Exploring the Lived Experiences of Self-Care among Patients with Type 2 Diabetes Mellitus in Indonesia: A Phenomenological Study

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Abstract

Aims: This study aimed to explore the lived experiences of patients with type 2 Diabetes Mellitus (T2DM) in Indonesia regarding their self-care practices and the influence of psychosocial, cultural, and spiritual factors in managing the disease.

Methods: A qualitative phenomenological study was conducted using in-depth interviews with 15 purposively selected patients with T2DM from primary healthcare centers in Bukittinggi, Indonesia. Eligible participants had a T2DM diagnosis, no severe cognitive or functional impairment, and provided informed consent. Data were collected between December 2024 and March 2025 using semi-structured interviews and analyzed using Colaizzi's seven-step method, with NVivo 12 used only for data management.

Results: Six themes emerged: acceptance and meaning-making in the following of diagnosis, physical activity in daily life, strategies for blood glucose monitoring, medication adherence and herbal use, dietary management and challenges, and diabetic foot care practices

Conclusion: Self-care among T2DM patients is deeply influenced by emotional resilience, spiritual values, and family roles. Tailored and culturally appropriate interventions are essential for enhancing diabetes management and long-term self-care in community settings.

Keywords: patient experience, qualitative research, self-care, spirituality, type 2 diabetes mellitus

Introduction

Diabetes Mellitus (DM) remains one of the most pressing global public health challenges. According to the International Diabetes Federation (IDF), approximately 589 million adults aged 20–79 years live with diabetes worldwide in 2024, equivalent to one in nine adults, and this number is projected to increase to 853 million by 2050 (International Diabetes Federation (IDF), 2025). Characterized by chronic hyperglycemia due to defects in insulin secretion, insulin action, or both, DM leads to serious complications,

including cardiovascular disease, kidney failure, neuropathy, retinopathy, and premature death (World Health Organization (WHO), 2024). The burden of DM is disproportionately increasing in low- and middle-income countries (LMICs), driven by rapid urbanization, sedentary lifestyles, and shifts toward energy-dense diets, where health systems often face limitations in effectively managing chronic conditions (American Diabetes Association (ADA), 2023; International Diabetes Federation (IDF), 2025).

Indonesia is among the countries experiencing a rapid increase in the prevalence of DM. Epidemiological evidence indicates that countries in Southeast Asia, including Indonesia, bear a substantial DM burden, with a high proportion of cases remaining undiagnosed until complications develop (Chan et al., 2020). Regional disparities further contribute to the DM burden in Indonesia, driven by variations in diet, physical activity, obesity, and lifestyle between urban and rural populations (Kurniawan et al., 2024). In Sumatra, West Sumatra Province is generally classified as having a moderate DM prevalence (1–1.8%), with notable variations across districts (Siagian et al., 2025). Local data from Bukittinggi show an increase in DM-related primary care visits from 2,336 in 2017 to 2,958 in 2019, followed by a decline in 2020 (Meilisa et al., 2023). In this context, DM remains a key non-communicable disease in primary healthcare. Evidence from Indonesia and comparable settings indicates that highly refined carbohydrate diets, limited physical activity, and urbanization-related lifestyle changes contribute to delayed diagnosis and suboptimal DM management (Oddo et al., 2019; Sukarno et al., 2024). Semi-urban settings, such as Bukittinggi, illustrate how urbanization interacts with cultural practices to shape illness perception and health-seeking behavior.

These behaviors are commonly organized within the framework of DM self-management, which comprises seven core pillars: healthy eating, physical activity, medication adherence, self-monitoring, problem-solving, healthy coping, and risk reduction (American Diabetes Association (ADA), 2023; Sugiarto, 2021). Empirical evidence consistently demonstrates that effective engagement in DM self-care is associated with improved glycemic control, reduced DM-related complications, and an enhanced quality of life (Powers et al., 2020; Saeedi et al., 2019). However, self-care implementation is a complex process influenced by psychological factors, family support, health literacy, and sociocultural context (Almutairi et al., 2022; Pamungkas et al., 2017). In the Indonesian context, community-based self-care interventions have often been generic, with limited attention to the cultural, emotional, and spiritual dimensions that shape patients' long-term engagement in diabetes care (Cipta et al., 2024).

Most previous studies on diabetes self-care have employed quantitative approaches focusing on clinical outcomes such as HbA1c levels or adherence rates, which, while valuable, fail to capture the full range of lived experiences, emotions, and cultural values that patients navigate daily (Powers et al., 2020). Although these outcome-oriented studies provide robust evidence regarding the effectiveness of self-care interventions, they offer limited insight into how individuals experience, interpret, and negotiate self-care practices in their everyday lives (Coffey et al., 2019). Qualitative studies that foreground patients' lived experiences, emotions, and sociocultural meanings of self-care remain relatively scarce, particularly in Indonesia and other low- and middle-income countries (Linawati et al., 2022). Moreover, existing research has rarely examined how self-care practices are integrated with spiritual beliefs, cultural values,

and family roles, or how patients in semi-urban contexts navigate internal and external barriers to sustaining long-term engagement in self-care behaviors (Lin et al., 2025; Pamungkas et al., 2017). Without a deeper understanding of these contextual dimensions, diabetes self-care interventions risk being poorly aligned with patients' lived realities, potentially limiting their long-term effectiveness.

The novelty of the present study lies in its holistic and practice-oriented contribution to qualitative DM literature. While existing qualitative studies have predominantly focused on individual behaviors or clinical adherence, limited attention has been given to how self-care is embedded within patients' sociocultural, emotional, and spiritual contexts, particularly in LMICs. Building on the current state of the art, this study moves beyond viewing self-care as a set of prescriptive behavioral tasks and conceptualizes it as a culturally embedded, emotionally mediated, and socially supported practice. By foregrounding patients' lived experiences in a semi-urban Indonesian setting where spiritual values and family involvement play a central role, this study addresses an urgent gap in understanding how self-care is meaningfully enacted in everyday life. Such insights are essential for informing culturally sensitive, patient-centered nursing interventions and community-based DM education programs that are responsive to local realities and resource limitations. Accordingly, this study aimed to explore the lived experiences of patients with type 2 Diabetes Mellitus (T2DM) in Bukittinggi, Indonesia, focusing on how they perceive, adopt, and sustain self-care practices within their psychosocial, cultural, and spiritual contexts.

Methods

Study Design

This study employed a qualitative phenomenological design to explore the lived experiences of self-care management among patients with T2DM. A phenomenological approach was chosen to gain deeper insights into how patients understand, experience, and practice self-care in the context of chronic illness (Öhlén & Friberg, 2023). This study was reported in line with the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist to ensure comprehensive reporting of the qualitative process (O'Brien et al., 2014; Tong et al., 2007).

