Original Article

Assessing health-care needs of patients with diabetes in Iran's health-care system: A modified Delphi method study

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Abstract:

INTRODUCTION: Due to the increasing prevalence of diabetes in the world, the assessment of the patient needs is essential. Understanding the needs of patients will play a very important role in providing an effective training program for patients. This study aimed to explain the health-care needs of patients with diabetes in Iran's health-care system.

MATERIALS AND METHODS: The present study was conducted using a modified Delphi technique in three rounds in 2017–2018. In the first round, patients' needs were extracted based on qualitative interviews and a review of the literature. Then, the second and third rounds were determined through surveys, achieving maximum consensus and grading the importance of the patients' basic needs. Participants selected using purposeful sampling and included 58 diabetes patients, family, and providers of the health system who were referred to urban health centers, rural, and one of the clinics of Darreh Shahr, Ilam Province. For data analysis, qualitative content analysis was used in the first Delphi round and descriptive statistics were used in the second and third rounds.

RESULTS: Regarding health-care needs of patients with diabetes, four main themes included: information and knowledge needs, need for reinforcement/reform of religious-cultural beliefs, need for health self-management, and ultimately supportive needs have emerged.

CONCLUSIONS: According to the results, before designing and developing effective educational programs, the need assessment to improve knowledge, correcting unrealistic attitudes and beliefs, as well as modifying their self-care behaviors and performance in preventing diabetes is recommended.

Keywords:

Delphi technique, diabetes mellitus, health personnel, health system, health care, Iran, needs assessment, Type 2

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Introduction

Diabetes mellitus (DM) is commonly known as a metabolic disorder characterized by increased blood glucose levels, as one of its most important features that can lead to premature death.[1] In this respect, the International Diabetes Federation estimated that patients with DM constituted 451 million (age 18–99 years) people worldwide in 2017, i.e. 8.8% of adults aged 20–79 years, so it is expected that the number of individuals living with DM will increase to 693 million by the year 2045.[2] It is estimated that by the year 2030, 9.2 million Iranian individuals will have diabetes[3] DM has been also recognized as one of the major health problems[4] which can impose huge economic burdens on patients, families, and most importantly health-care systems.[5] Therefore, failure to properly manage this disorder can bring about long-term complications such as cardiovascular disease, stroke, blindness, as well as nephropathy.[6] It

can also result in reduced quality of life and increased incidence of psychiatric disorders such as depression,[7] inducing a negative impact on patients' ability to perform self-care.[5] Diabetes education is an important component of the treatment process, besides diet, exercise, medications, as well as insulin treatment.[8] Since education broadens patients' knowledge and skills, changes their behaviors, increases their motivation to adhere to treatment guidelines, improves their quality of life, encourages them to get involved in a treatment process, prepares them to practice self-care, raises their awareness of cardiovascular risk factors, and enhances their psychological flexibility.[9,10] In spite of the effectiveness of education in DM management, numerous studies have demonstrated that patients' knowledge and practice regarding adherence to treatment, prevention, and management of DM complications, and diet have been poor or inadequate.[11] On the other hand, inadequate education of patients has been considered as the most important factor affecting their poor knowledge and performance, so that the majority of people are receiving little formal DM education.[12] Moreover, DM patients' health-care needs are abundant,[13] and their identification is of utmost importance.[2]

The first step in the design and development of educational contents is a proper needs assessment. Information obtained from needs assessment used as a basis for curriculum development to increase skills and knowledge of patients and expert personnel[14] is thus assumed as the starting point of any intervention program.[15] The Delphi method, introduced as one of the knowledge acquisition techniques,[16] has a structured process for predicting and assisting in decision-making during survey rounds of information collection, and ultimately, group consensus.[17] Given that quantitative approaches to research may not work well to deeply investigate knowledge, beliefs, and attitudes as well as details of participants' thoughts and notions, selecting a qualitative study assessing patients' needs seems logical. Such studies can discover patients' needs from their perspectives and in their own words, which can lead to a more in-depth and objective vision of unique experiences in individuals.[18] Therefore, the present study was conducted as a part of a comprehensive one aimed at explaining health-care needs based on DM patients' experiences from the perspective of patients and health-care providers.

