



RESEARCH ARTICLE

Barriers and experiences of patients with type 2 diabetes mellitus in maintaining dietary patterns and glycemic control at Bhayangkara TK II Hospital, Medan

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ABSTRACT

Background: Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder requiring continuous self-management, including dietary regulation and glycemic control. However, many patients face barriers in maintaining these behaviors. This study aimed to explore the barriers and experiences of T2DM patients in maintaining dietary patterns and glycemic control at Bhayangkara TK II Hospital, Medan.

Method: A qualitative phenomenological study was conducted. Participants were selected using purposive sampling, including 5 T2DM patients (aged >45 years, diagnosed >5 years), 5 family caregivers, and 1 internist. Data were collected through in-depth interviews and analyzed using Colaizzi's seven-step method. Cross-case thematic synthesis was applied to integrate perspectives from all three participant groups.

Results: Cross-case thematic synthesis revealed five overarching meta-themes: (1) The emotional trajectory of chronic illness, characterized by shock, denial, gradual acceptance, and persistent adaptation challenges across patients and caregivers; (2) The struggle for dietary adherence and lifestyle modification, identified as the most universally acknowledged challenge, with patients facing cravings, fear of malnutrition, and diet fatigue, while caregivers struggled with meal preparation and patient resistance; (3) Family as a pillar of support and a source of strain, with family providing essential instrumental and emotional support while caregivers experienced significant psychological and financial burden; (4) Navigating healthcare systems, cost, and complementary therapies, with reactive glucose monitoring due to cost barriers, and 60% of patients using herbal remedies without disclosing to healthcare providers; and (5) Visions for the future and sustainable solutions, with patients aspiring to remain productive, caregivers drawing on spiritual motivation, and the physician advocating for practical strategies and multidisciplinary approaches.

Conclusion: T2DM self-management is a dynamic and complex process involving emotional adaptation, dietary challenges, family support, and healthcare engagement. Strengthening patient self-efficacy, family involvement, and practical strategies such as bringing home-cooked meals are essential for improving glycemic control and quality of life. Healthcare systems should adopt a biopsychosocial approach that addresses the emotional, social, and practical dimensions of diabetes management, ensures affordable access to monitoring devices, and implements family-inclusive education programs.

Keywords: type 2 diabetes mellitus, dietary patterns, glycemic control, family support, self-management

Introduction

Type 2 diabetes mellitus (T2DM) is a non-communicable disease that has become a global public health concern.¹ It is a chronic metabolic disorder characterized by hyperglycemia due to impaired insulin

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production or insulin resistance.² If not managed properly, T2DM can lead to serious complications affecting the heart, blood vessels, nerves, and other organs.³ Diagnosis is made through blood glucose tests including HbA1c, fasting plasma glucose, or random plasma glucose.⁴

According to global epidemiological assessments, hundreds of millions of people worldwide live with diabetes, and it directly causes over a million deaths annually.¹ Indonesia reflects this global trend, with domestic health surveys showing a continuous rise in diabetes prevalence over recent years. It is projected that Indonesia will experience a dramatic increase in diabetes cases by 2030.⁵ In North Sumatra Province, regional statistics confirm hundreds of thousands of active diabetes cases, with a significant gap in patients receiving adequate healthcare services. Type 2 diabetes dominates regional cases, accounting for nearly sixty percent of the recorded population.^{6,7} At regional facilities like Bhayangkara TK II Hospital, Medan, clinical monitoring shows a year-on-year increase in admitted diabetes patients.

