

SELF-CARE MANAGEMENT, EMOTIONAL DISTRESS AND SELF-EFFICACY: RELATIONSHIPS WITH HEALTH-RELATED QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES

Abstract: The purpose of this study was to investigate the combined effects of self-care management, emotional distress, self-efficacy on health-related quality of life as well as investigating the relative contribution of self-care management, emotional distress, self-efficacy to health-related quality of life among patients with type 2 diabetes. The sample was composed of 110 patients of the hospital attendants. They aged between 40 and 60 years with a mean of 49.45 and a standard deviation of 8.23. Diabetes Self-Management Questionnaire (DSMQ, Schmitt et al., 2013), Diabetes Distress Scale (DDS, William et al., 2005), The diabetes management self-efficacy scale (Azita and Rahim, 2014) and Quality of Life Instrument for Indian Diabetes Patients (QOLID, Jitender et al., 2010) were employed for data collection. Findings indicated that there were significant correlations between self-care management, emotional distress, self-efficacy and health-related quality of life. The independent variables (Self-Care Management, Emotional Distress and Self-Efficacy) when put together yielded a coefficient of multiple regression (R) of 0.450 and a multiple correlation square of 0.435.

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INTRODUCTION

Diabetes mellitus by definition, is a "chronic disease caused by an inherited and/or acquired deficiency in the production of insulin by the pancreas, or by the ineffectiveness of the insulin produced" (WHO, 2018). It was found, as estimated Diabetes Atlas published of the International Diabetes Federation (IDF), that 415 million persons had diabetes mellitus in 2015 all over the world, and this number is projected to increase to more than 642 million by 2040 (Thai, Nguyen, Trung, Quang et al. 2018).

Diabetes is considered to be one of the largest global health serious problems of the 21st century. It negatively affected lifestyle, resulting in less physical activity and increased obesity. The age-adjusted death rate of diabetes mellitus (DM) is 22.62 per 100 000 of the population and it ranks 98th in the world (Gebremedhin, Workicho, Angaw 2019). The International Diabetes Federation (IDF) has recognized Egypt as the 9th leading country in the world for the number of type II diabetes patients and its prevalence was nearly tripled over the last 2 decades (Waly and Hamed 2018). Diabetes mellitus is said to be associated with other psychological, social and health problems such as reduced life expectancy, micro-vascular complications, increased risk of macro-vascular complications (ischaemic heart disease, stroke and peripheral vascular disease), and diminished quality of life. Management of diabetes requires complex, continual, and demanding self-care behaviour (Sanjay, Biranchi and Rajiv 2018). It is of great importance that we come to understand factors for self-care and management of diabetes and impact of this chronic disease on patients' health related quality of life.

HEALTH-RELATED QUALITY OF LIFE

Quality of life is defined as an "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 2018). While health-related quality of life, which is seen as physical, psychological, and social domains of health, influenced by a person's experiences,

beliefs, expectations, and perceptions (Gebremedhin et al. 2019).

Recently, health-related quality of life has become an interesting issue for research (Raghuvansh, Pawan and Roopkamal 2018). Different researchers reported that diabetes has a negative impact on health-related quality of life (Kidist, Zeleke, Bizuayehu and Hordofa 2018). Developing a scale for measuring health-related quality of life will help healthcare professionals in monitoring treatment guidelines and improving patients' health-related quality of life. This can also guide interventions that will improve their situation and avert more serious consequences (Gebremedhin et al. 2019). Several studies have shown that diabetes correlated negatively with quality of life in patients. Nevertheless, these patients can experience a better quality of life with proper control and management of blood glucose (Azar et al. 2015)

Grace, Samuel et al. (2017) found that the overall Quality of life in Ghana and Nigeria were relatively low. In Ghana, significant correlates of higher scores on the Quality of life scale were medication adherence and employment status. Among patients in Nigeria, employment status and diabetes mellitus empowerment were significant predictors of Quality of life in patients with diabetes mellitus. A positive and significant correlation was also observed between self-caring and life quality associated with health (Elnaz, Ali and Fariba 2016).