Materials and Methods

This study was a needs assessment using the Delphi method fulfilled in the first half of 2017–2018 over 6 months. The study samples included a total number of 58 patients with DM, patients' family members, a physician, an internal medicine specialist, a nutritionist, a psychologist, and a charge nurse; from urban and rural community health centers and a health clinic in a hospital in the city of Darreh Shahr, Ilam, a West province of Iran, selected via purposive sampling method. The inclusion criteria were patients with DM with minimum 6 months of the disease, absence of any other chronic diseases or motor limitations, ability to speak and share experiences, as well as willingness to cooperate in the study voluntarily. Withdrawal from cooperation was considered as an exclusion criterion.

To implement the study and to collect the data, the modified Delphi method was employed in three rounds. The first round of the modified Delphi method started based on the qualitative interviewing and extensive literature review.[19] In the second and third rounds of this technique, nursing specialists and professors are included in the study due to having more comprehensive and complete information as experts in the field of the disease and patients' needs. Accordingly, in the first round of the modified Delphi method, DM patients' needs were determined using a qualitative approach and semi-structured interviews. To collect the data in this round, individual interviews were conducted with eight people (including patients, family members, a physician, a nutritionist, a psychologist, and a nurse) and eight interviews were administered with focus groups of 6–8 people (50 patients with DM) in health care centers. The interviews were conducted with homogeneous groups aimed at providing experiences about the disease as well as patients' needs for DM management by themselves, their family members, and health-care providers in the treatment team. To observe maximum variation in terms of patients' characteristics, their health-care records were reviewed. After phone calls and explanations of the purpose of the study and also upon their consent, the participants were invited to take part in the study. The time and the place of the interviews were determined based on the consensus of patients and researchers. On the day of individual interviews and focus group discussions, the consent of all the participants was obtained to record the interviews. Each interview also lasted approximately 30–45 min.

The interviews were conducted by a researcher with over 20 years of experience with DM patients and familiarity with qualitative interview technique. The interview place was in the clinic hall or the conference room of health-care centers. At the beginning of each interview session, the researcher introduced oneself to participants and explained the purpose of the study. Furthermore, the participants were assured that all their information will remain confidential and will be exploited only for research purposes. All verbal communications, as well as nonverbal behaviors such as

eye contacts and facial changes, were similarly noticed and recorded. The interview sessions for focus groups were separately held in the mornings and evenings upon the request of the participants. To maintain the consistency of the interviews, some question guides were also employed. Accordingly, each interview started with a general question; "Tell me about your experiences with diabetes" accompanied by more specific ones such as; "What information do you need to take care of yourself?" Moreover, a series of exploratory questions such as; "Please explain more" or "What do you mean?" were used. On the completion of the interviews, they were carefully transcribed verbatim. Besides, the researcher constantly reviewed the interviews to gain a general sense of the data. During the interviews, the data were simultaneously analyzed and subsequent interviews were conducted based on data processing. Interviews continued until data saturation. To analyze the data and to reach an appropriate level of abstraction, a conventional content analysis approach based on the steps proposed by Graneheim *et al*.[20] were employed. After coding the data, the main concepts were separately extracted in the form of 8 main categories and 24 subcategories in the form of patients' needs. In the second round, the data collected were submitted in the form of a preliminary draft to four patients and seven experts (a physician specialized in internal medicine, a nutritionist, a psychologist, and a nurse as well as three nursing professors in the field of DM and glands), and then they were requested to declare their explanations or criticisms on each of the categories and subcategories, and if they had further opinions, add them at the bottom of each section. Finally, all the data obtained from the previous two rounds were completed in the third round of the study. To survey opinions and to reach a final consensus, the data were sent to participants and experts in person or via E-mails and the needs with maximum consensus (90%) were identified as the basic needs of patients with DM. It is worth noting that the data in the third round were analyzed using the rating method. Hence, the participants were asked to rate the categories based on their importance and priority from score zero (less important) to score 10 (much more important). After receiving the responses by the participants, lower and higher scores represented low and high priority, respectively. In each round, the preliminary draft in the form of a questionnaire was sent to participants by the researchers via E-mail or distributed in person, and they were asked to return them within 7–10 days.

