

Investigation of the Relationship between Social Support and Adherence to Treatment among Elderly Individuals with Type II Diabetes Mellitus

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ABSTRACT

Introduction: Although no treatment is available for diabetes, it can be controlled. In order to successfully control and manage the disease, patients' adherence to treatment is of particular importance. Besides, many factors are effective in patients' ability to adhere to treatment. The present study aimed to assess the relationship between social support and adherence to treatment among elderly patients suffering from type II diabetes mellitus in diabetes clinic of Fasa in southern Iran.

Methods: This descriptive-analytical study was conducted on 200 elderly people with type II diabetes mellitus referred to the diabetes clinic of Fasa in southern Iran. The study data were collected using a demographic and clinical information checklist (age, weight, sex, education level, marital status, living status, and disease duration), Modanloo's adherence to treatment questionnaire, and multi-dimensional scale of perceived social support. The data were then entered into the SPSS 22 software and were analyzed via descriptive statistics, chi-square, independent t-test, and logistic regression analysis.

Results: The mean age of the participants was 72.05±7.92 years and the mean of their disease duration was 11.38±3.17 years. Besides, the majority of the participants (70%) were female. The total mean score of adherence to treatment was 154.91±19.61, indicating moderate adherence to treatment in most of the participants (51.50%). Moreover, adherence to treatment was associated with social support (in the three dimensions of family, friends, and significant others), sex, and living status.

Conclusion: The results indicated that social support could be considered as a valuable resource in the interventions aimed at diabetes management and control.

Keywords: Social support, Adherence to treatment, Elderly, Type II diabetes mellitus.

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INTRODUCTION

The number of elderly individuals is rapidly increasing all around to world. Based on the World Health Organization's (WHO) latest report, there are 961 million elderly individuals around the globe. This measure has been estimated to be doubled by 2025 and to reach two billiards by 2050. It should also be noted that the majority of these individuals live in developing countries (1). Based on Iran's 2016 census, individuals aged above 60 years comprised 9.3% of the country's population, (2) which showed an ascending trend compared to the results of the 2011 census (8.1%) (3). This measure has been predicted to reach 26% (26 393 000 people) by 2050 (4). Considering population aging, the incidence of disability and mortality resulting from chronic disorders will be higher compared to those associated with acute diseases among elderly people (5). Additionally, aging increases the probability of suffering from several chronic diseases, such a way that most elderly

people aged above 60 years suffer from at least one chronic disease (6). Chronic diseases, in turn, account for more than two-thirds of common disabilities among this population. Evidence has indicated that 80% of elderly people in the U.S. suffered from at least one chronic disease and 50% had two or more chronic diseases, and these individuals consumed almost one-third of healthcare expenditures (7). The most prevalent chronic diseases among elderly people include hypertension, high cholesterol level, arthritis, diabetes, cardiovascular diseases, cancer, and dementia.(8)

Diabetes is a chronic disease diagnosed with the body's disability in glucose metabolism (9). If not controlled, diabetes can lead to ocular diseases, nerve damage, cardiovascular diseases, and expensive health care (10). Type II diabetes mellitus is the most prevalent type of diabetes mellitus, accounting for 90-95% of the cases. The prevalence of diabetes mellitus increases through the life, with the highest prevalence being observed among elderly

people. Based on the previous studies, the prevalence of type II diabetes mellitus was 11% among Iranian elderly individuals.(11)

Non-adherence to treatment could lead to disease recurrence, progress of disabilities, and need for immediate treatments and hospitalization (12). Recent studies have revealed non-adherence to treatment among 55% of elderly people (13). The mean of adherence to treatment has been reported to range from 0% to 100%. In Iran, this measure has been reported to vary from 12.7% to 86.3% (14). Based on WHO, socioeconomic factors are highly effective in **patients' adherence to treatment**. Social support is an important socioeconomic factor; sufficient social support could improve the treatment outcomes among patients with chronic disorders (15). Social support is a determinant of **health, which refers to the importance of humans' social dimension, is associated with individuals' health, and has protective effects on physical health** (16). Social support as **an individual's perception or experience of how much one is loved, cared for, and valued by others and is considered as a part of an active social network** (17). Social support has also been defined as the degree of receiving love, **companionship, and attention from one's family members, friends, and significant others**. Social support not only refers to the number but also to the quality of relations (18). Evidence has indicated that weak social support on the part of friends and others could affect the health status (19). On the other hand, high social support has been reported to be associated with improvement of physical and mental health .(20)

There are numerous social support styles and resources, which differ depending on the cultural, social, and economic conditions of communities. Considering the high prevalence of chronic diseases including diabetes among elderly people, importance of adherence to healthcare advice for controlling the disease and reducing the related complications and disabilities, and lack of studies in this field in Iran, the present study aims to investigate the relationship between perceived social support and adherence to treatment among elderly individuals with type II diabetes mellitus.