SELF-CARE MANAGEMENT

Self-management has been considered one of the most important factors in the treatment of type 2 diabetes (Saeideh, 2017). Patient self-care management refers how serious the patient is in his intention to follow a diabetic meal plan and prescribed medication regimen, corresponding with the recommendations made by his doctors or healthcare professionals (Rami, Abdelmajid et al., 2017). Diabetes self-management is a right step on the right track in order to achieving healthy and satisfying life (Sanjay et al. 2018). Manjula and Jayarani (2015) found a positive correlation between self-efficacy and self-care behaviour. They also reported an increase in self efficacy and self-care behaviour as associated with a decrease in HbA1c (refers to glucose and haemoglobin

joined together) values. It was noted that HbA1c and self-efficacy was significantly associated with age. Only a very small percentage of study subjects had good self-efficacy and self-care behaviour.

Khalid, Garth and Snider (2015) reported that most of their participants reported that they took their medication as prescribed by their doctors and healthcare professionals, however, many of them did this not in compliance with other self-management practices. The better self-care behavior was correlated with better score in the satisfaction domain (Liu, Tai, Hung, Hsieh and Wang, 2010)

SELF-EFFICACY

Diabetes self-efficacy is defined as beliefs about personal capacity to hold diabetic self-care skills (Saeideh 2017). Highly self-efficacious patients are successful in self-management of their chronic conditions (Dallolio et al. 2018). Health care providers find self-efficacy, or the belief that one can self-manage one's own health, an important goal particularly in their endeavour for handling or dealing with or treating chronic illness (Rossella, Paola et al., 2018). Perceived self-efficacy could lead to self-management behaviours among diabetic patients (Azita and Rahim 2014).

Patients' diabetes self-efficacy predicts their adherence of medication and is shown to be correlated with other psychosocial variables such as attitudes, perceived relationship with health care providers, perceived social support, and quality of life (Celano, Beale, Moore, Wexler and Huffman, 2013). Saeideh (2017) reported significant positive correlations between self-efficacy and social support subscales, self-care and health-related quality of life. The final path model fitted well and showed that direct self-care paths and indirect social support had the most effects on health-related quality of life.

Hajar et al.(2017)found a negative correlation between age and general self-efficacy and diabetes self-efficacy while, there was a positive correlation between general self-efficacy and diabetes self-efficacy.

EMOTIONAL DISTRESS

Pouwer et al. (2005) indicate that patients with diabetes suffer from high levels of diabetes-specific emotional stress. Worrying about the future and the possibility of serious complications are among serious emotional problem that patients with type 2 diabetes suffer from. They also feel guilty or anxious when you get off track with diabetes management (François 2009)

Emotional problems might have a role to play in complicating the required self-management of the disease and lessen the persons' abilities to manage self-care activities necessary to achieve an adequate glycaemic control (Ragnhild et al., 2014).

Liu et al. (2010) found that emotional distress was correlated negatively with quality of life scores. Emotional distress was the most important explanatory factor of quality of life, accounting for 28.7%-53.8% of total variance.

For some individuals, high disease emotional distress may affect self-management and adherence to medication which has subsequent effects on glycaemic control. While for other persons, poor control can lead to distress, which can influence disease management (Boon et al., 2015).

PROBLEM STATEMENT

Most of doctors and health professionals all over the world still focus on treating diabetes mellitus, but they go less aware of the social and economic impact that diabetes has. They also are unacknowledged or have limited knowledge/information on health-related quality of life profile of their patients. This misunderstanding in turn, is regarded as the biggest barrier to have effective intervention strategies that could help stop the high increase in type II diabetes. This study poses the following questions:

1-Are there relationships between and among self-care management, emotional distress, self-efficacy and health-related quality of life?

2-What are the combined effects of self-care management, emotional distress, self-efficacy on health-related quality of life?

3-What is the relative contribution of self-care management, emotional distress, self-efficacy to health-related quality of life?

SIGNIFICANCE OF THE STUDY

This study could contribute to the literature on health-related quality of life among patients with type 2 diabetes. The study is concerned with patients who suffer from diabetes mellitus and presents some factors, namely self-care management, emotional distress, self-efficacy in order to know their relative contribution to health-related quality of life. This may help them be optimistic that the diabetes mellitus will not have a negative effect on their life.

HYPOTHESES

Hypothesis 1: There is a positive correlation between self-care management, self-efficacy and health-related quality of life.

Hypothesis 2: There is a negative correlation between emotional distress and health-related quality of life.

Hypothesis 3: There are combined effects of self-care management, emotional distress, self-efficacy on health-related quality of life.

Hypothesis 4: Self-care management, emotional distress, self-efficacy contribute to health-related quality of life.

