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Original Article

Investigating the Information Needs of People with Type 2 Diabetes in the COVID-19 Pandemic Era in Iran: A Qualitative Study

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Abstract

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Introduction: One of the most pervasive and dangerous diseases that affected Iran and the world from December 2019 to May 2023 was the outbreak of COVID-19. People had an intense fear of the virus for a variety of reasons. One of the main concerns of people with Type 2 diabetes is their need for accurate and reliable information on how to deal with the virus. Therefore, the main goal of this study is to identify the information needs of patients with Type 2 diabetes against COVID-19.

Methods: The present study was conducted using a qualitative approach and content analysis. The statistical population included 14 patients with Type 2 diabetes in Kermanshah. The data were collected through semi-structured interviews.

Results: The findings showed that 211 basic concepts, four primary categories, and thirteen subcategories are fundamental in meeting the information needs of patients with Type 2 diabetes. The main categories included information about COVID-19, mental health care, personal health care, and health care organizations.

Conclusion: In general, patients with Type 2 diabetes had limited information and knowledge about the types of care required against COVID-19. Therefore, professional nurses in hospitals need training on how to deal with COVID-19 and how to care for Type 2 diabetes patients against this virus and similar viruses. In order to meet patients' information needs, hospitals should manage nurses and specialists and create a database. People's health is the basis of all human life and is necessary for adequate care.

Introduction

Diabetes is one of the most common chronic diseases (1) and one of the most common diseases in our time (2). Furthermore, the rising prevalence of Type 2 diabetes is among younger adults (3); it is a growing public health challenge worldwide (4-5), requiring the patient's participation in self-care due to its gradual onset and unpredictable recovery (6). On the other hand, this disease damages various organs of the affected person and shortens the lifespan of people. This disease appears in Type

1 and 2 diabetes, gestational diabetes, and other diseases.

It is estimated that 425 million people around the world currently have diabetes. By 2045, that number is expected to rise to 625 million (7). This situation occurs more in low—and middle-income countries (8). The most important symptoms of Type 2 diabetes are excessive thirst, frequent urination, nervousness and lethargy, impaired vision, numbness or tingling of the fingers, and the formation of wounds and slow healing of wounds (9).

Diabetes mellitus is also a disease in which the patient's care depends on the patients themselves, and the patient often has to follow the instructions and individuals' diet. Hence, they constantly search for and manage information about their situation (10). Correspondingly, irregular education and the old age of patients cause weakness in the self-care of these patients (11). The valuable and beneficial effects of patient education have been confirmed many times in various studies (12). Moreover, the lack of knowledge and awareness regarding a chronic disease such as diabetes is a common problem among people suffering from the disease. This can lead to severe complications in patients and imposes heavy costs on the health system (13). The weak immunity of diabetic patients against various viruses causes serious harm to the patient. One of these newly identified viruses is COVID-19.

Emerging infectious diseases such as acute respiratory syndrome and Zika virus disease are a significant threat to public health. Despite extensive efforts, there is still uncertainty about how, when, and where new diseases emerge (14). In January 2020, deep sequencing analysis of lower respiratory tract samples identified the novel acute respiratory syndrome virus, or Coronavirus two, as the causative agent for pneumonia (15). This new virus was a severe risk to people with certain diseases, especially patients with Type 2 diabetes. As reported by (16-19), diabetic patients have suffered the most damage from COVID-19. Due to the newness of this virus, studies have been conducted during the last three years (20-23). Most of these studies in the initial stage were aimed at the nature, recognition, clinical features, or complications of this virus and were in the form of reviews and research articles. However, limited research has been conducted regarding the information needs of diabetic patients in the time of COVID-19 (12-13). However, having information can play a fundamental role in care and self-control. In this regard, providing the correct information at the right time and to the right audience can solve or reduce some challenges (24). Pulido et al. (25) concluded that misinformation is more shared but less produced than science-based evidence or fact-checking. Homolak et al. (26) state that the scientific community can use more efficient data to create a suitable basis for finding new solutions for the COVID-19 pandemic. Therefore, identifying the information needs of patients with Type 2 diabetes against COVID-19, prioritizing them with proper planning, and using the professional care process can help meet the needs of diabetic patients. Considering the need to access information as a critical factor in facilitating the adaptation and self-management of patients with Type 2 diabetes, the researcher decided to identify the information needs of patients with Type 2 diabetes by conducting a qualitative study, and thus provide a clearer picture of to this virus for diabetic patients as self-care at home and in order to help health service organizations. Therefore, the central question of this study is what are the informational needs of Type 2 diabetic patients against COVID-19.

