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Predicting the Meaning of Life-Based on Moral Development and Cognitive Styles in Patients with Type 2 Diabetes

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Abstract

Background and objectives: Diabetes is the fifth leading cause of death in most countries of the world and causes disability, high medical costs, and increased mortality. The current study aimed to predict the meaning of life based on moral development and cognitive styles in patients with type 2 diabetes.

Methods: This study was carried out with an applied and descriptive-correlational design. The statistical population consisted of all patients of the Karaj Diabetes Association in Alborz, Iran, in 2019, out of whom 200 subjects were selected using convenience sampling and Cochran formula. In order to collect data, the Meaning of Life Questionnaire of Steger et al. (2006), Kolberg's Moral Development Test (1981), and Kolb's Cognitive Styles Scale (1981) were used. Pearson correlation coefficient and multiple linear regression were used to analyze the data. The data were analyzed by SPSS software (version 23), and the significance level was considered 0.05.

Results: The obtained results showed that moral development and cognitive styles had a positive and significant relationship with the meaning of life in patients with type 2 diabetes (P<0.001). In addition, altruism, moral development level, objective experience, cognitive styles, reflective observation, abstract conceptualization, and active testing can predict the meaning of life in individuals with diabetes (P<0.001).

Conclusion: It can be concluded that moral development and cognitive styles can predict the meaning of life among patients with type 2 diabetes and these results support the importance of the role of the meaning of life in individuals with type 2 diabetes.

Keywords: Cognition, Diabetes Mellitus, Moral Development, Personality

Introduction

Diabetes is the fifth leading cause of death in most countries of the world and causes disability, high medical costs, and increased mortality (1). This chronic disease is caused by a deficiency or inhibition of insulin and associated with impaired metabolism of carbohydrates, fats, and proteins (2). The prevalence of type 1 and 2 diabetes is increasing worldwide; however, the rate of increase in type 2 diabetes is higher. This increase can be due to several factors, including lifestyle changes, prevalence of obesity, and decrease in physical activity (3). Diabetes, as the silent epidemic of this century, is one of the health problems of all countries. The International Diabetes Federation estimated the number of patients with diabetes to be 624 million by 2040 (4). In Iran, the frequency of this disease has been reported to be 3.5 million individuals, which is estimated to be more than 5.1 million by 2025 (5). Failure to accept the disease, sensitivity to blood sugar fluctuations, insulin injections, restrictions on a diet, need for careful and continuous self-care, and possibility of physical factors cause psychological problems, such as meaninglessness in the lives of diabetic patients (6).

The meaning of life is considered one of the main components in the psychological health of individuals (7-8). The results of studies showed that meaning in life is associated with optimism (9). The factors, such as the sense of belonging to others, being needed, and physical efficiency, are meaningful factors to life. The meaning of life with revaluation and new targeting has created new thoughts and directions that increase social interactions and environmental impacts (10). Understanding the meaning of life can increase tolerance levels and therefore affect factors, such as pain perception (11). Stress plays a dual cause and effect in relation to diabetes (12). This disease is one of the most common chronic diseases the role of effective psychological factors in which has been studied (13).

Moral development plays an important role in the lives of patients with diabetes and is an infrastructure for interactions that help patients to adapt to the disease (14). Ethics grow through stages and depend on the growth of cognition. Each new stage of cognitive development follows a higher level of moral awareness. The recognition of moral values is made through the interaction of child space with the outside environment. In Kolberg's view, moral development is a development that grows during the stages of cognitive reorganization, and each stage has a specific construction and organization. Each construction, while making it possible to achieve a stage, is the opening point for the next step (15).

Morality gives individuals a general peace of life in physical and mental dimensions. In addition, moral development makes an individual's compromise with himself, surroundings, and situations, and in this way it ensures mental health (16). Effective psychological studies, along with medical treatments, are necessary to manage this disease (17). The achievement of cognitive development is a necessary condition for moral change. The way of passing from moral elementary stages to higher stages is based on the child's cognitive development (18). Therefore, it is important to pay attention to cognitive development and its related styles. Furthermore, diabetes and patient's need for self-care cause many challenges in daily life, and recognizing cognitive styles leads to more adaptation to this disease (19).

