Original Article

Psychosocial Factors and Their Relationship With Self-management in People With Type 2 Diabetes Mellitus: A Conceptual Framework Based on Socio-Cognitive Theory

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Abstract

Background and aims: Maintaining the health of diabetic people depends on the self-management of the disease. This study aimed to evaluate the relationship of distress, self-efficacy, perceived social support, and self-care with self-management behaviors in the patients with type 2 diabetes.

Methods: The present analytical-descriptive study was conducted on 228 diabetic patients, during 2016-2017. Most of the participants were male (60.6%) and the mean age of them was 51.95±15.04. The participants were selected based on a simple random sampling method after completing the consent form. The required data were collected through questionnaires of distress, self-efficacy, perceived social support, self-care, and self-management. The data were statistically analyzed using SPSS software version 22.0.

Results: Out of 228 participants, 77.3% were married and the highest frequency in terms of educational attainment was related to those with a high school diploma. The results indicated that the duration of affliction with diabetes was less than 10-15 years in 88.9% of the participants. Pearson correlation test demonstrated that the total score of self-management had a significant relationship with the total scores of distress, perceived social support, self-efficacy, and self-care (P<0.005). The results of regression analysis also indicated that distress, perceived social support, self-efficacy, and self-care had a predictive power of 0.43% for self-management. Among these variables, the predictive powers of self-efficacy and self-care were statistically significant, and the prediction rate of self-efficacy was more than that of other ones (β = 0.17).

Conclusion: The study findings showed that the researchers who want to perform interventions based on cognitive-social theory should mainly focus on self-care and self-efficacy.

Keywords: Diabetics, Self-management, Psychological and social factors, Socio-cognitive theory

Introduction

The chronic, non-contagious, and costly nature of diabetes imposes a huge financial burden on patients, families, and society, so that the mortality rate in diabetic patients is 1.5%-2.5% higher than that in the general population.[1]

According to the DALY index, type 2 diabetes burden in 2001 in Iran was equal to 306 440 years. Considering the growing trend of this disease and its costs, this figure is increasing.[2,3]

The process of self-management means motivating the patients using their viewpoints and opinions. The results of a qualitative study showed that the main troubles of patients in this regard are rooted in the complexity of educational materials, communication with patients, and their current lifestyles.[4]

Stress affects health behaviors and regimens of patients both directly, by influencing neuroendocrine or the immune system, and indirectly, in the form of despair and anxiety.[5] In addition to what mentioned above, self-efficacy is now considered as an effective factor in ordering the motivation, guiding the human behavior, and coping with stressful situations.[6] A person with low self-efficacy is less likely to try to do a new health behavior or change a habitual behavior. Self-efficacy affects one's motivation and forces him/her to persistently pursue a special behavior.[7]

In addition, many studies conducted on the significance of the outcome evaluation with an emphasis on self-care behaviors indicate that diabetic patients need to learn a

variety of self-care behaviors to effectively regulate their blood glucose.[8,9]

Moreover, social support is the most important feature studied in relation to the counteraction of undesirable effects and psychological pressures. By definition, social support means a sense of belonging and being accepted and loved by others.[10] In spite of many positive impacts mentioned for social support by researchers, it is very important to pay attention to patient perception in this regard. In other words, the perception of support is more important than its acquisition.[11,12]

Generally, understanding the factors affecting self-management behaviors paves the way for the development of strategies and solutions that realize the health education goals and cause the success factors to be chosen more logically.[13] Appropriate educational planning based on behavioral change models can help us achieve our goals.[14]

One of the most important behavioral theories that provide a good understanding of the outcome behavior in the patients is the cognitive-social theory.[15,16] The theoretical framework of this theory is premised on the assumption that the occurrence of the desired behavior is the result of the integration of cognitive, psychological, and social factors. Taking into account all above-mentioned items,[16] the cognitive-social theory is capable of interpreting self-management behaviors of the patients with chronic diseases.[17]

Based on this theory, the main variables of this study included individual factors such as gender and age, psychological factors such as distress and self-efficacy, environmental factors such as perceived social support, and behavioral factors such as self-care behavior in the diabetic patients.

Objectives

Since a few studies have been conducted on the self-management behaviors of diabetic patients using the cognitive-social theory in Iran, the present study aimed to investigate the relationship of psychosocial factors with self-management behaviors in the diabetic patients based on the socio-cognitive theory.

