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# Perceptions of type-II diabetes patients about the support sources for their disease: A qualitative study to access support sources in deprived regions

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# Abstract

**Background**: The number of patients with diabetes is increasing in all countries and different societal strata. This chronic disease requires extensive behavioral changes and adherence to a complex treatment program. Various factors affect the process of diabetes care and treatment; among them, support sources have been proposed as highly involved in controlling this disease. The present study was conducted to explain the perceptions of type-II diabetes patients about the support sources for their disease.

**Methods**: The present qualitative study was conducted using conventional content analysis in 2020 in Lorestan Province as one of Iran's deprived provinces on 19 participants, including 14 patients with diabetes type-II and five of their family caregivers. The participants were selected through purposive sampling, which continued until the saturation of the data. Data were collected using semi-structured interviews, and analyzed using conventional content analysis.

**Results**: The process of content analysis resulted in the extraction of two themes: Care incentives, consisting of the 'influential supporters' and 'efficient organizations' categories, and support strategies, consisting of the 'technological scope' and 'economic support' categories. These themes reveal the nature and dimensions of participants' perceptions of support sources.

**Conclusions**: By revealing the different dimensions of support sources in type-II diabetes patients, the results stressed that care programs for type-II diabetes patients should be designed considering the support sources available and with the goal of improving the capacity of the personal, social, and professional networks associated with these patients.


# Background

Diabetes type-II is one of the most common non-communicable diseases in the world that is caused by insulin secretion deficiency and increased blood glucose (1).This metabolic disease is one of the main causes of mortality, disability, and chronic diseases such as renal failure and cardiovascular diseases (2). According to the latest World Health Organization statistics, the diabetes-related mortality rate in Iran in 2016 was reported as 1270 in men and 1520 in women aged 30–69 years and as 2570 in men and 3220 in women aged above 70 years (3).Diabetes is currently recognized as a health risk in the world, and healthcare policy-makers are faced with challenges in ensuring the proper management of diabetes (4). A large number of adults with type-II diabetes are exposed to the complications caused by the lack of control over diabetes risk factors, and despite the routine care measures, 20–30% of diabetes patients poorly control their blood glucose. Patients who cannot control diabetes risk factors are exposed to disabilities caused by diabetes complications, such as stroke, heart attacks, amputation, renal failure or vision impairment (5, 6), and higher treatment costs (7–9).

With the growing health inequity, self-management programs are not effective in reducing the serious outcomes of chronic conditions such as diabetes (10). This ineffectiveness is particularly observed in

deprived communities and in countries with low GDPs, where the greater empowerment of deprived groups is especially emphasized (11). Studies have shown that the self-management of diabetes is not as simple as deciding to follow clinical diabetes guidelines, but is more about a complex interaction between people, social networks, and access to resourses(12). Moreover, there is a significant relationship between health and support sources, and those who receive more support are healthier (13).

Social support has a direct relationship with diabetes self-care behaviors and is an important predictor of self-care behaviors in the management of chronic diseases, especially diabetes, and the most important predictor of the adherence to treament in patients (2, 14, 15). Social support improves the ability to follow a healthy lifestyle and facilitates the adaptation to the disease (14). Evidence shows that healthy behaviors and lifestyle changes develop through social networks (16). These networks support patients in the management of chronic diseases through practical and emotional measures and by the effect they exert on the members of the patients' personal networks (16, 17).

According to studies, support sources have an important role in improving disease outcomes and self-management in diabetic patients (2, 14, 18). Moreover, the patients' perception of support is related to their culture, race, and ethnicity (19). The present study was thus conducted to explain the perceptions of patients with type-II diabetes and their family caregivers about the support sources available for their disease in Lorestan Province, which is one of Iran's deprived provinces in terms of medical facilities, and in which providing services to patients is further challenged by the mountainous nature of the region and its dispersed rural areas and nomadic tribes.