METHODS

This descriptive-analytical study aimed to explore the relationship between perceived social support and adherence to treatment among elderly individuals with type II diabetes mellitus. The research population included all elderly patients with type II diabetes referred the diabetes clinic in Fasa in southern Iran. Based on a previous study (21) and considering the sample size determination formula (confidence level of 95%, power of 80%, and acceptable difference of $d= 0/2$), a 169-subject sample size was estimated for the research, which was increased to 200 in order to enhance the accuracy of the study.

$$n = \frac{Z^2 \cdot SD^2}{d^2}$$

After gaining permission from the Research Vice-chancellor of the University and receiving a code from the Ethics Committee, the researcher referred to the diabetes clinic of

Shariati Hospital in Fasa in southern Iran. Therein, a list of elderly individuals was prepared using the records in the clinic. The inclusion criteria of the study were suffering from type II diabetes, aging above 60 years, using medications for blood glucose control, not having serious diseases and disabilities such as blindness, amputation, cardiovascular, respiratory, and cerebral problems, and renal disorders leading to dialysis, not using psychotropic drugs, not using medications other than insulin, and being under treatment by a physician or a medical team. The study participants were selected via simple random sampling and were invited to take part in the research through telephone contact. At first, the participants were provided with explanations about the study objectives and their oral consent was obtained. Then, the questions were explained to them quite simply and clearly. It should be mentioned that the study was conducted in a quiet place in the presence of the researcher.

The study data were collected using a demographic and clinical information form (age, weight, sex, education level, marital status, living status, and disease duration), **Modanloo's adherence to treatment questionnaire** (22) and Multidimensional Scale of Perceived Social Support (MSPSS) (23).

Modanloo's adherence to treatment questionnaire

This questionnaire was designed and psychometricized by Modanloo et al. This questionnaire contained 40 items divided into seven subscales as follows: nine items related to making effort for treatment (e.g., I am responsible for my health to the same extent as the treatment team is), seven items related to intention to take the treatment (e.g., I seek for treatment with intensification of disease symptoms), seven items related to adaptability (e.g., Before doing any task, I think about its impact on my disease), five items related to integrating illness into life (e.g., In case of the **family's cooperation in my life affairs, I do not forget my treatment**), four items related to sticking to the treatment (e.g., I stick to the treatment advice even without the **treatment team's control and supervision**), five items related to commitment to the treatment (e.g., I disrupt the treatment in the recovery period or with weakening of disease symptoms), and three items related to indecisiveness for applying treatment (e.g., I do not apply the **treatment team's advice with their commands and reprehensions**). The items were scored using a six-option Likert scale ranging from 'completely' to 'not at all'. Thus, the total score of the scale could range from 0 to 200. Accordingly, higher scores of each subscale and the entire questionnaire represented higher adherence to treatment. It should be noted that the **patients' adherence to treatment was computed and interpreted by changing the scores to percentages and their comparison to the minimum and maximum scores of the questionnaire**. Accordingly, scores from 0-25%, 26-49%, 50-74%, and 75-100% indicated weak, moderate, good, and very good adherence to treatment, respectively. The adherence to treatment could be examined separately in each dimension or as a whole. In order to determine the quantitative content validity of the scale, Content Validity Ratio (CVR) and Content Validity Index (CVI) were

computed. The results showed that the content validity of the questionnaire was equal to 0.914. Besides, the reliability of the questionnaire was approved by Cronbach's alpha=0.921. Its internal consistency was also confirmed by the test-retest method with a two-week interval ($r=0.875$).

Multidimensional Scale of Perceived Social Support

This questionnaire was designed by Zimet et al. (1988) in order to evaluate perceived social support on the part of friends, family, and significant others in an individual's life. This scale included 12 items, which assessed perceived social support in the three abovementioned dimensions using a seven-option scale ranging from 'completely disagree' to 'completely agree'. The total score of the scale was calculated by summing up the scores of all items and dividing it by the number of items; i.e., 12. In addition, the score of each subscale was computed by adding up the scores of the related items. The reliability and validity of this scale were approved by Zimet et al. (23, 24). Salimi et al. (2009) also confirmed the reliability of the three dimensions of social support received from family, friends, and significant others

by Cronbach's alpha coefficients of 0.86, 0.86, and 0.82, respectively (25).

In the study by Adib-Rad et al. also, the reliability of the questionnaire was found to be 0.94, 0.89, 0.90, and 0.90 for the total score of perceived social support and the three dimensions of friends, family, and significant others, respectively (26).