Finally, patients' health-care needs were extracted and finalized into four main categories and nine subcategories. All the participants in the second and third rounds of the study were homogenous. In the qualitative part of the study and in order to achieve the accuracy and robustness of the data, four proposed criteria by Guba and Lincoln were included. To ensure the credibility of the findings, allocation of sufficient time to collect data, sampling with maximum variation (age, marital status, level of education, and duration of disease), researchers' long-term involvement in data, as well as member checking were taken into account. To measure the dependability of the findings, peer review was fulfilled. The researchers also tried to not to interfere with their assumptions in data collection and analysis as much as possible to meet the confirmability of the study. Finally, the transferability of the findings was accomplished by providing a rich description of the process of data collection and analysis.

This study was approved by the Vice-Chancellor's Office for Research and Technology of Baqiyatallah University of Medical Sciences with a code of ethics: IR.BMSU. REC.1395.342.

Results

In this study, majority of the DM patients were female, 32 (70%) with a mean age of 54.85 ± 6.02 years. Most of these participants (62.5%) had an elementary school education. The mean of the duration of the disease was by 7.70 ± 5.15 years. The health-care providers were also mostly female 4 (92%) and married. In terms of the level of education, these participants were holding a bachelor's degree to an internal medicine specialty. The mean of age and work experience of the given participants was 42.53 ± 1.34 and 18.62 ± 6.20 years; respectively.

The results of data analysis were grouped into four main categories and nine subcategories following the review of codes along with summarization based on similarities to identify the needs of DM patients. The four main categories included information and knowledge needs, need for reinforcement/reform of religious-cultural beliefs, need for health self-management, and ultimately, supportive needs that were explained and interpreted by presenting the relevant subcategories using interviews with the participants. They are shown in Table 1.

Information and knowledge needs
This main category contained three subcategories of need for disease recognition, identification of disease causes, and awareness of disease symptoms.

Information and knowledge needs in DM patients also referred to as health literacy, are considered as an effective factor in the acquisition of capabilities for disease management. Self-management process in DM patients also consists of three characteristics, i.e. knowledge, ability to interpret symptoms, and response to disease-specific manifestations. In this respect, a nutritionist having master's degree with a 6-year work experience said that:

Table 1: Main categories and subcategories from content analysis of text data about health-care needs of diabetes' patients

Main categories	Sub categories
Information and knowledge needs	Need for disease recognition
	Identification of disease causes
	Awareness of disease symptoms
Need for reinforcement/ reform of religious-cultural beliefs	Unconfirmed DM treatment beliefs
	Role of cultural-religious beliefs in DM control
Need for health self-management	Need for self-care
	Attention to promotion of psychological and sexual health
Supportive needs	Health-care system support
	Family and community support

DM=Diabetes mellitus

"…*The largest part of patients has an average-to-low literacy. Most of them also have educational problems. They do not know how important education in the field of food pyramid is or they do not even know about the value of snacks during the day* …"

Patients' lack of awareness and inability to recognize the disease symptoms were also among factors affecting delayed treatments and disease complications in DM patients. In this regard, a 25-year-old female participant with middle school education and an 8-year history of DM stated that:

"… *I think the disease is silent. I have been drinking a lot of water for a long time and losing weight, but no one told me to have a blood test. I visited the physician after a long time later and told him about my weight loss, my good appetite, as well as my fainting. He asked about my blood glucose, but I had no answer* …"