Blood glucose instability occurs when glucose levels rise or fall outside the normal range due to an imbalance between energy intake and unhealthy lifestyle changes.² The International Diabetes Federation tracking data shows that hundreds of millions of adults globally live with diabetes, with steep projections spanning into 2030 and 2045. Indonesia consistently ranks among the top five countries globally for total number of diabetes patients.⁸

Dietary patterns have a significant impact on blood glucose elevation.⁹ In T2DM patients, insufficient insulin secretion or insulin resistance impairs glucose utilization by tissues, leading to postprandial glucose spikes.² The management of T2DM is based on five pillars: diet (meal planning), physical activity, metabolic monitoring, pharmacotherapy, and education.⁴ However, many patients face barriers in self-management, particularly in maintaining healthy eating habits, exercising, medication adherence, blood glucose monitoring, and stress management. Barriers to dietary adherence and glycemic control are complex, involving internal factors (lack of nutritional knowledge, low self-efficacy, psychological distress, difficulty resisting temptations) and external factors (economic constraints, inadequate health education, lack of family support, work demands).¹⁰⁻¹² Preliminary interviews at Bhayangkara TK II Hospital revealed that patients struggle with dietary compliance, have misconceptions about medication allowing free eating, use complementary therapies, and experience psychological fatigue leading to self-discontinuation of treatment. Given these challenges, this study aimed to explore the barriers and experiences of T2DM patients in maintaining dietary patterns and glycemic control at Bhayangkara TK II Hospital, Medan.

Method

This qualitative study used a phenomenological design to explore and describe the lived experiences of T2DM patients, family caregivers, and the attending physician regarding dietary management and glycemic control. The phenomenological approach was selected because it allows for an in-depth understanding of participants' subjective experiences, perceptions, and meanings attached to their daily management of diabetes.¹³ The study was conducted at Bhayangkara TK II Hospital, Medan, from April to May 2026. This hospital was selected because it serves a large number of T2DM patients and preliminary data showed an increasing trend in diabetes cases from 1,942 in 2024 to 2,073 in 2025.

Purposive sampling was used to select 11 participants. The inclusion criteria for patients were: (1) diagnosed with T2DM for more than 5 years; (2) aged 45-70 years; (3) able to communicate clearly; and (4) willing to participate in the study. Family caregivers were included if they: (1) lived with the patient for at least 3 years; (2) served as the primary caregiver; and (3) were willing to participate. The internist (coded as SP) was included because they had more than 3 years of experience managing T2DM patients.

In-depth interviews were conducted using semi-structured interview guides developed separately for patients, families, and the physician. The interview guides were developed based on literature review and preliminary observations at the study site. Each guide consisted of open-ended questions designed to explore participants' experiences, barriers, coping strategies, and expectations regarding dietary management and glycemic control. Interviews were conducted in a private room at the hospital or at participants' homes, based on their preference. Each interview lasted between 45 and 90 minutes. All interviews were audio-recorded with informed consent and transcribed verbatim in Indonesian. Data collection continued until saturation was reached, which was achieved after all 11 interviews were completed. Field notes were also taken during and after each interview to capture contextual details and non-verbal cues.

Data were analyzed using Colaizzi's seven-step phenomenological method.¹⁴ The steps included: (1) reading and re-reading transcripts to gain an overall understanding; (2) extracting significant statements

relevant to the phenomenon; (3) formulating meanings from each significant statement; (4) clustering meanings into themes; (5) developing an exhaustive description of the phenomenon; (6) identifying the fundamental structure of the phenomenon; and (7) returning to participants for validation (member checking). The analysis was conducted in Indonesian to maintain the original meaning, and selected quotes were later translated into English for publication.

To ensure trustworthiness, several strategies were applied. Credibility was enhanced through member checking, where participants reviewed and confirmed the accuracy of the transcribed interviews and emerging themes. Triangulation of sources was achieved by collecting data from three different groups: patients, caregivers, and the physician. Triangulation of methods was done through in-depth interviews and non-participant observation during clinical consultations. An audit trail was maintained throughout the research process, documenting all decisions and analytical steps. Transferability was addressed by providing thick descriptions of the context and participants, allowing readers to assess the applicability of findings to other settings.

Ethical approval was obtained from the Research Ethics Committee of Universitas Prima Indonesia (Protocol Number: UNPRI/EC/2026/045). Written informed consent was obtained from all participants before data collection. Participants were assured of their right to withdraw at any time without consequences. Confidentiality was maintained by using pseudonyms and codes (P1-P5 for patients, F1-F5 for caregivers, and DK1 for the physician). Data were stored securely and accessible only to the research team.