Study Setting

The study was conducted at primary healthcare centers in Bukittinggi, West Sumatra, Indonesia, from December 2024 to March 2025. These centers provide primary care services and serve a diverse population, including a large number of T2DM patients. The semi-urban context of Bukittinggi is culturally rich, making it an appropriate setting for exploring culturally embedded self-care behaviors.

Study Population

Participants were adult patients with a confirmed diagnosis of T2DM who were registered at the participating primary healthcare centers. The inclusion criteria were as follows: (1) diagnosis of T2DM; (2) absence of severe cognitive impairment, assessed through clinical judgment during recruitment based on participants' ability to comprehend interview questions and communicate coherently; (3) absence of severe functional dependency, assessed through clinical judgment based on participants' ability to perform daily activities independently; and (4) willingness to participate in in-depth, audio-recorded interviews. Purposive sampling was employed to achieve maximum variation in terms of age, sex, duration of illness, and socioeconomic

background. The sample size was determined by data saturation rather than a predetermined number. Saturation was achieved when no new themes or meanings emerged from the successive interviews. After redundancy was observed, three additional interviews were conducted to confirm saturation, resulting in a total of 15 participants (Guest et al., 2017).

Data Collection

Data were collected through face-to-face, in-depth interviews using a semi-structured interview guide developed by the research team. The interview guide was developed using a systematic methodological approach for qualitative interviews and principles of qualitative interviewing, emphasizing open-ended questions, and alignment with the study objectives (Kallio et al., 2016; Roberts, 2020). It was informed by the literature on diabetes self-care and chronic illness management and conceptually grounded in phenomenological inquiry. Prior to data collection, the interview guide was reviewed by two qualitative research experts to enhance clarity and content validity.

Data were collected through face-to-face, in-depth interviews using a semi-structured interview guide developed by the research team. The guide was informed by the literature on diabetes self-care and chronic illness management and conceptually grounded in phenomenological inquiry to explore the lived experiences and meanings of self-care among patients with T2DM. It incorporated key self-care domains, including daily self-management behaviors, emotional and spiritual coping, perceived barriers and facilitators, and family and social support, and was reviewed by two qualitative research experts before data collection.

Each interview lasted approximately 40–60 minutes and was conducted in Bahasa Indonesia to facilitate participant comfort and full comprehension. Interviews were scheduled at a time and location mutually agreed upon by the researcher and participants. Most sessions were held in private consultation rooms across seven primary health centers, creating a quiet and confidential environment for the participants. Verbal and written informed consent was obtained before each session. All interviews were audio-recorded with the participants' permission to ensure accuracy, and field notes were concurrently taken to capture non-verbal cues, emotional responses, and contextual details.

The interviews were conducted by AW and WF, who were both experienced in qualitative interviewing and DM-related research. The FDR assisted as a moderator, managing logistical arrangements, and observing nonverbal cues during the sessions. The RO recorded detailed field notes and maintained contextual documentation. The entire research team underwent a preparatory briefing prior to data collection to ensure methodological consistency and adherence to ethical practices.

Data Analysis

The interview data were analyzed using Colaizzi's phenomenological method, a rigorous and systematic approach designed to extract meaningful insights from participants' lived experiences (Abalos et al., 2016). This method was particularly appropriate for understanding how patients with T2DM engage in self-care practices within their sociocultural and emotional environments. NVivo 12 was used solely as a data management tool to support the organization and retrieval of data. All analytical decisions, including coding and theme development, were made manually by the

researchers. The data analysis followed Colaizzi's seven-step framework: 1) Reading and Familiarization: All interview transcripts were read multiple times by the research team to gain an in-depth understanding of participants' narratives and the nuances of their lived experiences with diabetes self-care; 2) Extracting Significant Statements: Key phrases and expressions that directly reflected participants' experiences were identified; 3) Formulating Meanings: The team interpreted the underlying meanings of each significant statement to conceptualize their experiential essence; 4) Clustering into Themes: Formulated meanings were categorized into subthemes and clustered into broader themes. Prominent themes included emotional responsibility, spiritual coping, and family involvement; 5) Developing an Exhaustive Description: A comprehensive narrative was constructed to describe the essence of participants' experiences, integrating all emergent themes and contextual interpretations; 6) Identifying the Fundamental Structure: The exhaustive description was distilled into a concise structural summary that captured the core meaning of living with and managing T2DM through self-care; and 7) Validation by participants (member checking): To ensure credibility, a summary of the findings was shared with selected participants. Their feedback was used to verify that the interpretations accurately represented the participants' lived realities.

Data analysis was conducted collaboratively by the research team to enhance the reliability and analytical depth. AW, FDR, and RO were primarily responsible for reviewing the transcripts, identifying significant statements, and developing the formulated meanings. WF supported the cross-checking of emerging themes and coding consistency, with NVivo used only for data management. Regular debriefing meetings were held to discuss analytical decisions, resolve coding discrepancies and reflect on researcher biases. Member checking was performed by AW to confirm the resonance of the themes with the participants' actual experiences. This structured and reflexive approach ensured that the analysis remained grounded in participants' voices while allowing for rigorous thematic interpretation. The use of Colaizzi's method ensured a rigorous analytical process, while NVivo was used solely to support data management and organization, enhancing transparency and auditability (Tabel 1).

Trustworthiness

To ensure the rigor of the study, the four criteria of trustworthiness–credibility, transferability, dependability, and confirmability–were systematically applied (Korstjens & Moser, 2018). 1) Credibility was established through prolonged engagement with the data, including repeated transcript readings and collaborative coding by researchers (AW, FDR, RO), as well as member checking with selected participants to validate the accuracy and resonance of the interpreted findings; 2) Transferability was supported by providing rich contextual descriptions of the study setting (primary health centers in Bukittinggi), participant characteristics, and the sociocultural background in which self-care practices were embedded, allowing readers to assess relevance to other similar contexts; 3) Dependability was ensured by maintaining a detailed audit trail that documented all methodological decisions, coding revisions, and analytical discussions during team meetings. The audit trail enabled transparency and consistency throughout the research. 4) Confirmability was strengthened by practicing researcher reflexivity, including the use of reflective journals to acknowledge and bracket personal assumptions, as well as peer debriefing sessions held among the research team (AW, WF, FDR, RO) to discuss emerging interpretations and ensure that the findings were grounded in participants' narratives rather than researcher bias.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of Fort De Kock University, Bukittinggi (Approval No. 767/UFDK. KEPK/XI/2024). Written informed consent was obtained from all the participants. Confidentiality was maintained by anonymizing the transcripts and securely storing the data. Participants were informed of their right to withdraw at any point without consequence

Results

Participants Characteristics

This study included 15 participants with T2DM, predominantly female (80%), with a mean age of 48.6 years. Most participants had a high school education (46.7%) and were mainly engaged in informal occupations, particularly trading (40%). The duration of illness ranged from 1 to 15 years, with 60% of participants having lived with DM for five years or more, indicating substantial lived experience in managing the disease (Table 1).