Methods

This cross-sectional descriptive-analytical study was carried out in 2017, and registered in Social Determinants of Health Research Center (code: EC-2323). and approved by the Ethics Committee of Deputy of Research and Technology, Shahrekord University of Medical Sciences, Shahrekord, Iran (IR.SKUMS.REC.1396.30). The statistical population consisted of the patients who received diabetes-related healthcare services in Imam Ali Clinic of Shahrekord during 2016-2017. In this center, type2 diabetes related services were delivered to these patients formally. Considering a standard deviation of 0.2 (an estimation of the correlation coefficient between psychosocial factors score and self-management score) and 95% confidence level, the sample size was determined to be at least 190. Assuming an attrition rate of 20%, the final sample size was decided to be 228 diabetic patients.

The inclusion criteria were: being over 30 years, elapsed time of at least one year from diabetes diagnosis, and non-affliction with a confirmed mental illness. The exclusion criteria also included: failure to meet the inclusion criteria, and reluctance to continue with the study.

Before the beginning of the study, the required permissions were obtained and an informed consent form was signed by the participants. They were briefed on the research objectives and procedure, and were assured that their information will be kept confidential. In addition, they were given the freedom to leave the study at any stage.

Measurement Tool

In order to fulfill the study goals, a multi-part tool was used. The first part of this tool included 13 items which dealt with personal as well as disease information of the patient (such as age, gender, job, marital status, and educational status).

The second part consisted of 17 items on the distress of diabetic patients (such as: "I feel that my physician does not have enough information about my disease" and »I feel my life is in the hands of diabetes«) which were scored based on a 6-point Likert scale (from never: 1 to always: 6). This tool was developed by Polonsky et al at the University of California to measure the overall distress of diabetic patients. Cronbach's alpha coefficient of this tool was equal to 0.87. The total point on this tool varied between 17 and 102.[18]

The third part of this tool dealt with self-efficacy of the patients in 8 items (such as: "How confident are you that you can take action when your blood sugar decreases during exercise?" and "How confident are you when your diabetes is controlled?") which are scored based on a 10-point Likert scale (from I'm not sure: 1 to I'm pretty sure: 10). This tool was developed by Bodenheimer et al at Stanford University and its Cronbach's alpha was reported to be 0.82. If there were two numbers for each item, the smaller number was accepted. In addition, if 2 out of the 8 items were answered, the patient was asked to fill out the tool again. Higher scores on this tool indicated higher levels of self-efficacy.[19]

The fourth part (MPSS) was about perceived social support (such as: "How much can you benefit from family and community support?" and "Does social support play a role in controlling diabetes?") which was developed by Bruwer et al. This tool consisted of 12 items which measured perceived social support from three sources of the family (4 items), friends (4 items), and important people of life (4 items). This tool was scored based on a 7-point Likert scale (from completely agree: 7 to completely disagree: 1) and the total score ranged between 12 and 84.[20] The reliability of this tool was assessed and approved on various populations and its Cronbach's alpha was determined to be 0.85-0.91. In addition, its reliability through test-retest method was obtained to range between 0.72 and 0.85. The Persian version of this tool was evaluated after specifying its psychometric properties in Iranian subjects, and its Cronbach's alpha on a sample of 176 patients with myocardial infarction was determined to be 0.83.[21]

The fifth part of this tool dealt with self-care in the

diabetic patients and consisted of 14 items (such as: "Have you followed a healthy diet during the week?" and" How many times have you consumed fruits and vegetables in seven days a week?") which were scored 0-7 times a week. This tool was developed by Toobert et al at the University of Guildford, UK. The total score of general diet, specific diet, physical activity, blood glucose, foot care, medical regimen, and smoking was obtained from the mean score of items 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10, 11, 12, and 13, and 0 and 1, respectively.[22]

The sixth part measured self-management behaviors of diabetic patients and include 35 items (such as: "When I eat outdoors, I choose small dices." and" I control my weight effectively.") which were scored based on a 5-point Likert scale (from strongly agree: 5 to strongly disagree: 1). This tool was developed by Lin et al to provide a measure for assessing self-management behaviors of diabetic patients. With a Cronbach's alpha of 0.93, this tool consisted of 5 scales of self-organization (10 items), self-regulation (9 items), interaction with health professionals and other influential people (9 items), self-monitoring of blood glucose (4 items), and adherence to the proposed treatment regimen (3 items). Cronbach's alpha of these scales ranged between 0.76 and 0.90. The minimum and maximum scores on this scale were 35 and 175, respectively. The self-management score in each field could also be calculated.[23]

Data Analysis
The obtained data were statistically analyzed using descriptive tests, Pearson correlation test for continuous variables, analysis of variance, and regression analysis in SPSS software version 22.0 (SPSS Inc, Chicago, Illinois).