Results

Participant characteristics

This study involved 11 participants comprising 5 T2DM patients, 5 family caregivers, and 1 internist (SP). All patients had been diagnosed with T2DM for more than 5 years and were aged over 45 years. The majority of patients were female (60%, n=3), of Javanese ethnicity (60%, n=3), and had completed junior high school education (60%, n=3). All patients (100%) were married, had been living with T2DM for more than 5 years, and were aged over 45 years. The mean age of patients was 58.6 years (range: 52-67 years). Three patients (60%) had complications, including diabetic retinopathy (n=2) and peripheral neuropathy (n=1). All patients (100%) received oral therapy, and 2 patients (40%) also used insulin.

Table 1. Characteristics of participants (N=11)

Characteristic	Patients (n=5)	Caregivers (n=5)
Sex		
Male	2 (40%)	2 (40%)
Female	3 (60%)	3 (60%)
Ethnicity		
Javanese	3 (60%)	3 (60%)
Batak Karo	2 (40%)	-
Batak	-	2 (40%)
Education		
Elementary	1 (20%)	1 (20%)
Junior high	3 (60%)	3 (60%)
Senior high	1 (20%)	1 (20%)
Marital Status		
Married	5 (100%)	4 (80%)
Unmarried	-	1 (20%)
Duration		
DM >5 years	5 (100%)	-
Care >3 years	-	5 (100%)
Age		
<45 years	-	1 (20%)
>45 years	5 (100%)	4 (80%)

Among the family caregivers, most were female (60%, n=3), of Javanese ethnicity (60%, n=3), and had completed junior high school education (60%, n=3). The majority were married (80%, n=4) and aged over 45 years (80%, n=4). All caregivers (100%) had been caring for the patient for more than 3 years, with a mean duration of care of 6.2 years (range: 3-10 years). The relationship between caregiver and patient varied: spouse (n=2), child (n=2), and daughter-in-law (n=1). The physician (SP) was female, of Batak ethnicity, aged less than 45 years, with more than 5 years of experience managing T2DM patients. She was

responsible for an average of 25-30 T2DM patients per week at the internal medicine outpatient clinic of Bhayangkara TK II Hospital.

Cross-case thematic synthesis

Analysis of in-depth interviews across all three participant groups revealed five overarching meta-themes that capture the shared and divergent experiences of T2DM self-management. These meta-themes represent the fundamental structure of the phenomenon, integrating perspectives from patients, family caregivers, and the physician. Table 2 provides a summary of each meta-theme with representative perspectives from each informant group.

Table 2. Summary of overarching meta-themes and perspectives by informant group

Meta-Theme	Patients (P1-P5)	Caregivers (F1-F5)	Physician (DK1)
The Emotional Trajectory of Chronic Illness	Shock, denial, sadness at diagnosis; gradual acceptance; adaptation of daily routines; persistent fatigue and frustration	Stress and frustration managing patient emotions; suppressing own feelings; patience required to avoid conflict	Patients often present in denial; mental health stability correlates with metabolic control; acceptance is a prerequisite for treatment success
The Struggle for Dietary Adherence and Lifestyle Modification	Difficulty resisting cravings; fear of malnutrition with strict diets; portion control strategies; diet fatigue over time	Challenges preparing special meals; patient resistance to dietary changes; monitoring food intake; nutritional education needed	Dietary control is the greatest challenge; patients misjudge portions and calorie content; boredom with restricted menus leads to non-adherence
Family as a Pillar of Support and a Source of Strain	Instrumental support (meal prep, medication, appointments); emotional support and motivation; reduced isolation through family involvement	Caregiving roles require significant time and effort; psychological burden from patient mood changes; financial strain from treatment costs	Family is the cornerstone of successful management; patient outcomes depend on family cooperation; family education is critical
Navigating Healthcare Systems, Cost, and Complementary Therapies	Reactive glucose monitoring (only when symptomatic); cost limits access to monitoring devices; use of herbal remedies alongside medication	Facilitating healthcare access (transport, appointments); verifying health information; filtering advice from social networks; financial constraints	Patients hide herbal use; drug-herb interactions are a concern; cost of monitoring devices is a barrier; need for affordable access
Visions for the Future and Sustainable Solutions	Aspirations to remain productive and not burden family; advising others on health; hope for better quality of life	Spiritual motivation as coping strategy; hopes for improved hospital services; desire for caregiver support groups and education	Recommends practical strategies (home-cooked meals); advocates multidisciplinary approach; emphasizes continuous education for patients and families

