



## Research Paper

# “Failure to control blood sugar” experiences of persons with type 2 diabetes mellitus



Patcharee Numsang<sup>a,\*</sup>, Areewan Oumtane<sup>b</sup>, Suwakon Kurat<sup>c</sup>, Rattana Sananok<sup>d</sup>, Sakaorat Kraichan<sup>a</sup>, Puangkaew Sarapoke<sup>a</sup>

<sup>a</sup> Srimahasarakham Nursing College, Faculty of Nursing, Prabromarajchanok Institute, Thailand

<sup>b</sup> Faculty of Nursing, Chulalongkorn University, Bangkok, Thailand

<sup>c</sup> Faculty of Nursing, College of Asian Scholars, Khonkaen, Thailand

<sup>d</sup> Primary Care Unit, Mahasarakham Hospital, Thailand

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## ABSTRACT

**Objectives:** This study aimed to explore the experiences of persons with type 2 diabetes mellitus having poor glycemic control.

**Methods:** A narrative qualitative study was conducted. Eight participants were recruited at a hospital's primary care unit (PCU) in northeastern Thailand from October to December 2021. The data was collected using in-depth interviews, field notes, and non-participatory observation. It was then analyzed based on the thematic analysis guide of Braun & Clarke (2006).

**Results:** The results revealed four main themes and eight sub-themes: lifestyle practice (inappropriate eating behaviors, taking diabetes drugs irregularly, exercising irregularly); perception of self-care (mis-perceptions about self-care practices, diabetes was a genetic disease and therefore had to be accepted); awareness regarding complications (not being aware of glycemic control, issues with social gatherings); stress from socioeconomic issues (feeling stressed in daily life).

**Conclusions:** It is the role of healthcare professionals to stress the importance of healthy behaviors to improve glycemic control in terms of diet, exercise, medication use, perception, awareness, culture, and beliefs. The study results could aid healthcare providers in developing innovations in nursing care or interventions to change unhealthy behaviors.

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## What is known?

- Poor glycemic control is the common risk factor for comorbidities and complications that impact quality of life.
- Complex lifestyle change is required to effectively self-manage and keep the blood glucose within the target range, which is essential for reducing the risk of complications.

## What is new?

- There are barriers to achieving glycemic control in persons with diabetes.

- A better understanding of problems of unhealthy behavior, which may be due to lifestyle management, the person's knowledge, perception, awareness regarding complications, and cultural beliefs, will help improve glycemic control.
- Fully understanding unhealthy behavior and its reasons is essential in managing diabetes effectively.

## 1. Introduction

Type 2 diabetes is a health problem and one of the fastest-rising worldwide health emergencies. Diabetes affects 422 million adults worldwide and, according to estimates, is expected to affect 643 million people by 2030, rising to 783 million by 2045 [1]. In 2021, Thailand had 6.1 million diabetes cases (20–79 years), placing it fourth in Asia after China (140.9 million), Indonesia (11.5 million), and Japan (11 million) [2], as well as facing an increase in diabetes cases because of unhealthy diets and high obesity rates among

\* Corresponding author.

E-mail address: [patchaee@smnc.ac.th](mailto:patchaee@smnc.ac.th) (P. Numsang).

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other factors [3]. Nearly half of all studies reported key factors of a low to moderate quality of life due to insufficient income, poor family support, and inadequate diabetes knowledge [4], as well as poor illness perception and self-care practices [5].

Type 2 diabetes is caused by the progressive loss of beta-cell insulin secretion frequently on the background of individuals with insulin resistance that may improve by promoting lifestyles including a healthy diet, weight loss, regular exercise, smoking cessation, and pharmacologic treatment [2,6]. Therefore, persons with type 2 diabetes usually occur only in adults, with the highest proportion being middle-aged 40 years or older due to rising overweight or obesity. Maintaining blood glucose levels at glycated hemoglobin (HbA1c) < 7.0% is essential to avoid severe complications [6] because poor glycemic control will increase the risk of microvascular and macrovascular complications such as chronic kidney disease, heart disease, and stroke [7].

In the Thai diabetes population, self-management of uncontrolled blood glucose is the biggest problem for healthcare providers. Studies have reported that blood glucose control is strongly associated with illness perception [5], knowledge, diabetes self-management, and self-efficacy [8], such as medication adherence, glucose monitoring, diet, and physical activity. As a country, Thailand is divided into four main regions. Also known as the Isan region, the northeast faces a rapidly increasing prevalence of diabetes, with the highest mortality rate from diabetes being in the northeastern province in 2020 [9]. Isan people have unique cultures, beliefs, languages, and lifestyles [10]. In a special Isan diet, sticky (glutinous) rice is the staple food, main menu, and source of carbohydrates, which is categorized as having a high glycemic index (GI) [11], as well as sweet tropical fruits such as durian, longan, and rambutan.