The term style was firstly used by Allport in 1973. He described the cognitive style as the usual way of solving problems, thinking, perception, and recall (20). In fact, cognitive styles intelligently organize individuals' preferences for acquiring knowledge and, if necessary, modifying it (19). On the other hand, cognitive styles are closely associated with the concept of psychological differences (20). Cognition refers to the mental and psychological functions of the individual. The perception of different aspects of mental activities, such as understanding, remembering, arguing, thinking, making decisions, and imagining. Everyone has their own cognitive style (21).

Palamenaghi et al. showed that the meaning of life has a significant relationship with mental, physical, and social health components. In addition, the effect of social attitudes and public policies proportional to the quality of life predict the meaning of life in these patients (22). In a study titled "Searching for the Meaning of Life: Personality, Cognitive Style and Dynamics between Searching for Meaning and its Experience", Stinger et al. demonstrated that fundamental motivations moderate the relationship between the search of meaning and its presence. The results highlighted the importance of cognitive style characteristics in the meaning of life and their relationship with each other (23). Karimi Sani et al. in their study showed that criminals have a lower moral development level than normal individuals. In general, the level of moral development, meaning of life, and identity style of criminals and noncriminals are different (24) and technology and provision of welfare and comfort, there are many individuals who have many facilities but do not feel satisfied with their lives; as a result, many studies have been conducted on life satisfaction and well-being in chronic diseases and effective factors indicating that among the factors that can play an important role in life satisfaction and well-being are cognitive styles. On the other hand, addressing ethical issues and their growth and development put an individual on a path that, by mea19ningfully giving his/her life to the difficulties of life, especially against chronic diseases, adapts him/herself to the existing conditions and maintains his/her mental health. Therefore, with this background in mind, the present study tried to investigate the variables associated with predicting the meaning of life in diabetic patients. This study aimed to predict the meaning of life based on moral development and cognitive styles in patients with type 2 diabetes.

Methods

The present study was carried out with an applied and descriptive-correlational design. The statistical population consisted of all patients of the Karaj Diabetes Association in Alborz, Iran, in 2019. To calculate the required sample size for an unlimited population of Cochran formula, error value of 0.05 and previous study (25), 184 subjects were selected for the sample size, and considering sample attrition, 200 participants were considered to fill out the questionnaires of this study. In the current study, the convenience sampling method was used to choose the samples so that among the available patients with type 2 diabetes, the patients who wished to answer the questions were selected, and the research questionnaires were provided to them. The inclusion criteria were having type 2 diabetes (based on medical records), education level of diploma and higher, age range of 45-65 years, lack of mental disorders (based on medical records), no consumption of medications for the treatment of psychiatric disorders (based on medical records), and no chronic physical diseases except for diseases related to diabetes (based on medical records). The exclusion criteria were incomplete and invalid information, mental illness, and no chronic physical illness except for diabetes-related diseases. The reason for choosing the age range of 45-65 years was that the research samples in Karaj Diabetes Association were within this age range.

In this study, ethical principles were observed by the researcher. The authorities and research assistants were ensured of the confidentiality of the information about the participants. The report with the results of the study was presented to the

educational-therapeutic centers on request. The study participants were reassured of the confidentiality of their information. The study objectives were explained to the participants, and the study results would be available to the participants after that. Moreover, a written informed consent form was completed and signed by the patients. The results of the reality of the obtained data were presented, and the participants were appreciated for participating in the implementation of the research project. In addition, the participants were free to withdraw from the study at any time of its implementation, ensuring there would be no psychological, social, physical or financial damage. Furthermore, the participants were reassured about the compensation of possible or accidental psychological, social, physical, or financial damage. The present study was registered (IR.IAU.K.REC.1397.054) in the Ethics Organization in Islamic Azad University of Karaj Branch, Alborz province, Iran.