Meta-Theme 1: The emotional trajectory of chronic illness

The diagnosis of T2DM triggered a significant emotional trajectory characterized by initial shock, fluctuating denial, gradual acceptance, and ongoing adaptation across all participant groups. This emotional journey profoundly influenced patients' capacity for self-management and shaped the caregiving experience.

All patients (100%) reported experiencing intense emotional responses upon receiving their diagnosis. P1 described her reaction: *"When the doctor said I had diabetes, I felt shocked and sad... why me? I never expected it because I had always felt healthy. I cried in the bathroom and didn't want to come out."* P3, who previously sold fried foods, expressed a similar response: *"At first I thought it was just fatigue. But after the examination, my blood sugar was 350. I was in shock and couldn't sleep for a week. I thought, do I really have to stop selling?"* DK1 confirmed that denial is a common initial response, particularly among patients without family history of diabetes: *"Patients often come in a state of denial. They don't believe it because they have no severe symptoms. Some even return to the lab multiple times to recheck the results."*

Over time, patients reported varying processes of acceptance, though this was rarely linear. P1 explained that family support and understanding of diabetes consequences helped her accept her condition: *"After the doctor explained the dangers of high blood sugar, I started to understand. My children also keep reminding me. Now I have accepted it, although sometimes I still feel sad."* However, P4 acknowledged that acceptance fluctuates: *"Sometimes I still don't believe it. There are days when I feel normal, like nothing is wrong. But when I eat something sweet, my head spins, and then I remember I am sick."*

All patients reported significant changes to their daily routines. P1, who previously sold fried bananas at 4:00 AM, now only does light housework: *"I used to sell fried bananas at 4 AM until noon. Now I can only do light cleaning at home. I get tired quickly now, unlike before."* P5, a former farm laborer, expressed frustration with his physical limitations: *"I used to be able to lift 50 kg sacks of rice. Now even lifting a bucket of water leaves me breathless. But what can I do, I have to accept this condition."*

Caregivers experienced parallel emotional challenges. F1 described the emotional pressure of caregiving: *"She gets offended easily now. I have to control my emotions. Sometimes I cry too, but I can't show it in front of mother."* F5, whose patient refused special meals, expressed frustration: *"I get annoyed when he is stubborn and doesn't want to listen to advice. But I have to be patient; he is my parent."* DK1 emphasized the clinical importance of mental health in diabetes outcomes: *"Most patients are still reactive in monitoring blood glucose. We want patients to achieve acceptance. If mentally healthy, hormone regulation is more stable. This is important for treatment success."*

Meta-Theme 2: The struggle for dietary adherence and lifestyle modification

Dietary management emerged as the most universally acknowledged challenge across all participant groups. Patients, caregivers, and the physician all identified dietary adherence as the central difficulty in T2DM self-management, though each group framed the challenge differently.