Therefore, a better understanding of how persons with diabetes view and understand their condition is needed to encourage self-care management to prevent complications. This is particularly important as diabetes-related complications and mortality rates are increasing in the northeastern region. To improve our understanding of how persons with diabetes perceive the importance of glycemic control, self-manage their diabetes, and consider their beliefs, qualitative research can be used to help researchers fully understand the phenomenon from the perspective of the individual to describe the meaning of experiences through narrative stories or life experiences of an individual [12]. The present research aimed to study the experiences of people with diabetes who have poor glycemic control. The results of this study can be useful for better understanding self-care management and may help healthcare professionals develop an effective self-care behavior program for controlling blood glucose.

## 2. Methods

### 2.1. Study design

A narrative qualitative study, as described by Creswell [12], was conducted to examine the experiences of persons with inadequate glycemic control who live in northeastern Thailand. Narrative research is about studying or exploring individuals' lives and telling experiences through narrative stories. This method is designed to ensure that knowledge is obtained accurately and reflects the phenomenon directly experienced by participants. This will provide an insightful method for understanding nursing experiences or phenomena.

### 2.2. Setting and participants

The participants were recruited at a Hospital's primary care unit

(PCU) in the northeastern region. Inclusion criteria were as follows: 40 years old or above, diagnosed with uncontrolled diabetes with HbA1c > 7.0%, which is considered poor control [13], and being able to speak Thai and or Isan language. The recruitment of new participants ended when data saturation was achieved, that is, when the most recently interviewed participants, which continued in the process, provided no new (relevant) information or concepts, and key themes had been revealed [14]. A total of eight participants were selected through the purposive sampling of participants who had been diagnosed with type 2 diabetes mellitus.

### 2.3. Data collection

Individual, in-depth interviews were deemed the most appropriate method for thoroughly understanding experiences [15]. The researchers interviewed participants at home in the PCU area from October to December 2021. Data was collected using a semi-structured interview to give direction and ensure the reliability of the findings. Field notes were used to aid the researchers in understanding the phenomenon, enhancing data, and providing a rich context for analysis [16]. The interview was divided into two main sections: 1) sociodemographic details and 2) experiences with having poor glycemic control related to self-care management. The researchers started with the general questions (e.g., Can you tell me about your health?) followed by probing questions (e.g., How did you feel when you found out you had diabetes? Why? How do you know about glycemic control? How do you manage to live with diabetes each day?). Then, the questions were focused on the data collection and progression of analysis (e.g., Can you tell me more about your condition and describe your experiences? Anything else you would like to add?). The recorded interviews lasted about 60 min and were transcribed verbatim by the interviewers.

### 2.4. Data analysis

In this study, four researchers analyzed the data based on thematic analysis guide of Braun & Clarke [17] and verbatim transcripts including field-notes as follows: 1) becoming familiar with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report. Firstly, familiarity was established with the data by checking the transcripts' accuracy against the first sound recordings. Next, the codes were examined to identify themes and subthemes and matched to the data extracts from documentation of peer debriefings. The codes were divided into themes and collated with all relevant coded data extracts within the identified themes. The researcher compared these codes and established a consensus. Finally, the themes were reviewed and refined. The themes and sub-themes were tested for referential adequacy by repeating this process until coding saturation was achieved or to determine whether additional coding modifications were unnecessary.

### 2.5. Rigor and trustworthiness

Rigor and trustworthiness were established using Lincoln and Guba's criteria [18]. The study was covered and guided the accuracy and reliability of the data by one nursing professor and a team of experienced researchers in qualitative research. The first and the second authors established credibility by triangulating different researchers and sources of data collection by comparing information from field notes and non-participatory observation to participants' interview data to provide a more thorough description of the phenomenon at hand and to establish trustworthiness during each phase of thematic analysis [17]. Other researchers were also

engaged in the data analysis and coding processes. The researchers attempted to achieve transferability by providing a rich and detailed study description. Peer review or debriefing provided an external check of the research process. The researchers and their professional peers with qualitative research experience reviewed identified themes multiple times. After the interviews, the research team read all the transcripts, coded them into finalized themes and sub-themes by four researchers during thematic analysis, and re-checked with members.

