

Enablers of and Barriers to Effective Diabetes Self-Care in Iran: A Qualitative Study

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Introduction: Self-care behaviors are the most important factor in diabetes management, and improving such behaviors is the cornerstone in helping patients to manage their illness. The current study aimed to determine interfering factors in the self-care process in patients with diabetes.

Methods: The present qualitative study with content-analysis design was performed from March 2017 to April 2019 in Mashhad, Iran. Data collection was started with sampling and continued until saturation. Data were collected through semistructured interviews. Participants comprised 21 patients with diabetes (adults with type 1 or 2 diabetes) aged 31–60 years. Data analysis was performed using the Landman method and MaxQDA 10 software.

Results: Qualitative content analysis showed that patients' self-care behavior was influenced by different factors and conditions. In the current study, four key themes facilitating or preventing self-care behaviors in patients with diabetes were extracted: accessibility, environmental factors, behavioral habits, and personal factors.

Conclusion: A range of personal and environmental factors may play an important role in the formation of self-care behaviors in patients with diabetes, and providing medical, welfare, and social support to such patients can facilitate self-care behavior formation in them. On the other hand, by removing perceived barriers, patients may be better able to adhere to self-care behaviors.

Keywords: interventional conditions, self-care, diabetes, qualitative

Introduction

Diabetes is one of the most common and expensive chronic diseases worldwide.¹ Its complications cause heavy costs for the patient and society.² Nowadays, in spite of advancements in health care and improvements in patient survival, the prevalence of diabetes is increasing.³ Diabetes is a metabolic disease with long-term consequences, and according to the World Health Organization, by 2025 about 333 million people will suffer from the disease worldwide,⁴ particularly in developing countries.⁵ Therefore, about 75% of patients with diabetes will be in these countries by 2025.^{6,7}

Due to the increasing prevalence of the disease and its associated costs, its control is essential. Self-care is an effective factor in controlling diabetes, and in some studies has been even more effective than drug interventions.⁸ However, self-care for diabetes is a complex and difficult task that often requires major lifestyle changes and affects a variety of factors.⁹ According to Orem's theory, self-care focuses on each individual's ability to perform it, and is defined as "the practice of

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activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being".¹⁰ Self-care behaviors include having a healthy diet, engaging in physical activity, adhering to medication, self-monitoring of blood sugar, and taking care of the feet.^{11,12}

Self-care and compliance of patients are highly important factors in controlling diabetes and preventing its complications. Despite the importance of self-care, research findings show that patients with diabetes do not get good self-care scores in many areas.^{6,12,13} Based on recent research, patients with diabetes need to devote an average of 58 minutes daily to self-care. The American Public Health Association has also reported that >75% of adults with chronic illnesses should play an active or all-important role in self-care.¹⁴ Numerous studies have examined self-care behaviors, including drug use, insulin injection, and urine and blood-sugar checks, among patients with diabetes, and their results showed that adherence to most of these behaviors was low among patients. The prevalence of the disease, its mortality and morbidity, economic costs, and consequently its personal and social burden emphasize the need for urgent action to assist patients with diabetes to better control their disease.¹⁵

Improving self-care behaviors is the cornerstone in helping patients better control their illness, and this highlights the importance of understanding interventional conditions that affect self-care behaviors in patients with diabetes.¹⁶ Since quantitative studies, using a limited number of questionnaires, cannot reflect the depth and complexity of patient viewpoints about the confounding factors of self-care behaviors, it is important to perform qualitative research on factors affecting self-care behaviors. Therefore, considering the importance of self-care behaviors in improving and controlling diabetes, the current study aimed to investigate different conditions affecting self-care behaviors in patients with diabetes.

Methods

Setting

The study setting was specialist diabetes clinics of private and public hospitals in Mashhad, Iran.

Study Design

The current qualitative study with a content-analysis approach was performed to explore facilitators of and barriers to effective self-care in patients with diabetes (adults with type 1 or type 2 diabetes). Data were collected through semistructured interviews.