# Methods

For this qualitative conventional content analysis study, sampling was conducted between February and April 2020. The study setting consisted of community health centers in Lorestan Province. The participants included patients with type-II diabetes and their families, who were selected by purposive sampling. The study inclusion criteria for the patients were: Age over 18 years, confirmed diagnosis of diabetes type-II by a specialist, having a diabetes record at the health center, over six months since the diagnosis of diabetes, no known psychological disorders or dementia, ability to communicate, being well-spoken, and willingness to take part in the study. The inclusion criteria for the family members were: Ongoing contact with the patient, ability to communicate, and willingness to take part in the study.

After obtaining the Code of Ethics from Shahid Beheshti University of Medical Sciences and the necessary permissions from Lorestan University of Medical Sciences, candidates meeting the study inclusion criteria were selected for participation, and written informed consent was obtained from them after they were briefed on the study objectives. The participants were selected with maximum diversity in terms of age groups, education, and geographical area (urban and rural) in Lorestan province.

Data were collected through in-depth, semi-structured, face-to-face interviews, which were held at a time and place convenient for the participants either in clinics or diabetes centers after arrangement with the relevant authorities to ensure participants' privacy and comfort. All the interviews were conducted face-to-

face based on the interview guidelines by a nurse familiar with diabetes care and interview techniques (A.SH). The interviews started with general questions to gain participants' trust, and specific questions were then asked to accomplish the study objectives. The interviews opened with questions such as: "How long have you had diabetes?", and "How have you managed to control your disease in this time?", and continued with: "What care measures do you receive as a diabetic patient?", and "What source or sources are available to you to meet your care needs?". Attempts were made to better understand the discussed matters using probing questions such as: "Could you expand on that?", and "Do have any experience in this regard?". The interview eventually ended with the open-ended question of: "Is there anything else you might wwant to add?".

With prior permission from the participants, all the interviews were recorded. After each interview, the recordings were transcribed immediately or in the shortest time possible, and the transcscripts were then analyzed in MAXQDA-2018. Each interview lasted between 30 and 60 minutes (mean of 45 minutes). The interviews continued until the saturation of the data, i.e. when the codes became repetitive and no further new categories could be extracted, which was accomplished after 19 interviews (five with the family members, and 14 with the patients).

Data were analyzed using the Graneheim and Lundman content analysis method (20). Data were converted into written format before the analysis. Each statement was given a code based on the study philosophy and objectives. The initial classification of the codes was then carried out, and conceptually similar codes formed categories, and each category was given a name. The newly-emerging codes were constantly compared to the other codes and placed in the category with which they had the greatest similarity. During the analysis, the categories and relevant codes were also constantly compared with each other and with the data. Then, the similar and relevant categories were combined to form the subcategories. Next, the similar subcategories were combined to form the categories. After each interview, the previous categories were reviewed or they were combined or formed a new category. Thus, with the formation of the subcategories, the main categories were also extracted and the relationship between them was determined.

To ensure the accuracy and reliability of the data, the following four criteria were used: Credibility, Dependability, Confirmability, and Transferability. The researcher was in touch with the study subject and the patients for one year, and had an appropriate amount of interaction with the participants both before and during the study, spent enough time collecting the data and had a prolonged enagement with the data and was immersed in them. The transferability of the results was increased through maximum diversity sampling, combining the data sources (interviewing diabetes patients and their families), combining the study locations (health centers, doctors' surgeries, clinics, and community health centers in urban and rural areas), and the selection of participants from different levels of education, expertise, and job positions. The findings were controlled using member checks and external checks. To this end, four documents from the coded interviews were given to four patients and their families who had not taken part in the study, and the consistency of the data was confirmed by them. To ensure the accuracy of the data interpretation, parts of the interview transcripts plus the relevant codes and categories were

assessed and confirmed by two observers experienced in qualitative research. The researcher did not allow his assumptions to interfere with the process of data collection and analysis, and assessed and interpreted the data without any prejudice. For confirmability, the researchers accurately recorded a detailed report of the process of data collection, interpretation, and analysis, so that they could be as repeatable as possible.