Moreover, unawareness of the disease symptoms was delineated by a clinic physician with 6-year work experience as follows:

"… *Some signs and symptoms are not real. Some patients think that they have been affected with diabetes because they suffer from itching. They even find a wound which takes time to heal but assume it as a symptom of diabetes* …"

It should be noted that knowing the names of medications is taken into account as one of the indications that patients are adhering to treatments, helping them to manage the disease; however, most DM patients did not know the names of their medications they were taking after years of being affected with the disease. For example, a 50-year-old female participant with elementary school education and a 10-year history of DM added that:

"… *I do not know the names of my medications. One of them is big and circular and the other one is small and rectangular. I take them twice in the mornings and at night and I think I feel like vomiting* …"

The desire to receive education and information about DM and its complications was one other need raised by patients. In this regard, a 47-year-old female participant with third-grade middle school education and a 14-year history of DM said that:

"… *They always say everyone with diabetes has wounds all over their body, but I have not still seen one. I like to talk more with the physician. I wash my feet every day, sometimes I wear socks, but I put on slippers while doing agricultural work* …"

Need for reinforcement/reform of religious-cultural beliefs

This category included two subcategories of unconfirmed DM treatment beliefs and the role of cultural-religious beliefs in DM control.

It should be noted that need to make changes and adjustments in incorrect cultural assumptions and misconceptions common among people in a region as well as consideration of culture, beliefs, traditions, and customs are among important factors affecting the incidence and management of diseases. Since culture is a multidimensional concept and can be defined by unique behaviors, lifestyles, and attitudes that represent customs, habits, specific values, behaviors, emotions, and beliefs of a community, it can induce underlying factors that improve or control the condition of the disease or vice versa, exacerbate factors contributing to the development and management of the disease. Therefore, it is indispensable to pay attention to culture and beliefs in the face of the disease and affected individuals. In this respect, one of the participants in the focus group as a 47-year-old woman with middle school education and a 14-year history of DM stated that:

"… *People always suggest bitter cucumber. They sometimes say that opium is useful to reduce blood glucose for men who are obese and have high levels of blood glucose. But, I myself had pickles, verjuice, and okra and I think they were very good* …"

Another participant, a 60-year-old man with elementary school education and an 8-year history of DM also added that:

"… *One day I went to change my insurance card, someone recommended bitter cucumber as an herbal medicine, I ate half of it, I felt extremely bad, I was dying, I got diarrhea with blood traces. My blood glucose level turned to 60 and my hands and feet were shaking* …"

Furthermore, the role of religiosity and religious beliefs, as well as faith in God in people's lives, is very important and its effects cannot be ignored so that it was considered as a significant factor in treatment by the participants

and also as an agent to improve and reduce disease symptoms. Accordingly, a 45-year-old woman with a high school diploma and a 15-year history of DM said that:

"… *I feel relaxed whenever I say prayers or attend religious ceremonies. When I give alms, I feel good for two to three days, and my blood glucose is normal* …"

Moreover, meeting and interacting with family members and helping relatives were among other factors that had a positive impact on DM patients from the perspectives of the participants. In this regard, a 43-year-old female participant with an 8-year history of DM reiterated that:

"… *On Thursdays, I go regularly to the graveyard and say prayers for my deceased father, it makes me feel good. I also go to see my mother and grandmother and help them; I feel that my blood glucose is controlled then* …"

Need for health self-management

The results of the data analysis illuminated the need for health self-management as another category associated with DM patients' needs.

Ability to perform health self-management is taken into account as one of the important predictors of blood glucose and quality of life in DM patients; accordingly, poor self-management behaviors lead to extensive complications as well as economic losses of complementary therapies due to involvement of other limbs and organs of the body. This main category was made up of two subcategories of need for self-care and attention to promotion of psychological and sexual health.