Study Participants

In the current study, participants were selected through purposive sampling from patients with diabetes interested in participating. Participants were selected based on analysis of data, with maximum diversity in social status at the city level (from different geographical areas, urban and rural, of both sexes, and of different ages). To obtain comprehensive information, some patients were initially interviewed and other individuals with similar characteristics either interviewed or considered for subsequent interviews if they had not been helpful. Interviews continued until data saturation. Written informed consent was obtained from each participant. All participants consented to have their voices recorded, and the information they provided was kept confidential.

Inclusion criteria were consent for participation, at least 1 year from date of diabetes diagnosis, ability to partake in interviews, and Iranian nationality. The exclusion criterion was unwillingness to continue cooperation. The age of participants was 31–60 years, and after in-depth interviews with 28 participants, data richness and saturation were obtained. Each interview lasted 30–50 minutes. Interviews were conducted in hospitals affiliated with Mashhad University of Medical Sciences or diabetes clinic meeting rooms in conditions that participants were comfortable with light, sound, and ventilation.

The main research question was: "What are the enablers and barriers to effective diabetes self-care?" At the beginning of the interview, open-ended questions were asked to initiate discussion and communication to collect the information that the researcher sought. Participants were then asked a series of interview-guide questions, such as: What is your problem with controlling your illness?; What helps you to control your blood sugar?; and Have you ever encountered any factors or issues that made your illness worse? Then, exploration questions, such as "Can you explain more?", were asked to encourage participants and gain more comprehensive information.

Data were analyzed based on Landman's (2004) five steps. In the first step, the interview was recorded on a mobile phone, immediately transcribed verbatim, and used as the main research data. In the second step, the recorded audio was repeated, manuscript transcripts reviewed several times, and decisions made to divide the text into semantic units. In the third step, the semantic units were abstracted and codes selected based on participants' experiences. Concepts were identified from sentences and paragraphs, and codes assigned and summarized. Subsequently, with the help of experts, the

validity of the codes was checked and verified after determining coefficients of agreement among parties. In the fourth step, based on a continuous comparison of similarities, differences, and proportions, codes implying a single topic were grouped into categories, and subcategories were categorized. In the fifth step, the interpretive level, themes of the same classes were formed.

To increase portability, findings were evaluated by two health-education professionals not involved in the research team. Participants were also selected to maximize diversity to increase data-transfer capability. The reliability of the data was verified by transcribing as quickly as possible and accurately recording all stages of the study. To verify the findings, participants were requested to review the extracts, and concepts not approved by participants were modified and revised.

Data Analysis

Data were analyzed using MaxQDA version 10.0 qualitative research software. Semantic units (words or sentences) were labeled with codes, and the first researcher grouped these into categories and subcategories. The codes were checked by and discussed with an independent coresearcher and controversies resolved by consensus. In cases of unresolved disagreements between first researcher and independent coresearcher, a third researcher was consulted for a final decision.

Results

Sex, occupation, socioeconomic and cultural status, age, and level of education were the most important underlying factors in the design. Of course, because of the study type, we attempted to select participants with maximum diversity. Participants in the study were aged 31–60 years, and richness and saturation of the data were obtained after in-depth interviews with 28 participants (21 main contributors, four members of treatment staff [physicians and nurses], and three patients' family members; [Tables 1 and 2](#)).

Intervention conditions in self-care behaviors were placed in a range of facilitating and inhibiting factors. These consisted of four categories: accessibility, environmental challenges, behavioral habits, and individual factors. Access to sports facilities, healthy food, and health-care information were placed in two subcategories. Supporting authorities and challenging conditions created the category of environmental factors. Physical activity and healthy eating were classified as behavioral habits. The search for knowledge, information deficits, self-induction, spirituality, reasoning, paying attention to illness, misconceptions, and confusion were categorized as

individual factors. The main categories and subcategories were the factors that motivated the individual to move toward the desired behavior. After evaluation of the initial codes extracted from the interviews, four main categories and 16 subcategories were identified ([Table 3](#)).

