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ORIGINAL RESEARCH

The Experience of Fear of Complications Among Patients with Type 2 Diabetes Mellitus: A Qualitative Study

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Introduction: Type 2 diabetes (T2DM) is a globally concerning chronic disease. Fear of complications (FoC) refers to a unique diabetes-related emotion among diabetic patients, arising from worries that complications may cause physical harm, which can affect blood glucose control. Therefore, it is crucial to comprehensively understand the factors influencing FoC and implement effective intervention plans.

Purpose: To understand the real experiences of patients with T2DM when facing the FoC, so as to provide a reference for implementing targeted nursing intervention measures to alleviate the patients' psychological FoC.

Methods: Using the purposive sampling method, 16 patients with T2DM were selected as the research subjects from the Department of Endocrinology of a Class III Grade A hospital in Shaanxi Province from March to April 2025. A phenomenological research method was adopted to conduct semi-structured interviews with them. The Colaizzi's seven-step analysis method was used to analyze the data and extract themes.

Results: A total of 3 themes and 9 sub-themes were extracted, including disease uncertainty (uncertainty in symptoms, uncertainty in management, uncertainty caused by medical staff sources, uncertainty caused by personal sources), social support (peer support, medical support, family support), and coping styles (acceptance and facing, evasion and submission).

Conclusion: The experience of FoC among patients with T2DM is complex and diverse. Medical staff should attach great importance to providing psychological counseling for these patients, eliminating their sense of uncertainty about the disease, offering professional guidance, and assisting in achieving multi-faceted support. This can help alleviate their experience of FoC and thus promote their physical and mental health.

Keywords: type 2 diabetes mellitus, fear of complications, stress coping theory, qualitative study

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Introduction

Diabetes Mellitus (DM) is a chronic metabolic disease characterized by hyperglycemia and abnormal lipid metabolism, which is caused by insufficient insulin secretion or impaired insulin action.[1] According to the latest data from the 11th edition of the IDF Diabetes Atlas released by the International Diabetes Federation in 2025, there are approximately 589 million people with diabetes worldwide, and this number is projected to increase to 853 million by 2050.[2] Among them, Type 2 diabetes mellitus (T2DM) accounts for more than 90% of all diabetes cases, making it the most common type of diabetes.[3] T2DM has an insidious onset and a long course, with chronic hyperglycemia as its main clinical feature.[4] Chronic hyperglycemia can cause severe damage to multiple organs and tissues such as the heart, brain, and kidneys of diabetic patients,[5,6] leading to many serious complications. Meanwhile, studies have shown that as the prevalence of T2DM increases year by year, the number of chronic diabetic complications will also increase, such as diabetic macrovascular complications, microvascular complications, and lower extremity vascular diseases,[7] which will impose a heavy disease burden on patients and increase mortality.[8,9]

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The unpredictability of disease progression caused by diabetic complications, the sense of uncertainty about disease treatment and prognosis, and the burden of long-term treatment may lead to fear of complications (FoC) in patients, which refers to the degree of worry among diabetic patients about long-term complications and their resulting adverse consequences, and is a unique diabetes-related emotion.[10] Studies have found that nearly 40% of diabetic patients experience severe FoC due to concerns about concurrent blindness, organ failure, amputation, etc.[11] Severe FoC not only affects patients' quality of life, social functions,[12] and disease prognosis,[13] but also exacerbates anxiety and depression, and reduces the sense of well-being.[14] It is worth noting that patients are often more likely to be aware of the potential risk of complications when they are aware of their own lifestyle deficiencies (such as long-term high-fat diet, lack of exercise), personal medical history (such as having experienced early symptoms of complications), or family genetic tendency.[15–17] Therefore, it is necessary to assess the level of FoC in patients with T2DM and implement targeted and effective interventions.

