

Development of Culturally Congruent Regional Food Recipes for Type 2 Diabetes Management: A Mixed-Methods Study in Phitsanulok, Thailand

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ABSTRACT

Background: Dietary non-adherence remains a global barrier to effective Type 2 Diabetes Mellitus (T2DM) management, often exacerbated by a "one-size-fits-all" nutritional approach. In Thailand, despite the implementation of the "Clinical Practice Guideline for Diabetes 2023" and the "Phuwadol Model" for diabetes remission, many patients struggle to sustain behavioral changes due to cultural disconnects. **Objectives:** To develop and assess the sensory acceptability of culturally congruent regional food recipes for T2DM patients in Phitsanulok, Thailand. **Methods:** A convergent parallel mixed-methods design was utilized. Qualitative data explored dietary behaviors via in-depth interviews (n=30; comprising 10 patients, 10 caregivers, and 10 healthcare providers). Quantitative assessment involved a satisfaction survey (n=30) of two developed regional recipes. **Results:** Six qualitative themes emerged: (1) Pre-diagnosis "Sugar Attachment," (2) Post-diagnosis fear-driven adaptation, (3) The nurse's role in communal support, (4) Misconceptions in regional nutrition, (5) Demand for evidence-based local recipes, and (6) Accessibility of local raw materials. The developed recipes (Banana Blossom Salad and Sour Curry with Lotus Stem) utilized local, low-glycemic index (GI) ingredients. Quantitative results showed exceptionally high satisfaction in visual appearance and taste. **Conclusions:** Integrating local culinary wisdom into nursing practice through Leininger's framework may enhance dietary adherence. This model bridges the "knowledge-to-action" gap by aligning clinical standards with the lived cultural experience of the patient. However, these findings are limited to sensory acceptability and lack empirical glycemic or biochemical validation.

Keywords: *Culturally Congruent Care; Dietary Adherence; Nursing Intervention; T2DM*

INTRODUCTION

Diabetes mellitus (DM) remains a paramount global health crisis of the 21st century, positioned by the World Health Organization (WHO) as a critical non-communicable disease (NCD) that drives escalating healthcare costs and premature mortality (World Health Organization, 2016). Data from the International Diabetes Federation (IDF) indicate that approximately 537 million adults globally live with diabetes, with Type 2 Diabetes Mellitus (T2DM) representing over 90% of cases (IDF, 2021). Thailand has mirrored this global trend; historically, an epidemiological transition established a baseline that propelled T2DM prevalence to nearly four million people (Aekplakorn *et al.*, 2011), a figure that continues to escalate in current contexts, corroborated by recent non-communicable disease data emphasizing the growing prevalence of metabolic conditions across rural health districts (Division of Non Communicable Diseases, 2023). Despite the evolution of pharmacological therapies, a substantial proportion of the Thai population fails to achieve optimal glycemic targets, resulting in devastating microvascular complications, most notably diabetic nephropathy (Deerochanawong & Ferrario, 2013).

The progression from poorly managed T2DM to Chronic Kidney Disease (CKD) and end-stage renal disease (ESRD) presents a profound burden on the Thai healthcare system, driving severe microvascular complications and significant financial strain (Ong-Ajyooth *et al.*, 2009; Ingsathit *et al.*, 2010). For those advancing to end-stage renal disease (ESRD), the financial strain of renal replacement therapy initially exceeds 200,000 THB per patient annually, totaling a national expenditure of over 6,000 million THB (Ingsathit *et al.*,

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2010), burden that has only intensified in the current decade. Beyond economics, the management of renal care is hampered by a systemic shortage of specialized nursing staff and logistical barriers to treatment access in rural areas.

Central to the Thai nursing mandate is the "Clinical Practice Guideline for Diabetes 2023" (Diabetes Association of Thailand, 2023), which emphasizes medical nutrition therapy (MNT) as a cornerstone for achieving diabetes remission. While international guidelines (American Diabetes Association Professional Practice Committee, 2024) and national guidelines advocate for carbohydrate counting and the "Phuwadol Model"—a diabetes school approach focusing on food exchange programs—translating these into sustainable changes remains a challenge (Vichitkunakorn *et al.*, 2025). Despite these established practices, a significant number of Thai patients fail to achieve remission or glycemic control. Recent statistics from a subsequent, distinct national health survey indicate that the complexity of dietary management, coupled with deeply rooted cultural eating habits, often overrides clinical education (Aekplakorn, 2021), highlighting an ongoing epidemiological trend since the earlier 2011 report.