Table 1. Participant Characteristics

Code	Gender	Age	Education	Occupation	Duration DM (years)
P1	Female	60	Junior high school	Trader	10
P2	Female	60	Junior high school	Housewife	15
P3	Female	58	Undergraduate	Retired	5
P4	Female	50	High school	Trader	5
P5	Male	45	High school	Trader	2
P6	Female	40	High school	Trader	2
P7	Female	45	Junior high school	Housewife	2
P8	Male	52	High school	Trader	10
P9	Female	47	Junior high school	Housewife	5
P10	Female	45	Undergraduate	Civil servant	3
P11	Male	45	High school	Farmer	2
P12	Female	55	Junior high school	Housewife	7
P13	Female	48	High school	Trader	8
P14	Male	43	High school	Driver	2
P15	Female	42	Undergraduate	Lecturer	1

Thematic Findings

Using Colaizzi's phenomenological approach, six major themes emerged from interviews with 15 participants living with T2DM in Bukittinggi, Indonesia. The analysis followed systematic steps: identifying significant statements, formulating meanings, clustering them into themes, and constructing exhaustive descriptions. The themes reflect a holistic picture of self-care management practices and challenges faced by individuals with T2DM in their sociocultural context (Figure1).

Theme 1: Acceptance and Meaning-Making in the Following of Diagnosis
Participants shared diverse emotional and cognitive responses to their T2DM diagnosis. This theme emerged from categories related to individual reactions, family attitudes, and psychosocial support sources.
Some participants expressed regret regarding their past lifestyle choices:

"*I do regret that I haven't paid much attention to the food I consumed*." (P8)

Others experienced spiritual resignation and acceptance.

"*It's sad, yes. But this disease is from God; all comes from Him and returns to Him*." (P2)

"*So what? I still accept this situation. It's impossible for us to drown in sorrow*." (P1)

Family reactions ranged from sadness to unconditional support.

"*My children were sad at first, but they've accepted it now and keep encouraging me to manage it better*." (P11)

"*My husband and children always love me and support my check-ups*." (P2)

Supportive family dynamics helped the patients reframe their illness and maintain resilience.

"Alhamdulillah, my family continues to provide support so that I can maintain my health and control my blood glucose levels, as they are concerned about potential complications. (P10)*"*

Theme 2: Physical Activity in Daily Life
Although formal exercise was rare, participants reported engaging in household chores or walking as their main forms of physical activity.

"*Every morning, I walk to the mosque... about 30 minutes*." (P5)

"*I clean the house, cook, and sweep the yard. That's my daily exercise*." (P6)

The barriers included fatigue and time constraints.

"*I don't really have time because I take care of my grandchildren*." (P12)

"*Sometimes I feel too weak just to mop the floor*." (P2)

Participants were often assisted by family members with physical tasks, indicating a blend of autonomy and dependence in their daily routines.

"*I only engage in household activities, and even then, to a limited extent, as my child sometimes assists me."* (P15)

Theme 3: Strategies for Blood Glucose Monitoring
This theme involved strategies for self-monitoring blood glucose, including the use of digital tools, routines, and support systems.
Some participants used alarms or reminders on their phones.

"*I set a reminder on my phone to check my blood glucose*." (P8)

"*No, I just remember it myself, I've been doing it for years*." (P4)

Monitoring frequencies varied—weekly, biweekly, or monthly—depending on access and awareness.

"*I go to the clinic every two weeks for the check-up.*" (P3)

"*I have a glucometer at home, so I check every week*." (P6)

Clinic-Based versus Home-Based Blood Glucose Monitoring
"I check my blood glucose at the primary healthcare center." (P2)
"I check my blood glucose at home because I have my own monitoring device." (P14)
Family members played a critical role in the following ways:

"*My child always reminds me to check because I often forget*." (P9)

Theme 4: Medication Adherence and Herbal Use

Some participants reported consistent adherence to medications prescribed by healthcare providers as part of their daily treatment routine: "*I consume regular medicine prescribed by the doctor*." (P8)

Use of Herbal Remedies:

"*Sometimes I boil moringa leaves from my garden instead of taking pills*." (P1)

Some participants experienced fear of side effects.

"*I don't take my medicine every day—my back hurts if I do*." (P2)

Reminders from family and habits supported adherence.

"*I'm used to it now; I don't even need to be reminded*." (P1)

"*My family reminds me all the time*." (P7)

Others set alarms or relied on self-awareness.

"*I set an alarm to remember my medicine schedule*." (P10)

Theme 5: Dietary Management and Challenges

This theme encompassed the frequency of eating, portion control, food selection, and obstacles to dietary discipline.

Eating frequencies ranged widely.

"*I eat rice five times a day, but in small portions*." (P8)

"*I only eat twice—day and night*." (P4)

Efforts to limit rice and sugar intakes were evident.

"*I reduced rice from 3 ladles to just 2*." (P4)

"*Now I eat fruits and vegetables more than anything else*." (P5, P7)

Despite this awareness, cravings were difficult to control.

"*Sometimes I just eat whatever is available. Just a little, though*." (P2)

"*I get hungry, so I eat to satisfy that, not because I'm careless*." (P13)

Some participants cooked their own meals to avoid processed ingredients.

"*If I want something sweet, I make it myself at home*." (P8)

Theme 6: Diabetic Foot Care Practices

This theme included routines for foot care and strategies for treating wounds.

Common practices included soaking feet and using oils.

"*I soak my feet in warm water almost every day*." (P1)

"*I use massage oil when I feel tingling*." (P5)

Others used lotion or wore special shoes.

"*After a bath, I always dry between my toes*." (P7)

"*I wear special shoes for diabetes now*." (P10)

Wound care was managed either at home or through professional services.