In order to conduct the study, during a 3-month period, firstly, the researcher, while coordinating with the authorities of the Diabetes Association of Karaj and obtaining their consent for the study, referred to this center at the specified times, distributed the Meaning of Life Questionnaire (2006), Kolberg's Moral Development Test (1981), and Kolb's Cognitive Styles Questionnaire (1981), and collected them after completion. In order to perform the tests, general explanations were given, and the full explanations were individually provided during the implementation if needed.

In this study, the following tools were used to collect the data.

The Meaning of Life Questionnaire (2006)

The Meaning of Life Scale (2006) with 10 items was presented by Steger et al. (2006) to assess the existence of meaning in life and try to find it (26). The questionnaire is scored based on a 7-point Likert scale (from 1: completely incorrect to 7: completely incorrect). According to the rating of the answers, the total score in this test will be 10 to 70. The total scores of the items (i.e., 8, 7, 3, 2, and 10) are the levels of effort an individual devotes to find meaning in life, and the sum of the scores of the items (i.e., 4, 1, 6, 5, and 9 with reverse coding) determines the meaning of an individual's life (26). The validity of this scale for life evaluation was 0.86 For the existence of meaning subscale, the validity was 0.87, and the reliability of the subscales of meaning and meaning search was estimated to be 0.73 and 0.70, respectively (27).

Colberg's Moral Development Test (1977)

This test was developed by Kolberg in 1977 to measure altruism orientations and moral judgment. The test has 49 items in which three hypothetical situations are raised. The first part consists of the riddle of a young burglar with a position (17 items). These riddles each have one position, and each puzzle is divided into two parts, each part with its own items. At the same time, the items in the first part are graded based on a multi-degree scale from absolutely yes to absolutely not. In addition, the items of the second part of the test, which measures the moral level of the individual, are based on a 5-point Likert scale from very high to very low. The scores are within the range of 0 to 96, and obtaining higher grades means observing more ethical issues by the individual (28). Cronbach's alpha coefficient in the original version of the questionnaire, the first part in multiple studies, was within the range of 0.74 to 0.84, and the reliability of the second part of the test was reported to be 0.77 with Cronbach's alpha (28).

Kolb's Cognitive Styles Questionnaire (1981)

This questionnaire was developed by Kolb (1981) to measure cognitive styles (29) with 12 items. Each item consisted of four parts, namely objective experience, reflective observation, abstract conceptualization, and active experimentation. With the sum of these four parts in twelve items of the questionnaire, four scores are obtained, indicating four learning methods. From two-to-two subtraction of these methods (i.e., abstract conceptualization subtracts from objective experience and active experimentation), two scores are obtained from reflective observation. Respondents rank their proposed options based on grades 1-4 according to their learning style preference. If the proposed options are completely, somewhat, slightly, and very lowly in accordance with the learning method of the sample, the score is 1 to 4, respectively. The total score of these options is 4, indicating four learning methods. Accordingly, the first option in each item is the objective experience learning method; the second option is the reflective observation learning method; the third option is the method of learning abstract conceptualization; the fourth option is the active experimentation learning method (29). The lowest and highest scores were considered 12 and 48, indicating low and high cognitive styles, (29). The reliability coefficient was reported by Cronbach's alpha in objective experience component, reflective observation, abstract conceptualization, and active experimentation equal to 0.64, 0.58, 0.72, and 0.68, respectively (30).

Descriptive statistics, including mean and standard deviation, were used to describe the data. Before testing the hypotheses, the normality of the studied variables was investigated using the Kolmogorov-Smirnov test, and then the appropriate Pearson correlation coefficient was used. The data were analyzed using SPSS software (version 23), and the significance level was considered 0.05

Results

The distribution of the respondents by gender showed that 58% (n=116) and 42% (n=84) of them were female and male, respectively. In addition, the educational levels of the participants were reported as diplomas (42.5%; n=85), postgraduate (13%; n=26), undergraduate (36%; n=72), and postgraduate (8.5%; n=17).