### 2.6. Ethical consideration

The researchers informed participants of the objective and detailed information before conducting the interviews, and all participants gave their consent before participating in the study. All participants were allowed to use the tape recorder and were assured that their data would be used only after permission. Institutional review board approval was obtained from Mahasarakham Hospital (Approval. no MSKH\_REC 64-02-032).

## 3. Results

### 3.1. Characteristics of participants

For the eight participants, the mean age was 55.5 years (range: 46–64 years). All participants had above-average BMI (BMI >23.0 kg/m<sup>2</sup>). Six had comorbidities and complications, including chronic kidney disease or diabetic nephropathy and comorbidities such as hypertension (HT) and dyslipidemia (DLD). None of the eight (100.0%) participants could control their fasting blood sugar (FBS >100.0 mg/dL) and glycated hemoglobin (HbA1c > 7.0%) (Table 1).

### 3.2. Experiences of persons living with diabetes

Experiences of persons with diabetes having inadequate glyce-mic control comprise four main themes and eight sub-themes related to the data on experiences: 1) lifestyle practice; 2) perception of self-care; 3) awareness regarding complications; 4) stress from socioeconomic issues.

#### 3.2.1. Lifestyle practice

3.2.1.1. *Inappropriate eating behaviors.* Persons with diabetes often neglect to control their diet. Some were knowledgeable about a healthy diet but could not follow their doctor's advice because they tend to like highly seasoned food (spicy, sweet, salty taste). They enjoy eating a lot of sweet food because it makes them feel full and gives them sufficient energy for working. They ate more sweet foods because they felt hungry while experiencing hypoglycemia.

**Table 1**  
Characteristics of participants.

Participants	Gender	Age (years)	Marital status	Duration of illness (years)	Care giver	Drinking & smoking	Herb/ supplement	BMI (kg/ m <sup>2</sup> )	FBS (mg%)	HbA1c (%)	BP (mmHg)	Comorbidity & complications	Self-care behavior
DM1	Female	54	Married	7	Husband	Drinking	No	29.7	143	8.7	139/85	HT	Self-help
DM2	Female	56	Divorced	1.5	Sister	No	Previous	25.7	164	8.1	134/79	–	Self-help
DM3	Female	64	Widowed	10	Grandchild	Drinking	No	26.7	151	8.1	134/87	HT	Self-help
DM4	Female	56	Widowed	4	Son	No	No	27.1	238	9.0	118/56	HT, CKD, DLD	Self-help
DM5	Female	59	Married	9	Husband	No	Yes	31.6	180	10.2	155/90	HT, CKD	Partial
DM6	Male	60	Married	3	Wife	No	No	25.0	214	10.3	164/90	HT	Self-help
DM7	Male	46	Single	5	Grandchild	Yes	No	25.2	125	7.6	102/72	–	Self-help
DM8	Male	49	Single	5	Sister	Yes	No	25.7	146	8.3	134/86	HT, DLD, Gout	Self-help

Note: CKD = Chronic kidney disease. HT = Hypertension. DLD = Dyslipidemia. FBS = fasting blood sugar. 1 mmHg = 0.133 kPa.

“Doctors told me to avoid sweet foods. At that time, I didn't feel good with my body. After drinking sugary/sweet water, I felt better immediately. After that, my blood sugar level was high (Laughs).” (DM3, F64)

“I always like to eat sticky rice more than plain rice because plain rice will make me feel hungry and not full (Laugh). This is the reason why my sugar is high.” (DM4, F56)

“For sticky rice, I can't avoid or stop eating it. I still eat this at breakfast, lunch, and dinner. Sometimes, I will eat fruits, sweets, and dessert. I eat a lot of sweets now. I like this food so much. If I don't eat them, I will feel hungry. After meals, I want desserts, sweets, ice cream, and soft drinks. I like these very much. After that, I will feel full or better than before.” (DM5, F59)

“... my blood sugar level is rising continuously. If we eat some fruits such as durian, longan, and rambutan, our blood sugar will be higher. There is no way to go down.” (DM7, M46)

3.2.1.2. *Taking diabetes medicine irregularly.* It was found that someone did not take their diabetes drugs regularly because they couldn't go to pick up the medicine at a hospital. Often, no one could take them because their relatives had to work. Sometimes, they would forget to take pills, but they would take them immediately upon remembering.

“The doctors gave me some big packages of diabetes medicine. I take them when I remember. No one took me to the hospital. Sometimes health care volunteers, neighbors, and grandchildren will take me there, but they also have to work and have a lot of business to take care of.” (DM3, F64)

3.2.1.3. *Exercising irregularly.* Persons with diabetes in the study did not exercise regularly, did non-pattern exercise, and used little time for exercise.