METHOD

DESIGN

For the purpose of this study, quantitative survey research was employed. The independent variables are self-care management, emotional distress, self-efficacy, while the dependent variable is health-related quality of life.

PARTICIPANTS

A convenient sampling method was used to recruit the participants. They were from Unit of diabetes and endocrine in department of Internal Medicine Mansoura University Hospital. The sample was composed of 110 patients of the hospital attendants. They aged between 40 and 60 years with a mean of 49.45 and a standard

deviation of 8.23. In order to be included in this study, patients should meet the following criteria: (i) 40 years and above; (ii) diabetes diagnosis of 12 months duration; (iii) are able to read and write. Individuals who met these inclusion criteria and provided consent were recruited to the study. The instruments for the study were delivered to the unit staff (doctors and nurses) in order to be administered. Eighty (72.7%) males and 30 (27.3%) females participated in the study. One-hundred (81.8%) were married and live with their families (wife, husband and children), six (5.4%) widows and four (3.6%) divorced/separated. Eight (7.2%) were Christian and one-hundred and two (92.7%) were Muslim. Their educational qualifications revealed that 67 (60.9%) are primary/preparatory, 28 (25.4%) were bachelor holders and 15 (13.6%) were technical school degree holders.

INSTRUMENTS

Diabetes Self-Management Questionnaire (DSMQ, Schmitt et al., 2013). A four-point Likert scale (3-‘applies to me very much’ to 0-‘does not apply to me’) consisting of 16 items that cover five different aspects of diabetes self-management. Higher scores indicate more desirable self-management behaviour. The scales reflect patients’ dietary control, medication adherence, blood glucose monitoring, physical activity, and physician contact. Internal consistency coefficient (Cronbach’s alpha) values for dietary control was 0.78; medication adherence was 0.76; blood glucose monitoring was 0.84; physical activity was 0.75; physician contact 0.72 and the whole scale was 0.88. For convergent validity of Diabetes Self-Management Questionnaire, correlation with the Self-management skills Scale (Mansour, Abdul Meneim, and Rayan 2015) was significant ($r=0.63, p<.01$).

Diabetes Distress Scale (DDS, William et al., 2005). It is a 17-item Likert scale examining distress experiences among patients with diabetes. Patients respond to each item by 1 (no distress) to 6 (serious distress). This scale has four subscales: emotional distress (EB), regimen distress (RD), interpersonal distress (ID), and physician distress (PD). The composite score of

the scale was calculated by summing the 17 items' results and the sum is divided by 17. Composite score of less than 2 (on each subscale) is considered moderate distress, but if it is ≥ 3 , then it is classified as a high distress. Internal consistency coefficient (Cronbach's alpha) values for emotional distress (EB) was 0.83, regimen distress (RD) was 0.87, interpersonal distress (ID) was 0.88, physician distress (PD) was 0.90 and the whole scale was 0.92. For convergent validity of Diabetes Distress Scale, correlation with the Psychological Stress Scale (Hassan 2007) was significant ($r = 0.62, p < .01$).

The diabetes management self-efficacy scale (DMSES) (Azita and Rahim, 2014). This scale aims at estimating the extent to which diabetic patients are confident at their abilities to manage their blood sugar, diet, and level of exercise. It is 5 point Likert scale ranging from "can't do at all" to "certain can do". It consists of 20 items. Higher scores indicate higher self-efficacy in

performing diabetes management self-efficacy activities. In this study, internal consistency coefficient (Cronbach's alpha) values for of the diabetes management self-efficacy subscales were: 0.70 for specific nutrition, 0.78 for general nutrition, 0.83 for blood glucose control, 0.85 for physical activity & weight control, 0.87 for medical control and 0.90 for the whole scale. Construct validity of the DMSES, by the original authors, was assessed using exploratory and confirmatory factor analysis which yielded 5 logical categories including: a) specific nutrition; b) general nutrition, c) blood glucose control; d) physical activity & weight control; and e) medical control. For discriminant validity of the diabetes management self-efficacy scale, Mean, Std. Deviation and t values for the differences between high and low groups. All values were significant at level ($p < .01$), which indicated the discriminant ability of the scale discriminate between two groups.