Currently, research on fear of diabetic complications at home and abroad is mainly quantitative,[11,18,19] with few qualitative studies on the experience of FoC in patients with T2DM. In a study by Arend et al[11] involving 502 diabetic patients, the average score of the Fear of Complications Questionnaire (FCQ) was 25.3±10.6, among which the item "worries about future health" scored the highest. More than one-third of the subjects scored ≥30, indicating severe fear of diabetic complications, and most of them had been diagnosed with diabetic complications. Kuniss et al,[18,19] in their study on 104 patients with T2DM, pointed out that female patients were more likely to experience fear and worry about complications compared with male patients. Quantitative research lacks an overall grasp of phenomena and cannot deeply explore the psychological experience of fear, thus it is not conducive for medical staff to formulate comprehensive, effective and targeted intervention strategies for FoC. Qualitative research, on the other hand, can capture patients' habits, lifestyles, inner feelings and thinking patterns, making it easier to understand their psychological experience of FoC. Therefore, this study adopts a qualitative research method to conduct in-depth interviews with T2DM patients who have FoC, exploring their experience of such fear. It aims to help patients cope effectively, avoid adverse outcomes, and provide a basis for the construction of nursing intervention programs in the later stage.

Materials and Methods

Design

This study used the qualitative descriptive approach, which provides the most intimate and straightforward account of participants' experiences and perceptions.[20] The Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines were adhered to in this study[21](Appendix 1).

Setting and Participants

This study was conducted from March to April 2025 in Endocrinology Department 1 and Endocrinology Department 2 of a tertiary first-class hospital in Xianyang City, Shaanxi Province, China. During the study period, the hospital admitted a large number of patients with T2DM, providing a sufficient sample size for this study. To participate in this study, participants must meet the following criteria: (1) They meet the diagnostic criteria in the latest "Chinese Guidelines for the Prevention and Treatment of T2DM (2020 Edition)" published by the Chinese Diabetes Society of the Chinese Medical Association;[22] (2) They are 18 years old or above; (3) They have the experience of FoC, that is, the score of the Chinese version of the FoC Questionnaire (FCQ)[23] is ≥ 30 points; (4) They have normal cognitive, communication and comprehension abilities. We excluded the following patients: (1) Those who participated in other clinical studies simultaneously; (2) Patients with severe mental illnesses; (3) Patients with other serious diseases (malignant tumors, liver and kidney failure).

In this study, we adopted the purposive sampling method.[24] To collect as much information as possible and gain a better understanding of the true thoughts of patients with T2DM who have a FoC, we implemented the maximum variation sampling strategy based on the patients' demographic information (such as age, gender, occupation, marital status, and educational level) and disease-related information (such as the payment method for medical expenses, the presence or absence of diabetes complications, the duration of diabetes, and the FCQ score). Clinical nursing specialists and doctors from the Department of Endocrinology reviewed the medical records of inpatients and screened out potential participants who met the inclusion criteria.

Data Collection

This study adopted a face-to-face semi-structured interview method. Guided by the "Stress Coping Theory",[25] an interview outline was initially formulated according to the research objectives and literature review. The first author conducted pre-interviews with two patients who met the inclusion criteria respectively. After discussing the issues that emerged during the pre-interviews, two medical directors and a clinical nursing expert assisted in revising the interview outline. The final interview outline includes the following main questions: (1) What are your confusions about your current symptoms? (2) What troubles or doubts do you have in the process of treatment? (3) When do these fearful emotions of yours arise? And when are they the most obvious? (4) In which aspects do you hope that others can provide you with effective help? (5) When you have emotions related to the fear of diabetes complications, how do you deal with them? (6) Regarding the topic of the fear of diabetes complications, what other issues do you care about? Or is there anything else you would like to share with me?