"*I use betadine and keep the wound dry*." (P1)

"*I go to a modern wound care clinic if it doesn't heal."* (P10)

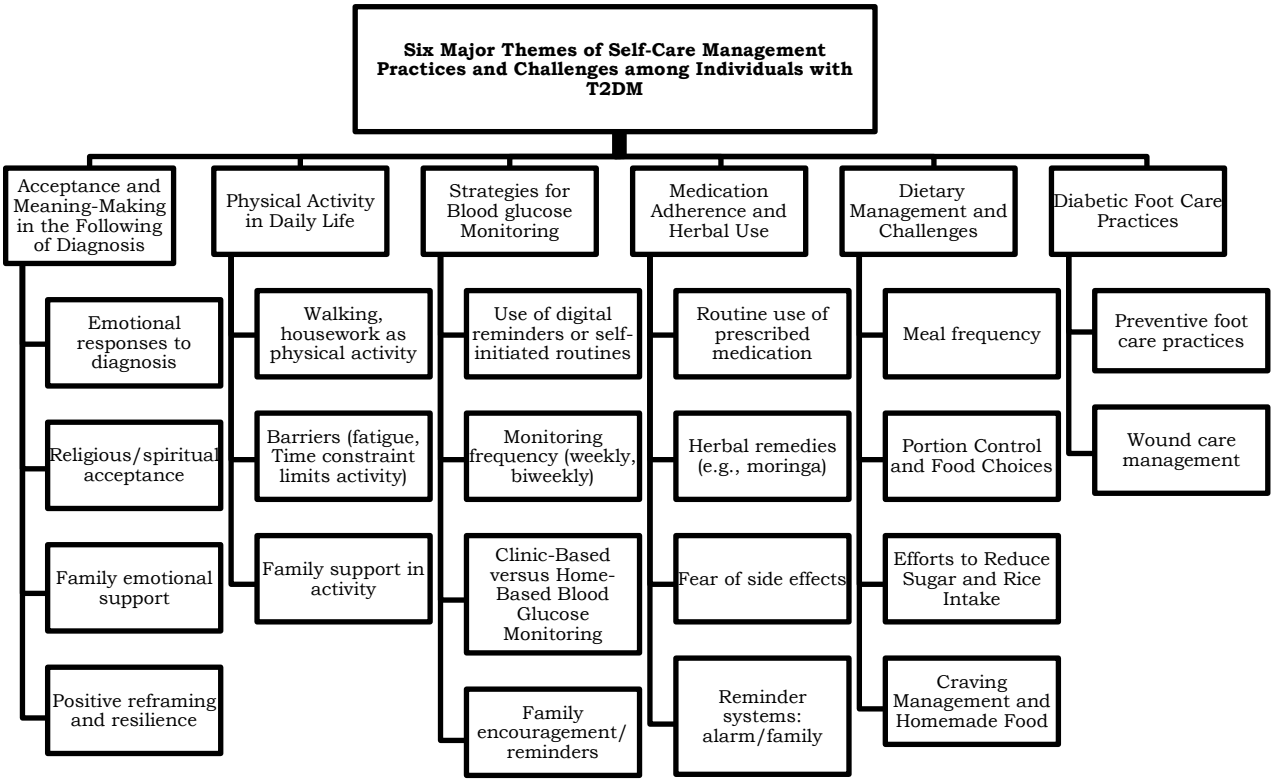

Figure 1. Thematic map illustrating six major themes and subthemes of self-care management practices among individuals with type 2 diabetes mellitus (T2DM) based on qualitative data.

The Colaizzi phenomenological analysis process transformed significant statements into formulated meanings, categories, and themes of self-care experiences among participants with T2DM (Table 2).

Table 2. Colaizzi Thematic Analysis

Significant Statement	Formulated Meaning	Emerging Category	Theme
"I do regret that I haven't paid much attention to the food I consumed."	Regret reflects an awareness and acknowledgment of past lifestyle choices.	Emotional responses to diagnosis	Acceptance and Meaning-Making Following Diagnosis
"It's sad, yes. But this disease is from God; all comes from Him and returns to Him."	Illness is interpreted as part of divine will, facilitating acceptance of the disease.	Religious/ Spiritual acceptance	
"My children were sad at first, but they've accepted it now and keep encouraging me to manage it better."	Family encouragement supports emotional resilience and positive reframing.	Family emotional support	
"My husband and children always love me and support my check-ups."	Family support fosters resilience		

Significant Statement	Formulated Meaning	Emerging Category	Theme
"Alhamdulillah, my family continues to provide support…"	Supportive family promotes coping and resilience	Positive reframing and resilience	Physical Activity in Daily Life
"Every morning, I walk to the mosque… about 30 minutes."	Walking is integrated into daily routines as a form of physical activity.	Walking, housework as physical activity	
"I clean the house, cook, and sweep the yard. That's my daily exercise."	Household chores are perceived as functional, physical activities.		
"I don't really have time because I take care of my grandchildren."	Time constraint limits activity	Barriers (fatigue, Time constraint limits activity	
"Sometimes I feel too weak just to mop the floor."	Fatigue limits activity		
"My child sometimes assists me."	Family support facilitates activity	Family support in physical activity	
"I set a reminder on my phone…"	Digital reminder supports monitoring	Use of digital reminders or self-initiated routines	Strategies for Blood Glucose Monitoring
"I just remember it myself."	Personal routine-based monitoring		
"I check weekly or monthly."	Monitoring frequency varies	Monitoring frequency (weekly, biweekly)	
"I go to the clinic every two weeks."	Monitoring via healthcare services	Clinic-based versus Home-based blood glucose monitoring	
"I check at home because I have my own device."	Independent home monitoring		
"My child always reminds me."	Family prompts support adherence	Family encouragement/reminders	
"I consume regular medicine prescribed by the doctor."	Consistent medication adherence	Routine use of prescribed medications	Medication Adherence and Herbal Use
"Sometimes I boil moringa leaves…"	Herbal therapy as complement	Herbal remedies (e.g., moringa)	
"I don't take my medicine every day—my back hurts."	Perceived medication side effects lead to non-adherence	Fear of side effects	
"My family reminds me all the time."	Family support enhances adherence	Reminder systems: alarm/family	
"I set an alarm for my medicine schedule."	Technology supports adherence		
"I eat rice five times a day, but small portions."	Eating frequency variation	Meal frequency	Dietary Management and Challenges
"I eat fruits and vegetables more."	Healthy food selection behavior	Portion control and food choices	
"I reduced rice from 3 ladles to 2."	Effort to reduce staple carbohydrate intake	Efforts to reduce sugar and rice intake	
"Sometimes I eat whatever is available."	Difficulty controlling cravings		

Significant Statement	Formulated Meaning	Emerging Category	Theme
"If I want something sweet, I make it myself."	Self-prepared food supports dietary control	Craving management and homemade food	Diabetic Foot Care Practices
"I soak my feet in warm water almost every day."	Routine preventive foot care practice	Preventive foot care practices	
"I use massage oil when I feel tingling."	Use of topical agents for symptom relief		
"After a bath, I dry between my toes."	Foot hygiene to prevent complications		
"I wear special shoes for diabetes."	Use of protective footwear to prevent injury		
"I use betadine and keep the wound dry."	Self-managed wound treatment at home	Wound care management	
"I go to a wound care clinic if it doesn't heal."	Seeking professional treatment for wound care		

Discussion

Acceptance and Meaning-Making in the Following of Diagnosis

Upon diagnosis, participants described a range of emotional reactions, including regret, sadness, and eventual acceptance, which were often influenced by family support. Feelings of regret over past lifestyle choices reflected a sense of personal responsibility and functioned as a reflective process that motivated behavior change rather than self-blame. Similar emotional responses have been identified as part of DM-related emotional distress, which can foster adaptive coping and engagement in self-care behaviors (Morales-Brown et al., 2024). Spiritual beliefs played a central role in shaping participants' interpretations of their illness, with many viewing DM as part of the divine will. This reflects the culturally embedded coping strategies commonly reported in Southeast Asian contexts, where spirituality supports emotional regulation and meaning-making in chronic illness (Arifin et al., 2020). Positive religious coping is associated with improved psychological well-being and better adherence to treatment regimens (Lucchetti et al., 2021). Acceptance emerges as a gradual, non-linear, and relational process supported by emotional regulation, spirituality, and family encouragement (Wahyuni & Ramayani, 2020). Family involvement provides both emotional reassurance and practical assistance, reinforcing the role of social support in sustaining self-care behaviors (Kandel & Wichaidit, 2021). This process illustrates participants' adaptive adjustment to living with a chronic condition, aligning with evidence that greater illness acceptance is associated with improved life satisfaction among individuals with long-term health conditions (Majchrowicz et al., 2025).