Results
Most of the participants were male (60.6%) in this study and the mean age of them was 51.95±15.04. In addition, 77.3% of the participants were married and the highest frequency in terms of educational attainment was related to those with a high school diploma. The results indicated that the duration of affliction with diabetes was less than 10-15 years in 88.9% of the participants (Table 1). Pearson correlation test demonstrated that the total score of self-management had a significant relationship with the total scores of distress, perceived social support, self-efficacy, and self-care ($P < 0.005$) (Table 2). The results of regression analysis also indicated that distress, perceived social support, self-efficacy, and self-care had a predictive power of 0.43% for self-management. Among these variables, the predictive powers of self-efficacy and self-care were statistically significant, and the prediction rate of self-efficacy was more than that of other ones ($\beta = 0.17$) (Table 3).

Discussion
The present study aimed to investigate the relationship between some psychosocial factors and self-management behavior of diabetic patients. The results showed that the total score of self-management had a significant relationship with the total scores of distress, perceived social support,

Table 1. Frequency of Demographic Variables in Diabetic Patients

Variable	Subgroups	No. (%)
Age (y)	Below 45	57 (29.4)
	45-55	41 (17.1)
	55-65	41 (20.2)
	Over 65	64 (34.8)
Gender	Male	79 (57.2)
	Female	59 (42.8)
Marital status	Single	34 (24.6)
	Married	77 (55.8)
	Widow	22 (15.9)
	Divorced	5 (3.6)
Educational attainment	Illiterate	34 (24.6)
	Lower than high school diploma	34 (24.6)
	High school diploma	36 (26.1)
	Bachelor and higher	3 (23.9)
History of the disease	<5 years	40 (29)
	5-10 years	48 (34.8)
	10-15 years	22 (15.9)
	>15 years	28 (20.3)

self-efficacy, and self-care ($P < 0.005$).

Nelson et al evaluated the effective factors in the self-management of American soldiers with type2 diabetes who did not have proper control over their illness (HbA1c <5). Their results showed that the intervention managed to improve the status of their diet, blood glucose control, and physical activity. However, self-care behaviors, including adherence to the diet, physical activity, and blood glucose self-monitoring showed a significant improvement in the patients with a higher level of self-efficacy. Their results showed that it was necessary to pay a special attention to self-efficacy and readiness for change in the diabetic patients with inadequate control over their disease.[24] These results are consistent with the findings of the present study indicating that increased self-efficacy and self-care improves self-management in the patients.

The results of Liu et al also indicated that satisfaction with the quality of life was associated with a better understanding of diabetes and the ability to improve self-care behaviors. They also found that emotional distress was the most important factor influencing the quality of life. The findings of the present study also showed that distress had a close relationship with self-management. In another study, the relationship between psychosocial distress, self-management behaviors associated with diabetes, and metabolic control in the patients with type1 diabetes was evaluated and it was concluded that there was an inverse relationship between distress and self-management.[25] This is consistent with the findings of the present study.

Social support is another point that is necessary to be mentioned in relation to self-management of diabetic patients. Type 2 diabetes is more common among adults and several studies have argued that theory-based interventions

Table 2. The Relationship Between Independent Variables and Self-management Behavior