# Results

The participants of this study included 19 people (14 type-II diabetes patients and five of their family members). The patients were aged 37 to 69 years, with a mean age of 50.86 ± 10.40 years. The family members were aged 25 to 42 years, with a mean age of 33.40 ± 6.98 years. Tables 1 and 2 present participants' demographic details.

Table 1
Demographic data of the patients (n = 14)

| | |
|---|---|
| **Age** | **37 to 69 years, with a mean of 52.86 years** |
| **Sex** | Female (n = 7) / male (n = 7) |
| **Marriage** | Married (n = 12) / widowed (n = 2) |
| **Place of residence** | Village (n = 6) / city (n = 8) |
| **Diabetes duration/year** | 5 to 15 years, with a mean of 9.21 years |
| **Income** | Not adequate (n = 14) |
| **Occupation** | Farmer (n = 4) / housewife (n = 5) / retired (n = 2) / corporate job (n = 1) / self-employed (n = 2) |
| **Education** | Illiterate (n = 2) / primary school (n = 4) / high school diploma (n = 4) / academic education (n = 4) |

Table 2
Demographic data of the family members (n = 5)

| | |
|---|---|
| **Age** | **25 to 42 years, with a mean of 33.40 years** |
| **Sex** | Female (n = 3) / male (n = 2) |
| **Marriage** | Married (n = 2) / single (n = 3) |
| **Place of residence** | Village (n = 2) / city (n = 3) |
| **Occupation** | Corporate job (n = 2) / self-employed (n = 1) / student (n = 2) |
| **Education** | High school diploma (n = 1) / academic education (n = 4) |
| **Relationship with the patient** | Brother (n = 1) / spouse (n = 2) / child (n = 2) |

After the analysis of the interviews and the extraction, review, and abstraction of the codes, the subcategories and categories were named based on their nature. Ultimately, two themes emerged from the nature and dimensions of participants' perceptions of their disease support sources, including care incentives and support strategies (Table 3).

Table 3
The themes, main categories and sub-categories

| Theme | Category | Subcategory | Codes |
|---|---|---|---|
| Care incentives | Influential supporters | Support received from formal care providers | Community health worker support |
| | | | Effective presence of the health house physician |
| | | | Ease of access to GPs |
| | | | Preferring to visit a specialist |
| | | | Continuity of care with diabetes care providers |
| | | Surrounding support networks | Supportive family |
| | | | Social support |
| | | | Volunteer support |
| | Efficient organizations | Receiving healthcare | Assurance resulting from access to health houses |
| | | | Comforting diabets centers |
| | | Easy access to medical services | Ease of access to clinics |
| | | | Prompt emergency services |
| Support strategies | Technology scope | Good communication tools | Opportunities provided by the virtual space |
| | | | Telephone support |
| | | Improving care knowledge | Dietary guidelines |
| | | | Insulin injection skills |
| | Economic support | - | Clinic's inexpensive specialized services |
| | | | Free care in diabetes centers |

## 1. Care Incentives

Support incentives were support sources within the two categories of 'influential supporters' and 'efficient organizations'.

### 1.1. Influential Supporters

Influential supporters include people who support the patients, and can either be formal caregivers or from surrounding support networks. Formal caregivers are usually found in the most accessible health centers and include community health workers, health house physicians, diabetes caregivers, general practitioners, and specialists. With regard to the cooperation of health workers, participant 11 said: "*We have health house in our villages, and I go to them for my insulin injection*". Regarding the ease of access to GPs, participant 4 said: "*I go to a general doctor when I need a drug. The clinics always have a general practitioner on site, who writes me a prescription. I don't have to wait or pay for a specialist. It gets my work done quickly*".