Table 1. Mean, Std. Deviation and t values for the differences between high and low groups in (DMSES)

group	N	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)	Mean Difference
S N High	40	13.4750	1.15442	.18253	11.371	.000	3.60000
Low	40	9.8750	1.63593	.25866			
GN High	40	13.0250	1.12061	.17718	20.896	.000	4.45000
Low	40	8.5750	.74722	.11815			
BGC High	40	14.4750	1.79726	.28417	11.141	.000	5.42500
Low	40	9.0500	2.50077	.39541			
PAW High	40	14.3500	1.81941	.28767	10.839	.000	5.30000
Low	40	9.0500	2.50077	.39541			
MC High	40	14.3750	1.79297	.28349	10.945	.000	5.32500
Low	40	9.0500	2.50077	.39541			

Quality of Life Instrument for Indian Diabetes Patients (QOLID, Jitender, Arvind, Sonia and Abhishek, 2010). It is a 34 items 5 Likert- Scale. It covers 8 aspects of quality of life: role limitations due physical health, physical endurance, general health, treatment satisfaction, symptom frequency, financial worries, mental health, and diet advice satisfaction. A score for

each domain was calculated by simple addition of items scores. Each individual domain score was then standardized by dividing by maximum possible domain score and multiplying by 100. All individual standardized domain scores were then added and divided by 8 (number of domain) to obtain an overall score. The scale had overall reliability (Cronbach's alpha 0.894) and

significance subscale reliability (0.55 to 0.85). In this study, reliability was calculated by using t-retest after 14 days. Correlation coefficient were 0.691 for the whole scale ($p < .01$). As for validity, exploratory factor analysis was used. Eigenvalues greater than 1 and factor loading cut-off of 0.4 were used in order to obtain the best fitting

structure and the correct number of factors. In this study, 8 factors provided the most meaningful factor pattern and accounted for 61.7% of the total variance. The factor loadings and factor structure resulting from factor analysis through varimax rotation are shown in table 2.

Table 2. Rotated factor analysis of (QOLID)

Item number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
1	0.621							
2	0.601							
3	0.605							
4	0.598							
5	0.603							
6	0.607							
7		0.567						
8		0.588						
9		0.545						
10		0.577						
11		0.541						
12		0.537						
13			0.611					
14			0.602					
15			0.620					
16				0.600				
17				0.601				
18				0.612				
19				0.618				
20					0.579			
21					0.571			
22					0.610			
23						0.622		
24						0.604		
25						0.602		
6						0.611		
27							0.607	
28							0.604	
29							0.617	
30							0.612	
31							0.630	
32								0.605
33								0.608
34								0.611

PROCEDURES

Prior to administering the scales, patients were informed about purpose of the study and voluntarily stated that they accept to participate to the study. To ensure that the respondents responded to the items honestly and sincerely, they were told not to identify themselves in any

way on the scale paper. They were also informed that they should not be concerned with anything concerns their participation in the study and their responses are for research purposes only and would be kept confidential. All data were entered in an SPSS file.

DATA ANALYSIS

The data were analysed using Pearson correlation and multiple regression. Multiple regression was used to explore the relative contributions of self-care management, emotional distress, self-efficacy to the prediction of health-related quality of life among patients with type 2 diabetes.

RESULTS

Descriptive data and inter-correlations

Table 3 shows the means, descriptive statistics and inter-correlations of self-care management, emotional distress, self-efficacy and health-related quality of life. Table 3 shows that there are significant correlations between self-care management, emotional distress, self-efficacy and health-related quality of life. self-care management correlates positively with self-efficacy ($r = 0.578$), and health-related quality of life ($r = 0.608$). However, it correlates negatively with emotional distress ($r = -0.542$).

Table 3. Descriptive statistics and inter-correlations of self-care management, emotional distress, self-efficacy and health-related quality of life.

Variables	self-care management	emotional distress	self-efficacy	health-related quality of life
self-care management	1.00	-.542**	.608**	.608**
emotional distress	-.542**	1.00	-.552**	-.455**
self-efficacy	.578**	-.552**	1.00	.580**
health-related quality of life	.608**	-.455**	.580**	1.00
Mean	35.018	34.972	34.681	43.709
Standard deviation	4.199	4.134	4.214	4.025
** P <.01				

SELF-CARE MANAGEMENT, EMOTIONAL DISTRESS AND SELF-EFFICACY AS PREDICTORS OF HEALTH RELATED QUALITY OF LIFE

Results presented in table 4 show that the independent variables (Self-Care Management, Emotional Distress and Self-Efficacy) when put together yielded a coefficient of multiple regression (R) of 0.450 and a multiple correlation square of 0.435. This shows that 43.5% of the total variance in health-related quality of life of

those who participated in the study is accounted for by the combination of self-care management, emotional distress and self-efficacy. Table 5 indicates that the analysis of variance of the multiple regression data produced an F-ratio value significant at 0.01 level ($F(3, 106) = 28.962$; $P < 0.01$).