“I do exercise on the bed in the morning, stretch out and raise my legs, then go to make a merit, then walk and walk for exercise around my house for a moment.” (DM4, F56)

“Because I can't do exercise now, the accumulated sugar (HbA1c) will be at 8.0% to 9.0%.” (DM5, F59)

#### 3.2.2. Perception of self-care

3.2.2.1. *Misperceptions about self-care activities.* Persons with diabetes misunderstand medicines and supplements. They often drank supplements based on advertisements on social media and recommendations by relatives. They believed taking many

medications would cause complications but stopped because of this fear.

*“... we eat 4–5 egg whites per day. I found this by myself by searching websites. We try this because we want to recover from diabetic kidney problems. We get information and read it from this (a video on social media). I found this by myself from searching websites because I can't go anywhere. After eating, I will go to the hospital to check my blood. If the results are good, I will continue to eat it. ... Our son bought me some collagen. He told me to try it.”* (DM5, F59)

*“If we take many medicines, our kidneys will deteriorate. Sometimes I will stop taking medicine. Taking many pills, our kidneys will become progressively worse.”* (DM6, M60)

**3.2.2.2. Diabetes is a genetic disease and, therefore, has to be accepted.** Participants in the study believed their diabetes was hereditary because their relatives and most of the others who lived in this community had diabetes. From their belief, they accepted the nature of illness and expressed willingness to accept complications, which makes them start not to pay attention to any signs from their body.

*“Most of my parents and siblings have diabetes. I feel nothing because everyone has diabetes. So yeah (as if having already made up their mind), I understand my sickness. We feel ill. When I experience diabetes, I can accept this.”* (DM1, F54)

*“I don't think anything because it was not just us having diabetes. It is an illness happening to everyone. It is heredity. All family members have diabetes. So, it is common. I can accept this. If you do not have diabetes, you are old-fashioned (Laugh). They are ill with a common disease. That's that! (Laugh).”* (DM3, F64)

### 3.2.3. Awareness regarding complications

**3.2.3.1. Being unaware about glycemic control.** Persons with diabetes knew that alcohol would increase blood sugar level, so many would stop drinking near the appointment date to attain a lower level of HbA1c. Someone drank a lot of beverages or sweets in the number of over limitations. They were not concerned with the risks associated with complications from uncontrolled blood glucose.

*“... If we drink beer or alcohol, the blood sugar and blood pressure will be high. So, we drink a minimum of alcohol or stop drinking. When I go to meet doctors, I will stop drinking. After my visit, I will drink again.”* (DM3, F64)

**3.2.3.2. Issues with social gatherings.** Persons with diabetes were found to lack control in social settings often. They knew about eating behaviors but couldn't necessarily control them. Some still drank alcohol in varying degrees of moderation to heavy drinking because friends persuaded them, particularly at social gatherings.

*“... but friends invite me. We must drink when having a party. Last night we drank ten bottles with our three friends. The doctors told me to stop drinking because of diabetes. If we drink, my diabetes will be worse. Anyway, I drink alcohol. I can't tolerate abstinence at social gatherings. There are many friends at parties.”* (DM1, F54)

*“We can't stop drinking when we go out after work. Many friends will invite me to drink alcohol. It is social. Most of them will drink in the evenings. We will gather together.”* (DM8, M49)

### 3.2.4. Stress from socioeconomic issues: feeling stressed in daily life

Persons with diabetes felt stressed daily, making it more difficult to control their high blood sugar. These problems mostly stemmed from socioeconomic issues such as poverty, debt, the high cost of living, and the burden of family members.

*“... I feel stressed about debt. Our farm was damaged by flooding. For expenditures, things are used up. We are stressed. We don't have money. We must fight to go on living... I thought my blood sugar and blood pressure were high because I was stressed. Since the car accident, I have become further stressed. My blood sugar doesn't go down (with tears in her eyes). I feel stressed and frustrated with my stepdaughter; they often argue with me.”* (DM5, F59)

## 4. Discussion

In this study, it was found that persons with diabetes commonly have poor glycemic control; for example, because of unhealthy lifestyle behavior due to their self-care practice and knowledge linked to diet, medication use, and exercise, as misperception and a lack of concern regarding complications, as well as beliefs related to culture.