Many patients resisted strict dietary restrictions due to concerns about nutritional deficiency and weakness. P5 stated: *"I don't have any restrictions... I just control my portions so I don't lack nutrition. If I'm restricted from everything, I'll become weak and unable to work."* P4 admitted struggling with cravings: *"I find it very difficult to resist temptation. I used to always drink sweet iced tea, now I've reduced it. But when I'm stressed, I really crave sweet things."* P3 faced daily temptation from her work environment: *"Every day I see fried foods, the smell makes me salivate. Sometimes I eat a little, just one or two bites. But my husband gets angry if he sees me eating fried food."*

Caregivers faced significant challenges in preparing special meals. F5 revealed: *"We gave up making special meals because he refused and said he would become malnourished. We don't know what to do anymore."* However, some caregivers developed successful strategies. F2 explained: *"We separate mother's vegetables from ours so we know exactly what mother eats. Sometimes we all eat low-sugar food so she doesn't feel isolated."* F3 described setting an example: *"I also reduce my rice portion to set an example. When my wife sees me eating less, she also reduces hers."*

DK1 identified dietary control as the greatest clinical challenge: *"The main difficulty is when patients eat outside and don't know the calorie count. They also get bored with restricted menus and want to return to old habits. Patients often say, 'Doctor, I've been dieting but my blood sugar is still high.' They don't realize the portions they consume."*

Despite barriers, some patients demonstrated dietary discipline. P2 described significant changes: *"I used to always drink sweet drinks, now I've reduced them. My portion went from 2 plates to 1 plate. I also eat regularly, at 7 AM, 12 PM, and 6 PM."* P1 successfully changed her eating patterns because of family support: *"My children prepare the food. They know what foods are good for me. I trust them, so I eat what they prepare."* P5 developed his own strategy for controlling cravings: *"If I'm hungry at night, I eat low-sugar bread or fruit. I don't eat rice at night. For young people, maintain your health. Don't eat rice at night; if hungry, eat low-sugar bread."* DK1 recommended practical strategies to overcome dietary barriers: *"I emphasize bringing food from home because it is healthier and portions are known. This is very important for patients who work outside the home."*

Meta-Theme 3: Family as a pillar of support and a source of strain

Family involvement emerged as a double-edged sword in T2DM management. While family support was essential for treatment adherence and emotional well-being, caregiving placed significant burdens on family members that were often unacknowledged.

All patients received instrumental support from families, including meal preparation, medication reminders, and accompaniment to healthcare facilities. P1, who experienced blindness due to diabetic retinopathy, was highly dependent on her family: *"My children and husband still care for me even though I've lost my vision. They prepare my food, give me medication, and inject insulin. I can't do anything by myself anymore."* F1 described her role as primary caregiver: *"I prepare the medication and give insulin injections because mother can no longer see. Every morning and evening I give the injection, and I also schedule her meals. This is my responsibility as her child."* F3 emphasized the importance of direct

communication with healthcare providers: *"We always accompany him to control visits; we need to hear directly from the doctor about restrictions so that we understand and can help at home."*

All patients reported receiving emotional support that helped them stay motivated. P1 expressed: *"My children and husband still care for me even though I've lost my vision. They support me and give me motivation. They say, 'Mother must be strong, we are all here supporting you.' That's what keeps me going."* P2 acknowledged the value of family support: *"My husband always says, 'It doesn't matter that you're sick, we'll take care of it together.' I'm not alone because I have family."*

However, family support was not without cost. Caregivers reported significant psychological burden. F1 described: *"She gets offended easily now. I have to control my emotions. Sometimes I get stressed, but I can't show it in front of mother because I'm afraid she'll get more upset."* F3 acknowledged the impact on his marital relationship: *"Sometimes we argue about food. I forbid certain things, she gets angry. But I realize this is for her own good. Just be patient."* Financial strain was also significant. F5 explained: *"We don't have a special budget for diet food because he refuses any diet anyway. But the cost of medication and regular check-ups is quite burdensome. We have to choose our expenses carefully."* F2 revealed sacrifices made: *"We reduce our own expenses for treatment costs. Often we have to borrow money."*

DK1 emphasized that family involvement is central to treatment success: *"Family must be the main support team. The patient's success depends on family cooperation in preparing daily meals. Patients with family support usually have better glucose control."*

Meta-Theme 4: Navigating healthcare systems, cost, and complementary therapies

Access to healthcare, financial constraints, and the intersection of conventional and complementary medicine emerged as significant themes across all participant groups.