Methods

The current study method is qualitative, and the content analysis was done using conventional data analysis. Content analysis is a research technique that has gained popularity in health studies (27), strategic management, psychology, communication, and other social science disciplines (28). Conventional content analysis is a widely accepted method of data analysis for qualitative and mixed-methods research (29).

The statistical population included 14 patients with Type 2 diabetes in Kermanshah City, and the study was conducted from 2021 to 2022. The sampling method in the current research was purposeful. This signifies that individuals with Type 2 diabetes were recognized and selected, provided they possessed

the ability and willingness to engage in interviews, along with a sufficient understanding of different information-seeking strategies. The researcher got to know the patients by asking colleagues and acquaintances and having random meetings in the doctor's office. The data saturation method was used to determine the volume and size of the sample. In qualitative research, reaching data saturation indicates the interview completion time. In order to carry out ethical points and to gain reassurance, the interviewees were informed before the interview that their names would not be mentioned in the article or anywhere else, and secondly, the research participants were assured that their statements would be kept confidential and will not be used against them anywhere.

Instrument

The data were collected through semi-structured interviews. The interviews were conducted by telephone and social network through WhatsApp with the interviewees' consent, according to the restrictions and compliance with health protocols. The interviews were conducted between December 2021 and February 2022 in Kermanshah City, and the duration of the interviews was between 20 and 35 minutes.

In this study, first, to start the interview, the researcher gave the interviewees some information about myself (the author) and the purpose of this study. The interview started with a general question about the personality characteristics of the interviewees. For this purpose, the researcher started with general questions, including how they got diabetes. After introducing themselves in a few short minutes, the author continued with the main questions, which were the information needs of the patients. Therefore, several questions were asked in general as an interview guide, such as, "How much information do you have about type 2 diabetes?" ""How much information do you have about COVID-19?" "What information do you need about Type 2 diabetes against the Coronavirus?" "What do you think is the nature of the causes of Type 2 diabetes?" These questions required an open and interpretive answer, and the following questions were designed based on the interviewees' answers during the interview. At the end of the interview, the interviewees were asked if there is anything specific about their information needs during COVID-19 that has not been discussed as such needs further explanation and discussion.

Data analysis

Data analysis was explored through conventional content analysis (27) to find out the information needs of the interviewees. After collecting qualitative data, concepts, categories, and primary and secondary factors were identified using the open and axial coding methods. This process was done in five steps:

In the first stage, after the end of each interview, the data were transferred to paper. In the second stage, the researcher read each interview several times to have a better understanding. In the third stage, general categories and subcategories were developed based on the process of open and central coding of the collected data and refinement of conceptual codes (determining the units of meaning and primary codes). In the fourth stage, by extracting common conceptual codes and refining and removing duplicates of some conceptual codes, concepts were identified and specified, and by refining these concepts, they were organized in the form of subcategories. In the fifth stage, general categories and subcategories were presented based on the process of open and central coding of the collected data, and the conceptual codes were refined med (Identifying and determining the primary and subcategories).

Due to this article's limitations, we did not present the initial codes and 221 initial concepts. Table 1 shows the sample results of the main category, subcategory, and primary code.

Table 1. An example of the content analysis process of interviews

Row	Primary code	Sub-category	Main category
1	… I think getting access to reliable information about the treatment methods gives me a relief.	Treatment method	Information needs related to the type of disease
2	When I think about the Coronavirus or when someone discusses it, especially the dangers of this virus, I automatically get very anxious about this virus	Anxiety	Informational needs related to psychological care

Validity and reliability of the tool

Four criteria (credibility, transferability, dependability, and conformability) were used to assess the validity and reliability of the research.

