→ Research Article

Predicting the Meaning of Life Based on Moral Development, Cognitive Styles, and Hopefulness in Patients With Type 2 Diabetes

Mona Ajabi[1] ID **, Seyedeh Zahra Sadati[2]*** ID **, Zohreh Zadhasan[3]** ID **, Shahnaz Ouliaei[4]** ID

[1]Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran
[2]Assistant Professor, Department of Psychology and Educational Sciences, Qaemshahr Branch, Islamic Azad University, Qaemshahr, Iran
[3]Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran
[4]Department of Educational Sciences, Malayer Branch, Islamic Azad University, Malayer, Iran

Abstract

Background: Diabetes is the fifth leading cause of death in most countries of the world and causes disability, disability, high medical costs, and increased mortality. This study aimed to predict the meaning of life based on moral development, cognitive styles, and hopefulness in patients with type 2 diabetes (T2D).

Methods: The statistical population of this descriptive-correlational study consisted of all patients of the Karaj Diabetes Association in 2019 (Iran), among whom 200 cases were selected by the convenience sampling method and Cochran formula. The Meaning of Life Questionnaire (2006), Kohlberg's Moral development Test (1977), Kolb Cognitive Styles Scale (1981), and Snyder Hope scale (1996) were used for data collection. Pearson correlation test and multiple linear regression were applied to analyze the data by SPSS23, and the significance level was 0.05.

Results: The results revealed that moral development ($\beta=0.15$, $P=0.03$), cognitive styles ($\beta=0.38$, $P<0.001$), and hopefulness ($\beta=0.22$, $P<0.001$) had a positive effect on the meaning of life.

Conclusion: It can be concluded that moral development, cognitive styles, and hopefulness can predict the meaning of life among people with T2D, highlighting the importance of the role of the meaning of life in people with T2D.

Keywords: Moral development, Diabetes mellitus, Cognition, Hope

*Correspondence to
Seyedeh Zahra Sadati,
Tel: +989112578799;
Email: sadati.zahra@yahoo.com

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Background

Diabetes is considered the fifth leading cause of death in most countries worldwide and leads to disability, disability, high medical costs, and increased mortality (1). This chronic disease is caused by a deficiency or inhibition of insulin and is associated with the impaired metabolism of carbohydrates, fats, and proteins (2). The prevalence of type I and II diabetes is increasing worldwide, but the rate of increase in diabetes II is higher. The factors for this increase can be lifestyle changes, the prevalence of obesity, and a decrease in physical activity (3). Diabetes, as the silent epidemic of this century, is one of the health problems in 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 people, which is estimated to be more than 5.1 million by 2025 (5, 6). The meaning of life is considered one of the main components of the psychological health of individuals (7, 8). Researches indicate that meaning

in life is associated with optimism (9). Factors such as the sense of belonging to others, needed, and physical efficiency are meaningful factors in life. The meaning of life with revaluation and new targeting has created new thinking and directions that increase social interactions and environmental impacts (10). Understanding the meaning of life can increase tolerance levels and thus affect factors such as pain perception (11). Stress plays a dual cause and effect concerning diabetes (12). This disease is one of the most common chronic diseases, and there is evidence on the effect of psychological factors on the mentioned disease (13).

Moral development plays an important role in the lives of patients with diabetes and is an infrastructure for interactions that help patients adapt to the disease (14). Ethics grows through stages and depends on the growth of cognition. Each new stage of cognitive development follows a higher level of moral awareness, and moral values are recognized through the interaction of child space with the outside environment. 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). In addition, moral development creates a person's compromise with himself, the surroundings, and situations, and in this way, ensures mental health (16).

Effective psychological research, along with medical treatments is necessary to manage this disease (17). Achieving cognitive development is an essential condition for moral change. The way of passing from the moral elementary stages to the 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. Further, diabetes and the 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 first used by Allport in 1973. He described the cognitive style as the usual way of solving problems, thinking, perception, and recall (20). Cognitive styles intelligently organize people's preferences for acquiring knowledge and, if necessary, modify it (19). Cognitive styles, on the other hand, are closely associated with the concept of psychological differences (20). Cognition refers to the mental and psychological functions of the individual (21).