Physical Activity in Daily Life

Physical activity among participants was primarily integrated into their daily routines rather than being performed as structured exercise. Participants commonly described housework, walking, and religious activities, such as walking to the mosque, as their main forms of movement. These practices reflect culturally acceptable and accessible forms of physical activity embedded in everyday life, particularly in LMICs settings, where formal exercise programs may be less feasible (Thielen et al., 2023). Despite these routine-based activities, participants reported several barriers that limited their consistency, including fatigue, joint pain, caregiving responsibilities, and DM-related physical discomfort. Such barriers constrained mobility and reduced participants'

capacity to engage in sustained physical activity, echoing findings that physical limitations and competing daily roles frequently hinder exercise adherence among adults with chronic conditions (Biernat et al., 2024). Family involvement emerged as an important contextual factor, with family members often providing assistance or encouragement in managing physical tasks, reflecting the collective nature of self-care practices within the participants' local sociocultural context. Overall, these findings suggest that physical activity interventions for individuals with T2DM should prioritize culturally embedded and functional forms of movement, such as walking and household activities, rather than relying solely on standardized or structured exercise prescriptions, particularly in resource-limited and community-based settings.

Strategies for Blood glucose Monitoring

Self-monitoring of blood glucose (SMBG) has emerged as a central component of self-care management among participants, with strategies ranging from the use of smartphone alarms and home glucometers to routine clinic visits, reflecting proactive engagement in disease management (Majchrowicz et al., 2025). These variations reflect differences in health literacy, resource access, and technological familiarity. Participants who used digital reminders described better consistency, supporting recent evidence that mobile health (mHealth) interventions can facilitate SMBG adherence when integrated into daily routines (Huda et al., 2025; Ma et al., 2025). However, for older adults, simpler approaches, such as habitual routines or family reminders, were often perceived as more practical than technology-based solutions alone. The frequency of SMBG varied considerably and was influenced by the perceived health status, convenience, and access to monitoring devices or healthcare services. Home-based monitoring was associated with greater autonomy and self-efficacy, whereas dependence on clinic-based monitoring highlighted structural barriers, such as cost and limited access to care. These findings align with recent evidence indicating that socioeconomic conditions and self-care confidence significantly shape SMBG behavior in people with T2DM (Pitora et al., 2025). Family involvement emerged as a key facilitating factor, particularly in reminding and assisting participants with monitoring routines, reflecting the collective orientation of self-care in this sociocultural context. Contemporary studies have shown that family and community-supported self-management approaches are effective in improving glycemic monitoring and overall DM outcomes, particularly in LMICs settings (Tang et al., 2023; Zaini et al., 2025). Overall, these findings suggest that effective SMBG is not solely an individual responsibility but is embedded within family support systems and contextual resource availability. Integrating culturally sensitive, family centered strategies with accessible monitoring tools may enhance SMBG adherence and sustainability in community-based DM care settings.

Medication Adherence and Herbal Use

Medication adherence is a complex and negotiated practice shaped by biomedical recommendations, cultural beliefs, and social support. While most participants reported regular use of prescribed medications, many also incorporated herbal remedies, such as moringa leaves, reflecting the strong cultural acceptance of traditional medicine in Indonesia. Similar patterns have been reported in recent studies, showing that patients with T2DM in Southeast Asia often combine biomedical treatment with herbal practices based on cultural beliefs and perceived safety (Pradipta et al., 2023). Although herbal remedies are often viewed as natural and harmless, unsupervised use may pose risks when combined with pharmacological therapy, particularly in the absence of

professional guidance. Fear of medication side effects was identified as a contributor to intentional nonadherence, a finding consistent with contemporary evidence indicating that perceived adverse effects and concerns about long-term medication use remain major barriers to adherence among individuals with T2DM (Alsaidan et al., 2023). Conversely, adherence was facilitated by habit formation, family involvement, and the use of simple technological aids such as phone alarms. Recent studies have demonstrated that family reminders, daily routines, and low-cost digital support can significantly improve medication adherence, particularly in community-based and low-resource settings (Belete et al., 2023; Khalili Azar et al., 2024). Overall, these findings highlight that medication-taking behavior is not solely an individual biomedical decision but is embedded within cultural and family contexts. Therefore, effective adherence interventions should prioritize open communication between patients and healthcare providers, culturally sensitive education that acknowledges traditional practices, and family-based support strategies to help individuals make informed and consistent treatment decisions.

Dietary Management and Challenges

Dietary regulation emerged as a central, yet challenging, component of self-care among participants with T2DM. Participants demonstrated increased awareness of the importance of dietary control, particularly through efforts to reduce carbohydrate intake, such as limiting white rice consumption, a culturally significant staple food. This reflects the growing recognition of the relationship between carbohydrate moderation, dietary quality, and glycemic control, as emphasized in contemporary DM nutrition guidelines (Evert et al., 2019). Despite this awareness, maintaining consistent dietary practices is difficult. Participants described ongoing challenges related to cravings, emotional eating, and social influences, underscoring the complex psychological and environmental factors that shape their dietary behavior. These findings are consistent with recent evidence showing that emotional regulation, social context, and food availability significantly influence dietary adherence in individuals with T2DM (Zare et al., 2024). Such challenges highlight that dietary self-care is not solely a matter of knowledge but also of emotional coping and social negotiation. Some participants responded proactively by preparing meals at home to avoid processed foods and better control the ingredients, reflecting greater dietary autonomy and self-regulation. Recent studies have shown that home food preparation is associated with improved diet quality and more consistent adherence to dietary recommendations among individuals with chronic conditions, including DM (Baheti et al., 2023; Polak et al., 2018). However, the ability to sustain these practices is often influenced by socioeconomic constraints, time availability, and cooking skills. Overall, these findings suggest that dietary interventions for T2DM should move beyond standardized nutritional advice and incorporate culturally sensitive, context-aware strategies that address emotional eating, social expectations, and practical barriers to dietary adherence. Supporting patients in developing realistic and culturally compatible dietary routines may be more effective than prescriptive approaches alone.