All the participants were interviewed face-to-face by the first author in the ward of the department. Firstly, the first author explained to the participants the purpose of this study, the principle of confidentiality, and the necessity of audio recording throughout the interview process. The participants signed an informed consent form that contained demographic information and disease-related information. After a brief exchange of greetings, the first author gradually initiated a conversation with the participants according to the interview outline. The important details and non-verbal communication during the interviews were recorded in the field notes. We transcribed the audio recordings within 24 hours after each interview. After 14 interviews, the newly collected data overlapped with the previously obtained data, and no new themes or codes emerged, which indicated that the data had reached saturation.[26] To ensure that no new themes would emerge, we conducted 2 additional interviews. Therefore, a total of 16 interviews were carried out during the data collection phase.

Data Analysis

The researchers transcribed the audio materials into text within 24 hours after the interview. The results were presented anonymously, with names replaced by serial numbers. The text was then imported into NVivo 14.0 software for organization and analysis, and the non-verbal information of the interviewees during the interview process was marked at the corresponding positions. The Colaizzi 7-step analysis method was adopted for the analysis of the interview data,[27] which included repeatedly reading the interview materials, identifying meaningful statements, coding the recurring viewpoints, gathering them to form theme clusters, defining and fully describing the themes, extracting the themes, and returning the results to the interviewees for verification and confirmation. During the analysis process, in accordance with the principle of triangulation, two researchers independently organized and analyzed the data. In case of any differences in opinions, the research team would discuss and make a ruling.

Ethical Considerations

This study was approved by the Ethics Committee of the Affiliated Hospital of Shaanxi University of Chinese Medicine on April 2, 2025 (Approval No.: SZFYIEC-BA-2025, No).[12] Before the interview, all participants signed the informed consent form after fully understanding the purpose and procedures of the study. All participants joined the study voluntarily and had the right to withdraw at any time. The principle of confidentiality was strictly observed throughout the entire research process.

Rigor

To ensure the rigor of the study, this qualitative study adhered to the following principles: dependability, credibility, confirmability, and transferability.[28] Before the study commenced, all researchers received systematic training in qualitative research methods to ensure the dependability of the study. The purposeful selection of participants and the acquisition of saturated data ensured the credibility of the study. Before data collection, the first author established a trustworthy relationship with the participants by interacting with them during his/her clinical practice. This pre-existing connection might introduce a form of interpersonal relationship bias. During the interviews, the first author might unconsciously show more empathy towards the patients he/she had previously interacted with. As a result, he/she might overemphasize the factors mentioned by these patients as barriers to participation while overlooking some factors that could promote their participation. The researchers are aware of the potential impact of these biases on the research results. Therefore, throughout the interview process, the first author remained impartial, objective, and non-judgmental. He/she avoided asking leading questions and used interview techniques to obtain in-depth information. Important details were documented in field notes for the researchers' self-reflection. After each interview, we provided the transcribed textual information to the participants for review to ensure that their true opinions were accurately represented. Two researchers analyzed the data independently and determined all the codes and themes through group discussions. We documented the background information and research process in detail to verify the transferability of the study. The data collection and analysis processes were fully documented and preserved for verification.

Results

This study included 16 patients with T2DM, 8 males and 8 females (Table 1). To protect the privacy of the participants, they were coded as N1 to N16. These participants were aged between 30 and 67 years old. The interview duration ranged from 15 to 35 minutes. This study identified three themes: disease uncertainty, social support, and coping styles. These themes and their sub-themes together constitute the influencing factors of the FoC among patients with T2DM.

The Sense of Uncertainty About the Disease

The sense of uncertainty about the disease in patients with T2DM mainly stems from four aspects: uncertainty about the symptoms, uncertainty about the management, uncertainty caused by the source of medical staff, and uncertainty caused by personal factors.

