

## The relationship between social support and self-care behavior in patients with diabetes mellitus

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**A** – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

**Summary Background.** Diabetes mellitus (DM) is currently not curable but controllable and must be managed. Family support has been stated as a vital component in successful control of DM and the strongest determinant of adherence to diet therapy in DM patients.

**Objectives.** The study was conducted to examine social support and its relationship with practicing self-care behavior in patients with DM in Mashhad.

**Material and methods.** In this analytical cross-sectional study, 400 patients with DM were selected over two months from DM clinics in Mashhad using the census sampling method. Data was collected using demographic information, social support and self-care questionnaires. Data analysis was done in SPSS 21 using the statistical Spearman's rank correlation coefficient, *t*-Test and analysis of variance.

**Results.** The results indicated a significant relationship between the social support and self-care behavior of DM patients ( $p = 0.031$ ). This means that social support is an effective factor in practicing self-care behaviors. Moreover, the results indicated that most of the samples had moderate social support and self-care behavior. There was a significant relationship between self-care and health literacy in the study ( $p = 0.026$ ): individuals with higher health literacy had better self-care. There was a significant relationship between education and monthly income with self-care behaviors and support of the individuals ( $p = 0.001$ ).

**Conclusions.** Individuals with better social support have adhered to DM self-care behaviors, and adhering to self-care behaviors has led to blood sugar control and prevention of adverse effects. Furthermore, patient support and participation in self-care enable them to take the next step for better management of the disease and prevention of future adverse effects.

**Key words:** social support, diabetes mellitus, self care.

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### Background

Over recent decades, the prevalence of DM in the world has increased annually by about 6%, with the world facing a DM epidemic. According to a prediction by the World Health Organization (WHO), the number of 20-year-old and older adults with DM is expected to reach 300 million by 2025 [1]. Additionally, 150 million people suffer from DM in the world, 15% of whom suffer from diabetic foot ulcers [2]. The prevalence of DM is estimated to be 7.7% in Iran's 25–64-year-old population [3]. According to studies available, the most significant cause of mortality in DM patients and chronic adverse effects of DM is lack of self-care [4]. Self-care in DM is considered as one of the most basic solutions for controlling the disease and prevents 85% of these problems and can reduce the readmission of these patients [5].

DM is currently not curable but controllable and must be managed. Type 2 DM control involves the implementation of a multidimensional self-care program that usually involves blood glucose determination, diet, exercise, medication, body weight control and training.

Such self-care activities may be very demanding and usually involve major changes in lifestyle, thus many patients do not fully comply with medical recommendations despite their awareness of the adverse effects of the disease, leading to the possibility of the spread of complications related to DM increasing. Various studies indicate that social support has positive effects on different aspects of self-care activities. This concept is defined as social support being “the facilities others provide for the individual” [6]. Social support has been defined as the feeling of acceptance by others [7], as well as the degree of having love, companionship and the attention of family members,



friends and others [8]. It can affect all family members, thus family support is considered as a vital component in successful control of DM and the strongest determinant of adherence to diet therapy in Type 2 DM patients [9].

Social support affects DM control through two major processes: a) social-support direct effect through health-related behaviors, such as enjoining healthy behaviors, and b) the moderating effect of social support that helps moderate the effects of acute and chronic stress on health, as well as increased adaptation to DM [6]. Previous studies have shown a relationship between social support as an environmental and psychological factor and self-care behaviors [10]. Moreover, low social support from friends and others can affect the health status situation, and high levels of social support are associated with higher physical and psychological levels [11].

## Objectives

Given the points stated and the status of social support in practicing self-care behaviors in DM patients, the study was conducted to examine social support and its relationship with practicing self-care behaviors in patients with DM in Mashhad.