The majority of patients did not have personal blood glucose monitoring devices. P3 stated: *"I check my blood sugar at the health center because I don't have the device at home. It's expensive to buy, and the strips also need to be purchased continuously."* P1 revealed an irregular pattern of testing: *"I only check when I have complaints. For example, dizziness or blurred vision. If there are no complaints, I don't check."* Only P5 had a personal monitoring device, but he used it irregularly: *"I have the device, but I rarely use it because it's troublesome and the strips are expensive. I use it when I have extra money."* DK1 identified this reactive pattern as clinically concerning: *"Most patients are still reactive in monitoring blood glucose. They only check when symptoms appear, even though extreme glucose fluctuations can occur without symptoms. This is very dangerous."*

Caregivers played a crucial role in facilitating healthcare access. F4 explained: *"I schedule the check-ups and remind mother. If not reminded, mother often forgets or is reluctant to go because she feels healthy."* F2 revealed financial challenges: *"Transportation to the hospital is not cheap, especially if we have to go back and forth. Sometimes we have to borrow money for transportation."*

All patients reported adherence to prescribed medications, but 60% also used complementary therapies. P5 described: *"I take the medication every day, never stop. I also regularly drink boiled genjer leaves, which are said to lower blood sugar. I drink it twice a day, morning and evening."* P4 combined medical treatment with traditional herbal medicine: *"I take the doctor's medication, but I also regularly drink herbal medicine bought at the market. I think, if there's something natural, why not try it? But I don't tell the doctor because I'm afraid of being scolded."* Caregiver F1 expressed concern: *"My mother often tries various concoctions from neighbors. I worry about interactions with the doctor's medication. I always check with the doctor first when there is new information."*

DK1 acknowledged the prevalence of complementary therapy use: *"Many patients use herbal remedies without my knowledge. I always ask at each visit whether they are consuming any other medications or concoctions. Drug-herb interactions can be dangerous, for example, increasing the risk of hypoglycemia or affecting kidney function."*

Meta-Theme 5: Visions for the future and sustainable solutions

Across all participant groups, there was a shared desire for improved quality of life, sustainable management strategies, and better support systems.

All patients expressed a desire to remain productive and not burden their families. P5 stated: *"I want to keep working and not burden my children. I still want to contribute, even if only a little."* P4, who worked as a daily laborer, stated: *"As long as I'm still strong, I want to work. So my children can continue their education. I don't want to just sit at home."*

Four out of 5 patients provided advice to others. P5 advised: *“For young people, maintain your health. Don't eat rice at night; if hungry, eat low-sugar bread. Don't wait until you're sick to become aware.”* P1 emphasized the importance of regular check-ups: *“I rarely checked my health because I felt healthy. Now I regret it. My message to everyone is to have regular health check-ups.”*

Spirituality provided strength for many caregivers. F1 stated: *“We believe that good support and prayers have their own strength. We always pray for mother's recovery.”* F3 added: *“Every night we pray together for my wife's recovery. This gives us peace and strength.”* All caregivers expressed appreciation for hospital services. F3 stated: *“The service at Bhayangkara is excellent, the nurses are friendly, the doctor explains patiently. We feel comfortable here.”* F1 hoped for improved services: *“I hope there is more intensive education for families, such as training on caring for diabetes patients at home. And perhaps blood glucose monitoring devices could be more affordable.”* F2 expressed desire for a support group: *“I hope there is a group or community for diabetes caregivers. We could share experiences and tips.”*

DK1 emphasized the importance of practical strategies: *“I emphasize bringing food from home because it is healthier and portions are known. This is very important for patients who work outside the home.”* DK1 advocated for a multidisciplinary approach: *“For complex cases, I adjust insulin dosage or refer to nutrition specialists or psychology. Sometimes the main barrier is mental, not physical.”* DK1 expressed hope for systemic improvements: *“I hope blood glucose monitoring devices and strips could be more affordable or even free for patients who cannot afford them. This would greatly assist self-monitoring.”*

Summary of thematic findings

The cross-case thematic synthesis identified five overarching meta-themes that collectively capture the lived experience of Type 2 Diabetes Mellitus (T2DM) self-management from multiple perspectives. The first meta-theme explores the emotional trajectory of chronic illness, noting that diagnosis triggers significant emotional responses including shock, denial, and sadness. While patients gradually adapt, emotional fluctuations persist and directly influence their self-management capacity, while caregivers simultaneously experience parallel emotional burdens, underscoring mental health as a critical component of metabolic control.