The other important strength of a person is hopefulness, which is occasionally used interchangeably with optimism, even though many studies revealed that they are related but different concepts (22). One of the strategies of positive psychology is instilling hope for recovering and flourishing individuals (23). According to Snyder (24), hope includes both cognitive and motivational dimensions. It is a positive motivational state which includes an interaction of pathway and agency thinking through the goal attainment process (25).

Palamenaghi et al demonstrated that the meaning of life has a significant relationship with mental, physical, and social health components. Furthermore, the effect of social attitudes, public policies, and proportional to the quality of life predict the meaning of life in these patients (26). In a research study, Stinger et al found that fundamental motivations moderate the relationship between meaning searching and its presence. The results highlighted the importance of style cognitive characteristics in the meaning of life and their relationship with each other (27). Karimi Sani et al concluded that criminals have a lower moral development level than normal people. In general, the level of moral development, meaning of life, and identity style of criminals and non-criminals are different (28).

Objectives

Addressing ethical issues and their growth and development put the person on a path that, by meaningfully giving his life to the difficulties of life, especially against

chronic diseases, adapts himself to the existing conditions and maintains his mental health. Therefore, according to the above-mentioned explanation, this study attempted to investigate variables associated with predicting the meaning of life in diabetic patients. More precisely, it aimed to predict the meaning of life based on moral development, cognitive styles, and hopefulness in patients with type 2 diabetes (T2D).

Methods

This is an applied and descriptive-correlational study. All patients of the Karaj Diabetes Association in 2019 were included in this study. To calculate the required sample size for an unlimited population of Cochran formula, the error value of 0.05, and a previous study (25), 184 subjects were selected for the sample size, which considering the amount of dropouts, 200 participants were considered to fill out the questionnaires of this study. The response rate for this research was 80%. In this study, the convenience sampling method was used to select the samples so that among the available patients with T2D, those who wished to answer questions were selected, and the research questionnaires were provided to them. The inclusion criteria included having T2D (based on medical records), having an education level (diploma and above), and being in the age range of 45-65 years. On the other hand, the exclusion criteria were providing incomplete and invalid information and having a mental illness based on clinical interviews. The reason for choosing the age range between 45 and 65 years was that the research sample in the Karaj Diabetes Association was within this age range. After obtaining oral consent from the participants, the questionnaires were distributed among them, and if each participant had any explanations about each of the questionnaire questions, they would be answered by the researcher.

In this research, the researcher observed several ethical principles, including ensuring the authorities and research assistants of the confidentiality of the information about the participants, presenting the report with the results of the research to the educational-therapeutic centers upon request, explaining the research objectives to the participants, and completing and signing a written informed consent form.

The Meaning of Life Questionnaire

The Meaning of Life Scale was presented by Steger et al to assess the existence of meaning in life and to find it (29). It consists of ten questions. The score of the questionnaire is graded based on the Likert spectrum of 7 degrees and is graded as 1 completely incorrect to 7 completely incorrect. According to the rating of the answers, the total score in this test will be 10-70. The total scores of questions (8-7-3-2-10) are the amount of effort a person makes to find meaning in life, and the sum of the scores of questions (4-1-6-5-9 with reverse coding) determines

the meaning of one's life (29). The validity of this scale for life evaluation was 0.86. For subscale, the existence of meaning was 0.87, and the reliability of the subscales of meaning and meaning search was estimated to be 0.73 and 0.70, respectively (30).