## Material and methods

This was an analytical cross-sectional study carried out on DM patients over 30 years of age in Mashhad. Inclusion criteria were the willingness to participate in the study, definitive diagnosis of Type 2 DM based on laboratory evidence recorded in inpatient health records in healthcare centers, not having any chronic illnesses and DM adverse effects, age 30 and over, Iranian nationality and at least 6 months have passed from the disease diagnoses. The exclusion criteria were withdrawal from the study, suffering DM adverse effects, patients with gestational DM and any medical problems preventing self-care behaviors (exercise and regular physical activity). Random sampling method was available. The sampling was random convenience sampling method. Given the sample size of 400, the individuals took part in the study after becoming aware of the project goals.

The following tools were used for data collection: 1. Demographic information questionnaire with 11 questions, such as age, gender, education level, job type, duration of illness, etc. and 2. Social Support Questionnaire (SSQ). This scale was developed in 1986 by Wux, Riedel and Stewart using the Structure Analysis Method and has 23 questions in three subscales: family support, 8 items; friend support, 7 items; and others' support, 8 items. The answering method was yes or no, where the scores were divided into three groups: poor, average and good. Individuals with scores below 50% were placed in the poor group, between 50–75% in the average, and above 75% in the good group. The validity and reliability of this questionnaire were

reported on in previous studies in Iran [12]. The self-care behavior construct was based on the short form of the self-care behaviors questionnaire by Toobert and Glasgow (Summary of Diabetes Self-Care Activities (SDSCA)) [13], the validity and reliability of which have been proven in many studies in Iran, such as the study by Hatamloo et al. [14]. The questionnaire has 12 questions and measures self-care behavior in 4 domains (nutrition, physical activity, blood sugar monitoring and blood sugar consumption) over the past 2 days.

The scores in the questionnaire ranged from zero to two. If a patient selects all days of the week in answering a question like "How many days of exercise or physical activity did you have in the past week?", he gets the highest score (i.e. 2). If he had not done so in the past week, he would receive zero. This was done for all 4 self-care behaviors, including diet, physical activity or exercise, using an anti-DM drug and blood glucose self-control behavior. Higher scores show more favorable self-care behaviors over the past week. One has to note that the researcher completed the questionnaires as a structured interview with participants in 15–23 minutes.

Data was analyzed in SPSS 21 using Spearman's rank correlation coefficient, independent *t*-Test and analysis of variance. The significance level in all tests was considered as less than 0.05.

## Ethical approval and consent to participate

All procedures performed in the study followed the ethical standards of the institutional and/or national research committee and those of the 1964 Helsinki declaration. All project participants were informed of the study objectives and completed a written consent form and were assured of the confidentiality of their personal information.

## Results

The age of the patients in the study ranged from 33 to 71 years, with a mean age of  $53.8 \pm 11.9$ . A majority of the participants in the study had Type 2 DM (89%) and were female (59%), married (69%), with high school education (35%) and 73% of the participants had a family history of DM, and the source of health information on DM for 76% of the individuals was physicians and clinic staff.

Thus, the comparison of mean self-care scores based on individual characteristics of the patients and disease specifications did not show any significant differences in various age groups and the mean score of self-care behaviors ( $p = NS$ ).

The results showed that the mean self-care score had a significant relationship with educational level, economic status and regular physician visits, thus the mean self-care score was significantly higher in patients with university education and higher economic status and in those who regularly visited a physician compared to the others (Table 1).

Table 1. Self-care score values in terms of statistical variables

Specifications	Number	Percent	Self-care score	Test result*
			Mean $\pm$ SD	
Age (years)				
30–40	103	25	$31.9 \pm 13.1$	$f = 0.3$
40–50	125	31	$34.6 \pm 9.7$	
50–60	172	43	$28.1 \pm 12.7$	$p = NS$
$\leq 60$	40	10	$26.9 \pm 7.4$	
Gender				
female	236	59	$32.4 \pm 12.8$	$2X = 2.4$
male	164	41	$28.6 \pm 8.6$	$p = NS$
Marital status				
single	35	8	$34.9 \pm 11.8$	$2X = 0.4$
married	278	69	$30.6 \pm 12.2$	$p = NS$
widowed and divorced	87	21	$29.4 \pm 7.9$	