Table 4. The regression results of the Predictor Variables (Self-Care Management, Emotional Distress and Self-Efficacy) and the Outcome Measure (Health-Related Quality of Life). Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square change	F Change	Df1	Df2	Sig. F change
1	.671a	.450	.435	3.02644	.450	28.962	3	106	.000

- a. Predictors: (Constant), DMSES, DDS, DSMQ
 b. Dependent Variable: QOLID.

Table 5. Summary of Multiple Regression Analysis between the Predictor Variables (Self-Care Management, Emotional Distress and Self-Efficacy) and the Outcome Measure(Health-Related Quality of Life). ANOVA.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	795.803	3	265.962	28.962	.000a
Residual	970.888	106	331.277		
Total	1766.691	109			

- a. Predictors: (Constant), DMSES, DDS, DSMQ
 b. Dependent Variable: QOLID.

As for results displayed in table 6, the independent variables made significant individual contributions to the prediction of health-related quality of life. The results indicated that the following beta weights which represented the relative contribution of the independent variables to the prediction were observed. self-care

management ($b = 0.370$, $t = 4.128$; $P < 0.01$) and self-efficacy ($b = 0.303$, $t = 3.374$, $P < 0.01$). However, the contribution of emotional distress to health-related quality of life did not reach significant level. This means that emotional distress does not predict health-related quality of life.

Table 6. Relative Contribution of the Independent Variables to the Prediction of Health-Related Quality of Life. Coefficients.

Model	Unstandarized coefficients		Standarized coefficients	t	Sig
	B	Std error	Beta		
1 (constant)	8.839	2.897		3.051	.003
DSMQ	0.370	0.090	0.386	4.128	.000
DDS	0.069	0.089	0.070	0.770	.443
DMSES	0.303	0.090	0.318	3.374	.001

- a. Predictors: (Constant), DMSES, DDS, DSMQ
 b. Dependent Variable: QOLID.

As is shown in *Figure 1* the histogram of the residuals with a normal curve superimposed. The residuals look close to normal. The normal probability plot of the residuals as shown in *Figure 2*. is approximately linear. This supports

the condition that the error terms are distributed in a normal way. Overall , as shown in figure 3, the residual plot (see below) shows the residuals and a histogram with a normal distribution overlay.