The struggle for dietary adherence and lifestyle modification emerges as another central theme, with dietary management being the most universally acknowledged challenge. Patients routinely struggle with cravings, fear of malnutrition, and diet fatigue, while caregivers face daily difficulties preparing special meals and monitoring intake, and the physician identifies the misjudgment of portions and boredom with restricted menus as key barriers. The family functions simultaneously as a pillar of support and a source of strain, providing essential instrumental and emotional support that is critical for treatment adherence and well-being. However, this caregiving dynamic creates significant psychological and financial burdens that must be explicitly recognized and addressed to ensure sustainable long-term support.

Navigating healthcare systems, cost, and complementary therapies represents a further layer of complexity, often resulting in reactive glucose monitoring due to financial barriers. Many patients utilize complementary therapies without disclosing them to healthcare providers, which raises serious concerns about drug-herb interactions, while caregivers play a crucial role in facilitating healthcare access and filtering complex health information. Finally, visions for the future and sustainable solutions highlight the differing aspirations across groups, as patients aspire to remain productive and avoid burdening their families, caregivers draw on spiritual motivation and hope for improved services and support groups, and the physician advocates for practical strategies, multidisciplinary approaches, and improved access to monitoring devices.

These meta-themes are deeply interrelated, with emotional well-being directly influencing dietary adherence, family support affecting both emotional and practical management, and healthcare access shaping the overall capacity for effective self-management. The convergence and divergence of perspectives across participant groups highlight the complexity of T2DM self-management and the ultimate need for integrated, family-centered interventions.

Discussion

This phenomenological study examined the barriers and experiences of T2DM patients, family caregivers, and the attending physician in maintaining dietary patterns and glycemic control. Five overarching meta-themes emerged: the emotional trajectory of chronic illness, the struggle for dietary

adherence, family as both support and strain, navigating healthcare systems and complementary therapies, and visions for the future.

The diagnosis of T2DM triggered significant emotional responses including shock, denial, sadness, and anxiety across all patient participants, consistent with the psychological stages of adaptation to chronic illness. A recent systematic review and thematic synthesis on diabetes distress identified that a major area underpinning experiences of diabetes distress is not feeling in control, manifesting as threatened autonomy, sense of helplessness, and negative sense of self. The review emphasized that clinicians should consider how psychological factors such as locus of control and learned helplessness may constitute underlying mechanisms impacting emotional regulation.¹⁵ Our study found that caregivers experienced parallel emotional burdens, including stress, frustration, and the need to suppress their own emotions. This aligns with research showing that diabetes care places significant burden on families.¹⁶ The physician recognized that mental health stability correlates with metabolic control, a finding supported by evidence that diabetes distress is positively associated with HbA1c and may mediate the relationship between depressive symptoms and glycemic outcomes.¹⁷

Dietary management emerged as the most universally acknowledged challenge. Patients reported difficulty resisting cravings, fear of malnutrition, and diet fatigue. A systematic review and qualitative meta-synthesis of 120 studies found that barriers to diet modification include self-discipline, emotions, family and social support, social significance of food, and knowledge, with these barriers being inter-linked and overlapping. The review further noted that social marginalization magnifies these barriers.¹⁸ A qualitative study in Iran identified social barriers to dietary adherence, including cultural insensitivity, social pressures, misconceptions, and time constraints.¹⁹ Similarly, an exploratory qualitative study from India found that dietary self-management is shaped by knowledge, current practices, and the barriers and enablers for dietary self-care.²⁰