Specifications	Number	Percent	Self-care score	Test result*
			Mean $\pm$ SD	
Education				
elementary	91	22	28.7 $\pm$ 12.7	$F = 4.3$ 0.03
guidance	94	23	31.0 $\pm$ 10.4	
secondary	140	35	30.1 $\pm$ 13.1	
academic	75	19	32.9 $\pm$ 9.4	
See your doctor regularly				
yes	274	68	37.9 $\pm$ 10.8	$t = 3.8$ 0.001
no	126	32	31.3 $\pm$ 12.5	
Family history of diabetes				
yes	293	73	35.7 $\pm$ 11.2	$t = 1.2$ $p = NS$
no	107	27	30.5 $\pm$ 9.7	
Economic situation				
poor	82	21	30.6 $\pm$ 13.2	$2X = 3.7$ 0.04
medium	218	55	31.4 $\pm$ 12.3	
good	78	19	31.7 $\pm$ 9.2	
excellent	22	5	34.7 $\pm$ 10.6	

\*Significance level was less than 0.05 in all subjects.

Social support	Age	Marital status	Education	Family history of diabetes	Economic situation
Correlation coefficient	-3.681	0.385	4.973	0.473	2.690
Significance level	$p < 0.005$	0.812	$p < 0.005$	0.721	0.048

	Mean $\pm$ SD	Poor	Medium	Good	Excellent
		Number (percent)	Number (percent)	Number (percent)	Number (percent)
Social support	17.16 $\pm$ 4.07	52 (13)	185 (46.2)	163 (40.7)	-
Self-care behavior	34.85 $\pm$ 12.19	137 (34.2)	166 (41.5)	83 (20.7)	14 (3.5)

Dimensions of self-care	Social support	
	Correlation coefficient	Significance level
Healthy diet	0.758	$p < 0.001$
Physical activity	0.893	$p < 0.001$
Blood sugar monitoring	0.680	$p < 0.001$
Proper use of medicines	0.737	$p < 0.001$

There were no significant relationships between gender, marital status and family history of DM and self-care behaviors in the study ( $p = NS$ ) (Table 2).

The results showed a significant and inverse relationship between social support and the age of the subjects ( $p < 0.005$ ): social support decreased with an increase in age. However, there was a significant and direct relationship with the level of education. No significant relationships were found between social support and marital status, family history of DM and economic status.

In the examination of social support, the results showed that 40.7% of the samples had good social support, 46.2% average social support, and the rest had poor social support. The mean score of overall social support was 17.16, determined by desirability level, which shows that the mean score of social support in these patients was average, and the majority of samples had moderate to poor self-care (Table 3).

In the descriptive statistics, the mean total score of self-care was 34.85, with a standard deviation of 12.19, which indicates that the score of self-care behavior in these patients is average, with the majority of samples having average and poor self-care based on desirability level.

Spearman's rank correlation coefficient between social support and the domains of diabetes self-care behaviors (healthy eating behaviors, physical activity, blood glucose monitoring, and proper medication use) was significantly and directly correlated (Table 4).

## Discussion

The study was conducted to examine the relationship between social support and self-care behaviors in patients with DM admitted to public and private centers in Mashhad.

In this study, the self-care score was close to 34.85  $\pm$  12.19 and showed at least moderate levels of self-care. This finding was in agreement with previous studies conducted by Anbari et al. [15], Kordi et al. [16] and Moeini et al. [17].

Moreover, the study by Jordan et al. on self-care behaviors in DM patients in America showed that patients' self-care status was moderately favorable [18]. However, in the study by Mazlom et al. [19] and Parham et al. [20], the self-care of the studied samples was reported as poor and undesirable. It seems that the differences in patients' self-care status in various studies are

due to various elements, such as differences in social support of the samples examined, differences in self-care education programs for DM patients or differences in knowledge and attitude towards self-care behavior.