Regarding the credibility of the research, the researcher has had Type 2 diabetes for more than five years and is under the supervision of a specialist doctor. Therefore, the researcher has been in constant contact with the research environment, which has made him gain the participants' trust in the research. To ensure the findings can be generalized and applied to similar groups and settings, the research results are shared with individuals who have firsthand experience with diabetes, either personally or through a family member. However, they did not participate or play a role in this research; it was placed to check its transferability and appropriateness. The result of this study was to confirm the findings and provide additional experiences and views used in the data analysis process. The criterion of dependence in the present research was carried out by methods such as trying to win the trust of the interviewees through careful and deep listening. Finally, to confirm the research findings, the manuscripts, along with the initial codes, were given to four faculty members to express their opinions separately. After expressing their opinions, the author analyzed the announced items.

Results

The characteristics of the participants in terms of demographic characteristics are given in Table 2.

Table 2. Level of health literacy in people with type 2 diabetes before and after the training intervention

Participating code	Gender	Age	Job	History of diabetes	The drug used
1	Male	51	Business	6	Metformin
2	Male	54	Government employee	9	Insulin/Metformin
3	Male	48	Business	5	Metformin
4	Male	55	Government employee	7	Insulin
5	Male	46	Government employee	5	Insulin/Metformin
6	Female	50	Factory worker	3	Metformin
7	Male	51	Private sector employee	6	Metformin
8	Male	50	Private sector employee	5	Insulin/Metformin
9	Female	44	Government employee	4	Metformin
10	Male	49	Business	8	Insulin/Metformin
11	Male	52	Private sector employee	6	Insulin
12	Male	47	Factory worker	5	Metformin
13	Male	52	Business	4	Insulin/Metformin
14	Male	48	Private sector employee	6	Metformin

The qualitative data analysis process was such that after collecting the data, the main and subcategories were identified. By extracting common conceptual codes and refining and removing duplicates, some conceptual codes were identified, and by refining these concepts, they were organized into subcategories. The results of the initial coding of the research showed that a total of two hundred and twenty-one conceptual codes were obtained, which were refused to be presented due to the reduction of the volume of this research. The results of the primary and secondary categories are shown in Figure 1.