Variables	1	2	3	4	5	6	7	8	9	10
Total score of distress	1									
Total score of perceived social support	-0.33 $P<0.001$	1								
Total score of self-efficacy	-0.42 $P<0.001$	0.31 $P<0.001$	1							
Total score of self-care	-0.22 $P<0.001$	0.14 $P<0.001$	0.37 $P<0.001$	1						
Adherence to the drug regimen	-0.29 $P<0.001$	0.069 $P<0.001$	0.28 $P<0.001$	0.21 $P<0.001$	1					
Blood glucose self-monitoring	0.013 $P<0.001$	0.096 $P<0.001$	0.062 $P<0.001$	0.24 $P<0.001$	0.15 $P<0.001$	1				
Self-organization	-0.3 $P<0.001$	0.35 $P<0.001$	0.13 $P<0.001$	0.51 $P<0.001$	0.46 $P<0.001$	0.14 $P<0.001$	1			
Self-regulation	-0.37 $P<0.001$	0.4 $P<0.001$	0.3 $P<0.001$	0.31 $P<0.001$	0.11 $P<0.001$	0.015 $P<0.001$	0.51 $P<0.001$	1		
Interaction with health professionals and other influential people	-0.19 $P<0.001$	0.32 $P<0.001$	0.5 $P<0.001$	0.37 $P<0.001$	0.091 $P<0.001$	0.12 $P<0.001$	0.42 $P<0.001$	0.29 $P<0.001$	1	
Total score of self-management	-0.24 $P<0.001$	0.35 $P<0.001$	0.29 $P<0.001$	0.31 $P<0.001$	0.091 $P<0.001$	0.5 $P<0.001$	0.46 $P<0.001$	0.39 $P<0.001$	0.51 $P<0.001$	1

Table 3. Predictive Power of Independent Variables in Relation to Self-management Behavior of Diabetic Patients

Independent Variables	Standardized Beta	P Value	R²
Total score of distress	0.015	0.95	
Total score of perceived social support	0.053	0.52	0.43
Total score of self-efficacy	0.173	0.027	
Total score of self-care	0.116	0.035	

supported by peers can promote self-management behaviors. Schillinger et al showed that improvement of interpersonal skills in diabetic patients promoted behavioral indicators and adoption of self-management behaviors.[26] In another study on diabetic patients, Aikens et al stated that living alone could predict patient's disregard for self-management behaviors. However, if patients were supported by their families and friends, living alone was not able to predict their disregard for self-management behaviors.[27] In consistency with these findings, the results of the present study indicated that social support had a significant relationship with self-management but could not predict self-management behaviors.

Kanbara et al conducted a study to evaluate the effect of self-efficacy on the promotion of social support and reduction of mental stress response in the diabetic patients and found that enhancement of emotional support significantly increased the level of active adaptation to diabetes. On the other hand, behavioral support reduced frustration and mental response of patients and controlled their health. Therefore, it could be stated that behavioral support was better than emotional support and could improve the health status of diabetic patients.[28] The findings of the present study also demonstrated that there was a direct relationship between social support and self-management behaviors.

One of the remarkable items in health education is behavioral theories and models which provide a framework for understanding the quality of learning and behavior. Nugent et al stated that the use of three structures of

cognitive theory (personal, environmental, and behavioral factors) in the patients could improve their self-management behaviors.[29] The findings of the present study also showed that psychological factors such as distress and self-efficacy, environmental factors such as perceived social support, and behavioral factors such as self-care had a significant relationship with self-management in the diabetic patients.

The results of regression analysis also indicated that distress, perceived social support, self-efficacy, and self-care had a predictive power of 0.43% for self-management. Among these variables, the predictive powers of self-efficacy and self-care were statistically significant, and the prediction rate of self-efficacy was more than that of other ones (β=0.17).

Morovati et al conducted a cross-sectional study to evaluate the status of self-efficacy in the patients with type2 diabetes, factors affecting it, and its relationship with self-care in Yazd. Their results showed that there was a positive correlation between self-efficacy and self-care behaviors. They also suggested that self-efficacy was the most important determinant of self-care behaviors in the diabetic patients and it was necessary to be improved, especially in women.[30] The results of the present study emphasized the decisive role of self-efficacy in the self-management behaviors of diabetic patients. The findings of Sarkar et al indicated that there was a significant relationship between self-efficacy and self-management, and self-efficacy was the most important predictor of self-management behavior in the diabetic

patients of different races and levels of health literacy.[31] This is consistent with the findings of the present study.

Limitations of the Study

One of the limitations of this research was its conduction in only one clinic because of easy access. In addition, the target group of this study enjoyed a low level of health literacy which caused some problems. This was tried to be somewhat resolved by employing well-trained questionnaires.