In this study, perceived social support was close to 46% of the participants and showed at least moderate levels of social support. This finding was in agreement with the previous studies conducted by Cooper et al. [21] and Gillibrand and Stevenson [22].

In a study, Heidari indicated that social support in DM patients is not favorable [23], and Morovvati and Rouhani [24] reported that social support in DM patients was not desirable. These results are consistent with the findings of this study.

The results of various studies show that social support is one of the factors affecting health and self-care behaviors. Among the other positive results of social support are increased behavioral health, personal growth and competence and better adaptation to the illness [25].

The results showed a direct and significant relationship between self-care behavior and social support among DM patients, and thus patients with higher social support showed better self-care behaviors. Therefore, social support, especially family support, can be a vital component in successful DM control. Idalski Carcone et al. reported that social support plays a direct role in controlling and enhancing self-care behaviors in patients with DM [10]. Furthermore, the study by Zare Shahabadi et al. indicated a direct and significant relationship between perceived social support and self-care activities [26].

Aalto and Uutela showed a relationship between social support and adherence to diet therapy in DM patients as well [27]. Glasgow et al. reported that family support was the strongest determinant of adherence to diet therapy in patients with Type 2 DM [9]. Sharifirad et al. consider one of the hurdles to patients' adherence to diet compliance was lack of social and family support [28]. Those receiving higher levels of social support from their spouses and those around them will adhere better to self-care behaviors [29].

In examining family support, diet, and exercise among old Mexican-Americans with Type 2 DM, Wen et al. showed that adherence to diet and exercising improved with the increase in this support [30]. Marzilli and Cossege showed that family support has a significant effect on adherence to diet and exercise in DM patients [31], which is consistent with the results of the present study.

In his results, Klomegah showed that if family members, friends and relatives adhere to a healthy diet, adherence to a healthy diet would be easier for patients as well [32]. Lloyd et al. studied the psychosocial factors related to glycemic control. In their study, adherence to these recommendations increased

with an increase in social support for adherence to self-care instructions [33]. These results are consistent with the findings of this study.

Furthermore, social support and self-care significantly decreased with increasing age and duration of diabetes. This result is similar to a study conducted by Robatsarpooshi et al. [34], and the finding in this study was in agreement with Mayberry's and Osborn study, which stated there was no association between perceived social support and education level [35].

If those around the DM patient use positive reinforcing behaviors (e.g. encouragement or companionship) to oblige the patients to adhere to their treatment plan, a better result is reached, and DM patients better adhere to their treatment plan. For instance, families have to bear in mind that preparing and eating foods suitable for diabetic patients can enable the patients to adhere better to their diet. DM can be controlled by observing self-care areas. Ultimately, one can deduce that those with better social support are more likely to adhere to DM self-care behaviors, and adhering to self-care behaviors leads to blood sugar-level control and prevention of adverse effects.

Among the limitations of the study, one can cite the long time needed to fill in the questionnaire by patients with low levels of education, for whom the research team deployed a dedicated questioner to convince them to complete the questionnaires patiently and accurately by explaining the purpose of the study.

## Conclusions

The results showed a significant relationship between social support and DM self-care behavior. This means that social support is one of the factors affecting self-care behaviors. Additionally, social support in nursing care can enhance the health status of DM patients. Thus, patient support and participation in self-care enable them to build on their ability to better manage the disease and prevent its subsequent adverse effects. Ultimately, it is recommended that social support, the factors affecting it, self-management behaviors and the factors facilitating these behaviors in the family and community, along with the hurdles to social support and self-care behaviors, should be identified, and plans should be made for interventions to take effective steps to enhance the level of self-care behaviors and to value social support in the family and community.

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