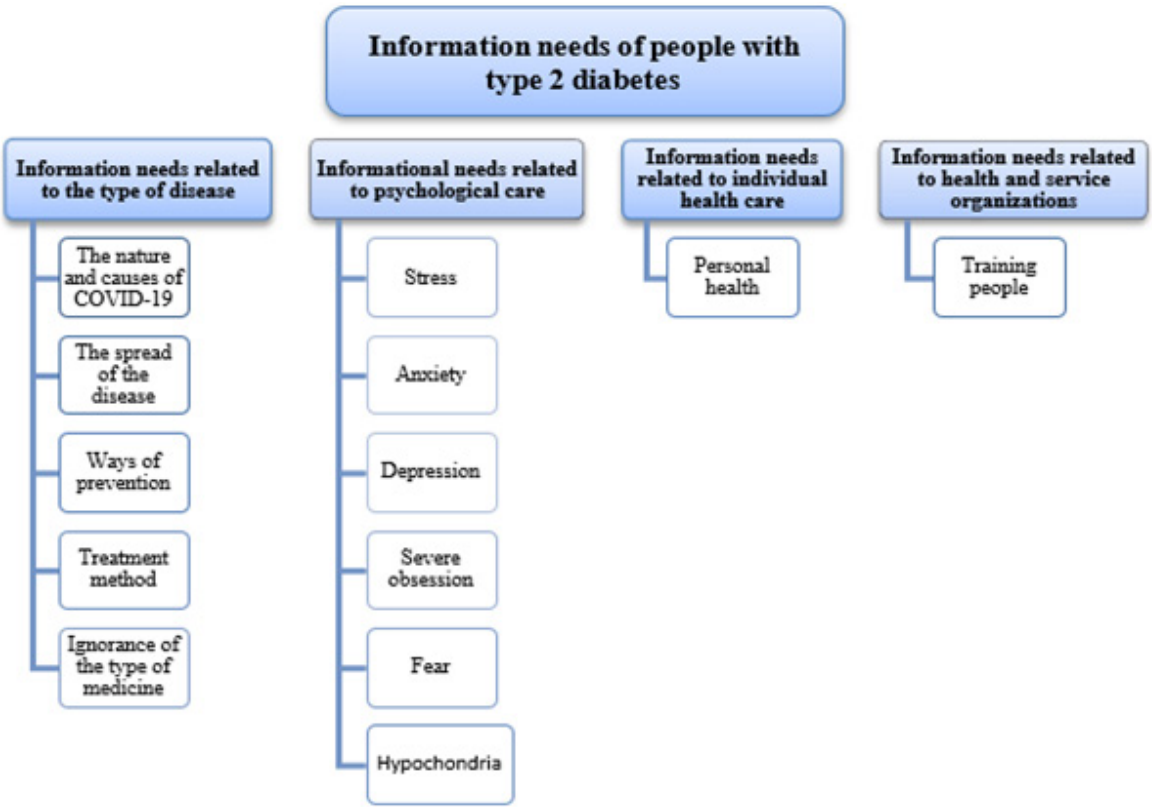

Figure 1. Results of content analysis of interviews and coding: primary and secondary categories

According to Figure 1, the central and subcategories affecting the information needs of patients with Type 2 diabetes against COVID-19 can be classified into four categories, including main factors and thirteen sub-factors. The four main categories included informational needs related to COVID-19, mental health care, personal health care, and the structure of health organizations, which are discussed below:

Category 1: Information needs related to the type of disease

The coding and content analysis results of the categories showed that five categories or subcategories are fundamental in the information needs of Type 2 diabetes patients against COVID-19. Subcategories from the interviewees' point of view can be seen in Table 3.

Table 3. Results of content analysis of interviews related to the subcategory of information needs related to the type of disease

Main category	Sub- categories
Information needs related to the type of disease	The nature and causes of COVID-19
	The spread of the disease
	Ways of prevention
	Treatment method
	Ignorance of the type of medicine

The nature and causes of COVID-19: Patients with Type 2 diabetes stated that they were unaware of the nature of COVID-19. They faced a lack of reliable information or sources to understand the nature and origin of the virus. As a result, they turned to mass media and social networks, following the general public's advice to find the information they needed.

These patients emphasized the existence of complete information with scientific support and the certainty that it existed in these media. According to them, these media outlets are confused due to the contradictory information about COVID-19. One of the interviewees in this research says:

"When Coronavirus broke out in Iran, I immediately looked for information about this virus from my friends and colleagues. The media I used the most were Telegram and Instagram, as well as television and satellite. As I was doing the more Internet searching, the more confused I became about this virus. Different social networks started publishing and providing different information without having any knowledge. The more I read, the more I was afraid of Coronavirus..." (Interviewee 9; Female, 44 years old).

- **The spread of the disease:** Another category that patients mentioned was the need for information related to various factors of the spread of COVID-19. Their main answer was that they did not have accurate information about the spread of COVID-19. As one of them states:

"Different news can be found about the spread of Coronavirus. Every day, a new type is revealed. At first, they said that by contacting the carriers, but after a while, we found out that people were infected who were not in contact with others. One day they say to use masks and gloves, one day they say no, it doesn't have much effect, there are many different words in this space, it is hard to understand what are the ways of spread, of Coronavirus" (Interviewee 8; Male, 50 years old).

- **Ways of prevention:** One of the effective factors in the prevention and control of diabetic patients during a crisis is to have sufficient information and knowledge about the patient, the factors affecting the occurrence of the disease, and how to prevent all types of viruses that will affect the disease of diabetes. According to the research and the news published in reliable mass media, there is currently no specific and definitive treatment for COVID-19. Nevertheless, with knowledge and expertise, it is possible to prevent this virus to some extent. One of the interviewees stated:

"Since there are many warnings in the country, especially the Ministry of Health, through television or the Red Crescent, that warn people to stay home. However, there was a rumor that some people got infected with Coronavirus without being in contact with others. I think I need extensive information on how to prevent this disease. In fact, my physical condition puts me at greater risk than others" (Interviewee 7; Male, 51 years old).

- **Treatment method:** The next factor that patients with Type 2 diabetes felt the need for information about COVID-19 was the treatment methods in case of contracting this virus. They believed that if they had reliable and documented information from the Iranian Ministry of Health, they could treat themselves with a better view and knowledge if they were infected with the virus. One of the interviewees stated:

"Two to ten percent of people infected with Coronavirus have died, and many people have been able to get their health. Although this percentage is perfect in this crisis, this amount is by no means satisfactory; I think getting access to reliable information about the treatment methods gives me relief" (Interviewee 12; Male, 47 years old).

