# Quality of Life in Diabetic Patients: The Predicting Role of Personal Resources

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## Abstract

**Background:** Diabetes control is highly self-care and emotional complications and mental stress play an important role in controlling blood sugar in diabetes, and these factors affect the quality of life of people with diabetes. The aim of this study was to determine the predicting role of personal resources for quality of life in diabetic patients.

**Methods:** This was a cross-sectional study done in 2017. The population of this study was all diabetic patients referred to Shahid Motahari, Imam Reza (AS) and Nader Kazemi clinics in Shiraz in 1396. A total of 198 patients were selected by simple random sampling method. Quality of life, optimism, self-efficacy of diabetic and resiliency questionnaires were used for data collection. Data were analyzed by SPSS software version 19 using Pearson correlation and multivariate regression.

**Results:** Findings showed that resiliency, self-efficacy and optimism had a positive and significant relationship with the quality of life of patients with diabetes. In a prediction model, self-efficacy and resiliency could predict 19% of the quality of life changes in patients with type 2 diabetes (P<0.05). The findings of this study showed that self-efficacy and resilience variables predicted the quality of life of patients, but optimism had no predictive power.

**Conclusion:** The results of this study showed that increased self-efficacy and resiliency lead to increased quality of life in diabetic patients. This may help the patients to cope with problems and excitement and is effective in planning interventions for diabetics.

## Introduction

Diabetes is referred to as a "silent epidemic" and is considered a major public health problem in the United States and the rest of the world. This is because diabetes is the most common metabolic disease with an increasing incidence that reduces life expectancy by one third.[1] According to the World Health Organization, prevalence of diabetes in adults worldwide was estimated to be 4.0% in 1995 and will have risen to 5.4% by the year 2025.[2] Currently, there are more than 3 million diabetic patients in Iran; if necessary measures are not taken in this regard, this population is going to be around 7 million.[3]

Concerns and limitations of the disease, such as kidney impairment and visual impairment, affect the perception of the health of these patients, causing various psychological and socioeconomic problems.[4] Psychiatric disorders such as generalized anxiety disorder, mood disorder, panic disorder, sleep disturbances and impaired coping methods have been reported in diabetic patients.[5]

Diabetes mellitus is one of the chronic diseases that affects the quality of life, and these patients are faced with a lot of changes in many aspects of quality of life. For example, severe dietary restrictions, daily

intake of oral drugs or insulin, as well as long-term complications of diabetes affect the quality of their life negatively.[6] Quality of life (QoL) of the patients with diabetes mellitus reflects personal perceptions of life experience, social, vocational and domestic performance against hope and ideals in physical, psychological, relationships, environmental and spiritual aspect.[7] Improved Quality of Life (QOL) is an important goal because quality of life is associated with depression, disease progression, medication compliance, and mortality.[8]

A number of studies have evaluated the role of psychiatric interventions in diabetes. Interventions for behavioral changes have been effective in improving self-care and diabetes control abilities and can improve the quality of life of people with diabetes.[9, 10] Recent studies have shown that self-care behaviors are increased by psychological interventions. According to some researchers, one of the psychological interventions that is effective in improving the quality of life of people with diabetes is the increase in personal resources in people.[11] In various studies, different variables have been selected as the personal sources.[12-14] In this research, three resiliency, self-efficacy and optimism variables were selected as indicators of personal resources.

Self-efficacy is today considered as an important prerequisite for behavior, as it acts as an independent part of the basic skills of a person. Self-efficacy is a key concept derived from social cognitive theory and refers to individual beliefs and judgments about his abilities in performing duties and responsibilities.[15] Social cognitive theory is applicable to health behavior, and especially to the past, for self-management of chronic diseases.[16] Within this framework, self-efficacy plays a central role for self-control behaviors that are related to good management and disease control. In diabetes, low self-efficacy is associated with low blood sugar control.[17, 18]

Garmezy and Masten defined resilience as a process, an ability, or a consequence of successful adaptation to the threatening condition.[19] This structure suggests the ability of individuals to cope with the problems and risks.[20] Resilience is a construct describing an individual's capacity to increase psychological and/or physical well-being in the face of stress. Resilience has been shown to positively impact healthy choices and outcomes.[21]

Optimism is also conceptualized as a source of coping, plays a key role in adapting to chronic diseases, and makes the patients physically and psychologically better.[22]

Diabetic patients need high levels of self-care to control their illness; in addition, emotional complications and mental stress play an important role in controlling blood sugar in diabetes, and these factors also affect the quality of life of people with diabetes. Therefore, any factor that can manage the mental stresses of their lives more efficiently can have a positive effect on the quality of life of these patients. Therefore, it seems necessary to identify the key components affecting the quality of life and determine their predictive role for designing interventions and future plans.