Uncertainty About the Symptoms

Many interviewees indicated that they generally harbor a fear of diabetes complications. Symptoms that occur in daily life, such as fatigue and cold hands and feet, are difficult to determine whether they are triggered by diabetes due to their lack of specificity. This ambiguity in symptom attribution has exacerbated their unease. Meanwhile, the uncertainty regarding the development of complications has made them even more anxious about their future health conditions,

Table 1 Participant Demographics and Disease-Related Information

No	Age (Years)	Gender	Educational Level	Marital Status	Profession	Payment Method of Medical Expenses	Whether There Are Diabetic Complications	Duration of Diabetes Mellitus (Months)	FCQ Score (points)
N1	58	Male	⑤	Married	Civil servant	A	No	36	41
N2	64	Male	⑤	Married	Retiree	A	No	276	36
N3	32	Female	③	Single	Company employee	A	Yes	24	34
N4	60	Female	③	Married	Retiree	A	Yes	60	45
N5	48	Male	①	Married	Jobless	B	No	180	43
N6	56	Female	③	Widow	Retiree	A	Yes	36	35
N7	46	Male	②	Married	Company employee	A	No	7	40
N8	33	Male	④	Married	Company employee	A	No	24	37
N9	67	Female	②	Married	Retiree	A	Yes	240	39
N10	30	Female	③	Married	Worker	A	Yes	36	41
N11	33	Female	③	Married	Farmer	C	No	24	39
N12	49	Female	①	Married	Farmer	C	No	84	36
N13	45	Male	③	Married	Company employee	A	No	12	46
N14	33	Male	③	Married	Company employee	A	Yes	36	41
N15	43	Male	③	Married	Company employee	A	Yes	72	36
N16	62	Female	②	Married	Retiree	A	Yes	264	34

Notes: ① Illiteracy; ② Primary school education; ③ Junior high school education; ④ Senior school education; ⑤ Associate degree; A, Employee medical insurance; B, Residents' medical insurance; C, New Rural Cooperative Medical Scheme. FCQ refers to the Chinese version of the Fear of Complications Questionnaire for Diabetes. The total score of the scale ranges from 0 to 45 points. A score of ≥ 30 points indicates the presence of fear of complications.

worrying that the disease will worsen without their awareness. (N1: I have had heart disease for 10 years, and I am particularly afraid that a rise in blood sugar will cause damage to the vascular endothelium, which is irreversible); (N3: I have had diabetes for a long time, and the symptoms have not improved. My vision is still deteriorating continuously); (N7: My eyes were teary, I felt a bit tired, and my hands and feet were also cold. At that time, I did think that it might be caused by diabetes, but I did not take it seriously. Then these symptoms gradually improved); (N9: I had a colleague who also had diabetes before. Her husband took her to the hospital for dialysis every day. I witnessed it with my own eyes, so I am extremely afraid of complications and worried that I will end up like her).

Uncertainty Regarding Management

Due to the lack of systematic dietary knowledge, the interviewees do not understand the calorie and sugar content of foods, nor are they clear about scientific dietary combinations. When faced with the temptation of delicious food on the dining table, they always find it difficult to restrain their appetite. Eventually, this leads to a loss of control over their diet, which affects the stability of their blood sugar levels. (N1: I do not know what to eat in daily life. Although the doctor has repeatedly told me what to eat, I still do not know exactly what to eat and how much to eat. For example, even when I eat apples and tomatoes, my blood sugar level goes up. Sometimes, if I eat too little, I cannot get enough nutrients); (N11: After being discharged from the hospital, the doctor told me to control my diet, but I still could not help myself).

Uncertainty Caused by the Source of Medical Staff

Some interviewees reported that when medical staff provided health guidance, their explanations regarding diet were vague. They failed to give clear and detailed instructions on aspects such as the daily calorie intake standard, the reasonable proportion of various types of food, and the impact of different foods on blood sugar levels. Moreover, there were also many deficiencies in the interpretation of knowledge related to complications. When it came to the causes, development processes, serious hazards, and preventive measures of complications, the medical staff only gave general statements without conducting in-depth analysis based on the actual situations of the patients. As a result, patients found it difficult to accurately understand and master the key information, and were unable to effectively carry out self-health management. (N8: They just said to eat less sweet food and have staple food. It was just a general statement. I still do not know exactly what I can eat, and I am not quite sure how much I should eat either); (N10: The doctor told me that my urine protein level was high and there was something wrong with my kidneys, but did not say whether it was diabetic nephropathy or not. They just said these were abnormal indicators and then did not say anything more. They did not even clarify whether it was diabetic nephropathy).