- **Ignorance of the type of medicine:** Another thing that diabetic patients mentioned was that they did not know the type of medicine regarding the medicines that can prevent them from contracting COVID-19. Lack of reliable information about the potential medication for the treatment of the virus was one of the main problems of patients with Type 2 diabetes. Because they felt that in the absence of particular medicine, their health would be seriously threatened. On the other hand, the existence of profit-

seeking people produced incomplete and sometimes destructive and fake information in virtual space, especially social networks. This can cause serious harm to diabetic patients and other people. This is echoed in one of the interviewee's Statements:

"When this virus broke out, non-specialists introduced many chemical or herbal medicines, and unfortunately, due to the fear of the disease, some of the people rushed to pharmacies to buy chemical medicines, such as co-amoxiclav, anti-cough syrups, acetaminophen. Some people bought herbs such as garlic, ginger, and thyme, which were sold at high prices in the market. I think all this happened because of people's fear" (Interviewee 3; Male, 48 years old).

Category 2: Informational needs related to psychological care

Due to the speed of COVID-19 transmission, which was one of the unique features of this virus, the spread of COVID-19 has created an emergency situation in less than a few months around the world. This infectious disease has not only caused concerns about physical health but has also caused several mental illnesses. In this situation, it is necessary to maintain the mental health of people because people in different parts of society may experience stressful stimuli during the spread of COVID-19 (30). Holmes (31) pointed out that the 2019 Coronavirus pandemic has profoundly impacted all aspects of society, including mental and physical health. From the interviewees' point of view, the consequences of this virus can be seen in Table 4.

Table 4. Results of content analysis of interviews related to the subcategory of informational needs related to psychological care

Main category	Sub- categories
Informational needs related to psychological care	Stress
	Anxiety
	Depression
	Severe obsession
	Fear
	Hypochondria

- **Stress:** The mental and emotional factor that the patients mentioned was that these patients are always under severe stress against COVID-19. According to them, having information and knowledge about the virus's psychological consequences will help them deal with this situation properly. As one of these patients says:

"When discussing Coronavirus, I unconsciously feel a lot of stress and mental pressure; on the other hand, the statistics presented on TV or social networks cause my stress to increase. Every moment I cough, or my body heats up; I think I became infected; the stress really takes over my whole body, I even went to the border of madness" (Interviewee 14; Male, 48 years old).

- **Anxiety:** Another thing that most patients with Type 2 diabetes face is their anxiety from COVID-19. Anxiety is considered the highest mental suffering. As one of them says:

"When I think about the Coronavirus or when someone discusses it, especially the dangers of this virus, I automatically get very anxious about this virus" (Interviewee 1; Male, 51 years old).

- **Depression:** Another thing that Type 2 diabetes patients face is their severe depression. Considering that how to behave and deal with a depressed patient requires information and presentation of professional behaviors and self-care on behalf of the patient. Patients lacked the necessary information in

this field. As one of them says:

"I get very worried about this situation; I have imprisoned myself at home; I even do shopping through motor couriers and through the Internet. I think I got depressed. I often like to be alone" (Interviewee 10; male, 49 years old).

- **Severe obsession:** Another thing that patients with Type 2 diabetes have mentioned is their severe obsession. The use of various types of disinfectants that they use repeatedly at home in a short time has caused them to become obsessed. As one of them reported:

"I wash my hands with soap and water several times a day, almost every half or an hour. I clean them with disinfectants after washing them. The color of the skin of my hands has changed. I'm so afraid of it… I know this situation is not good, but I have no choice. I don't know if this fear is normal; something is wrong, I guess. I think I have a severe obsession" (Interviewee 6; Female, 50 years old).

- **Fear:** Another thing that most patients with Type 2 diabetes emphasize is the severe fear of COVID-19. As one of them said:

"A normal virus is not like a cold, it's very scary. Everyone around me, including my friends, discusses a lot of the news about the Coronavirus as if there is no more to say. I was scared. It is very important to know how to overcome this fear. I need help. Unfortunately, I do not have access to a good counselor or psychologist." (Interviewee 5; male or Male, 46 years old).

- **Hypochondria:** Hypochondria is one of the pseudo-somatic disorders in which, even though one is healthy, he/she thinks that suffers from a serious illness. One of the things that some of the interviewees mentioned is Hypochondria. In this regard, one of the interviewees said:

"When my family and friends talk about Coronavirus or its symptoms, or when I read various posts on social networks such as Telegram and Instagram by famous people or different people. I feel that symptoms like coughing, very low fever, or mild sore throat indicate that I also got Coronavirus. This situation bothers me" (Interviewee 3; Male, 48 years old).