Family played a crucial role in providing instrumental and emotional support critical for treatment adherence and well-being. A meta-synthesis of 40 qualitative studies identified that adults with T2DM perceive family behaviors as either facilitators of diabetes self-management, barriers, or equivocal behaviors with the potential to both support and impede self-management. Facilitator sub-themes included “positive care partnerships,” “family watchfulness,” and “families as extrinsic motivator,” while barrier sub-themes included “obstructive behaviors” and “limited capacity for family support”.²¹ However, our study also revealed that family support comes with costs. Caregivers experienced significant psychological and financial burden. A systematic review of family behaviors concluded that supportive family behaviors were related to better self-care and glycemic control, while obstructive or negative interactions were detrimental.²² Recent evidence suggests that family-based interventions have a significant effect on improving HbA1c, diabetes self-care, diabetes self-efficacy, diabetes distress, and positive family support.²³

The majority of patients lacked personal blood glucose monitoring devices due to cost, relying on reactive testing only when symptoms appeared. A systematic review of barriers to self-management in socioeconomically deprived populations identified healthcare costs, financial costs of healthy eating, and competing priorities as key barriers. The review emphasized that support from healthcare providers can facilitate self-management, and it is important that people with diabetes have access to interventions that are inclusive from a cultural perspective as well as affordable.²⁴ Notably, 60% of patients in our study combined conventional medication with complementary therapies without disclosing this to their healthcare provider. A systematic review and meta-analysis of 38 studies found a pooled prevalence of CAM use among adults with diabetes of 51%, with 37 types of CAM and 223 types of herbs identified. The review noted wide variation in prevalence rates across regions. The lack of disclosure to healthcare providers is concerning, as it increases the risk of herb-drug interactions that could cause hypoglycemia, nephrotoxicity, or other adverse effects.²⁵ A systematic review on CAM for glycemic control found evidence for the effectiveness of various natural products, including *Berberis aristata*/*Silybum marianum*, fenugreek seed, bitter melon, cinnamon, and *Nigella sativa*, but emphasized that healthcare providers should consider CAM in diabetes management.²⁶

Patients expressed aspirations to remain productive and not become burdens to their families, while caregivers drew on spiritual motivation and expressed hopes for improved services. The physician advocated for practical strategies, multidisciplinary approaches, and improved access to monitoring devices. A mixed-methods overview of 14 years of reviews on self-management interventions emphasized the importance of understanding the perspectives of patients with T2DM and their informal caregivers on outcomes of self-management interventions.²⁷

The findings have several clinical implications. First, diabetes care should adopt a biopsychosocial approach that screens for emotional distress and diabetes distress. Clinicians should consider including and leading discussions around distress during appointments, using approaches that promote patient autonomy and empowerment.¹⁵ Second, healthcare providers should routinely ask about complementary therapy use in a non-judgmental manner, given the high prevalence of CAM use and potential for adverse effects and drug interactions. Third, dietary education should be practical and culturally appropriate, addressing the social and environmental factors that shape and sustain dietary change.¹⁸ Fourth, healthcare systems should work to improve access to affordable blood glucose monitoring devices. Finally, establishing peer support groups and family-based interventions for patients and caregivers could help reduce isolation and improve outcomes.

This study has several strengths. The phenomenological approach captured rich accounts from multiple perspectives, and the use of member checking and triangulation strengthened credibility. However, limitations include the small sample size, single-site design, and reliance on self-reported experiences, which limit transferability and may be subject to social desirability bias.

Conclusion

This phenomenological study revealed that T2DM patients experience significant emotional distress, dietary adherence challenges, and financial barriers to healthcare access. Family support is crucial but often strained by caregiver burden. Improving T2DM self-management requires integrated interventions addressing emotional well-being, practical dietary strategies, family engagement, and affordable healthcare access. Healthcare systems should invest in patient-centered, family-inclusive education programs and support community-based interventions that empower patients and their families.

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