## Materials and Methods

### Population

The population of this study consisted of all Type 2 diabetic patients referred to Shahid Motahari, Imam Reza and Nader Kazemi clinics in Shiraz in 2017. The sample size was at least 188 people according to Cochran formula with a 10% drop; the minimum sample size was considered to be 207. Thus, 207 individuals diagnosed with diabetes by an internist or endocrinologist, according to their own records, had no disease other than diabetes (they did not have synchrony), and still had no problems with physical and mental disorders. They were between the ages of 18 and 60 years old. Exclusion criteria included lack of satisfaction of the employees to participate in the study, incomplete or incorrect completion of questionnaires, co-infection with another illness, age below 18 years or over 60 years, and short duration of diabetes which was considered one year. 198 questionnaires were returned and analyzed.

### Questionnaires
### Quality of Life

Quality of life questionnaire was used to measure the quality of life in diabetic patients, designed by Tomas et al. This questionnaire has 15 questions and aims to assess the quality of life of type 1 and type 2 diabetic patients.[23] This questionnaire is based on a Likert scale rated from 1 (completely dissatisfied) to 5 (completely satisfied). In a research conducted by Nasihatkon et al. (2012), the content validity and internal consistency of this questionnaire were evaluated and confirmed. The correlation between test-retest results was r=0.72 and P=0.01, respectively. Intra-cluster correlation (ICC) was estimated to be 0.77.[24] In this study, the reliability coefficient of Cronbach's alpha was 0.76.

### Optimism

To measure optimism, the LOT-R test was used to determine the extent of life (LO-R) of Scheier and Carver (1985). Scheier et al. (1985) showed that the reliability of this questionnaire using the Cronbach's alpha method was 0.70.[25] In Jadidy et al.'s study (1394), the reliability coefficient of Revised Life Orientation

Test (R-LOT) was 0.67 with Cronbach's alpha and 0.65 with split-half method. To test the validity of this test, we used concurrent validity by adding a general question posed by the researcher. The correlation coefficient was 0.72.[26] In this study, the reliability coefficient by Cronbach's alpha was 0.65.

### Self-Efficacy of Diabetic Patients

Also, for measuring the self-efficacy of diabetic patients, a self-efficacy questionnaire for managing type 2 diabetic (DMSES), developed by Vanderbil and colleagues in 1999, was used. The questionnaire contains 20 questions that measure the patients' ability to monitor their diet, physical activity and blood glucose measurements. Responses are rated on a 5-point Likert scale from "definitely can" to "can't at all". Norouzi and Tahmasebi (2014) examined the psychometric properties of this questionnaire in a sample of 322 diabetic patients. Cronbach's alpha coefficient was reported to be 0.92 for this scale. Criterion validity showed that diabetes management self-efficacy questionnaire was a significant predictor of diabetes self-care behaviors (correlation coefficient 0.61 and $P<0.01$).[27] In this study, the reliability coefficience was calculated, using Cronbach's alpha method of 0.90.

### Resiliency

The resiliency measure in this study was the resiliency scale of Conor and Davidson (2003). The questionnaire has 25 items that are scored on a Likert scale on a scale of zero (completely false) and five (always true).[28] The reliability and validity of the Persian form of resiliency scale have been evaluated and validated in the preliminary studies of normal and patient samples by Besharat et al. Cronbach's alpha of 0.86 is acceptable and confirms the reliability of the questionnaire. The validity of this structure in Iran was confirmed by Besharat in 2007.[29] In this study, the coefficient of reliability was calculated using Cronbach's alpha method 0.91.

The data were analyzed after they were collected through two descriptive and inferential statistics. The descriptive level of central inclination and dispersion indices and inferential level were used to test the hypotheses using Pearson correlation analysis and multivariate regression using SPSS-19 software.

## Results

Participants in this study were 198 patients with diabetes with a mean age of 55.35 years, standard deviation of 8.53, and an average duration of diabetes mellitus of 9.51 years with standard deviation of 6.83. 63 patients from Shahid Motahhari clinic, 67 from Imam Reza clinic and 68 from Nader Kazemi clinic participated in the study. Prior to analyzing the research hypotheses using regression method, regression assumptions were evaluated. The results of the Kolmogorov-Smirnov test for any of the variables were not significant. Also, the Variance Inflation Factor (VIF) for all predictor variables was almost equal to 1, which was far from 10. In addition, the Durbin-Watson value was 1.77, i.e. 0 and 4, so the regression method was suitable.