Persons with diabetes are knowledgeable about proper diet but cannot always follow the doctor's advice because of addictive behaviors regarding food taste. Previous studies have indicated that culture influences diabetes management and that patients tend to manage their diabetes according to their beliefs [19]. Cultural influences on diet management: for instance, difficulties in managing the habit of eating sweet food; so it is difficult to avoid eating many dishes [20]. Additionally, self-efficacy and health beliefs with Buddhist values in the community, which include self-management activities, such as dietary behavior, physical activities, medication adherence, and glucose monitoring, were associated with controlling blood glucose [21]. Accordingly, giving information for a good understanding of illness with diabetes, its impact and complications, and how their self-care will enable them to control blood glucose levels that can improve their quality of life and reduce serious complications [22]. Moreover, enhancing their perceived self-efficacy, such as having a healthy diet, exercising regularly, and taking medication, will help improve and achieve their self-management behavior [23].

A person's accurate perceptions of glycemic control are likely to be critical for successful behavioral change in diabetes self-care management, as both illness perceptions and self-management practices are linked to glycemic control [5]. Other studies on self-perception of glycemic control have found that misperception is linked to high adherence to lifestyle regimen, level of family support, failure to control blood pressure, and experiencing diabetic complications [24].

In this study, persons with diabetes believed that taking many diabetes medications would harm their kidneys, so they would not take some pills for fear that they may cause kidney failure. They took supplements because of advertising on a video on social media and advice from their relatives in the hopes that they would lessen the severity of their illness. They believed that taking diabetes medication for a long time would increase the speed of kidney deterioration, so some stopped taking their medicine. In addition, many took herbal supplements and used herbal medicine with the treatment. Likewise, most Thai diabetes persons received information about glycemic control using herbal medicine from their



relatives, friends, and social media [25,26]. Besides, they consume this in combination with antidiabetic medications prescribed by doctors.

They tend to believe that anyone can get diabetes just based on heredity. Thai people with diabetes describe the causes of their diabetes as heredity and incurable [27]. They understood that diabetes is incurable with aging, so they were not strict about eating behaviors. Similarly, diabetes is a family genetic condition, as their belief [28], and they expressed a loss of control in managing diabetes and a willingness to accept complications or consequences from diabetes.

Those with diabetes tend not to be aware of or concerned about complications from uncontrolled blood glucose, even though an appropriate diet and medication adherence are associated with adequate glycemic control [5]. Furthermore, many of those with diabetes in the study were not well-informed about glycemic control. They drank alcohol during traditional events, religious ceremonies, and social gatherings. The findings of this study are consistent with the research reporting lack of knowledge on awareness of diabetes and its complications [29].

According to the study, blood sugar control is compromised when people feel stressed in their daily routine and associated with unemployment, the perception of diabetes' interfering with everyday activities, and the lack of social support [30]. Income and family support were also associated with blood glucose levels [5]. Similar to the findings of the studies, they faced stress from the burden of financial support and inadequate social support [22].

Accordingly, there are limitations to the study in that the findings relate only to those living with type 2 diabetes and do not transfer to those with other forms of diabetes. The results may limit the broad generalization to all those with diabetes beyond the healthcare system of Thailand because of the number of participants and studying in culturally specific local areas.

## 5. Conclusion

In this study, we applied a narrative qualitative approach to understanding the experiences of persons with diabetes who had poor glycemic control. The findings of this study would be helpful to primary data for developing nursing interventions, especially as nurses play a crucial role in preventing complications from diabetes. The success of educational programs requires that health professionals understand cultural beliefs, views, and families [31]. Moreover, healthcare providers should conduct further research to understand conditions that affect patients' self-care management using ethnography or other relevant fields and develop new nursing interventions or innovations for changing behaviors or lifestyles based on a culture-specific program. Interventions such as lifestyle modification or non-pharmacological intervention will significantly improve self-efficacy, focusing on providing knowledge specific to the person's understanding, perception, awareness, belief, culture, and family.

## CRedit authorship contribution statement

**Patcharee Numsang:** Writing - original draft, Investigation, Writing - reviewing & editing, Project administration. **Areewan Oumtanee:** Supervision, Conceptualization, Methodology. **Suwakon Kurat:** Data curation, Validation, Formal analysis. **Rattana Sananok:** Resources, Data curation, Validation. **Sakaorat Kraichan:** Data curation, Validation. **Puangkaew Sarapoke:** Data curation, Validation.

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Nothing to declare.

## Data availability statement

The datasets generated during and/or analyzed during the current study are not publicly available due to [protect participant's privacy] but are available from the corresponding author upon reasonable request.

## Declaration of competing interest

There are no conflicts of interest to be reported.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2023.09.004>.

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