Conclusion

The results of the present study demonstrated the relationship of distress, self-efficacy, perceived social support, and self-care with self-management behaviors of diabetic patients in Shahrekord. The study findings showed that the researchers who want to perform interventions based on socio-cognitive theory should mainly focus on self-care and self-efficacy, because these variables are the best predictors of self-management behaviors. The results also indicated that distress and social support had a close relationship with self-management behaviors. Based on the study findings, it is recommended that more studies be conducted in order to determine the effect of interventions, based on the socio-cognitive theory, on the improvement of self-management behaviors in the diabetic patients.

Ethical Approval

The ethical approval was obtained from the Research and Technology Deputy of the Shahrekord University of Medical Sciences. In this study, the participants were informed of the purposes and significance of the research and the written informed consent was obtained from them. The participants were also assured that participation in the study was voluntary and could be discontinued at any time.

Conflict of Interest Disclosures

None.

References

1. Bharati DR, Pal R, Rekha R, Yamuna TV. Evaluation of the burden of type 2 diabetes mellitus in population of Puducherry, South India. Diabetes Metab Syndr. 2011;5(1):12-6. doi: 10.1016/j.dsx.2010.05.008.
2. Sakthiswary R, Zakaria Z, Das S. Diabetes mellitus: Treatment challenges and the role of some herbal therapies. Middle East J Sci Res. 2014;20(7):786-98. doi: 10.5829/idosi.mejsr.2014.20.07.82226.
3. Amini M, Khadivi R, Haghighi S. Costs of type 2 Diabetes in Isfahan–Iran in 1998. Iran J Endocrinol Metab. 2002;4(2):97-104.
4. Smith C, McNaughton DA, Meyer S. Client perceptions of group education in the management of type 2 diabetes mellitus in South Australia. Aust J Prim Health. 2016;22(4):360-7. doi: 10.1071/py15008.
5. Gallagher KM, Updegraff JA. Health message framing effects on attitudes, intentions, and behavior: a meta-analytic review. Ann Behav Med. 2012;43(1):101-16. doi: 10.1007/s12160-011-9308-7.
6. Lin CC, Anderson RM, Chang CS, Hagerty BM, Loveland-Cherry CJ. Development and testing of the Diabetes Self-management Instrument: a confirmatory analysis. Res Nurs Health. 2008;31(4):370-80. doi: 10.1002/nur.20258.
7. Kulzer B, Hermanns N, Gorges D, Schwarz P, Haak T. Prevention of diabetes self-management program (PREDIAS): effects on weight, metabolic risk factors, and behavioral outcomes. Diabetes Care. 2009;32(7):1143-6. doi: 10.2337/dc08-2141.
8. Al Hayek AA, Robert AA, Al Dawish MA, Zamzami MM, Sam AE, Alzaid AA. Impact of an education program on patient anxiety, depression, glycemic control, and adherence to self-care and medication in Type 2 diabetes. J Family Community Med. 2013;20(2):77-82. doi: 10.4103/2230-8229.114766.
9. Hofer R, Choi H, Mase R, Fagerlin A, Spencer M, Heisler M. Mediators and Moderators of Improvements in Medication Adherence. Health Educ Behav. 2017;44(2):285-96. doi: 10.1177/1090198116656331.
10. Wu SF, Young LS, Yeh FC, Jian YM, Cheng KC, Lee MC. Correlations among social support, depression, and anxiety in patients with type-2 diabetes. J Nurs Res. 2013;21(2):129-38. doi: 10.1097/jnr.0b013e3182921fe1.
11. Rambod M, Ghodsbin F, Beheshtipour N, Raieyatpishe AA, Mohebi Noubandegani Z, Mohammadi-Nezhad A. The Relationship between Perceived Social Support and Quality of Sleep in Nursing Students. Iran Journal of Nursing. 2012;25(79):12-23.
12. Yu Y, Yang JP, Shiu CS, Simoni JM, Xiao S, Chen WT, et al. Psychometric testing of the Chinese version of the Medical Outcomes Study Social Support Survey among people living with HIV/AIDS in China. Appl Nurs Res. 2015;28(4):328-33. doi: 10.1016/j.apnr.2015.03.006.
13. Powers MA, Bardsley J, Cypress M, Duker P, Funnell MM, Fischl AH, et al. Diabetes Self-management Education and Support in Type 2 Diabetes: A Joint Position Statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Diabetes Educ. 2017;43(1):40-53. doi: 10.1177/0145721716689694.
14. Butler JT. Principles of health education and health promotion.. Englewood, Colo: Morton Publishing Company; 1994.
15. Rogers LQ, Matevey C, Hopkins-Price P, Shah P, Dunnington G, Courneya KS. Exploring social cognitive theory constructs for promoting exercise among breast cancer patients. Cancer Nurs. 2004;27(6):462-73.
16. Rogers LQ, Fogleman A, Verhulst S, Bhugra M, Rao K, Malone J, et al. Refining Measurement of Social Cognitive Theory Factors Associated with Exercise Adherence in Head and Neck Cancer Patients. J Psychosoc Oncol. 2015;33(5):467-87. doi: 10.1080/07347332.2015.1067277.
17. Gallant MP. The influence of social support on chronic illness self-management: a review and directions for research. Health Educ Behav. 2003;30(2):170-95. doi: 10.1177/1090198102251030.