According to the findings shown in Table 1, the resiliency, self-efficacy and optimism variables had a positive and significant relationship with the quality of life in diabetic patients ($P<0.05$).

As shown in Table 2, the results of multivariate regression analysis revealed that multiple correlation of resiliency, self-efficacy and optimism with quality of life in diabetic patients was 0.44, which is significant at $P<0.01$ level, and these variables accounted for 19% of the variance in quality of life in patients with diabetes. The β obtained also suggests that resilience and self-efficacy predict the quality of life of patients positively, but optimism cannot predict the quality of life. Thus, the formula for modeling of predicting the score of quality of life in diabetic patients was:

Quality of life predicting score=17.06+ (0.163* Resilience Score) + (0.182 * Self-Efficacy Score)

**Table 1:** Mean, standard deviation and correlation matrix of the research variables (n=198)

| Variables | M | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. Quality of life | 45.95 | 9.67 | - | | | |
| 2. Resilience | 65.74 | 17.99 | 0.380** | - | | |
| 3. Self-Efficacy | 84.08 | 13.14 | 0.345** | 0.425** | - | |
| 4. Optimism | 21.70 | 2.61 | 0.161* | 0.108 | 0.173 | |

*$P<0.05$, ** $P<0.01$

**Table 2:** Multiple linear Regression of Predictive Variables with Quality of Life in Patients

| Variables | B | β | t | P | Multiple correlations | The coefficient of determination |
|---|---|---|---|---|---|---|
| Constant | 17.06 | | 2.77 | 0.006 | | |
| Resilience | 0.163 | 0.281 | 3.943 | 0.000 | 0.441 | 0.194 |
| Self-Efficacy | 0.182 | 0.209 | 2.907 | 0.004 | | |
| Optimism | 0.281 | 0.095 | 1.449 | 0.149 | | |

F=15.59, $P<0.01$

Also, the relationship between socio-demographic variables and quality of life in diabetic patients was investigated and the results are shown in the Table below. As shown in Table 3, there was a significant difference in the quality of life between male and female participants and women had a better quality of life. This significant difference was also seen about education, economic status and job status. It means bachelor and employed patients with high economic status had a better quality of life. Howver, there was no significant difference in marital status and residency status between the participants. Also, results showed that there was a negative and significant relationship between age, duration of diabetes, and number of children with quality of life in diabetic patients.

## Discussion

The aim of this study was to determine the predictive role of personal resources for quality of life in diabetic patients. The results of this study showed that self-efficacy, resiliency and optimism had a positive and significant relationship with the quality of life. Similarly, these three variables could predict 19% of the quality of life changes in patients. The findings of this study showed that self-efficacy and resilience variables predicted the quality of life of patients, but optimism had no predictive power. These findings were consistent with some of the previous studies in this field, with some inconsistencies. In addition, Mishali et al. in a study has shown that self-efficacy plays a role in controlling diabetes, and it is necessary to consider self-efficacy evaluation in the first stage of intervention design, which could in turn improve

the quality of life of patients.[30]

Also, based on the results of the research, optimism was not able to predict the quality of life in these patients. In this regard, Fournier et al. (2002) aimed to determine the role of optimistic beliefs in the process of adaptation of the three chronic diseases that are different in self-care by being controlled, a study which looked at the role of optimism in the physical and mental health of patients with diabetes. The results showed that when a chronic disease should be controlled by self-care, physical health was strongly dependent on hope for effectiveness. In contrast, when self-care options for chronic diseases were controlled, physical health was highly dependent on unrealistic thoughts and was negatively related to the hope of effectiveness. The influence of optimistic beliefs on mental health was controlled by self-care. These results indicate that optimistic beliefs are differently beneficial for physical health and depend on the amount of disease control. Unrealistic beliefs are helpful when patients with moderate-to-severe uncontrolled illness are involved, where self-care options are limited. In contrast, hope for positive effects can be helpful in the case of patients with controlled conditions that require self-care.[22] In addition, in explaining the inability of the variable of optimism in predicting the quality of life of diabetic patients, it can be explained that the objectivity and subjectivity of the questionnaires can affect the respondents' perceptions since optimistic variable questions are more subjective than other variables, and subjects are more challenging in answering and understanding the structure. Also, optimism cannot be explained solely at the individual