Access Category ([Table 4](#))

This was defined in a range from zero access, where no facilities were available, to unrestricted access, where all facilities were available to the patient. This category included four subcategories. Participants believed that access to these items strengthened the will and facilitated self-care.

Access to Sport Facilities

This included parks and clubs, which can be among the most important factors in strengthening willpower and increasing physical activity.

Participant 2: "Sometimes, the park is right for me, but there is no park or gym near our house. I have to do physical activity in the yard."

Access to Healthy Food

This included access to fruit and nutrition in the diabetic diet that was directly related to the patient's economic status.

Participant17: "Eat bread, eat fruit, maybe there was no fruit in home. You can't eat fruit one day, eat fruit at night, pick lettuce and cabbage, get it, get it now. Only we, those who get paid IRR10 million, IRR20 million month get nowhere, we who have no rights have no money unless you make IRR500,000 for business."

Access to Health-Care Facilities

Such factors as proximity of the home to self-counseling centers encourage the patient to attend classes or monitor blood sugar.

Participant 8: "Of course I have a blood-glucose monitor at home. Sometimes I feel bad. I measure my blood sugar myself. I can't take a day off every month to go there and check my blood sugar."

Access to Information

Such factors as access to the Internet or having a knowledgeable person at home are important in raising awareness of complications and conducting self-care behaviors.

Participant 12: "We don't have Internet at home. If the doctor has time for the medical advice, we follow. Otherwise, we do not behave in any particular manner."

Table 1 Demographic Characteristics of Participants

Code	Participants	Age, years	Sex	Education	Job
1	Diabetic patients	54	Male	Bachelor's degree	Retired
2		40	Male	Associate degree	Repair of home appliances
3		35	Female	Bachelor's degree	Housewife
4		46	Male	Bachelor's degree	Self-employed
5		41	Female	Bachelor's degree	Teacher
6		54	Female	Diploma	Housewife
7		39	Male	Associate degree	Bus driver
8		45	Female	Associate degree	Housewife
9		37	Female	Bachelor's degree	Housewife
10		50	Female	Diploma	Housewife
11		58	Male	Elementary school	Self-employed
12		43	Male	Diploma	Truck driver
13		46	Female	Associate degree	Employee
14		54	Male	Incomplete diploma	Worker
15		56	Female	Bachelor's degree	Retired
16		35	Male	Diploma	Free
17		55	Female	Incomplete diploma	Housewife
18		56	Female	Elementary	Shopkeeper
19		40	Female	Bachelor's degree	Employee
20		47	Male	Elementary	Worker
21		50	Male	Diploma	Worker
22	Personnel of centers and clinics	35	Male	PhD	Doctor
23		38	Female	PhD	Doctor
24		35	Male	Bachelor's degree	Employee
25		35	Female	Bachelor's degree	Employee
26	Patients' family members	25	Female	Associate degree	Secretary
27		30	Female	Bachelor	Employee
28		32	Male	Diploma	Free

Table 2 Summarized Demographic Information of Participants

		n	Percentage
Sex	Male	13	46.4
	Female	15	53.6
Age, years	<30	11	39.3
	40–50	8	28.6
	≥50	9	32.1
Education	Incomplete diploma	5	17.9
	Diploma and higher	11	39.3
	Bachelor's degree and higher	12	42.8

Table 3 Classes and Subcategories Extracted From Interviews

	Subcategories
Access	Sports facilities, healthy nutrition (ability to buy healthy food), health facilities, information
Environmental factors	Supporting authorities, challenging conditions
Behavioral habits	Physical activity, healthy diet
Individual factors	Seeking awareness, information deficits, self-indulgence, spirituality, reasoning, paying attention to illness, misconceptions, and chaos

Class of Environmental Factors

Sources of support and specific conditions were environmental factors that most participants considered an important factor in self-care behavior and that appeared to be contributors to effective behavior (Table 5).