Category 3: Information needs related to individual healthcare

Self-management strategies can be effective and beneficial along with the appropriate treatment of the disease. Acquiring the necessary skills and getting involved in self-care can make the patient more efficient in self-care (32). The third vital challenge faced by Type 2 diabetes patients is personal health care. During the COVID-19 crisis, personal hygiene was one way to prevent contracting this virus.

- **Personal health:** The patients mentioned the problems related to personal health care to prevent the spread of COVID-19. In this regard, one of the interviewees remarked:

"There are many counterfeit detergents in the market… What has caused me many problems is how and in what way to perform personal hygiene. I used so many detergents that I fear that they destroy my materials, not Coronavirus. I use a lot of household items that are used daily, I clean them several times, and I feel short of breath because I use so many detergents..." (Interviewee 2; Male, 54 years old).

Category 4: Information needs related to health and service organizations

Education and information are central to chronic disease management strategies (33). The main problem faced by patients with diabetes is that the health service organizations do not provide the necessary and sufficient training through the mass or local media based on scientific evidence, only a few clips showing how to wash or communicate with others. Moreover, this situation has caused them to face a big problem. This education can be achieved through reliable mass media such as radio and television. As one of them states:

"Unfortunately, the necessary training is only done on a few things, and that is about hand washing and, to a very small extent, personal hygiene, but I need to get more information instead of advertisements that are of little value now. I don't care; I prefer to have

proper information about Coronavirus. I suppose it is necessary to broadcast programs for those who have special physical and mental conditions" (Interviewee 11, Male, 52 years old).

Discussion

One of the vulnerable groups against COVID-19 are people who somehow have certain diseases, such as Type 2 diabetes (16-19). Homolak (26) believes that evaluating the quality of information is crucial for finding new solutions for the COVID-19 pandemic. However, one of the main concerns of Type 2 diabetes patients is that they need reliable information based on scientific evidence regarding the types of healthcare methods against this virus. Therefore, the information needs of these patients are divided into four major theme categories and thirteen subcategories.

The first category of information needs related to COVID-19 consists of five subcategories, including the nature and causes of COVID-19, the spread of the disease, ways of prevention, treatment methods, and ignorance of the type of medicine). Upsher et al. (34) have shown that diabetic patients suffer from a lack of information regarding the disease of COVID-19. Moreover, Peimani et al. (35) have shown that people with diabetes request updated information about diabetes and COVID-19.

One of the subsets was that patients need information about the causes and nature of COVID-19. They paid attention to the fact that the causes of the emergence of COVID-19 are not known to them. Some researchers, such as Manarvi and Matta (36), concluded that much of the information about COVID-19 is not based on scientific evidence. Nevertheless, the scientific community can use more efficient data to find new solutions to the COVID-19 pandemic (25). This study was consistent with some of the previous studies. Hamulak et al. (26) believed that the scientific community had the potential to utilize the data to form a basis for discovering new answers to the COVID-19 pandemic. This argument has been proven in research. For example, the results of the research by Yavar et al. (37) conducted in Iran and the results of the research by Nafees and Khan (38) conducted in India indicated that the most important were COVID-19 signs and symptoms, causes, and treatments of illness, prevention and control of COVID-19. Furthermore, the Birnatzki et al. (39) study investigated the information needs of people with diabetes. The result indicated that the identified treatment process was one of the main categories of information needs. Similarly, Grobosch et al. (40) reported that most of their participants needed information on all topics provided, especially in diabetes research and treatment/therapy. In addition, the findings of the study carried out by Peng and Yang Wang (41) showed that there are common information needs on both platforms about vaccination and the essential elements of the disease, including the onset symptoms, transmission routes, preventive measures, treatment and control of COVID-19.