Uncertainty Caused by Personal Factors

To accurately present the impact of individual differences among patients on disease management, the personal-level influencing factors of diabetic patients can be refined into two categories: disease cognitive reserve and psychological trait performance. In terms of disease cognitive reserve, some patients have basic disease knowledge, enabling them to clearly understand the characteristics of diabetes as a chronic disease, the long-term nature of treatment, and the logic of complication prevention. Consequently, they may show greater initiative in adhering to medication as prescribed, regularly monitoring blood glucose, and other aspects. In contrast, patients with insufficient cognition may have limitations in treatment compliance. Regarding psychological trait performance, anxiety is extremely common among patients. Many patients have an anxious personality, being inwardly sensitive and overly thoughtful, and tend to fall into anxiety over trivial matters (N13: I am careful and timid, very prone to anxiety. Colleagues around me smoke and drink but do not have diabetes, yet I do not smoke or drink and still got it). Such anxiety not only increases patients' psychological burden but may also interfere with their adherence to treatment plans, negatively affecting long-term disease control. In addition, although economic pressure is not an inherent personal trait, it is closely related to personal life and profoundly impacts patients' treatment mentality and behavior. The continuous expenses for medication, frequent examinations, and potential costs of complications impose a heavy burden (N4: My pension is only 2000 yuan. Diabetes can cause complications, and medicine for chronic diseases is expensive—how can I afford treatment). This economic pressure may further exacerbate patients' anxiety, forming a vicious cycle of "economic pressure-psychological anxiety".

Social Support

The social support received by patients with T2DM mainly comes from three aspects: peer support, medical support, and family support.

Peer Support

Peer support is an efficient way of exchanging disease-related information. In an equal environment, patients with T2DM share the same disease experiences. Their empathy towards the supported individuals enables them to have in-depth exchanges about the disease and emotions, which is something that family support and medical support can hardly replace. (N4: A fellow patient shared with us yesterday. She said that she had been here three times and thought the treatment here was effective. Then I felt that I had come to the right place); (N6: I have a pair of friends around me. Both husband and wife have high blood sugar levels. My friends would give some good suggestions, and I often consult them as well).

Medical Support

During the process of seeking medical treatment and managing diseases, different patients put forward their own expectations for medical services based on their individual needs. Some patients focus on the breadth of doctors' knowledge, while others emphasize the health education provided by public health departments and the intelligent convenience of medical services. (N1: I hope that, regardless of whether it's diabetes, kidney disease, or heart disease, doctors can also cover more knowledge from other related fields while studying the knowledge of their own fields); (N5: I hope that public health departments can provide more health education and popular science knowledge. The medication for diabetes and the regular blood sugar testing can be made intelligent so that there's no need to go to the hospital, and I can do the testing at home. In the future, I can communicate with doctors online about what medications to take, without having to rush to the hospital); (N15: I come to the hospital for reexamination every year. Every time I am here, the doctors are very dedicated. After receiving the treatment, I feel reassured and at ease, and the fear subsides).

Family Support

During the hospitalization process and the home-based management process, the support from family members is of vital importance to the psychological state of patients. The understanding and encouragement provided by the family can help alleviate the patients' fear. (N2: My family members can provide emotional value. Whenever I have any psychological burdens, I talk to them, and after sharing, I feel much better); (N7: My family members give me company and care, which gives me the courage as well); (N12: I am really afraid that diabetes will trigger various complications, which will affect my life and even pose a threat to my life. But I have never dared to show these concerns in front of my family. I do not want them to be anxious and sad along with me. I can only keep these fears deep in my heart and bear them silently on my own. As time goes by, the pressure in my heart is getting greater and greater, and the sense of loneliness is becoming more and more intense).