Sources of Support

These included encouragement by friends and coworkers, and especially family members, and was one of the effective factors in patient self-care behavior. Participant

Table 4 Subcategories and Primary Codes Extracted From the Access Class

	Subcategories
Sport facilities	Proximity to a park, proximity to the gym, exercise at home, yard, free use of gymnasiums, appropriate weather conditions
Healthy diet	Ability to buy healthy food according to the family's economic situation
Health facilities	Proximity to the clinic, proximity to diabetes counseling centers and clinics, access to physicians and nurses in the family, having blood sugar
Information	Having a knowledgeable person at home, access to the Internet, access to books and magazines and brochures, consulting with a doctor and a nurse, joining relevant social networks

Table 5 Subcategories and Sample Primary Codes Extracted From Environmental Factors

	Subcategories
Sources of support	Friends, relatives, family, colleagues, patients, physicians, nurses, and experts encouraging self-care behavior; being in charge of family, physician and family pressure, having athlete friends and associates, relationships with relatives and colleagues, communicating with successful patients
Specific conditions	Travel, lack of access to proper food, being forced to eat fast foods, stress, business, fatigue, mental activity

Table 6 Subcategories and Examples of Basic Codes Extracted From Behavioral Habits

	Subcategories
Behavioral habits	Physical activity: a sense of satisfaction and happiness, interest, and addiction to sports, family and coworker pressure, interest in group sports, more comfortable in group sports, and awareness of exercise results Healthy nutrition: interest in fruit consumption, interest in diet foods, eating light foods, making separate meals, not eating rice, avoiding oil, dislike of drinks and snacks, getting used to the diet

14 said about doing physical activity with others: “Yes, I just can’t exercise alone, so we talk when exercising. Time does not seem to pass. We are always together. The fact is that solo sport is so difficult.”

Specific Conditions

This was defined as any environmental factor making self-care difficult that participants could think of, with some thinking that they had no choice but to behave normally and leave the illness untreated.

Participant 7: “There are restrictions when traveling, more problems, more stresses, blood sugar is high in stress, you can’t diet or exercise.”

Class of Behavioral Habits

This was divided into two subcategories of physical activity and healthy eating. Healthy behaviors were those that motivated moving toward the desired behavior (Table 6).

Healthy Behavior

One of the most important factors affecting the health of a person is physical activity and proper nutrition, which can reduce the incidence of complications where these behaviors are facilitated.

Participant 21 commented on the facilitation of these behaviors: “I also drink tea with raisins at home, now that I am not consuming sugar.” “I do exercise in the yard, I don’t eat pasta, I don’t eat potatoes, I eat chicken parcels, and I eat little rice, as the doctor advises.”

Wrong Behaviors

One of the factors that impede self-care behavior in patients is wrong behavioral habits, including inadequate mobility and inadequate nutrition, which existed in many people before they became habitual. It is very difficult for a person to make such changes.

Participant 18 commented on wrong behavior: “The doctor said that you shouldn’t walk too long. I can’t walk when I go home (20 m). For example, I sweat a lot.”

Table 7 Subcategories and Sample Codes Extracted From Individual Factors

	Subcategories
Seeking consciousness	Attending counseling classes, using the Internet, using magazines and books, reading brochures in class, asking questions of experts and physicians, viewing health network, learning to read, asking questions, remembering
Defective information	Using inaccurate information, imitating others, getting information from untrustworthy sites, not attending counseling classes, forgetting things, too much work
Self-induction	Observing the side effects of those affected, seeing people successful in treatment, and feeling better
Spirituality	Having strong patience and faith, a sense of trust, and hope and spirit
Unreasonable reasons for not doing the behavior	Weaknesses, being a spouse, worrying about the host being upset, being alone in the house, being embarrassed by sport in the park, being at home easier, fasting, being a hereditary illness, everyone thinking of themselves, being ignorant of others, natural desire for delicious foods, difficulty accepting illness, fatigue, insomnia, late-night sleep, old age, overwork, mental illness, and other underlying diseases (low-back pain), expense
Not important to control the disease	Importance of health, having a positive sense of behavior, sense of compulsion, not paying attention to others' misconceptions, high level of awareness, strong will, the importance of timely medication and diet
Myths	Unbelievable disease, hereditary disease, untreatable disease, chemical medication, complicated medication, no complications, old age, industrial, medicinal, chemical
The mess	Fear of complications, observation of complications, awareness of consequences of complications, stress of daily medication use, the stress of insulin injection, hopelessness of treatment, accompanying illness for life

Class of Individual Factors

Individual factors that participants considered to be effective in self-care behaviors were knowledge-seeking, information deficits, self-indulgence, spirituality, reasoning, paying attention to illness, misconceptions, and disorder described in Table 7.