Diabetic Foot Care Practices

Foot care emerged as an important component of self-care among participants with T2DM, driven by their awareness of the risk of diabetic foot ulcers. Participants commonly reported basic preventive practices, such as soaking their feet, applying oils or lotions, and using appropriate footwear. These behaviors are consistent with current international recommendations emphasizing daily foot inspection, skin care, and

protective footwear to reduce foot-related complications (Jakosz, 2019). However, variations in wound management practices were observed. While some participants managed minor foot problems independently using home remedies, others sought professional or specialized wound care services. These differences suggest disparities in health literacy, access to care, and prior experience with DM-related complications among the participants. Although self-management may be sufficient for minor issues, the delayed or inadequate treatment of foot wounds substantially increases the risk of infection and lower-extremity amputation (Song & Chambers, 2023). Participants who accessed specialized foot care services demonstrated more proactive self-care behaviors, often supported by family encouragement or prior health education. Despite general awareness of foot-related risks, gaps remain in knowledge regarding early risk assessment and appropriate footwear selection. This underscores the need for structured, culturally appropriate foot care education integrated into community-based DM programs, which have been shown to improve preventive behaviors and reduce foot complications in LMICs settings (Yıldırım Ayaz et al., 2022).

Limitations

This study had several limitations. First, the sample size was limited to 15 participants from a single semi-urban setting in Bukittinggi, which may limit its transferability to other geographical or cultural contexts. Second, the findings are based on participants' narrated experiences, which reflect personal meanings shaped by their memory, social norms, and cultural expectations. While this subjectivity is central to phenomenological inquiry, it may influence how experiences are articulated during the interviews. Third, although Colaizzi's method provides a systematic analytical framework, the interpretation of themes remains inherently interpretive despite strategies to enhance rigor, including member checking and peer debriefing. Finally, the strong cultural and religious values of the Minangkabau community may uniquely shape self-care practices, limiting their applicability to populations with different sociocultural backgrounds. Future research involving diverse settings and populations is recommended to enhance transferability and deepen contextual understanding.

Contribution to Global Nursing Practice

The findings of current study contribute significantly to global nursing practice by deepening the understanding of culturally embedded self-care behaviors among individuals with T2DM. This study highlights the essential role of family support, spiritual beliefs, and local health practices, such as herbal medicine and foot care rituals, in shaping patient engagement in DM management. For global nursing, these insights reinforce the importance of culturally competent care that is sensitive to patients' values, beliefs, and social environment. This study underscores the need for nurses worldwide to adopt holistic, patient-centered approaches that incorporate emotional, spiritual, and community dynamics, especially in chronic disease care. Furthermore, the findings emphasize the potential of nurse-led interventions to improve health literacy, empower self-management, and strengthen support systems in both low-resource and high-income settings. This study also encourages nurses and health policymakers worldwide to design and implement tailored DM education programs that go beyond biomedical models by integrating indigenous knowledge and local resources. Ultimately, this supports the development of contextually relevant, evidence-based nursing practices that improve outcomes for diverse populations living with chronic illnesses.

Conclusion

This study revealed six key themes describing how individuals with T2DM in Bukittinggi manage their self-care. Participants showed varying levels of awareness and consistency in terms of blood glucose monitoring, physical activity, dietary control, and foot care. Emotional acceptance, family support, and spiritual values play essential roles in shaping self-care behaviors. However, barriers such as fatigue, forgetfulness, and limited health literacy persist. These findings underscore the need for culturally sensitive, family involved, and spiritually integrated nursing interventions to support better diabetes self-management.

Author Contribution

Conceptualization and study design: AW, WF. Data collection and analysis: AW, FRD, and RO. Manuscript drafting: AW and FRD. Critical revisions and final approval: AW, WF, FRD, RO

Conflict of interest

The authors declare no conflicts of interest regarding the publication of this article.

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Reference

Abalos Evalyn, Y., R. R., Locsin Rozzano C., & Schoenhofer Savina O. (2016). Husserlian Phenomenology and Colaizzi's Method of Data Analysis: Exemplar in Qualitative Nursing Inquiry Using Nursing As Caring Theory. *Int J Hum Caring*, *1*, 19–2016. https://doi.org/10.20467/1091-5710.20.1.19

Almutairi, J. S., Almigbal, T. H., Alruhaim, H. Y., Mujammami, M. H., AlMogbel, T. A., Alshahrani, A. M., Al Zahrani, A. M., Batais, M. A., & Shaik, S. A. (2022). Self-awareness of HbA1c and its association with glycemic control among patients with type 2 diabetes A multicenter study. *Saudi Medical Journal*, *43*(3), 291–300. https://doi.org/10.15537/SMJ.2022.43.3.20210536

Alsaidan, A. A., Alotaibi, S. F., Thirunavukkarasu, A., ALruwaili, B. F., Alharbi, R. H., Arnous, M. M., Alsaidan, O. A., Alduraywish, A. S., & Alwushayh, Y. A. (2023). Medication Adherence and Its Associated Factors among Patients with Type 2 Diabetes Mellitus Attending Primary Health Centers of Eastern Province, Saudi Arabia. *Medicina (Kaunas, Lithuania)*, *59*(5). https://doi.org/10.3390/medicina59050989

American Diabetes Association (ADA). (2023). *Standards of Medical Care in Diabetes—2023*. https://doi.org/10.1177/155005948201300303

Arifin, B., Probandari, A., Purba, A. K. R., Perwitasari, D. A., Schuiling-Veninga, C. C. M., Atthobari, J., Krabbe, P. F. M., & Postma, M. J. (2020). 'Diabetes is a gift from god' a qualitative study coping with diabetes distress by Indonesian outpatients. *Quality of Life Research*, *29*(1), 109–125. https://doi.org/10.1007/s11136-019-02299-2

Baheti, B., Liu, X., Wang, M., Zhang, C., Dong, X., Kang, N., Li, L., Li, X., Yu, S., Hou, J., Mao, Z., & Wang, C. (2023). Association between Meal Frequency and Type 2 Diabetes Mellitus in Rural Adults: A Large-Scale Cross-Sectional Study. *Nutrients*,

15(6). https://doi.org/10.3390/nu15061348

Belete, A. M., Gemeda, B. N., Akalu, T. Y., Aynalem, Y. A., & Shiferaw, W. S. (2023). What is the effect of mobile phone text message reminders on medication adherence among adult type 2 diabetes mellitus patients: a systematic review and meta-analysis of randomized controlled trials. *BMC Endocrine Disorders*, *23*(1), 1–12. https://doi.org/10.1186/s12902-023-01268-8