Coping Strategy

The coping strategies of patients with T2DM towards the FoC mainly include two types: acceptance and facing up to it, as well as evasion and submission.

Accept and Confront

Many interviewees mentioned in the interviews that they needed to accept the reality, recognize the current situation, start to accept the transformation of their own roles, and adopt positive coping methods to change their bad habits. They began to focus on health management, actively cooperate with the treatment, and have been taking better measures to cooperate with the treatment. (N2: I can only deal with it positively. I talk to my family members. After sharing my feelings with them, I feel much better in my heart); (N4: I can only actively cooperate with the treatment, follow the doctor's advice, and take the medicine as prescribed); (N6: Now I can only accept this disease); (N16: I think I should be more optimistic myself. Do not always dwell on the fact that I am ill. You know, if I died all of a sudden, that would be one thing, but since I am still alive, I should just let it go and try to comfort myself. Moreover, my daughter looked it up online and said that mood is related to this disease too).

Escape and Yield

Some of the interviewees feel a certain degree of psychological pressure in the face of the progression of the disease. This group of patients often shows an evasive mentality and assumes an attitude of resigning themselves to fate. (N1: I do not have any good solutions. I am just evading. Except for receiving effective treatment, I am avoiding everything else. I seldom participate in family activities, social events or work-related activities. I generally try not to bother others as much as possible); (N3: Diabetes is a chronic disease that's really tormenting. Sigh, I can only leave it to fate. If I go blind in the future, there's nothing I can do about it); (N14: I do not want to talk about this disease with others. I get nervous as soon as I hear about it. I can only bear it silently by myself and leave everything to fate).

Discussion

Based on the Stress Coping Theory, this study explored the factors influencing FoC in patients with T2DM from the perspective of the patients themselves. The study identified 3 main themes and 9 sub-themes, including: disease uncertainty (uncertainty in symptoms, uncertainty in management, uncertainty caused by medical staff, uncertainty caused by personal factors), social support (peer support, medical support, family support), and coping styles (acceptance and confrontation, avoidance and submission).

The sense of disease uncertainty refers to the inability to determine events related to the disease. According to the Theory of Uncertainty in Illness,[29] when a disease triggers relevant stimuli, individuals will summarize and understand the composition and meaning of these stimuli. When individuals fail to summarize and generalize the meaning of these events, they will perceive uncertainty about the disease. In this study, patients' sense of disease uncertainty is manifested in their ambiguity about information such as disease symptoms, diagnosis, and management, as well as uncertainty caused by medical staff and personal factors. Scholar Lai[30] found through interviews with breast cancer survivors that patients have persistent uncertainty about the disease, and the uncontrollable and unpredictable nature of the disease increases their sense of insecurity and uncertainty. Tan[31] and others, in interviews with ovarian cancer patients, also found that the sense of disease uncertainty can trigger a series of reactions, thereby causing fear of disease recurrence. Studies have shown that the sense of disease uncertainty may affect patients' evaluation of stress, and then influence their coping strategies.[32] Therefore, medical staff can alleviate patients' sense of disease uncertainty through three types of strategies: structured information delivery, dynamic communication mechanisms, and targeted support. Specifically, they can adopt a three-step framework of "condition-treatment-prognosis", interpret examination indicators in plain language (eg, transforming "glycated hemoglobin" into "a 3-month report card of blood glucose control") and distribute illustrated disease manuals to help patients clearly understand disease information. They should establish regular outpatient follow-up and online consultation channels to ensure that patients' questions are answered within 48 hours, forming a continuous communication and feedback mechanism. Meanwhile, for patients with financial difficulties, they can link resources for interpreting medical insurance policies and assist in applying for chronic disease subsidies; for anxious patients, they can provide "lists of common questions" to predict and address concerns in advance. By providing hierarchical support to meet the needs of different patients, it helps them eliminate the sense of disease uncertainty and reduce the level of fear.