Other influential supporters of diabetes patients include surrounding support networks, which included a supportive family, social support, and volunteering supports in this study. According to diabetic patients, family members are one of their main sources of support for this group, which include the spouse, children, and parents of the patient. Family caregiver 5 explained: "*I myself and my sister and brother are often with my parents and do whatever there is to do. I know how to do injections, and I can do it if needed. We also have a blood sugar tester at home and a blood pressur emonitor too, which I control and note every day*". Family members' support of diabetic patients can be both emotional and functional. Family caregiver 2 said: "*My mother is so very careful with my father's diet. We don't even buy the stuff my father likes but are bad for him, so he wouldn't crave them. Because of his poor sight, we have created a safe environment at home for him, so he won't fall down God forbid"*. Also, participant 6 explained: "*My spouse as well as my children are all worried about me, and constantly ask if I've had my insulin injection and my medications*".

The patients' social supporters, who are developed according to their lifestyle and social characteristics, have an important role in supporting the patients. These social supporters include neighbors, acquaintances, friends, colleagues, and also those acquaintances of diabetic patients who work in health centers. According to the participants, these people can also provide patients with emotional and functional support. About support from the neigbors, participant 14 said: "*My neighbors know I have diabetes, and when my husband is not around, they look out for me and ask after my health*". About colleagues' support, participant 6 said: "*My colleagues look out for me, and look after me when I'm not well, and run my class for me*". About support from acquaintances working in health centers, participant 7 explained: "*When I'm unwell, I visit one of my relatives and his wife, who are health system retirees, and they test my glucose there and do my insulin injection for me*".

Another group of support sources for diabetic patients are volunteering supports. Although they have a weaker relationship with the patient, because of their special advantages, such as education or special facilities at their disposal, they vulontarily support the patients. The existence of these sources of support and access to them depend on the patient's social networks. Participant 4 explained: "*The village teacher*

*looks after us, and always asks my son about my health. He visits me at home and talks to me, and asks if I want him to bring me medications from the city if I need something*". Also, participant 1 said: "*Sometimes when it's cold, snowing, or raining and the road is blocked and it is difficult to come and go and the way is far, I either join a neighbor who has a car and wants to go to town or ask them to buy us our medications and bring them for us*".

### 1.2. Efficient Organizations

Some support is provided to patients through organizations. These sources can support the patients by delivering healthcare and medical services. Healthcare centers such as health houses are regarded as the first link in the support chain for patients living in villages. The existence of health houses made the patients feel reassured, and participant 9 said: "*There is the health house, and it is better than not having anything. It is reassuring when its doors are open*". Diabetes centers are other settings responsible for diabetic patients primary care. As such, family caregiver 4 noted that her mother visited the diabetes center because it made her feel good, and further argued about diabetes centers being comforting and said: "*Although we have the device at home and my mother controls her blood glucose herself, but if the diabetes center tells her that her glucose is OK, it's like it's different for her. Somehow it is comforting for her, the fact that she has somewhere to go to as a diabetic patient*".

In participants' statements, medical support sources include public and emergency clinics. About the ease of access to these clinics, participant 7 explained: *"I visit the clinic's specialist when I feel unwell. Sometimes specialists come to the clinic from other towns and we don't have to travel to nearby cities to see a doctor any more*". About emergency services' prompt delivery of services, participant 11, who lived in a village, said: "*It is very good now. Sometimes when you don't feel well and the roads are blocked, an emergency chopper comes to bring a doctor or take the patient to a hospital, so we no longer worry about the roads being blocked*". Recalling seeking help from emergency line 115, participant 8 said: "*I go to the hospital when I'm not well, the emergency department, and I'm usually take care of quickly*". Family caregiver 3 said: "*My father's blood glucose had dropped so badly once that he passed out, and as I did not have a car myself, I called 115, and they came and quickly transferred him to the hospital*".

## 2. Support Strategies

The support strategies theme involves tangible support services. These strategies consisted of the 'economic support' and 'technological scope' categories.

