width of origin	52.44	4.91	-	10.68	0.001
	1- neuroticism	-0.38	0.05	-0.36	-7.27	0.001
	2-Extroversion	0.16	0.06	0.14	2.62	0.009
	3-Openness to experience	0.09	0.07	0.05	1.24	0.21
	4- Being pleasant	-0.009	0.08	-0.005	-0.10	0.92
	5- Conscientiousness	0.24	0.07	0.18	3.13	0.002
	6-Adherence to treatment	0.037	0.02	0.07	1.70	0.08
	Emotional Intelligence 7-	*0*.14	0.05	0.18	2.61	0.009

, R^2= 0.51, R=0.71 F=45.18،0.001 P<

The results of simultaneous entry regression showed that among the predictor variables, only the variables of openness to experience, pleasantness, and treatment adherence did not have a significant relationship with psychological well-being and other variables had significant predictors for psychological well-being. In order to determine the role of the most important variable for predicting the criterion variable, stepwise regression was used, the results of which are shown in Table 4.

Table 4: Multiple regression results using step-by-step psychological well-being by personality traits, adherence to treatment, and emotional intelligence

The criterion variable	Predictive variables	B	S. E	B	T	P
Psychological well-being	**Width of origin**	55.94	4.05	-	13.78	0.001
	neuroticism	-0.37	0.05	-0.36	-7.36	0.001
	Emotional Intelligence	0.18	0.05	0.23	3.77	0.001
	Conscientiousness	0.23	0.07	0.18	3.17	0.002
	Extraversion	0.16	0.06	0.14	2.56	0.01

$P < 0.001, \quad F = 77.36, \quad R^2 = 0.50\,, \quad R = 0.70$

The ratio F of the linear composition of the predictor variables to the criterion variable is significant (F = 77.36; P <0.001). In other words; among the predictor variables, respectively: neuroticism, emotional intelligence, conscientiousness, and extraversion had the most role in predicting psychological well-being (R = 0.70). The results showed that these variables together explain 50% of the variance of psychological well-being.

Discussion and Conclusion

The aim of this study was to predict psychological well-being based on personality dimensions, emotional intelligence, and adherence to treatment. The findings of this study showed that among the predictor components, respectively: neuroticism, emotional intelligence, conscientiousness, and extraversion had the most role in predicting psychological well-being (R = 0.70). The results showed that these variables together explain 70% of the variance of psychological well-being. The results of the present study are in line with the (14, 16, 34, 35). Studies conducted by Steele, Smith, and Schultz in 2008, showed that neuroticism was mostly correlated with psychological well-being, followed by extraversion and conscientiousness (36). Also, among the components, openness to experience and pleasantness and the component of adherence to treatment did not have the predictive power of psychological well-being. The results obtained, as in previous studies, have indicated that the trait of neuroticism, with the component of psychological well-being has a negative beta coefficient, meaning that neuroticism has an adverse effect on psychological well-being. Neuroticism refers to a person's tendency to experience anxiety, stress, compassion, hostility, impulsivity, depression, and low self-esteem. People in whom neurotic traits are stronger than other personality traits frequently obtain lower score in health and well-being situations (37). People with high neuroticism use passive strategies in the face of stressful situations, such as avoidance, self-blame, arrogant thinking, methods based on interpersonal militancy, such as hostile reactions, and the release of negative emotions (35). They are more responsive to stressful situations and less equipped with coping skills that can help protect them from the negative consequences of chronic stress. In such a situation, the person becomes more vulnerable to life crises, because neurotic people tend to feel negative experiences such as fear, sadness, anger and hatred, and these negative emotions prevent them from feeling satisfied and satisfied with their lives. Research have suggested that neuroticism is associated with chronic pain. Higher levels of neuroticism are also associated with muscle problems. The findings are in accordance with the previous studies (38,39). Unlike extraversion, neuroticism is associated with a higher risk of developing emotional distress in people with cancer and, consequently, lower levels of mental well-being and physical health. In addition, neurotic personality traits may lead to poorer psychological well-being, so that people experience life events more as threatening and disturbing (40). In summary, according to previous research, neuroticism is associated with an increased risk of poorer mental health outcomes and consequently