Social support, as a protective factor against FoC, includes peer support, medical support, and family support. Studies have shown[33] that high-level and multi-dimensional social support can buffer stress, improve patients' psychological status, enable them to face the disease positively, and promote disease improvement. Peer support, through the sharing of information, ideas, emotions, and behavioral skills among individuals with similar disease or physical condition experiences, achieves mutual empathy among patients, which can significantly promote disease recovery.[34,35] In the future, attempts can be made to organize experience exchange meetings among T2DM patients to facilitate communication between them. In terms of medical support, patients' psychological state is more stable during standardized treatment. Medical staff need to strengthen the transmission of disease-related knowledge, such as providing guidance on post-discharge life, and establish a trusting relationship to reduce doubts. As an important part of social support, family support is crucial for patients. Existing studies have confirmed that family care and the exertion of family functions are closely related to the FoC.[36] Family support has a significant psychological promoting effect on patients with chronic diseases, which can not only effectively reduce their negative emotions but also enhance their faith and courage in facing the disease.[37] Patients mostly manage their condition at home after discharge. A good family environment is more conducive to the establishment of self-management behaviors, can also alleviate patients' negative emotions, and adjust their living habits.[38] Attention should be paid to the exertion of family functions, and patients' family members should be encouraged to provide more emotional support to meet patients' emotional needs. At the same time, medical staff should also encourage patients to take the initiative to seek help from their families, so as to jointly promote the improvement of disease symptoms and reduce patients' sense of loneliness.

In this study, the coping styles of T2DM patients with FoC mainly include two categories: acceptance and confrontation, avoidance and submission. Previous studies have found[39] that although avoidant coping styles can temporarily relieve negative emotions, they will make negative thoughts more intrusive, while adopting positive adaptive coping styles can reduce patients' FoC. Therefore, for patients who adopt avoidant coping, positive psychological intervention methods can be used to help them form positive thinking patterns, stimulate their enthusiasm for self-management, and reduce fear. Studies have shown that self-management is crucial for patients with T2DM. Good management ability can reduce readmission rates, maintain their physical and emotional functions, and improve their quality of life.[40] Patients with T2DM need long-term disease management after discharge, and most of them have multiple chronic comorbidities. Affected by multiple diseases, the burden of disease management faced by patients is further increased. Some patients have realized the harm of their bad living habits and choose to change these habits and actively cope with the disease. Among them, patients also mentioned that they hope to receive guidance from medical staff on daily life management. This reminds medical staff to attach importance to patients' home-based self-management, and can provide continuous nursing services to patients after discharge to improve their self-care ability. The research results of Xiao et al[41] showed that the implementation of digital diabetes management technology for home-dwelling T2DM patients is helpful to control their blood glucose levels and improve their health outcomes.

This study focuses on T2DM patients without obvious complications. Their FoC mainly stems from imagination of "unknown complications", manifested as worries about adverse outcomes such as blindness and amputation. The core influencing factors include lack of disease knowledge, insufficient doctor-patient communication, and anxious personality traits. This is significantly different from research results on "patients with existing complications." Wukich et al[42] included 254 patients without diabetic foot complications and 207 patients with diabetic foot problems. After comparing the fear levels of the two groups, they found that patients with diabetic foot lesions were more afraid of major lower limb amputation. In contrast, the fear of patients in this study is more reflected as generalized anxiety about "potential risks." The reason may be that the fear of diabetic foot patients is more specific and directly related to actual symptoms. For example, patients with foot ulcers may fear amputation, and the degree of fear is positively correlated with the severity of complications.[11] This difference suggests that clinical interventions need to be carried out in a stratified manner. For patients with existing complications, the focus should be on "practical explanations of complication management", which can be combined with cases such as infection control of foot ulcer wounds. For patients without complications, it is necessary to strengthen "education on the preventability and controllability of the disease", and specifically alleviate their fear by explaining the relationship between blood glucose control and complication prevention.