Kohlberg Moral Development Questionnaire

It was developed by Heilbrun and Georges in 1990 to measure altruism orientations and moral judgment. The test has 49 items in which three hypothetical situations are raised, including the riddle of a young burglar with a position (17 questions); Each of these riddles has one position, and each puzzle is divided into two parts; each part has its questions, and at the same time, the questions in the first part are graded with a multi-degree scale from absolutely yes to absolutely not. Moreover, the questions of the second part of the test, which measures the moral level of the individual, are on a 5-degree scale from very high to very low. The scores range from 0 to 96, and obtaining higher grades means observing more ethical issues by the individual (31). Cronbach's alpha coefficient in the original version of the questionnaire, the first part in multiple studies, was 0.74-0.84, and the reliability of the second part of the test was reported to be 0.77 with Cronbach's alpha (31).

Kolb Cognitive Styles Questionnaire

This questionnaire was developed by Kolb in 1981 to measure cognitive styles (32) with 12 items. Each sentence includes four parts that measure reflective observation, concrete experience, active experimentation, and abstract conceptualization, respectively. The four scores obtained from the sum of these four parts in the 12 questions of the questionnaire indicate the four styles of learning. Two scores are obtained from two-by-two subtraction of these styles, namely, the subtraction of abstract conceptualization from concrete experience and active experimentation from reflective observation. These two scores are placed on the axis, which constitutes the four quarters of a square, identified by the four learning styles as diverging, converging, assimilating, and accommodating (32). Emamipour reported the alpha coefficients of abstract conceptualization, concrete experience, active experimentation, and reflective observation as 0.49, 0.51, 0.47, and 0.53, respectively (33).

Snyder Hope Questionnaire

This twelve-question scale, which was first developed by Snyder in 1996, comprises two subscales of passage and motivation (34). To answer each question, alternatives were considered completely wrong to completely correct. In this questionnaire, higher scores indicate higher hope, while lower scores represent lower hope. The reliability of this scale was investigated in the Iranian version by the internal consistency method, and Cronbach's alpha was reported as 0.89 (35). The reliability of this scale was

also assessed by internal consistency in this study, and Cronbach's alpha was 0.84.

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

Results

The distribution of respondents by gender showed that 58% (116) and 42% (84) were females and males, respectively. According to education, 42.5% (85), 13% (26), 36% (72), and 8.5% (17) had a diploma, bachelor's degrees, Master's degrees, and Ph.D, respectively. The mean and SD of research variables are presented in Table 1.

The results of the Kolmogorov-Smirnov test represented that the distribution of the scores of the research variables with a 95% confidence interval was normal.

The results of the Pearson correlation coefficient (Table 2) showed the relationship between moral development and cognitive styles with the meaning of life, indicating that the correlation coefficient between moral development and cognitive styles with the meaning of life was 0.33 and 0.456, respectively. Consequently, there was a significant relationship between moral development, cognitive styles, and hopefulness with the meaning of life in people with diabetes.

Table 1. Mean and SD of Research Variables (n = 200)

Research Variables	Min.	Max.	Mean	SD
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
Hopefulness	17	43	20.14	1.85

Note. SD: Standard deviation; Min.: Minimum; Max.: Maximum.

Table 2. Results of the Pearson Correlation Coefficient of Moral Development and Cognitive Styles

Variables	1	2	3	4
Life meaning	1			
Moral development	0.33**	1		
Cognitive styles	**0.45	**0.46	1	
Hopefulness	**0.57	**0.62	**0.44	1

**$P < 0.001$

Table 3. Report on Regression of Life Based on Moral Development and Cognitive Styles

Predicting Variables	Unstandard 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
Hopefulness	2.91	0.83	0.22	3.50	0.001

According to Table 3, multiple correlation coefficients are the variables of moral development, cognitive styles, and hopefulness with the meaning of life (0.47). In total, these three variables predicted 21.8% of life meaning changes. The data further revealed that moral development ($\beta = 0.15$, $P = 0.03$), cognitive styles ($\beta = 0.38$, 0.001), and hopefulness ($\beta = 0.22$, $P < 0.001$) had a positive effect on the meaning of life. Therefore, the above-mentioned variables could significantly predict the meaning of life.