lower mental well-being (41). The feature of extraversion has a positive and significant correlation with the component of psychological well-being, meaning that extraversion has a direct effect on psychological well-being. This result is consistent with the findings of previous studies (13, 42, 43, 44). Extroverts are usually more likely than introverts to seek social support, and this feature can be exactly what supports people with chronic illness if needed (38). In fact, people with a high score in extraversion, intimacy and affection, collectivism, people and society, have a more friendly relationship with others and enjoy being with others, and the wider the network of social relations, due to mental health, the higher mental well-being they have. Extraversion refers to a person's desire to be positive, assertive, energetic, and intimate. People with this trait have always been active and tend to experience positive emotions. Therefore, these people have a positive attitude towards themselves and others and acceptance of various aspects such as positive and negative characteristics. In other words, high levels of extraversion are associated with an increase in positive emotions, a great deal of feelings of satisfaction and health. Conscientiousness has a positive and significant correlation with the component of psychological well-being, this result is consistent with the findings (45,46). Conscientious, responsible, reliable and trustworthy people have predetermined goals and desires that lead to good order and organization in life. These people are independent, that is, they influence life events and play an active role in their behaviors. Therefore, people with higher conscientiousness and responsibility can often do well in daily decisions that require important, challenging and stressful decisions. In contrast, people with low conscientiousness are not able to make the right decisions under the pressure of external forces. Also, the results obtained in this study did not show a significant relationship between the components of openness to experience and pleasantness with the component of psychological well-being. People with openness to experience have high imagination, mental curiosity, attention to inner feelings and the ability to analyze personal experiences (39). People with pleasant traits are more inclined to interpersonal interactions and believe that others are mutually helpful. The results obtained in this study indicate the lack of predictive power of the psychological well-being component by the attribute of openness to experience, which is in line with the results obtained in other studies (47, 48). In other words, the presence or absence of traits of openness to experience and pleasantness has no effect on increasing or decreasing the psychological well-being of diabetic patients. The results of this study show that there is a significant positive relationship between emotional intelligence and psychological well-being. This finding is consistent with the results of research conducted by (49, 50). Various studies also show that higher levels of emotional intelligence are associated with stronger psychological well-being (51, 52). According to Benzo et al.'s study, emotional intelligence was significantly associated with mental well-being and self-management behaviors in the face of chronic

illness (53). The results reveal that people with high emotional intelligence are able to understand the emotions of others and can change their behavior according to their circumstances and needs, and this leads to self-control and encouragement to repeat that behavior in the future. In explaining these results, it can be said that people who easily assess their emotions and are in direct contact with them are able to identify their emotions well and in their relationships with peers and the situations they are well managed, therefore, they suffer less from depression and physical illness, and in general, they show better known psychological well-being (54). Also, the ability to regulate emotions leads to knowing how and when to express their feelings and have a high adaptive power, which in turn leads to greater psychological well-being in these people (55). On the other hand, the results obtained in this study indicate the lack of effect of adherence to treatment on the component of psychological well-being. In other words, in this study, there was no significant relationship between psychological well-being and higher treatment, resulting in better medical outcomes, including better glucose control and lower mortality. Predictors of mental well-being include neurosis, emotional intelligence, conscientiousness, and extraversion, respectively, which had the greatest role in predicting psychological well-being of diabetic patients. Due to their effect on the psychological well-being of diabetic patients, these components can act as a key and predictive factor and affect the fate of diabetic patients and their treatment. According to the results, appropriate psychological interventions are necessary for people with diabetes because they are simple to provide and widely applicable to a wide range of mental disorders and may increase self-efficacy and motivation to care for diabetes itself (11). In the present study, the following limitations can be mentioned. First, it was not possible to measure the honesty and truthfulness of the respondents due to the lack of sufficient control. Second, since the present study was among those who referred to the office of endocrinologists, kidney and internal medicine specialists in 5 areas (north-south-center-east-west) of Tehran Municipality, caution should be exercised in generalizing the results and avoid generalizing the results to other communities in other areas and cities. In addition, this study was performed among 30- to 60-years-old diabetic patients without chronic physical or psychological illness, as well as without emphasis on the type of diabetes (type 1, type 2, pregnancy) and the gender of the patients; therefore, generalization of results should be done with caution. Therefore, it is suggested that in future studies, to obtain more definite results, research on more samples of diabetic people suffering from chronic physical and psychological diseases, as well as emphasizing the type of diabetes (type 1, type 2, pregnancy) and gender, similar studies to be done on a wider range of diabetics in other cities as well as other cultures to compare research results. At the theoretical level, the results of this study can pave the way for a better understanding of the factors affecting the improvement of mental well-being of diabetic patients and

the results of previous research and theories related to personality dimensions and emotional intelligence and understanding their relationship promotes adherence to treatment in diabetic patient. Also at the practical level, for preventive measures and appropriate screening of diabetic patients, more attention should be paid to the personality traits and emotional intelligence of patients. Considering the low quality of psychological well-being of diabetic patients with neurosis and the possibility of their greater vulnerability to the psychological effects of chronic diabetes, as well as the positive effects of emotional intelligence, conscientiousness and extraversion in predicting psychological well-being; It is recommended that counseling and psychotherapy services be provided at the same time as other medical treatments in diabetes treatment centers and clinics.

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