This study found through interviews that patients most frequently fear diabetic retinopathy and lower extremity vascular disease, which is consistent with the statistical research results of Kuniss et al[18] on diabetes patients' FoC. Their study showed that 62.1% of patients worry about lower extremity circulatory disorders and 57.3% about eye complications. This high level of fear may stem from the fact that visual and limb functions are directly related to the ability to take care of oneself, and patients are more sensitive and worried about such complications that may affect their daily independent life. However, patients in this study paid less attention to cardiovascular complications, which is in obvious contradiction with clinical data.[43] Studies have shown that 75% of diabetes patients will die from cardiovascular complications,[44] suggesting that it is necessary to strengthen popular science education on cardiovascular complications and correct the cognitive blind spot of this "invisible killer." In the future, combined with quantitative research, the FCQ can be subdivided into items to statistically analyze the fear scores of different complications, thereby providing more specific data support for formulating targeted intervention measures, helping patients fully understand the risks of various complications, reducing unreasonable fear, and increasing attention to high-risk complications.

Strengths and Limitations

This study has several remarkable strengths. First, to the best of our knowledge, it is the first qualitative study to use the Stress Coping Theory as an analytical framework to explore the influencing factors of the FoC in patients with T2DM. Second, this study fills a crucial research gap. Currently, most of the research on the FoC in patients with T2DM is quantitative. Such studies often fail to deeply explore the rich and complex psychological experiences of patients. Adopting a qualitative research approach helps to gain in - depth understanding of their psychological status. Meanwhile, it also lays a solid foundation for formulating targeted intervention measures to alleviate patients' FoC.

However, this study has some limitations. First, the sample size of this study is relatively small, which restricts the general applicability of the research findings. Second, the data collection relies on the self-reported data of patients, which may be affected by recall bias and social desirability bias. Third, a study based on a structured theory may limit the content of participants' responses. Lastly, we only collected qualitative data from a single hospital in northern China. Given that T2DM patients from different socioeconomic and cultural backgrounds may have different experiences and perspectives, caution should be exercised when generalizing the research findings to populations with other backgrounds. In the future, we will conduct multicenter studies with large sample sizes and comprehensively apply both quantitative and qualitative research methods to further verify the general applicability of the research findings and improve their validity.

Conclusion

This study explored the real psychological experience of FoC among T2DM patients through qualitative interviews, and summarized three core themes: disease uncertainty, social support, and coping styles. These findings directly reflect patients' subjective feelings when facing FoC. The study provides a precise direction for intervention for medical staff. By conducting targeted psychological counseling to alleviate negative experiences, eliminating disease uncertainty, building a multi-dimensional support network, and guiding positive coping strategies, it can reduce patients' FoC. This, in turn, can improve treatment compliance and self-management ability, lower the risk of complications, and ultimately promote the overall physical and mental health of patients. It also provides practical evidence for the synergistic improvement of psychological and physical aspects in the comprehensive management of T2DM.

Data Sharing Statement

All data related to the results are included in the manuscript. The interview transcripts are not publicly available because of individual privacy concerns.

Ethics Approval and Consent to Participate

The study was approved by the Ethics Committee of Affiliated Hospital of Shaanxi University of Chinese Medicine (Approval No.: SZFYIEC-BA-2025, No. [12]). All participants signed a written informed consent after being fully informed of the study purpose and procedure prior to the interview. All procedures involving human participants in this study were conducted in accordance with the Declaration of Helsinki.

Consent for Publication

All participants involved in the study signed an informed consent form for the publication of their anonymized responses and direct quotes.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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