Seeking Awareness

One of the effective factors in self-care behavior is awareness of these behaviors, which can be obtained through reading magazines, books, brochures and distributed in counseling classes and asking questions of experts and physician.

Participant 6: “The Internet is always there. For example, at night or when you don’t sleep, read about diabetes online.”

Information Deficits

Such factors as using inaccurate information, imitating others’ behavior, and not attending counseling classes can play a role in weakening patient awareness of healthy behavior.

Participant 18: “There were a few telegram channels where I was a member. They were saying herbal remedies, but I noticed conflicting viewpoints, which made me confused. That’s why I left the group . . . They say henna, so I put on henna (a kind of herbal remedy). I noticed that it increased my blood sugar — it was 440.”

Self-Induction

One of the factors contributing to self-care behavior is the induction of external observations and factors in the patient, which is enhanced by observing the complications of the patient, good self-esteem, observation of successful individuals, and others.

Participant 9: “Well, the more I do self-care, the better my mood.”

Spirituality

Such factors as patience, faith, hope, spirituality, God’s will, and confidence are some of the factors that facilitate patient acceptance and ultimately self-care.

Participant 3: “Although diabetes is a disease, it has many benefits. It is God’s will that humans become infected and care more about their health.”

Unreasonable Reasons for Not Doing the Behavior

One of the main factors that hindering self-care behaviors is projection or excuse-making for avoiding the behaviors, such as a mischievous wife, worrying about a host being upset, and embarrassment about playing in a park.

Participant 15: “The doctor told me you can’t walk long, so I don’t exercise at all.”

Not Important to Control the Disease

One of the most important things to be aware of is the importance of self-care and proper health and treatment.

Participant 17 commented on this importance and their concern about the disease: “I didn’t care about my illness. I ate whatever I made for my kids.” Participant 20 commented on the importance of health and self-care behavior: “Sometimes, some things are so valuable to accomplish, and one of these is healthiness.”

False Beliefs

Examples of these are erroneous beliefs about the illness, self-medication, chemical drugs, and no side effects.

Participant 18: “Henna lowers my blood sugar when I use it on my feet . . . Well, pills have side effects — most contain a lot of chemicals.”

Disturbances

These include fear of complications, observation of complications, awareness of side effects, the stress of daily medication use, and other things that cause distress and concern for the patient.

Participant 1: “Overall, I think my kidneys are not working.”

Discussion

The current study aimed to determine interfering conditions (enablers and barriers) in the effective self-care process of diabetic patients. One of the benefits of regular physical activity expressed by the participants was strengthening of the will and the sense of well-being that some considered. Lack of access to sport facilities was cited as one of the barriers to doing physical activity. The present study identified laziness, being busy with work, and disability in exercise due to physical ailments as problems affecting regular physical activity.

According to the current study, the self-care status of patients who had the support of their spouse, children, and relatives was better than that of those living alone or deprived of the support of others. This indicates that the patient’s life network and the quality of his or her social interactions with family members and family support with various emotional and psychological issues, as well as

assistance patients receive in performing their social roles, have positive effects on their performance. The study found that people that had an impact on participants’ regular physical activity included family members (children, spouses, and parents), physicians, and friends, similar to the results of Norman et al’s study of individuals influencing participants’ behavior.