Biernat, K., Marciniak, D. M., Mazurek, J., Kuciel, N., Hap, K., Kisiel, M., & Sutkowska, E. (2024). The Level and Limitations of Physical Activity in Elderly Patients with Diabetes. *Journal of Clinical Medicine*, *13*(21). https://doi.org/10.3390/jcm13216329

Chan, J. C. N., Lim, L.-L., Wareham, N. J., Shaw, J. E., Orchard, T. J., Zhang, P., Lau, E. S. H., Eliasson, B., Kong, A. P. S., Ezzati, M., Aguilar-Salinas, C. A., McGill, M., Levitt, N. S., Ning, G., So, W.-Y., Adams, J., Bracco, P., Forouhi, N. G., Gregory, G. A., … Gregg, E. W. (2020). The Lancet Commission on diabetes: using data to transform diabetes care and patient lives. *The Lancet*, *396*(10267), 2019–2082. https://doi.org/https://doi.org/10.1016/S0140-6736(20)32374-6

Cipta, D. A., Andoko, D., Theja, A., Utama, A. V. E., Hendrik, H., William, D. G., Reina, N., Handoko, M. T., & Lumbuun, N. (2024). Culturally sensitive patient-centered healthcare: a focus on health behavior modification in low and middle-income nations—insights from Indonesia. *Frontiers in Medicine*, *11*(April), 1–7. https://doi.org/10.3389/fmed.2024.1353037

Coffey, L., Mahon, C., & Gallagher, P. (2019). Perceptions and experiences of diabetic foot ulceration and foot care in people with diabetes: A qualitative meta-synthesis. *International Wound Journal*, *16*(1), 183–210. https://doi.org/10.1111/iwj.13010

Evert, A. B., Dennison, M., Gardner, C. D., Timothy Garvey, W., Karen Lau, K. H., MacLeod, J., Mitri, J., Pereira, R. F., Rawlings, K., Robinson, S., Saslow, L., Uelmen, S., Urbanski, P. B., & Yancy, W. S. (2019). Nutrition therapy for adults with diabetes or prediabetes: A consensus report. *Diabetes Care*, *42*(5), 731–754. https://doi.org/10.2337/dci19-0014

Guest, G., Namey, E. E., & Mitchell, M. L. (2017). Collecting Qualitative Data: A Field Manual for Applied Research. In *Collecting Qualitative Data: A Field Manual for Applied Research*. https://doi.org/10.4135/9781506374680

Huda, R. K., Chowhan, R. S., & Seervi, D. (2025). Effectiveness of mobile health technology-enabled interventions to improve management and control of hypertension and diabetes in India- a systematic review. *Preventive Medicine Reports*, *54*, 103094. https://doi.org/10.1016/j.pmedr.2025.103094

International Diabetes Federation (IDF). (2025). *IDF Diabetes Atlas*. International Diabetes Federation. https://diabetesatlas.org/resources/idf-diabetes-atlas-2025/

Jakosz, N. (2019). Book review – IWGDF Guidelines on the Prevention and Management of Diabetic Foot Disease. *Wound Practice and Research*, *27*(3), 144. https://doi.org/10.33235/wpr.27.3.144

Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, *72*(12), 2954–2965. https://doi.org/10.1111/jan.13031

Kandel, S., & Wichaidit, W. (2021). Self-Care and Family Support among People with Type 2 Diabetes. *J Health Sci Med Res*, *39*(1), 23–33. https://doi.org/10.31584/jhsmr.2020756

Khalili Azar, K., Mirzaei, A., Babapour, A.-R., & Fathnezhad-Kazemi, A. (2024). The

mediating effect of self-efficacy on the relationship between social support and medication adherence in adults with type 2 diabetes. *SAGE Open Medicine*, *12*, 20503121231221450. https://doi.org/10.1177/20503121231221446

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, *24*(1), 120–124. https://doi.org/10.1080/13814788.2017.1375092

Kurniawan, F., Sigit, F. S., Trompet, S., Yunir, E., Tarigan, T. J. E., Harbuwono, D. S., Soewondo, P., Tahapary, D. L., & de Mutsert, R. (2024). Lifestyle and clinical risk factors in relation with the prevalence of diabetes in the Indonesian urban and rural populations: The 2018 Indonesian Basic Health Survey. *Preventive Medicine Reports*, *38*, 102629. https://doi.org/https://doi.org/10.1016/j.pmedr.2024.102629

Lin, C., Zhu, X., Wang, X., Wang, L., Wu, Y., Hu, X., Wen, J., & Cong, L. (2025). The impact of perceived social support on chronic disease self-management among older inpatients in China: The chain-mediating roles of psychological resilience and health empowerment. *BMC Geriatrics*, *25*(1), 284. https://doi.org/10.1186/s12877-025-05902-z

Linawati, Y., Kristin, E., Prabandari, Y. S., & Kristina, S. A. (2022). Exploring the Experiences and Needs of Patients With Type 2 Diabetes Mellitus in Sleman Regency, Yogyakarta, Indonesia: Protocol for a Qualitative Study. *JMIR Research Protocols*, *11*(9), e37528. https://doi.org/10.2196/37528

Lucchetti, G., Koenig, H. G., & Lucchetti, A. L. G. (2021). Spirituality, religiousness, and mental health: A review of the current scientific evidence. *World Journal of Clinical Cases*, *9*(26), 7620–7631. https://doi.org/10.12998/wjcc.v9.i26.7620

Ma, X., Chattopadhyay, K., Xu, M., Li, L., & Li, J. (2025). Mobile App–Assisted Self-Monitoring of Blood Glucose in Type 2 Diabetes in Ningbo, China: 12-Month Retrospective Cohort Study. *JMIR Mhealth Uhealth*, *13*, e65919. https://doi.org/10.2196/65919

Majchrowicz, B., Kowalczuk, K., & Tomaszewska, K. (2025). Acceptance of illness and quality of life of patients under long-term home nursing care. *Frontiers in Public Health*, *Volume 13-2025*. https://doi.org/10.3389/fpubh.2025.1505164

Meilisa, Djuwita, R., & Satria, E. B. (2023). Analisis Situasi Masalah Penyakit Tidak Menular di Kota Bukittinggi (Situation Analysis of Non-Communicable Diseases in Bukittinggi City). *Human Care Journal*, *8*(1), 1–13. https://doi.org/10.32883/hcj.v8i1.2196

Morales-Brown, L. A., Perez Algorta, G., & Salifu, Y. (2024). Understanding Experiences of Diabetes Distress: A Systematic Review and Thematic Synthesis. *Journal of Diabetes Research*, *2024*, 3946553. https://doi.org/10.1155/2024/3946553

O'Brien, B. C., Harris, I. B., Beckman, T. J., Reed, D. A., & Cook, D. A. (2014). Standards for reporting qualitative research: A synthesis of recommendations. *Academic Medicine*, *89*(9), 1245–1251. https://doi.org/10.1097/ACM.0000000000000388