### 2.1. Economic Support

One of the important diabetes care and treatment issues is the cost incurred. Some participants revealed that they mostly went to centers where specialist's fees were cheaper. About the inexpensive specialist services in the clinic, participant 13 exlained: "*I come to the clinic because visiting a specialist here is cheaper. He does the same thing as in his office*". About the free care available in diabetes centers, participant 1 noted: "*This diabetes center they've set up, which is free, is very good for me, since I'm not*

*well off, and I get to know how I'm doing*". Participant 10 said: "*I always come here to get free care. The lady nurse takes my blood pressure and measures my weight, and if they have needles, they measure my blood sugar too. Knowing that my blood glucose or pressure is OK is good enough, and I don't have to go to a laboratory and pay, which is a lot of help*".

### 2.2. Technological Scope

This category includes methods of accessing the knowledge and information needed for care in type-II diabetic patients. Based on the present findings, the technological scope included the context of electronic communication and improving care knowledge.

The context of electronic communication facilitates patients' access to information and supports them by increasing their knowledge. The virtual space opportunities include the possibility of access to communication networks through the internet that encompass a variety of information about diabetes. Regarding the virtual space opportunities, participant 3 explained: "*I sometimes search the web for diabetes physical activities and diet, and sometimes use the information I get*". Family caregiver 5 said: "*I subscribed to one or two nutrition channels on Telegram, which have good stuff, and I can ask any question I have about the diabetes diet"*.

According to the participants, using the telephone is also a source of support for diabetic patients to obtain information, communicate with the medical team, and follow-up treatment. About telephone support, family caregiver 2 explained: "*My father controls his blood sugar, blood pressure, and weight at home and sends the info to a specialist in another town who knows him, and he tells us whatever is necessary for us to do*".

Another aspect of the technological scope of support sources in patients with chronic diabetes is care knowledge support and promotion through patient education in various ways. According to the patients, these instructions are focused on dietary guidelines and insulin injection skills in patients on insulin therapy. About dietary guidelines, participant 13 said: "*There is a nutritionist in this hospital too, and he talked to me about the diabetes diet, and I observe many of them*". About insulin injection skills, participant 12 said: "*The day I wanted to start getting on insulin at the hospital, the nurse taught me how to do injections, and practiced with me a few times until I was able to do it myself. They also showed me an instructional video"*.

## Discussion

The main study finding showed that diabetic patients and their families receive the greatest support from their surrounding support networks, especially their own family members. Although there are other care incentives and support strategies, only certain aspects of these sources were understood by the participants. For example, economic support has been limited merely to inexpensive specialist services and free care provided by diabetes centers and the technological scope merely to the use of electronic communication through the patients' and families' personal efforts rather than formally-planned

approaches. Moreover, the improvement of care knowledge was focused only on specific aspects of education, including dietary guidelines and insulin injection skills.

Diabetic patients received the greatest support from their families, and their surrounding support networks largely consisted of their own family members. Family support is an important component of diabetes social support and an inseparable part of patient care. Family support helps patients in maintaining the structure and organize their effective adaptation to a new lifestyle. Family members provide the patient with emotional support at any time without any expectations in return (21). In the present study, investigating families' support of their patients in the emotional and functional dimensions showed that children provided the greatest functional support to patients among all other family members, but in the emotional support dimension, the patients noted the role of their family's support in general and did not name any particular members. Similar studies on chronic patients have shown that, among all family members, patients consider their spouse their key element of support (22), and the spouses' support followed by the children's were the most important support sources for patients (12). This difference can be attributed to the culture and context of the participants in these studies. Lorestan has a patriarchal community, and because of the ruling culture, on the one hand, women refrain from verbally expressing affection to their family members, and on the other, men avoid expressing their feelings about their wife in the presence of others. It is therefore possible that some interviewees may have refrained from naming their spouse as a source of support for providing care. Studies also suggest that, in a patriarchal community, it is possible for the family dynamics to affect women's self-management behaviors, while the dynamics may be more favorable for men (23).