However, the results of the present study showed that it needed to be more consistent with some research. In the research by Mohamadian et al. (42), it has been shown that the patients had the most knowledge in the field of care and prevention of COVID-19. Furthermore, having information can significantly help the health and service system. One of the main concerns of governments and health systems is that they alone cannot control this virus unless it is brought into reality with the cooperation of all people. Furthermore, the findings showed that some patients, due to the fear of contracting this virus, arbitrarily use various chemical and herbal medicines that had no scientific basis and were only based on the rumors of people and profit-seeking people and some media and social networks. Therefore, the use of information on fake websites and social networks regarding the use of chemical drugs and unconventional substances will lead to other risks in addition to the virus for diabetic patients and other people. Therefore, it is necessary to provide accurate information based on scientific evidence to eliminate these risks and help them feed this group of patients.

Generally, the individuals interviewed reported a range of experiences, including taking different medications, referring to non-specialized and non-expert sources, and having limited knowledge about the potential side effects of chemical or herbal

drugs. Patients with Type 2 diabetes mainly lacked information about their medications.

The second main category of this research was the information needs related to the mental and emotional care of patients with Type 2 diabetes against COVID-19. This category included things such as stress, anxiety, depression, severe obsession, fear, and self-infection with COVID-19. The evidence shows that some of the common factors in diabetic patients are anxiety, depression, and diabetes-specific distress (43-47). Furthermore, psychological disorders such as depression, anxiety, and stress have been reported during the period of COVID-19 (48-49). Among them, depression has been an essential issue for diabetic patients (49). However, these mental and psychological symptoms in Type 2 diabetic patients have depth of suffering, and it seems that it is more than other people in the society. Upsher et al. (34) believe that people with diabetes during the COVID-19 pandemic have intensified anxiety about both diabetes self-management and attention to national recommendations about social distancing and health behaviors. In order to reduce these difficulties, Type 2 diabetic patients are in dire need of information regarding each of the mentioned categories. In addition, having information and knowledge about COVID-19 reduces their mental and emotional states. Research (e.g., 50- 56) has shown that COVID-19 may cause general panic, stress, fear, depression, boredom, anxiety, and general psychological disorders. In this regard, since diabetes affects the mental health of people suffering from it, not addressing these mental problems and solving them will have a serious negative impact on the social life (57) and the individual life of the diabetic patient. To solve these problems, Ozamiz-Etxebarria et al. (58) believe that this is not possible unless citizens have the proper knowledge and awareness about the virus. Eventually, the results reported by Kim (59) revealed that the increase in anxiety related to COVID-19 was associated with increased diabetes distress and depressive symptoms. In general, it was similar to Wilson's study (60), which sought to design models of information needs and information-seeking behavior. Wilson (1981) proposed defining basic needs as physiological, cognitive, or emotional. He went on to note that the context for any of these needs could be the person, or the demands of the person's role in their work or life, or the environment (political, economic, technological, and the like) in which this life or work takes place (61).

The third category obtained was the information needs related to personal health care. In the study, Wagner et al. (62) showed that most participants with diabetes reported moderate to severe problems due to a lack of clear public health guidelines, concerns about their safety, and lack of access to information or knowledge. With timely and constant awareness about personal health care, it is not possible to a large extent to contract the disease of COVID-19. Therefore, having information and awareness of the issues of how to use the personal health of a diabetic patient will be a step to prevent the epidemic of this virus.

The fourth main category was information needs related to health and service organizations. Wagner et al. (62) state that COVID-19 has disrupted the work of health professionals who take care of the behavioral and psychosocial needs of people with diabetes. The problem of these patients was that they needed necessary training by health organizations and services through national media. Some research indicates (34) that it is essential for diabetic patients to provide information from a healthcare professional. This is part of the responsibility of health organizations to provide specialized training on how professionals can disseminate evidence-based knowledge about COVID-19 or any pandemic crisis to people with diabetes (62). Generally, the government and health authorities should provide accurate health information concerning the epidemic based on evidence to the public (63). This information can potentially diminish anxiety and perceived vulnerability to the virus (64). In addition, this results in better adherence to the precautionary and preventive measures (65).

The outbreak of COVID-19 has created one of the biggest challenges for nursing management in hospitals worldwide (66). During unique crises such as the outbreak of COVID-19, one of the main duties of hospitals is to provide diabetic patients

with necessary and urgent training by professional nurses. This type of training can definitely solve the significant information needs of Type 2 diabetic patients. Whether it is diabetes or how to take care of diabetics against COVID-19, which requires providing specialized information. Therefore, one of the duties of health organizations is to provide necessary training to people, especially patients with particular conditions, because these patients need a lot of awareness and knowledge, which may be less so for other diseases.