In the studies mentioned, medical specialists, such as physicians, persuaded participants to do the physical activities, as well as the aforementioned people. As diabetic patients can play a pivotal role in their own health-promoting behavior such as regular physical activities, the medical care team can play a main role in this regard. In addition to those mentioned, health-care professionals, including physicians and colleagues, also encouraged participants to perform physical activity. Since diabetics play an important role in promoting their own healthy behaviors, including regular physical activity, the health-care team can play an important and valuable role in promoting physical activity in this population.^{17,18} Family and community support was one of the factors facilitating sport behavior expressed by participants in the current study. The findings of Arizi et al support the current study findings in the apparent impact of social support on women’s participation in sport activities¹⁹ and also confirmed the physical activity proposed by Downs and Hausenblas²⁰ and Esmacily et al.²¹

Healthy food — in other words, better nutrition — is one of the most important and perhaps the most important way of achieving bodily health, although it is also not effective in promoting mental health.²² The role of self-care in patient health makes them consider self-care behavior very important. As Shayeghian et al showed, self-care in diabetes involves a wide range of activities, such as regular blood-glucose monitoring, diet adjustment, exercise, timely medication use, and leg-checking.²³ Shiravastava et al showed that diabetes self-care behaviors have a significant impact on the process.²⁴

According to Lloyd et al, diabetes has the most physically related complications, leading to poor quality of life for diabetic patients in terms of general health and physical function.²⁵ Self-care is defined as a constructive decision-making process in which behaviors can maintain physiological balance, and if symptoms occur, the patient can manage these complications.²⁶ Most participants cited fear of disease complications as the predominant reason for self-care behaviors. Abdoli et al also cited fear of disease complications as one of the most common psychological reactions in such patients and the

root cause of concern for loneliness.²⁷ Disability also described patients' lives with shades of fear of blindness and amputation and their consequences, such as disability and dependence on others.⁵ Rockell et al reported a fear of long-term complications of diabetes as one of the contributors to self-care and disease control.²⁷

In the present study, having strong faith (spirituality) was one of the important factors in enhancing patients' self-care and self-care behaviors. Researchers have concluded that spirituality is an important factor in the adjustment of diabetic patients with stressful situations that helps, and should be considered an important aspect in the self-care of patients with diabetes.²⁸ The current study found that spirituality may be an important and influential factor in the self-care of diabetic patients. Spirituality may lead to improved self-care by its supportive and guiding role. Polzer and Miles reported on the role of spirituality in the lives of many African Americans. It was pivotal and provided a framework for their health and disease. These patients thought that their body was a gift from God, and hence they must work hard to preserve it. These patients maintained their relationship with God by reading the Bible, prayer, and meditation. These spiritual practices increased self-care and blood-sugar balance by increasing motivation (reducing unhealthy practices, such as overuse of sugar and reducing stress and anxiety).²⁹

Strengthening patients' self-esteem and emphasizes their high capacity for self-care, empowering families, raising patients' awareness of the disease, and devoting adequate time to health-care providers, facilitating the self-care process in such patients.³⁰ On the other hand, success in these behaviors requires adequate knowledge of the disease and its complications and empowerment of the patient and his/her family members to control the illness. Both patients and their families, have illnesses under their care. Also, community health authorities should develop community-based action plans based on effective intervention conditions for self-care to improve the health of these patients and strengthen their self-care behaviors, and should provide the necessary resources in providing services.

Strengths and Limitations

The current study had several strengths: the use of a pretested interview guide, where the questions were first tested for comprehension with patients of the target population, the data-analysis method that was conducted by two independent researchers to ensure reliability, and the fact that a previously unevaluated population was addressed in terms of their

perspectives on self-management, and the fact that each session was recorded, which enabled richer interpretation of the results. One of the limitations of the present study was the psychological state of the subjects under study and the individual and cultural differences that could have influenced response, and these conditions could not be controlled by the researchers. It is recommended that facilitating or inhibiting factors be considered for each barrier.

Conclusion

Due to the importance of intervention conditions in the patient self-care process, special attention can be paid to policies related to the diabetes-care system and intervention programs. While revealing similar barriers and facilitators to those encountered in the national literature, the current study highlighted the need for more robust support of diabetes education and self-management, while identifying priority areas for attention. Integrated self-management interventions are needed to address these barriers. These include tailoring dietary education to specific needs of the patient, increasing physical activity according to physical condition, guiding patients on how to manage their diabetes during social occasions and among family members and friends, and providing mental-health support to handle strong emotional reactions to the disease.