**Table 3:** Differences in diabetic patients' quality of life based on socio-demographic characteristics

| Variables | Indicators | Quality of Life | N | |
|---|---|---|---|---|
| | | Mean±SD | | P |
| Gender | Male | 44.69±9.59 | 70 | 0.013 |
| | Female | 48.27±9.46 | 128 | |
| Education | Illiterate | 41.26±1.10 | 46 | |
| | Primary | 45.35±1.60 | 40 | |
| | Junior high School | 44.86±1.56 | 30 | |
| | High School | 43.00±3.57 | 5 | 0.01 |
| | Diploma | 48.59±1.43 | 52 | |
| | Associate | 53.00±2.04 | 6 | |
| | Bachelor | 54.71±4.00 | 13 | |
| | Masters and Higher | 50.25±0.47 | 6 | |
| Marital Status | Married | 46.50±9.57 | 171 | 0.271 |
| | Single | 43.00±9.81 | 27 | |
| Economic Status | Low | 42.89±0.84 | 88 | 0.01 |
| | Moderate | 48.10±1.09 | 90 | |
| | High | 51.80±2.60 | 20 | |
| Residency Status | City | 46.44±10.10 | 170 | 0.123 |
| | Rural | 44.04±8.04 | 28 | |
| | R* | | | P |
| Age | -0.151 | 48.59±1.43 | | 0.034 |
| Duration of diabetes | -0.225 | 53.00±2.04 | | 0.002 |
| Number of children | -0.228 | 54.71±4.00 | | 0.003 |

If P Less than 0.05 indicates a significant statistical relationship

*Result of relationship between age, duration of diabetes and number of children with quality of life in diabetic patients

level, and the context is an important component of the optimism of individuals. On the other hand, due to the declining socioeconomic situation in the society and the dominance of a pessimistic atmosphere as a result of economic and social problems, the level of optimism in people has decreased. As to the relationship between socio-demographic variables and quality of life in diabetic patients, it was observed that women significantly had a lower quality of life than men. As shown in a study by Senez et al. (2004), quality of life in diabetic women was lower than diabetic men. Male patients may have more control over their illness than female ones, which can lead to an increase in personal resources in them and improve their quality of life. Also, in this study, the mean score of quality of life in people with undergraduate and postgraduate education was higher than other groups. People with higher levels of education have higher levels of health literacy than illiterate and lower educated people, and have a greater sense of internal control over their illness and their quality of life. In this study, there was an inverse relationship between age, duration of disease and the number of children. Also, they found that, on aging, the quality of life of diabetic patients decreased. The reason for this decline in the quality of life can be the increased age; duration of the disease; increased physical, emotional and self-care limitations; or increased cardiovascular complications and other complications of diabetes due to increased age and duration of the disease.[31] Similarly, Tang et al.'s (2006) research showed that the quality of life of elderly diabetic patients in the social dimension was lower than that of young patients. The results of the study showed a reverse relationship between the number of children and quality of life, so that the quality of life of the patients would be more favorable with fewer children.[32] The study also reported that marital status did not determine the quality of life of the diabetic patient, which is in agreement with the results of Papado Poulos (2007) and Eljedi's (2006) studies.[33, 34] According to the results, the mean of the quality of life in employed people was significantly higher than the unemployed. Employed people, because of better and more effective communication in society, usually have better social protection and a higher self-efficacy than unemployed ones, which can improve their quality of life. The results of this study showed that lower socioeconomic status led to a decrease in the quality of life. Environments with lower socioeconomic status can reduce optimism. In addition to diminishing optimism, it can increas disappointment and insecurity, which is closely linked to depression and anger.[35] The correlation between socioeconomic status and health factors can be explained through resonant psychological resources, including the internal locus of control, optimism, self-efficacy, and self-esteem. People with lower socioeconomic status have fewer resources to manage positive and negative experiences related to their health status and environmental stressors and have lower quality of life.

## Conclusion

This study showed that psychological factors such as personal resources and quality of life in diabetic patients are relevant. It is better to focus on these variables in the first stage of designing interventions for diabetic patients since focusing on modifiable variables to plan effective interventions and determine appropriate strategies is effective in improving the health of diabetics. It can also help the patients to deal with problems and emotions. Paying attention to personal resource variables leads to more effective results in improving long-term outcomes such as quality of life in chronic diseases, including diabetes.

This is a correlation study and only affects the existence of the relationship and the results do not indicate the causality, which is the most important limitation of this research. The variables considered affecting the quality of life of diabetic patients such as self-efficacy, resiliency and optimism can also be considered as limitation of the present study. Another limitation of this study was that the minimum sample size was 207, and with paying attention to research sample loss, more than 207 patients were selected. Therefore, generalization of the results of this study to diabetic patients in other communities should be done with caution. Therefore, in future studies, other possible factors affecting the quality of life such as psychological, cultural, physiological and environmental ones should be investigated.

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