In the present study, the way families emotionally supported the patients varied, from asking after their health to talking about their concerns about taking medications and following their diet. Functional support also varied widely in form, from accompanying the patients to doctor's visits to providing transport, paying for treatment costs, helping with injections and taking medications. The results of similar studies have also shown that emotional support can be basically in the form of spending time with the patient, which is often the way family members and friends choose to show their support, and functional support can also be in the form of family members accompanying the patient to medical visits, which shows a simple aspect of care (24).

The results showed that, irrespective of their place of residence and moderate to low living standards, diabetic patients emphasized family as their first source of support. Some studies have shown that urban families, nuclear families, and families with low to moderate incomes and a high degree of deprivation of resources show no desire to support their patients due to their poor family cohesion, significant family conflicts, fully closed or excessively open boundaries, poor organization, and members' emotional distance from each other (21). This difference can be attributed to people's culture in Lorestan, in which protecting and taking care of the family are an ethical priority and a customary practice for most people despite all the family's problems, including the shortage of support sources, low income, and unemployment. Taking care of an ill family member is thus not a choice but a duty for these families.

In the present study, some patients had social support (from friends, colleagues, acquaintances, and neighbors) as well as the support of volunteers. Meanwhile, the number and form of their surrounding support networks depended on their social network. Given the long distance between some villages and the city, the inaccessibility of the roads, and the lack of access to medical services, especially during the cold season, the support provided to rural patients by volunteers was regarded as an important source of support. This form of support was mostly functional an dincluded providing transportation and procuring medications. In one study, Rogers et al. focused on the power of relationships in social networks and investigated their role in the management of chronic diseases; they showed that poor social relationships are sometimes limited to the provision of a particular type of help through people with whom the patient has no close relationship or family tie (25). Portillo et al. also showed that the role of social volunteer organizations and groups becomes more prominent in domains where there is different levels of deprivation of community resources (26). These volunteer sources are the same social support sources that the participants of this study found helpful in providing transportation, sharing knowledge and experiences of the disease and offering emotional support. Another reason that appears to have strengthened the patients' poor communication with their surrounding care-related support networks (colleagues, friends, neighbors) was the value of these communications from the patients' perspective, since these relationships do not entail the sense of being an imposition and the stigma felt when receiving disease-related help through close relatives whose relationship with the patient is more dominated by empathy (27). In other words, relationships in these networks are less associated with the guilt and shame often seen in chronic patients, enabling a better dependence and independence balance (17).

In the dimension of supportive sources, the participants stated that formal caregivers in healthcare organizations support them. This form of support varied depending on the patients' place of residence, as rural patients mostly proposed health houses as an efficient support organization and benefited from the cooperation of community health workers and physicians attending these centers. The patients living in the city mostly recalled GPs and specialists as their source of support, and received support by visiting clinics and private surgeries. Moreover, in acute situations, both groups of patients (urban and rural), visited hospital emergency departments, and recalled emergency services as a source of support that quickly attended to their needs and helped them whenever required and in acute conditions. Diabetes nurses working as care providers in diabetes centers were also proposed as another source of support for both urban and rural patients. In agreement with the present findings, similar studies have shown that utilizing the services of healthcare providers in chronic diseases has been effective as a community-based strategy for providing medical services and prevent the deterioration of chronic patients' health (28). These care providers can provide social, emotional, informational, evaluative, and objective support to patients (29), and through extensive training, help connect them to community resources, get access to physicians, and resolve certain problems (30).

Most participants stated that their main reason for visiting diabetes centers was their free services. Other economic support sources proposed by diabetic patients as the facilitators of their disease follow-up were the inexpensive specialist services provided in public clinics compared to private surgeries and

centers. It should be noted that people's actions can be affected by their perception of the advantages and disadvantages of a behavior before it is performed (31).Therefore, anticipating disadvantages or costs for a certain behavior can in turn affect the intention to commit that behavior (32). Since studies have shown that diabetes is a costly disease due to its prolonged nature and complications and patients face problems in paying for the incurred costs in the long term (33), patients appear to choose sources with the greatest benefits. It can therefore be concluded that resolving financial barriers increasingly leads to the satisfaction and participation of type-II diabetes patients in following up their treatment.