Discussion

This study aimed to predict the meaning of life based on moral development, cognitive styles, and hopefulness in patients with T2D. Based on the results of the correlation coefficient, there was a significant relationship between moral development, cognitive styles, and hopefulness with the meaning of life in people with diabetes. The findings of this study demonstrated that the level of moral development had a significant relationship with the meaning of life in people with diabetes. Karimi Sani et al found that criminals have a lower level of moral development compared to normal individuals. In general, the levels of moral development, the meaning of life, and identity style of criminals and non-criminals are different (28).

Accordingly, the meaning of life refers to having 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 people's beliefs about the existence of an ultimate goal in life, belief in spirituality, and the hereafter. The existence of meaning in life is associated with well-being of life and mental health (8). Finally, chronic diseases such as diabetes can affect this structure. What has been evaluated in this study regarding the role of the meaning of life, namely, the evolution of ethics and cognitive style both have shown a significant relationship with this construct. 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 is the starting point for the next step while making it possible to achieve a stage. However, the basis of moral levels should not be considered solely in the case of power and the concept of justice. The foundations of moral development include the foundations of others such as love, human emotions, and empathy. The higher levels of ethics (i.e. at the post-contractual and main level), the more prominent the meaning of life is because of their ability to love and empathize, and the meaning of life has a significant relationship with high levels of moral development (11).

Therefore, people 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 research, meaning in life is a useful coping skill that makes a person enjoy his good times 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 (12). This disease is one of the most common chronic diseases, and previous research has investigated the impact of psychological factors on diabetes (11). The complexity of factors affecting the treatment and control of diabetes has led each group of researchers to examine it from a specific perspective. Effective psychological interventions, along with medical treatments are necessary to manage this disease. Achieving cognitive development is a necessary condition for moral change. How to pass from the moral elementary stages to the higher stages relies on the child's cognitive development. Therefore, it is crucial to pay attention to cognitive development and its related styles. Cognitive styles are defined as different ways of receiving and organizing information, implying the learner's methods of processing information in learning new concepts and principles; therefore, they can be used to give a true concept of the meaning of life (12).

The present study was limited to the sample of patients with T2D. This study was conducted on a certain age of patients (between 45 and 65 years old), thus caution should be taken in generalizing the results to patients under 45 or over 65 years of age and those with type 1 diabetes. Data were collected based on self-report scales. The study population consisted of patients with a diabetes diagnosis in Karaj, and due to the specific characteristics of this community, generalization may affect the results. It is suggested that the effects of psychological characteristics (the meaning of life, moral development, and cognitive styles) on other chronic diseases should be evaluated in future studies. It is recommended that this research be investigated in other regions and outside the geographical area of Karaj. In this study, a questionnaire was used to collect data, thus considering that the questionnaires have a self-assessment aspect, there may be bias in responses. Accordingly, it is suggested that the interview method be applied for data collection in future research, especially in collecting variable information about diabetes, using the interview method is necessary.

Conclusion

It can be concluded that moral development, cognitive styles, and hopefulness can predict the meaning of life among people with T2D, and these results support the importance of the role of the meaning of life in people with T2D.

Authors' Contribution
Conceptualization: MA, ZS, Methodology: ZZ, ZS, Validation:

ZS, Formal Analysis: ZZ, Investigation: ZS, MA, SO, Resources: SO, Data Curation: MA, ZS, Writing—Original Draft Preparation: Zohreh Zadhasan, Writing—Review and Editing: MA, ZZ, Visualization: MA, Supervision: ZS, Project Administration: ZZ, Funding Acquisition: ZS, MA, SO.

Conflict of Interests

The authors declare that they have no conflict of interests.

Ethical Approval

All ethical principles were considered in this research. The participants were informed about the purpose of the research and its stages. Informed consent was obtained from the subjects. They were also assured of the confidentiality of their information. Moreover, the subjects were free to withdraw from the study if desired. They were further informed that they would be provided with the results of the research. The present study was registered with IR.IAU.K.REC.1397.054 in the Ethics Organization in the Islamic Azad University of Karaj Branch.

Funding/Support

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