Suggestions

In forming self-care behaviors, there is a range of personal and environmental factors that may play an important role in caring for the disease. Providing medical, welfare, and social support to patients can facilitate patients' self-care. On the other hand, by removing perceived barriers, patients may be better able to adhere to self-care behaviors.

Limitations and Future Research

Patient concerns were considered to complete the research and optimize the interviews. At the start of the interview, participants were asked about when they would be interviewed and whether they were bored, and the timing of the next interview would be down to a poll. We sought to keep research identifiers confidential. Future research is needed to provide greater insights into patients' self-care behaviors and practices in all contexts.

Ethics and Consent Statement

The current study was based on a research project approved by the Ethics Committee of Mashhad University of Medical

Sciences (IR.MUMS.REC.1398.006). All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with those of the 1964 Declaration of Helsinki and its later amendments or comparable ones. All project participants were informed of the study objectives prior to the interview, completed a written consent form, and were assured of confidentiality. This research project was funded by Mashhad University of Medical Sciences.

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Disclosure

The authors report no conflicts of interest in this work.

References

- Haghighat A, Ghasemi N, Neshatdost HT, Kajbaf M, Khanbani M. Psychometric properties of diabetes management self-efficacy scale (DMSESS). *Iran J Endocrinol Metabol*. 2010;12(2):111–116.
- Tseng CH. Prevalence and risk factor of peripheral arterial obstructive disease in Taiwanese type 2 diabetes patients. *Angiology*. 2003;54:331–338. doi:10.1177/000331970305400309
- MorovatiSharifabad N, RouhaniTonekaboni N. Perceived self-efficacy in self-care behaviors among diabetic patients referring to yazd diabetes research center. *J Birjand Univ Med Sci*. 2009;15(4):91–100.
- Norouzi A, Ghofranipour F, Heydarnia A, et al. Determinants of physical activity based on Health Promotion Model (HPM) in diabetic women of Karaj diabetic institute. *ISMJ*. 2010;13:41–51.
- MorovatiSharifabad N, RouhaniTonekaboni N, Baghiany MH. Predictors of self-care behaviors in diabetic patients referring to yazd diabetes research center based on health believe model. *J Yazd Univ Med Sci*. 2008;15(3):85–96.
- ShahabJahanlu A, Ghofranipour F, Kimiagar M, et al. Relationship between knowledge, self-efficacy, and quality of life with blood sugar and lipid control in diabetic patients who consume tobacco. *J Hormozgan Univ Med Sci*. 2008;11(4):261–266.
- Rakhshandero S, Ghafari M, Heidarnia A, Rajab A. Effectiveness of an education intervention on metabolic control in patients referred to Iranian diabetes society. 2009. *Iran J Diabetes Lipid Disord*. 57–64.
- McDowell J, Courtney M, Edwards H, et al. Validation of the Australian/English version of the diabetes management self-efficacy scale. *Int J Nurs Pract*. 2005;11:177–184. doi:10.1111/j.1440-172X.2005.00518.x
- Wu SF, Courtney M, Edwards H, et al. Development and validation of the Chinese version of the diabetes management self-efficacy scale. *Int J Nurs Stud*. 2008;45(4):534–542. doi:10.1016/j.ijnurstu.2006.08.020
- Orem DE. *Nursing Concepts of Practice*. 6th ed. Mosby; 2001.
- Abedini Z, ShouriBidgoli A, Ahmari Tehran H. Study of knowledge and practice of patient self-directed care among diabetic patients. *Qom Univ Med Sci J*. 2008;2(2):37–42.