Table 1. Mean and standard deviation of study variables (n=200)

Study variable	Min	Max	Mean	Standard deviation
Moral development	1.1	4.7	2.97	0.75
Cognitive styles	14	40	29.27	5.73
Life meaning	11	50	30.78	8.04

Table 2. Results of Pearson correlation coefficient of moral development and cognitive styles

Variable	1	2	3
Life meaning	1		
Moral development	0.33**	1	
Cognitive styles	0.45**	0.46**	1

The results of the Kolmogorov-Smirnov test showed that the distribution of the scores of the study variables with 95% confidence was normal. Furthermore, the results of the Watson-Camera test demonstrated that the level of these statistics in this study was within the range of 1.5-2.5, indicating the independence of observations

Table 2 showed the relationship between moral development and cognitive styles with the meaning of life, indicating that the correlation coefficients between moral development and cognitive styles with the meaning of life were 0.33 and 0.456, respectively. Consequently, there was a significant relationship between moral development and cognitive styles with the meaning of life in individuals with diabetes.

Table 3. Report on semantic regression of life based on moral development and cognitive styles

Predicting variable	Nonstandard coefficients		Standard coefficients	t	P
	B	Standard error	β		
Moral development	1.61	0.74	0.15	2.14	0.03
Cognitive styles	0.14	0.18	0.38	5.46	0.001

According to Table 3, multiple correlation coefficients are the variables of moral development and cognitive styles with the meaning of life (0.47). In total, the two aforementioned variables predicted 21.8% of changes in life meaning. According to Table 3, the effect of moral development on the meaning of life (0.15) was positive and significant at the level of 0.033. Moreover, the effect of cognitive styles on the meaning of life (0.38) was positive and significant. Therefore, according to the results of Table 3, the variables of moral development and cognitive styles significantly predict the meaning of life.

Discussion

The aim of the present study was to predict the meaning of life based on moral development and cognitive styles in patients with type 2 diabetes. Based on the results of the correlation coefficient, there was a significant relationship between moral development, reflective cognitive style, objective experience, abstract conceptualization, and active experimentation with the meaning of life in individuals with diabetes. The results showed that moral development and cognitive styles (e.g., reflection, objective experience, abstract conceptualization, and active experimentation) could explain 25% of the variance of the meaning of life. Among the variables predicting the role of reflective cognitive styles, objective experience, abstract conceptualization was not significant. Only moral development and cognitive style of active experimentation played a significant role in the meaning of life.

Based on beta coefficients, the contribution of active testing style (beta coefficient=0.412) was more than other variables. The results showed that active testing cognitive style generally plays an important role in predicting the meaning of life. The results of this study were significantly in line with the findings of a study conducted by Palamenaghi et al. on the meaning of life with mental, physical, and social health components. In addition, the effect of social attitudes and public policies proportional to the quality of life predict the meaning of life in these patients (21). Krok believes that the underlying motivations moderate the relationship between the search for meaning and its presence. The results highlight the importance of cognitive style characteristics in the meaning of life and their relationship with each other (22). Karimi Sani et al. stated that criminals have a lower moral development level than normal individuals. In general, the level of moral development, meaning of life, and identity style of criminals and noncriminals are different (23).

The findings of this study demonstrated that the level of moral development had a significant relationship with the meaning of life in patients with diabetes. The results of the study conducted by Karimi Sani et al. indicated that criminals have a lower level of moral development than normal individuals. In general, the level of moral development, meaning of life, and identity style of criminals and non-criminals are different (23).

In explaining this finding, it can be said that the meaning of life refers to a kind of feeling of connection with the creator of the universe, having a purpose in life, pursuing and achieving valuable goals, and achieving perfection. The meaning of life is essentially cognitive because it includes individuals' beliefs about the existence of an ultimate goal in life, spirituality, and hereafter. The existence of meaning in life is associated with well-being and mental health (8). Finally, chronic diseases, such as diabetes, can affect this structure. What has been studied in the present study regarding the role of the meaning of life (i.e., the evolution of ethics and cognitive styles), both have shown a significant relationship with this construct.