18. Polonsky WH, Fisher L, Earles J, Dudl RJ, Lees J, Mullan J, et al. Assessing psychosocial distress in diabetes: development of the diabetes distress scale. Diabetes Care. 2005;28(3):626-31.

19. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. Jama. 2002;288(19):2469-75.

20. Bruwer B, Emsley R, Kidd M, Lochner C, Seedat S. Psychometric properties of the Multidimensional Scale of Perceived Social Support in youth. Compr Psychiatry. 2008;49(2):195-201. doi: 10.1016/j.comppsych.2007.09.002.

21. Moghimehfar F, Nasr-Esfahani MH. Decisive factors in medical tourism destination choice: A case study of Isfahan, Iran and fertility treatments. Tour Manag. 2011;32(6):1431-4. doi: 10.1016/j.tourman.2011.01.005.

22. Toobert DJ, Hampson SE, Glasgow RE. The summary of diabetes self-care activities measure: results from 7 studies and a revised scale. Diabetes Care. 2000;23(7):943-50.

23. Lin CC, Wu CC, Wu LM, Chen HM, Chang SC. Psychometric evaluation of a new instrument to measure disease self-management of the early stage chronic kidney disease patients. J Clin Nurs. 2013;22(7-8):1073-9. doi: 10.1111/j.1365-2702.2011.04048.x.

24. Nelson KM, McFarland L, Reiber G. Factors influencing disease self-management among veterans with diabetes and poor glycemic control. J Gen Intern Med. 2007;22(4):442-7. doi: 10.1007/s11606-006-0053-8.

25. Liu MY, Tai YK, Hung WW, Hsieh MC, Wang RH. [Relationships between emotional distress, empowerment perception and self-care behavior and quality of life in patients with type 2 diabetes]. Hu Li Za Zhi. 2010;57(2):49-60.

26. Schillinger D, Handley M, Wang F, Hammer H. Effects of self-management support on structure, process, and outcomes among vulnerable patients with diabetes: a three-arm practical clinical trial. Diabetes Care. 2009;32(4):559-66. doi: 10.2337/dc08-0787.

27. Aikens JE, Rosland AM, Piette JD. Improvements in illness self-management and psychological distress associated with telemonitoring support for adults with diabetes. Prim Care Diabetes. 2015;9(2):127-34. doi: 10.1016/j.pcd.2014.06.003.

28. Kanbara S, Taniguchi H, Sakaue M, Wang DH, Takaki J, Yajima Y, et al. Social support, self-efficacy and psychological stress responses among outpatients with diabetes in Yogyakarta, Indonesia. Diabetes Res Clin Pract. 2008;80(1):56-62. doi: 10.1016/j.diabres.2007.12.015.

29. Nugent LE, Wallston KA. Modified social learning theory re-examined: correlates of self-management behaviors of persons with Type 2 diabetes. J Behav Med. 2016;39(6):947-56. doi: 10.1007/s10865-016-9753-7.

30. Morowati Sharifabad MA, Rouhani Tonekaboni N. Social support and self-care behaviors in diabetic patients referring to Yazd Diabetes Research Center. Zahedan Journal of Research in Medical Sciences. 2008;9(4):275-84. [Persian].

31. Sarkar U, Fisher L, Schillinger D. Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? Diabetes Care. 2006;29(4):823-9.