Seemingly, health professionals need to understand that patients with Type 2 diabetes have different desires for accessing information about their disease and their drugs, which may influence the way they take medicine and, subsequently, the ways they manage their disease (67). However, Type 2 diabetic patients in this study had limited information and knowledge about the types of care in terms of mental, physical, and care. Perhaps the main reason for this situation is that these people have not been given proper continuous education through health organizations, hospitals, evidence-based social media, and even libraries provide information in coordination with health organizations since today in most social media, web spaces among people, there is a lot of false, misleading, and fake news about COVID -19. It is necessary that health service providers, organizations, nursing, psychologists, or associations that work on COVID-19 provide training on how to deal with this unknown virus for diabetic patients so that they can provide better and more professional services have authority.

Undoubtedly, in many countries, people with diabetes do not have the necessary information about diabetes or any regional or global epidemic crises. In this regard, St. Jean (68) states that Type 2 diabetes patients are not always aware of their information needs. This situation sometimes leads to serious consequences for their health. In order to meet the information needs of Type 2 diabetic patients, they can get accurate information from official health and service organizations, nursing, governmental associations, specialized non-governmental associations, and centers such as university libraries, public libraries, and mass media, especially radio, TV, and specialized social networks. Furthermore, people's health is the basis of all human life, and practical and adequate information is also essential for effective care.

Limitations

According to its nature, qualitative researches have limitations, and the present research is no exception to this rule. One of these limitations in qualitative research is the non-generalizability of the research results. Furthermore, the possible influence of people's biases and personal tendencies on the research results may have influenced the research results. Therefore, due to the limitations of the present study, the results should be generalized with caution. Second, tried to recruit an equal number of male and female Type 2 diabetes patients, but many women disagreed to be interviewed, and this situation caused only two women to participate in this study.

Conclusion

The results suggest that patients with Type 2 diabetes have limited information and knowledge about the types of care required against COVID-19. Therefore, healthcare providers, professional nurses, psychologists, organizations, or associations associated with COVID-19 activity must be trained in how to deal with this unknown virus for Type 2 diabetic patients so that they can provide better services. Also, the results obtained from the qualitative data analysis showed that for the safe implementation of Type 2 diabetic patients in critical periods, especially crises such as COVID-19, their different information needs should be identified. Furthermore, to achieve sustainable health, one of the vital components of human life, it is necessary to formulate appropriate strategic plans for Type 2 diabetes patients. In addition, there is a need for different libraries to provide the information needs of people and diabetic patients in times of crisis, especially COVID-19, in cooperation with the health system. The results of this study can have an influential role in communication between healthcare professionals, such as doctors, nurses, pharmacists, and psychologists, in dealing with

COVID-19 or any other disease. These specialists can work together in any crisis, specifically infectious diseases, whether local, regional, or global. Unquestionably, having accurate information about the crisis can help the health system. Moreover, to achieve sustainable health, one of the essential components of human life, it is necessary to formulate appropriate strategic plans for Type 2 diabetes patients.

Implications

The current research has the following theoretical and practical contributions:

Theoretical implication

This study is among the few conducted on the information needs of patients with Type 2 diabetes in Iran during the COVID-19 crisis. With this new perspective on patients' information needs, the results of this study are expected to greatly contribute to the theoretical foundations for researching the types of information needs of diabetic patients or other patients with various strains of COVID-19 or other viruses.

Practical implications

- In order to provide a comprehensive approach, governmental and non-governmental organizations and scientific associations that are active in the field of health services should provide Type 2 diabetic patients with sufficient information on dealing with all types of harmful viruses.
- It seems that health and service organizations play an essential role in increasing the information literacy of patients by providing necessary and continuous training to people with diabetes during extraordinary and challenging crises.
- Official organizations in the health field can significantly help patients by providing helpful information in critical and normal times. Furthermore, it can reduce many government costs.
- Health and service organizations can have an essential role in preventing and self-care against all kinds of dangerous viruses by setting up fully specialized sites and official social networks by providing information and scientific evidence.

Declaration

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Conflicts of Interests

The researcher had no conflict of interest in this article.

Ethical Statement

The author certifies that this study is original.

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Authors' contributions

The author was solely responsible for designing, running, and writing all parts of this study.

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