Ethics grow through stages and depend on the growth of cognition. Each new stage of cognitive development follows a higher level of moral awareness, and the recognition of moral values is made through the interaction of child space with the outside environment. In Kolberg's view, moral development is a development that grows during the stages of cognitive reorganization, and each stage has a specific construction and organization (6). Each construction, while making it possible to achieve a stage, is the starting point for the next step. However, the basis of moral levels should not be considered solely in the case of the power and concept of justice. The foundations of moral development include the foundations of others, such as love, human emotions, and empathy. As ethics grow at higher levels (i.e., at the postcontractual and main levels), the meaning of life becomes more prominent due to the ability to love and empathize. Furthermore, the meaning of life has a significant relationship with high levels of moral development (11).

In addition, among the scores obtained from the students in reflective cognitive styles, objective experience, abstract conceptualization with the scores obtained from the meaning of life, there was no significant relationship between the scores obtained from the meaning of life and the cognitive styles of active experimentation showed a significant relationship with the meaning of life. In this type of cognitive style, an individual uses mental habits or behaviors regularly leading to problem-solving, information processing, or mental maps and is reasonably confronted with the quality of life based on basic abilities (6). In fact, it is a style of perpetual potential that variables from person to person and affects learning, especially how a person performs. To change performance, a change in cognitive style should be made, and in order to influence the meaning of life in individuals' existence, focusing on the cognitive style of experimentation is active (9).

The findings of the present study showed that cognitive styles (e.g., reflective cognitive style, objective experience, abstract conceptualization, and active experimentation) could predict the meaning of life in patients with diabetes. The results of the current study are based on a study carried out by Istgar et al. that moderates the basic motivations of the relationship between meaning search and its presence. The results highlight the importance of cognitive style characteristics in the meaning of life and their relationship with each other (23).

In explaining the findings of the study, it can be stated that individuals whose lives have more meaning better deal with anxiety and life challenges and have better information processing and a more positive view of the future. According to the results of a study conducted by Garcini et al. (12), meaning in life is a useful coping skill that makes an individual enjoy his/her time and endures bad conditions, and following this feeling a person can act as a strong protector against stressful life issues and conditions, including coping with chronic diseases. Stress plays a dual cause and effect role in diabetes. This disease is one of the most common chronic diseases the role of effective psychological factors in which has been studied (11). The complexity of factors affecting the treatment and control of diabetes has led each group of researchers to its examination from a specific perspective.

Effective psychological interventions, along with medical treatments, are necessary to manage diabetes. Achieving cognitive development is a necessary condition for moral change. The way of passing from moral elementary stages to higher stages is based on the child's cognitive development. Therefore, it is important to pay attention to cognitive development and its related styles. Cognitive styles are defined as different ways of receiving and organizing information, which implies the learner's methods of processing information in learning new concepts and principles; therefore, cognitive styles can be used to define a true concept for the meaning of life (12).

The present study had several limitations. The participants of the study were limited to patients with type 2 diabetes. This study was conducted on patients with a certain age range (45 to 65 years); therefore, caution should be taken in generalizing the results to patients under 45 or over 65 years of age and patients with type 1 diabetes. The data were collected based on self-report scales. The study population consisted of patients with a diabetes diagnosis in Karaj, and generalization may affect the results due to the specific characteristics of this community. It is suggested to investigate the effects

of psychological characteristics (e.g., the meaning of life, moral development, and cognitive styles) on other chronic diseases in future studies. It is recommended to carry out this study in other regions as well as outside the geographical area of Karaj. In this study, a questionnaire was used to collect the data; consequently, considering that the questionnaires have a self-assessment aspect, there may be bias in responses. Therefore, it is necessary to adopt the interview method for data collection in future studies, especially in collecting variable information about diabetes.

Conclusion

It can be concluded that moral development and cognitive styles can predict the meaning of life among patients with type 2 diabetes and these results support the importance of the role of the meaning of life in individuals with type 2 diabetes.

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