It should be noted that caring and practicing treatments in patients depend on different abilities. For example, a woman (female, 32 years, a high school diploma, and an 8-year history of DM) who was still not managing her blood glucose despite taking pills after a long time and also no consent in terms of taking and injecting insulin, talked about accepting and continuing treatment and said that:

"… *While I was hospitalized, they said you need to learn how to inject insulin by yourself and they would not discharge me until I had learned it, because it was my daily practice and I could not go to the clinic in the mornings and evenings to get an injection, so I practically injected insulin by myself and was discharged and came home. Now, I feel good with insulin, I am very satisfied* …"

Attention to the diet prescribed to control blood glucose levels was among self-care behaviors demonstrated by the study participants. In this regard, a woman aged

43 years, having a high school diploma, with an 8-year history of DM stated that:

"… *I use less rice, pasta, and bread to control my blood glucose level. I usually use okra, cucumber, zucchini, tomato, and eggplant since they are widely grown in this village* …"

In contrast, negligence and nonadherence to dosing regimen and its discontinuation were among issues mentioned by the participants. For example, in the focus group, a 64-year-old woman with middle school education and a 6-year history of DM added that:

"… *I do not regularly take my medications. When I do agricultural work, my blood glucose level drops, so I discontinue taking them for two or three days. I think my blood glucose level has reduced by itself, so I do not need to take any medications* …"

Needs and promotion of mental and sexual health was another subcategory in this domain. Compared with healthy people, DM patients suffer from low mental health status. They also need to adapt themselves to diet, social restrictions, frequent blood tests, as well as sexual dysfunction. Therefore, applying some skills can help them improve their mental health status. This category included three subcategories of positive thinking, self-management, and attention to counseling services and programs. For example, in the focus group, a 32-year-old woman with high school diploma and an 8-year history of DM said that:

"… *I always think about good things. My daughter is studying medicine and thinking about her makes me feel good. I imagine how she will attend in her own office and I feel extremely high-spirited* …"

The DM patients were also maintaining their mental health through self-management. In this respect, a 60-year-old man holding a high school diploma with an 8-year history of DM stated that:

"… *If someone does not have a high regard for me, I try to remain silent; this way, I feel more comfortable* …"

It should be noted that DM is a chronic disease that can have significant effects on different aspects of life. Accordingly, one of the most important challenges in the case of living with DM patients is that their sexual needs are disturbed. For example, one of the participants in the focus group as a 50-year-old woman with elementary school education and a 10-year history of DM said that:

"… *I always have itching and burning in my genitals. I visit midwives at the center. They give me medications, but the infection recurs after two months. Every day, I run into squabbles with my husband* …"

Since DM has negative effects on the function of blood vessels and nerves because of the nature of the disease, it can lead to lack of sexual desire and consequently sexual dysfunction. Therefore, the need for counseling services and therapeutic follow-up on sexual problems was one of the issues cited a nurse with 12-year work experience:

"… *Patients with diabetes are facing many difficulties. They are suffering from decreased libido due to depression or some other complications. As they receive psychiatric counseling, their husbands complain more about sexual problems. For example, we had one case who remarried because his wife was affected with diabetes …*"

Supportive needs

Since DM is a chronic disease and most of the treatment progression is done at home and with the family, the participation of family members and their support for the implementation of treatment steps is very effective in treatment results. Moreover, the effect of community and health-care system support cannot be overlooked in terms of long-term follow-up and concerning achieving optimal performance. The results of this study also revealed that the category of supportive needs comprised of the subcategories of health-care system support for DM patients and the impact of family and community support on DM patients. In this regard, a 48-year-old internal medicine specialist with a 3-year work experience said that:

"… *Most patients are very restless and aggressive, they also have problems with their families, they need family support, but some families are tired of taking them to see the doctor or buying their medications, and even their frequent hospitalization. So, they run into struggles with their family …*"

On the other hand, the length of the disease and the complications resulting from inadequate and incorrect disease management can expose patients and their families with numerous challenges. Therefore, the supportive role of health-care system and community in controlling and improving family-patient conditions is of utmost importance. Accordingly, a 42-year-old nurse in charge of a hospital ward stated that:

"… *We need to teach families to accompany their patients. We need to sympathize with patients and their families, so families accept diabetic patients and also understand them not to feel lonely …*"

Another supportive need among participants in this study was a need for government funding and support by relevant organizations and associations. Unfortunately, there was no charity center and supportive organization in this city. In this respect, in response to the interview question, "What is your most urgent need for diabetes management?" a 45-year-old female participant with high school diploma and a 15-year history of DM said that:

"… *They must give us medications free of charge. These medications are very expensive and they are very difficult to obtain …*"

Moreover, a 53-year-woman as a first-grade high school student with a 12-year history of DM in the focus group added that:

"… *Everyone using medications for blood glucose control can gain weight, but that was not true for me because I am losing weight. The physician prescribed booster drugs but they are very expensive and I did not get them …*"

Discussion

DM, as a major concern of the third millennium, has affected all physical, psychological, and social aspects of patients' lives. The present study was to assess DM patients' needs through the experiences of patients and health-care providers in the health-care system in the city of Darreh Shahr, Ilam, Iran. According to the results of this study, the given needs were grouped into four main categories, including information and knowledge needs, need for reinforcement/reform of religious-cultural beliefs, need for health self-management, and ultimately supportive needs.

Knowledge and information needs were identified as the first category and the most important one in this study. In this respect, it was revealed that DM patients with low health literacy and less knowledge about their health status were receiving less preventive and care services and they had failed to manage the disease. Therefore, self-care ability in DM patients with inadequate health literacy was taken into account as a serious barrier to DM management, which had been further confirmed in other studies.[21-23] In this regard, health literacy, as a cornerstone for the acquisition of social and cognitive knowledge, is to develop skills and understanding necessary for disease management.[24] Health literacy has been also positively associated with self-care behaviors, dietary adherence, physical activities, blood glucose control, and foot care,[23] and its importance and impact have been emphasized as one of the aspects of health-care adherence.[25]

According to our findings, cultural beliefs can be also considered as underlying or exacerbating factors affecting DM. Therefore, identifying and explaining these beliefs are necessary to provide effective education for DM patients. In line with the results of this study, cultural beliefs and stories conveyed from former

generations had been reported to be much more effective in the performance of pregnant women in Southeast Asia compared with instructions and pieces of training provided by health-care providers.[26] Moreover, harmful nutritional interests and habits of the local people in their living place and their insistence to use some foodstuff, including ethnic dishes on special occasions among DM patients' families had been identified as the most important barriers to a healthy diet for DM.[27,28] The present study also highlighted the role of cultural beliefs and use of herbal medicines in DM patients living in this region. Unfortunately, patients had no awareness of the use of herbal and traditional medicines, and they had attempted to replace them for medications prescribed by specialists which could expose them with high-risk complications. While adherence to dosing regimen is vital to manage DM, patients themselves have a key role in DM treatment.[29] Moreover, cultural and economic conditions of DM patients can influence their self-efficacy in disease management, so that Muslim residents of Kenya had considered the use of herbal medicines for blood glucose control more effective than the consumption of chemically synthetic medications. The participants in the present study also emphasize the use of herbs and plant-based diets on blood glucose management. However, the cost-effectiveness of these medicines had been reported to be another reason for their wider consumption in Kenyan DM patients.[30]

DM patients also felt that there was a power beyond their life which could improve the results of treatments through their religious beliefs or communication with friends, family, or even nature.[31] Practicing religious activities and paying attention to spirituality can thus protect individuals against stressors, lead to the treatment of patients affected with depression, reduce their negative thoughts, promote interpersonal communications, and enhance their relaxation. In this regard, numerous studies have confirmed the positive role of spirituality in the treatment of patients. The increased power of internal control, enhanced recovery, reduced treatment costs, and improved self-management and self-care, as well as the promoted quality of life, had been reported in several studies.[31-33]