- Jordan DN, Jordan JL. Self-care behaviors of Filipino-American adults with type 2 diabetes mellitus. *J Diabetes Complications*. 2010;24(4):250–258. doi:10.1016/j.jdiacomp.2009.03.006
- Eslami M, Fesharaki M, Farmahini Farahani B, Haji Esmailpour A. Examine the relationship between depression and self-care behaviors in depressed and non-depressed patients with diabetes. *Iran J Diabetes Lipid Disord*. 2011;3:313–318.
- MacKichan F, Paterson C, Henley WE, Britten N. Self-care in people with long term health problems: a community-based survey. *BMC Fam Pract*. 2011;12(1):53. doi:10.1186/1471-2296-12-53
- Didarloo A, Shojaeizade D, Ardebli H, Niknami S, Hajizadeh E. Factors influencing women's behavior in diabetes self-care diabetes clinic in Khoy based on rational action theory developed. *J Sch Public Health Inst Public Health Res*. 2011;9(2):79–92.
- Mahmoodi A, Alavi M, NM N. Investigate the relationship between self-care and hemoglobin A1C in diabetics. *Sci J Hamadan Nurs Midwifery Fac*. 2012;20(3):20–25.
- Terry DJ, O'Leary JE. The theory of planned behavior: the effects of perceived behavioral control and self-efficacy. *Br J Social Psychol*. 1995;34(2):199–220. doi:10.1111/j.2044-8309.1995.tb01058.x
- Pender NJ, Pender AR. Attitudes, subjective norms, and intentions to engage in healthy behaviors. *Nurs Res*. 1986;35(1):15–18. doi:10.1097/00006199-198601000-00004
- Arizi F, Vahida F, Parsamehr M. The study of social support affect female's participation in physical activities. *Olympic*. 2006;14(1):77–86.
- Downs DS, Hausenblas HA. Elicitation studies and the theory of planned behavior: a systematic review of exercise beliefs. *Psychol Sport Exerc*. 2005;6(1):1–31. doi:10.1016/j.psychsport.2003.08.001
- Esmacily H, Peyman N, Taghipour A, KHorashadizadeh F, Mahdizadeh M. A structural equation model to predict the social-cognitive determinants related to physical activity in Iranian women with diabetes mellitus. *J Res Health Sci*. 2014;14(4):296–302.
- Zare E, Simbar M, Shahhoseini Z. Explaining the concept of self-care in adolescents. *J Qual Res Health Sci*. 2016;4(4):395–405.
- Shayeghian Z, Aguilar-Vafaie M, Besharat MA, Parvin M, Roohi Gilani K. The association between self-care and control of blood sugar and health-related quality of life in type II diabetes patients. *Iran J Endocrinol Metabol*. 2014;15(6):545–551.
- Shrivastava SR, Shrivastava PS, Ramasamy J. Role of self-care in the management of diabetes mellitus. *J Diabetes Metabol Disord*. 2013;12(1):14. doi:10.1186/2251-6581-12-14
- Lloyd A, Sawyer W, Hopkinson P. Impact of long-term complications on quality of life in patients with type 2 diabetes not using insulin. *Value Health*. 2001;4(5):392–400. doi:10.1046/j.1524-4733.2001.45029.x
- Riegel B, Dickson VV. A situation-specific theory of heart failure self-care. *J Cardiovasc Nurs*. 2008;23(3):190–196. doi:10.1097/01.JCN.0000305091.35259.85
- Abdoli S, Ashktorab T, Ahmadi F, Parvizi S, Dunning T. The empowerment process in people with diabetes: an Iranian perspective. *Int Nurs Rev*. 2008;55(4):447–453. doi:10.1111/inr.2008.55.issue-4
- Parsian N. *Spirituality and Coping in Young Adults with Diabetes*. Deakin University; 2008.
- Polzer R, Miles MS. Spirituality and self-management of diabetes in African Americans. *J Holistic Nurs*. 2005;23(2):230–250. doi:10.1177/0898010105276179
- Compeán Ortiz LG, Gallegos Cabriales EC, González González JG, Gómez Meza MV. Self-care behaviors and health indicators in adults with type 2 diabetes. *Rev Lat Am Enfermagem*. 2010;18(4):675–680. doi:10.1590/S0104-11692010000400003

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