After all, the data were entered into the SPSS 22 software and were analyzed using descriptive (mean, Standard Deviation (SD), percentage, and frequency) and inferential (chi-square, independent t-test, and logistic regression) statistics. $P<0.05$ was considered to be statistically significant. It should be mentioned that normal distribution of the data was confirmed using Kolmogorov-Smirnov test.

RESULTS

The mean age of the participants was 72.05 ± 7.92 years and the mean of their disease duration was 11.38 ± 3.17 years. Other demographic variables have been presented in (Table 1).

Table 1: The demographic characteristics of the elderly participants with type II diabetes

Variable		Number	Percentage
Sex	Male	60	30
	Female	140	70
Marital status	Single	19	9.50
	Married	181	90.50
Education level	Illiterate	43	21.50
	Below diploma and diploma	138	69
	Higher than diploma	19	9.50
Occupation	Homemaker or jobless	89	44.50
	Employee	64	32
	Retired	47	23.50
Living status	Living with others	151	75.50
	Living independently	49	24.50

The participants' mean scores of adherence to treatment and perceived social support have been presented in (Table 2).

Table 2: The mean scores of adherence to treatment and social support among the study participants

Variable	Scale	Mean (SD)	Minimum	Maximum
Adherence to treatment	Making effort for treatment	35.85 (5.53)	10	88
	Intention to take the treatment	30.32 (5.64)	15	74
	Adaptability	26.40 (5.63)	10	35
	Integrating illness into life	19.57 (5.22)	5	25
	Sticking to treatment	12.86 (4.50)	2	28
	Commitment to treatment	16.26 (4.91)	0	25
	Indecisiveness for applying treatment	13.64 (4.29)	1	59
	Total	154.91 (19.61)	76	196
Perceived social support	Family's support	16.33 (3.82)	4	20

As the table depicts, the total mean score of adherence to treatment was 154.91 ± 19.61 . Additionally, six (3%), 103

(51.50%), 82 (41%), and nine (4.50%) participants showed weak, moderate, good, and very good adherence to

treatment, respectively. The results of comparison of the participants with weak or moderate adherence to treatment to those with good or very good adherence to treatment

regarding the mean ranks of social support and its subscales have been presented in (Table 3).

Table 3: Comparison of the participants with weak or moderate adherence to treatment and those with good or very good adherence to treatment regarding the mean scores of social support and its dimensions

Social support	Variable	Weak or moderate adherence to treatment (n=109)		Good or very good adherence to treatment (n=91)		P-value*
		Mean	SD	Mean	SD	
	Family's support	14.54	3.98	16.12	3.62	0.01
	Friends' support	11.27	4.36	13.65	4.02	<0.001
	Significant others' support	13.09	4.27	15.92	4.22	<0.001
	Total support	41.05	8.25	45.33	9.89	<0.001

* Independent t-test

Accordingly, the mean ranks of social support and its subscales were significantly higher in the individuals with good or very good adherence to treatment compared to those with weak or moderate adherence to treatment ($p < 0.05$). The results of chi-square test revealed a significant difference between the participants with weak or moderate

adherence and those with good or very good adherence regarding the frequency distribution of adherence to treatment with respect to sex and living status. In other words, adherence to treatment was significantly associated with sex and living status ($p < 0.05$) (Table 4).

Table 4: Frequency distribution of the demographic variables in the two groups with weak or moderate and good or very good adherence to treatment

Variable	Categories	Weak or moderate adherence to treatment (n=109)		Good or very good adherence to treatment (n=91)		P-value*
		Frequency	Percentage	Frequency	Percentage	
Sex	Female	90	64.30	50	35.70	<0.001
	Male	19	31.70	41	68.30	
Marital status	Married	12	63.20	7	36.80	0.47
	Non-married	97	53.60	84	46.40	
Living status	Living independently	15	30.60	34	69.40	<0.001
	Living with others	94	62.30	57	37.70	
Occupation	Homemaker or jobless	47	52.80	42	47.20	0.68
	Employee	33	51.56	31	48.44	
	Retired	29	61.70	18	38.30	
Education level	Illiterate	28	65.12	15	34.88	0.57
	Below diploma and diploma	71	51.45	67	48.55	
	Higher than diploma	10	52.63	9	47.37	

* Chi-square test

The results of regression analysis revealed a significant relationship between adherence to treatment and social support, sex, and living status ($p < 0.05$) (Table 5).