Need for health self-management, which has explained by two subcategories, the need for self-care and attention to the promotion of psychological and sexual health, been also repeatedly emphasized in the dynamics of the treatment and the role of health system personnel in its continuity and accuracy had been further demonstrated.[34]

The healthy eating, monitoring blood glucose, compliance with medication, physical activity, and healthy coping skills as principle of self-care behaviors for people with diabetes. Good adherence to self-care was determined to be positively correlated with good glycemic control and improved quality of life,[35] as well as reduced risk for diabetes complications including vision impairments, poor wound healing, and dizziness and death.[4]

The attention to the promotion of psychological and sexual health has confirmed by the results of these studies. Sexuality is a considerable part of female life, and it greatly influences its quality. Although sexual dysfunction is frequent in diabetic women the female sexual health remains a much-ignored area in diabetes clinical medicine, the belief of women regarding the impact of diabetes on sexual health must be explored. However, it is important for psychological and social well-being as well as reproductive function.[36] On the other hand, sexual health issues continue to pose challenges for women with diabetes in terms of medical and psychological challenges. The feeling unpleasant, both emotionally and physically, is extensively reported by diabetic patients, which are the psychosocial aspects of diabetes and sexuality. This feeling associated with demonstrating the very harmful and distressing personal outcome that onset and severity are largely influenced by the duration of DM and age.[37]

It should be noted that DM patients also need family and community support and the possibility of observing habits, especially dietary ones for patients will be very challenging and impractical if families do not adapt to new conditions of their members.[38] Therefore, family support correlates with decreased blood glucose levels in DM patients.[39] In a study in this domain, support from health-care system and community had been introduced as a cornerstone for patients with DM regarding their psychological needs. Hence, the positive effects of this kind of support on patients' feelings, perceptions, and self-efficacy in caring had been confirmed. Moreover, effective management by the treatment team and community support had been significantly associated with the observance of health-related behaviors.[40] In Pender's health promotion model, family support is also signified as an interpersonal effect predicting health-promoting behaviors and interpersonal effects are thus considered as behavior predictors.[41] Besides, self-management behaviors reflect on the need for fundamental changes in social, physical, and psychological living conditions as well as the necessity of adaption to these changes. Therefore, counseling services are among the needs raised by DM patients.[42] Unquestionably, ability to communicate properly is one of the most important necessities to achieve helpful results of counseling, because proper relationships between health-care specialists and patients can induce a better understanding of personal interests and experiences of patients as well as increased

awareness of diagnosis and treatment program and its progression. Given the use of a specific local dialect in the region examined and no fluency in Persian, as the official language, DM patients had difficulty in establishing communications with the specialists in the present study.

The limitations of the present study included: short time of interview due to health-care personnel workload, poor knowledge's, and participation of patients. This study was also conducted in a limited society and a specific culture; thus, this study should be replicated in other societies and cultures in order to provide researchers with complete and accurate information. With regard to the qualitative approach adopted in this study and the results were context-dependent like other qualitative investigations, the generalizability of its findings to other communities and cultures is limited.

It is the first study that explaining health-care needs based on DM patients' experiences from the perspective of patients and health-care providers by using Delphi method. Further studies need to be conducted to better assess the challenges faced by health-care personnel to deliver a better diabetes care, education, and management of DM.

Conclusions

The results of this study assessing DM patients' needs revealed that knowledge and information needs were the first and foremost need raised by these individuals, so increasing knowledge and health literacy in patients can lead to understanding the disease along with follow-up and commitment to receive further treatments. Need for changes in cultural notions and beliefs need for health self-management, and ultimately supportive needs were also among the subsequent needs highlighted by patients living with DM. Accordingly, understanding DM patients' needs based on their cultures and beliefs can provide the grounds for developing educational contents in accordance with perceived needs from the perspectives of patients and health-care providers in the region, resulting in favorable effects in managing the disease and reducing its complications, and consequently improving the quality of individual and social life.

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Conflicts of interest

There are no conflicts of interest.

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