Taking advantage of technology was another source of support according to the participants. The participants believed that electronic communications, whether through the opportunities provided by the virtual space or as telephone support, have helped them obain disease-related information and follow up their care. With regard to remote communication technologies, the review of literature about chronic diseases suggests that communications with less intimacy and from a distance can provide diverse preferred aspects of support (17). For example, online communication can offer less interaction and stress that close and intimate relationships (34). The participants stated that professional care providers had helped them improve their self-care knowledge by providing them with educational support. Nonetheless, these trainings were mostly concerned with diabetes diets and insulin injection. In a study conducted by Gao et al., the informational support provided by physicians to patients was reported as the main source of informational support for type-II diabetes patients (35). Abdul Rashid et al., also showed that informational and emotional support can lead to self-efficacy in implementing care programs in diabetic patients by creating positive social interactions (24).

The analysis of the main themes in the present study showed that patients have contact with various social networks around them in accordance with the features of their place of residence and care needs. The cause of development of poor social relationships, such as that observed in relation to social networks about self-care, shows that a prominent feature of the contemporary society is the less concentration and higher expansion of support networks and knowledge resources, which have grown along side a set of primary intimate relationships (36). Quoting Amato, Rogers (2014) argued that the increasing interest in the role and functions of poor communications along with the dispersed relationships in social life is associated with the creation of a complex set of second-level transient networks consisting of neighbors, colleagues, and even taxi drivers(27). Similar to the present findings, these second-rate networks form important sources of support in some regions with limited resources, which increases the access to services and cohesion in the patients' social relationships (25).

Based on the present findings, it can be argued that family support and the patients' surrounding support networks have an important role in how type-II diabetes patients are supported. The results also suggest that when formal care providers are unable to provide for the patients' support needs, they will be replaced by surrounding support networks, to which patients have easier access and relate better. This issue might be another reason for the prominent role of surrounding support networks in type-II diabetic patients' life in the present study. In agreement with the present findings, Vest et al. divided the facilitators and barriers of self-efficacy in diabetes into three main themes, including the effect of social networks'

support (family, friends, acquaintances, colleagues, and others who work in healthcare centers), the nature of the physician-patient relationship, and the healthcare system's relationship with the patient (12).

# Conclusions

According to the results, participants' perception of support had two main themes: Care incentives, and support strategies. This result can help health managers and planners learn in which areas to plan and intervene in order to facilitate type-II diabetic patients' greater use of support sources. The results can also show planners and policy-makers that qualitative studies can also be used alongside quantitative studies to evaluate the effectiveness of programs associated with diabetic patients.

# Declarations

### Ethics approval and consent to participate

This study was extracted from a PhD thesis in nursing approved by Shahid Beheshti University of Medical Sciences in Tehran. The university's ethics committee assigned the code of ethics IR.SBMU.PHARMACY.REC.1398.294 to this thesis. For ethical considerations, informed written consent was obtained from all the participants to participate in the study at the outset, after briefing them on the study objectives. This consent was approved by the Research Deputy of Shahid Beheshti University of Medical Sciences. Furthermore, the participants were ensured that they could withdraw from the study at any stage, and that this decision would have no effect on their care and treatment process and would not have any consequences for them.

### Consent to publish

Not applicable

### Availability of data and materials

The datasets used and or/analyzed during the current study are not publicly available due to patient privacy concerns but are available from the corresponding author on reasonable request after Shahid Beheshti University of Medical Sciences in Tehran permission is obtained.

### Competing Interests

The authors declare that they have no competing interest

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The authors have not received any funding for this project.

### Author's Contributions

Study conception and design: SH.A and E.F; data collection and Critical revision of the article: SH.A; Data analysis and interpretation: SH.A and E.F; Drafting of the article: A.F and I.M. All authors have read and approved the manuscript.

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