Table 5: Regression analysis of the variables associated with adherence to treatment among the elderly participants

Variables	Bet a	SE	B	P
Sex	0.145	0.046	0.139	0.030
Marital status	0.137	0.042	0.153	0.242
Living status	0.124	0.065	0.131	0.001
Occupation	0.176	0.072	0.145	0.163
Education level	0.166	0.028	0.139	0.125

Disease duration	0.113	0.022	0.133	0.356
Social support	0.165	0.025	0.145	0.101

DISCUSSION

Appropriate adherence to treatment leads to promotion of patients' quality of life and is beneficial for patients, their family members, healthcare payers, healthcare providers, and societies (27). It also exerts significant effects on control of patients' Body Mass Index (BMI), blood cholesterol level, and blood glucose level (28). Therefore, the present study aimed to investigate the relationship between social support and adherence to treatment among the elderly people suffering from type II diabetes. The results indicated that the total mean score of adherence to treatment was 154.19+91.61 and that 51.50% of the participants had moderate adherence to treatment. Razaq et al (29) and Adisa et al (30), also reported the patients' moderate adherence to treatment. Similarly, Alqarni et al (31), showed that the majority of their study participants (42.9%) had moderate medication adherence. However, low adherence to treatment was observed among the patients with diabetes in the studies conducted by Linni et al. in China (32), Christopher et al. in Nigeria (33) and Borba et al. in Brazil (34). On the other hand, Pascal et al (35) reported high adherence to treatment among patients. These differences could be attributed to variations in education level and economic status as well as non-standard measurement of medication adherence.

The current study results revealed a significant relationship between adherence to treatment and social support (in the three dimensions of family, friends, and significant others). The prior studies have demonstrated that social support was associated with diabetes control and promotion of self-care behaviors (36-41). Another study indicated that social support played a critical role in reduction of mortality risk among elderly people with diabetes (42). Moreover, Sharfi Rad et al (43) Pointed to the positive impact of social support, particularly on the part of one's family and spouse, on controlling blood glucose and HbA1c levels. Furthermore, the results of a systematic review showed the effect of family's support alongside patient training on improvement of healthy eating diet, increase of self-efficacy, promotion of mental health, and betterment of blood glucose control among the patients suffering from diabetes (44). Miller et al (45) also disclosed a significant positive relationship between social support and adherence to treatment among patients with diabetes. Accordingly, family members' support in form of family cohesion and intimate relationships resulted in a three-fold increase in adherence to treatment and blood glucose control among patients with type II diabetes. Indeed, in comparison to structural family support (marital status and living status), functional social support (practical and emotional support) had stronger effects on the patients' adherence to treatment. In the same vein, Linni et al conducted a study on diabetic patients in China and came to the conclusion that social support and its subscales were considerably effective in adherence to treatment. The impacts of family members and significant others might empower health orientations, eventually

resulting in better adherence to diets, physical activities, and medications among patients with diabetes. Evidence has also indicated that family's and friends' support could promote adherence to treatment through improvement of positivism and self-confidence and reduction of stress and depression among patients.(46)

The present study findings revealed that adherence to treatment was significantly associated with sex and living status. In the same line, Morge et al (47) and Okolie et al (48) Supported the significant relationship between sex and adherence to treatment among patients with diabetes. However, no significant relationship was observed between sex and adherence to diabetes medications in the studies conducted by Khan in Saudi Arabia (49). Bagonza et al. in Uganda (50) and Atekha in Canada (51). On the other hand, Manjusha carried out a research in the United Arab Emirates (52) and stated that adherence to treatment was better in males than in females. On the contrary, the studies performed in Ethiopia and Germany showed better adherence to treatment among females compared to males (53) considering the relationships between sex and adherence to treatment, promotion of diabetic patients' motivation by educational interventions and regional campaigns might be effective.

Living with others has been reported to be effective in the patients' adherence to treatment (54). In contrast, some studies have indicated that living with others was among the barriers against diabetes self-care. For instance, family members and others did not intend to make use of appropriate foods for diabetic individuals, which could cause stress among patients and exert a negative impact on their adherence to treatment.

LIMITATIONS

The limitations of the present study included data collection using questionnaires, small sample size, and non-generalizability of the results to other diseases and other places. Hence, other instruments such as interview are suggested to be used in future studies. Indeed, further studies are recommended to conduct the intervention on other patients and compare the findings.

CONCLUSION

Although medication adherence is affected by numerous factors, the present study results indicated that social support played a key role in adherence to treatment among patients with diabetes. Thus, social support could be regarded as a valuable resource in the interventions aimed at promotion of diabetes management and control. In this context, cooperation of the society, specifically family members, healthcare personnel, and healthcare team, could be of particular importance in diabetic patients' self-care behaviors. Further studies are recommended to address interventions for improvement of adherence to treatment and its dimensions with a focus on social support and its subscales.

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DISCLOSURE

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CONFLICT OF INTEREST

None

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