Figure 1. Regression Standardized Residual

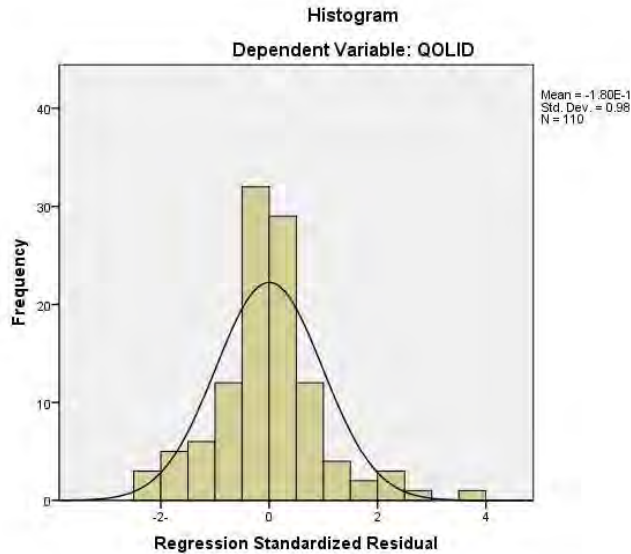


Figure 2. Normal P-P Plot of Regression Standardized Residual

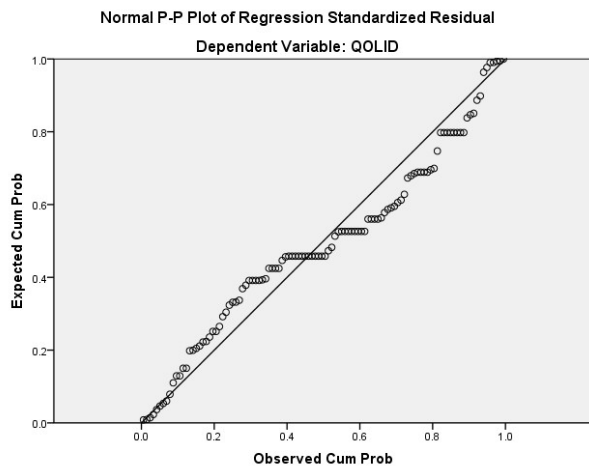
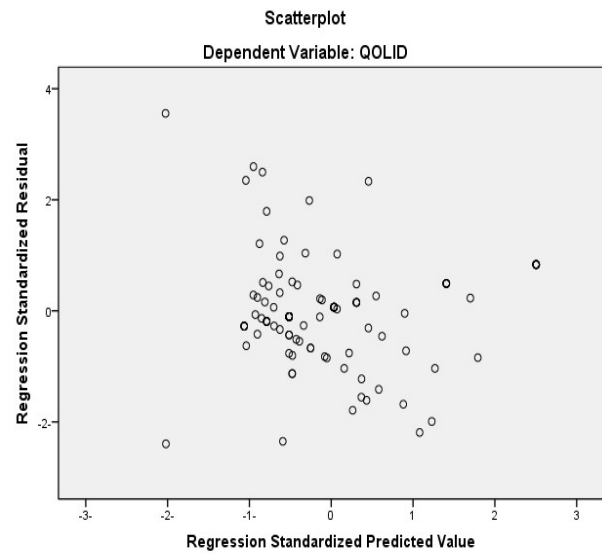


Figure 3. Scatterplot



DISCUSSION

The purpose of this study was to investigate the combined effects of self-care management, emotional distress, self-efficacy on health-related quality of life as well as investigating the relative contribution of self-care management, emotional distress, self-efficacy to health-related quality of life among patients with type 2 diabetes. Additionally, the aim was to find out if there were relationships between and among self-care management, emotional distress, self-efficacy and health-related quality of life. In this regard, the findings extend our knowledge on the association between self-care management, emotional distress, self-efficacy and health-related quality of life among patients with type 2 diabetes.

Emotional Distress correlated negatively with self-care management, self-efficacy and health-related quality of life. That is, the higher self-efficacy a diabetic patient has, the less emotionally distressed he might be. Also, when health-related quality of life is achieved this means that the person is leading a normal, psychological life. Hence, when emotional distress is severe, then one's own quality of life becomes worse. This goes in the same line with the findings of Liu et al.(2010) who found that the more severe the emotional distress, the worse quality of life scores were in every domain .

The findings from this study indicated that self-care management can play an important role in improving health-related quality of life among patients with type 2 diabetes. This goes in the same line with the findings of Riegel, Jaarsma and Stromberg (2012) who found that self-care management can enhance quality of life, and lessen healthcare costs. On the other hand, self-efficacy can have a buffering effect on risk factors that may impact health-related quality of life. It also helps patients to adopt a healthy lifestyle, and reduces negative affect (emotional distress) that might be produced as one experience chronic disease like diabetes. This goes in the same line with the findings of Yehle and Plake (2010) who found that self-efficacy may influence the performing of self-care health behaviours that can prevent or moderate the impact of risk factors on the individual's quality of life. Better self-efficacy scores were associated with better self-care management and health-related quality of life.

Patient's diabetes self-efficacy can be a good predictor of his/her medication adherence and can be associated with perceived social support from family and significant others ,and quality of life. This goes in the same line with the findings of Azar et al. (2015) who concluded that self-efficacy as a variable influenced adjusted self-management.

High levels of both self-efficacy and self-care management are needed to manage or handle the daily challenges associated with caring for diabetes, as higher levels of both of them help patients to perform better in diabetes self-care practices.

CONCLUSION

In conclusion, the present study provided evidence that self-care management, and self-efficacy had combined effects on health-related quality of life. Meanwhile, emotional distress did not predict health-related quality of life. Emotional distress, as a negative factor, might prevent patients from enjoying health-related quality of life. Having higher levels of self-efficacy was associated with better self-care management and health-related quality of life. It helps patients to practice diabetes self-care against diabetes. Moreover, being emotionally distressed, may affects the patient to have poor self-efficacy, which in turn has a bad effect on health-related quality of life. The results of this study pointed to the importance of including self-care management, and self-efficacy in improving health-related quality of life among patients with type 2 diabetes.

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