Oddo, V. M., Maehara, M., & Rah, J. H. (2019). Overweight in Indonesia: an observational study of trends and risk factors among adults and children. *BMJ Open*, *9*(9). https://doi.org/10.1136/bmjopen-2019-031198

Öhlén, J., & Friberg, F. (2023). Empirical Phenomenological Inquiry: Guidance in Choosing Between Different Methodologies. *Global Qualitative Nursing Research*, *10*, 23333936231173570. https://doi.org/10.1177/23333936231173566

Pamungkas, R. A., Chamroonsawasdi, K., & Vatanasomboon, P. (2017). A Systematic Review: Family Support Integrated with Diabetes Self-Management among

Uncontrolled Type II Diabetes Mellitus Patients. *Behavioral Sciences (Basel, Switzerland)*, *7*(3). https://doi.org/10.3390/bs7030062

Pitora, T., Azahra, S. Al, Khoirunissa, K., Suryani, S., Sabrina, N., Sabila, N., & Utami, W. R. (2025). Sociodemographic Relationships with Self-Care Management Adherence in Diabetes Mellitus Patients. *Jurnal Citra Keperawatan*, *V*(1), 79–89. https://doi.org/10.31964/jck.v13i1.392

Polak, R., Tirosh, A., Livingston, B., Pober, D., Eubanks, J. E. J., Silver, J. K., Minezaki, K., Loten, R., & Phillips, E. M. (2018). Preventing Type 2 Diabetes with Home Cooking: Current Evidence and Future Potential. *Current Diabetes Reports*, *18*(10), 99. https://doi.org/10.1007/s11892-018-1061-x

Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., Maryniuk, M. D., Norton, A., Rinker, J., Siminerio, L. M., & Uelmen, S. (2020). Diabetes Self-management Education and Support in Adults With Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy . *Diabetes Care*, *43*(7), 1636–1649. https://doi.org/10.2337/dci20-0023

Pradipta, I. S., Aprilio, K., Febriyanti, R. M., Ningsih, Y. F., Pratama, M. A. A., Indradi, R. B., Gatera, V. A., Alfian, S. D., Iskandarsyah, A., & Abdulah, R. (2023). Traditional medicine users in a treated chronic disease population: a cross-sectional study in Indonesia. *BMC Complementary Medicine and Therapies*, *23*(1), 1–9. https://doi.org/10.1186/s12906-023-03947-4

Roberts, R. E. (2020). Qualitative Interview Questions : Guidance for Novice Researchers Qualitative Interview Questions : Guidance for Novice Researchers. *The Qualitative Report*, *25*(9), 3185–3203. https://doi.org/10.46743/2160-3715/2020.4640

Saeedi, P., Petersohn, I., Salpea, P., Malanda, B., Karuranga, S., Unwin, N., Colagiuri, S., Guariguata, L., Motala, A. A., Ogurtsova, K., Shaw, J. E., Bright, D., & Williams, R. (2019). Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9(th) edition. *Diabetes Research and Clinical Practice*, *157*, 107843. https://doi.org/10.1016/j.diabres.2019.107843

Sharoni, S. K. A., & Wu, S. F. V. (2012). Self-efficacy and self-care behavior of Malaysian patients with type 2 diabetes: A cross sectional survey. *Nursing and Health Sciences*, *14*(1), 38–45. https://doi.org/10.1111/j.1442-2018.2011.00658.x

Siagian, A. D., Halim, R., Fitri, A., Syukri, M., & Suryani, H. (2025). Analisis Faktor Risiko dan Pemetaan Kasus Diabetes Mellitus di Pulau Sumatera (Analisis Data SKI 2023) (Risk Factor Analysis and Case Mapping of Diabetes Mellitus in Sumatra Island: Analysis of the 2023 Indonesian Health Survey Data). *Jurnal Kesetan Tambusai*, *6*, 5575–5585. https://doi.org/10.31004/jkt.v6i2.43909

Song, K., & Chambers, A. R. (2023). *Diabetic foot care*. https://doi.org/10.1097/00000446-196912000-00052

Sugiarto, S. (2021). Editorial : Pilar Perawatan Mandiri Diabetes Mellitus (Editorial : Pillars of Diabetes Mellitus Self-Care). *Jurnal Ilmiah Keperawatan (Scientific Journal of Nursing)*, *7*(2). https://doi.org/10.33023/jikep.v7i2.896

Sukarno, A., Hu, S. H.-L., Chiu, H.-Y., Lin, Y.-K., Fitriani, & Wang, C.-P. (2024). Factors Associated With Diabetes Self-Care Performance in Indonesians With Type 2 Diabetes: A Cross-Sectional Study. *Journal of Nursing Research*, *32*(2). https://doi.org/10.1097/jnr.0000000000000601

Tang, R., Luo, D., Li, B., Wang, J., & Li, M. (2023). The role of family support in diabetes self-management among rural adult patients. *Journal of Clinical Nursing*, *32*(19–

20), 7238–7246. https://doi.org/10.1111/jocn.16786

Thielen, S. C., Reusch, J. E. B., & Regensteiner, J. G. (2023). A narrative review of exercise participation among adults with prediabetes or type 2 diabetes: barriers and solutions. *Frontiers in Clinical Diabetes and Healthcare*, *4*(August), 1–13. https://doi.org/10.3389/fcdhc.2023.1218692

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, *19*(6). https://doi.org/10.1093/intqhc/mzab123

Wahyuni, A., & Ramayani, D. (2020). the Relationship Between Self-Eficacy and Self-Care in Type 2 Diabetes Mellitus Patients. *The Malaysian Journal of Nursing*, *11*(03), 68–75. https://doi.org/10.31674/mjn.2020.v11i03.011

World Health Organization (WHO). (2024). *Diabetes Melitus*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/diabetes

Yıldırım Ayaz, E., Dincer, B., & Oğuz, A. (2022). The Effect of Foot Care Education for Patients with Diabetes on Knowledge, Self-Efficacy and Behavior: Systematic Review and Meta-Analysis. *The International Journal of Lower Extremity Wounds*, *21*(3), 234–253. https://doi.org/10.1177/15347346221109047

Zaini, N., Idris, I. B., Ahmad, N., Hashim, S. M., Abdullah, N. N., & Shamsusah, N. A. (2025). Enhancing self-care management among women with type 2 diabetes mellitus. *Scientific Reports*, *15*(1), 13093. https://doi.org/10.1038/s41598-025-96308-9

Zare, H., Rahimi, H., Omidi, A., Nematolahi, F., & Sharifi, N. (2024). Relationship between emotional eating and nutritional intake in adult women with overweight and obesity: a cross-sectional study. *Nutrition Journal*, *23*(1). https://doi.org/10.1186/s12937-024-01030-3