The rationale for focusing specifically on dietary control, despite the multi-faceted nature of DM care (medication, exercise, and activity), is that nutrition remains the most culturally sensitive and difficult-to-sustain component (Tsiouli *et al.*, 2013; Vichitkunakorn *et al.*, 2025). While medication adherence is often high due to clinical supervision, dietary choices are made privately within a cultural context. Phitsanulok Province, situated in the lower northern/upper central region of Thailand, presents a unique context. The lifestyle is traditionally tied to water sources and riverine agriculture, leading to a diet rich in freshwater fish and aquatic plants (e.g., lotus stems). However, modern transitions have introduced high-sugar "street foods" and a persistent attachment to traditional sweets, complicating modern management. Addressing this challenge requires structured behavioral frameworks, as recent evidence demonstrates that targeted nursing interventions can significantly improve dietary compliance in chronic disease management (Vandepitte *et al.*, 2019).

From a nursing science perspective, the failure of many interventions stems from a lack of cultural resonance. Leininger's Culture Care Theory has been successfully applied in various DM studies to bridge the gap between "emic" (insider) folk knowledge and "etic" (outsider) professional care (Vandepitte *et al.*, 2019). This study addresses this gap by applying Leininger's Culture Care Diversity and Universality Theory. Utilizing the Sunrise Enabler as a diagnostic lens, this research explores how technological, religious, and social factors influence dietary choices. Furthermore, Leininger's three modes of nursing care—preservation, accommodation, and repatterning—provide a systematic pathway to integrate local culinary wisdom with clinical diabetic standards (Leininger, 2002; McFarland & Wehbe-Alamah, 2019).

By integrating nursing expertise with community-based nutritional innovation, this study aims to develop culturally tailored food recipes. This approach seeks to empower T2DM patients, foster glycemic control, and mitigate the risk of debilitating complications through interventions that are both medically rigorous and culturally meaningful.

Research Objectives

The main objective of this study is to develop, synthesize, and assess the sensory acceptability of culturally congruent regional food recipes utilizing local, low-glycemic index ingredients to enhance dietary adherence and sensory acceptability among patients with Type 2 Diabetes Mellitus (T2DM) in Phitsanulok, Thailand.

To achieve this overarching main objective, the specific research objectives are structured as follows:

- To assess the food consumption behaviors and cultural dietary context of patients with diabetes in Muang District, Phitsanulok, Thailand.
- To develop evidence-based local food recipes and evaluate patient satisfaction alongside the sensory acceptability of these newly developed regional recipes.

Research Question

Given the convergent parallel mixed-methods design, the qualitative strand of this study explores the lived experiences without prior hypotheses, while the quantitative strand is guided by the following research

question: What is the level of sensory acceptability and satisfaction of the newly developed culturally congruent regional food recipes (Banana Blossom Salad and Sour Curry with Lotus Stem and Tilapia) among patients with Type 2 Diabetes Mellitus?

METHODOLOGY

Study Design

This study employed a convergent parallel mixed-methods design (Creswell & Plano, 2018). This methodology is validated for nursing research as it allows for the triangulation of qualitative depth and quantitative breadth, providing a comprehensive view of complex health behaviors (Shorten & Smith, 2017). The qualitative strand utilized a descriptive phenomenological approach to deeply explore the "lived experiences," dietary taboos, and cultural meanings of food among diabetic patients. The quantitative strand focused solely on assessing the short-term sensory acceptability and practical feasibility of the developed regional food recipes without longitudinal adherence tracking or empirical glycemic validation (Junwin *et al.*, 2026).

Setting and Participants

The study was conducted in the Muang District of Phitsanulok Province. In the qualitative strand, a sample size of 30 participants across subgroups was utilized to explore thematic depth, noting that true saturation typically refers to smaller, highly homogenous groups (Guest *et al.*, 2006). Strict inclusion and exclusion criteria were applied across both strands to ensure internal validity:

Qualitative Strand Selection (n=30 total; n=10 patients, n=10 caregivers, n=10 providers)

Participants were selected via purposive sampling. The inclusion criteria for patients required a confirmed T2DM diagnosis for at least one year, residency in Muang District of Phitsanulok for over one year, and the ability to communicate in Thai. The inclusion criteria for caregivers required them to be primarily responsible for preparing family meals for at least six months. For healthcare providers, eligibility required participants to be professional nurses or clinical nutritionists with at least two years of continuous experience working in diabetes clinics.

Quantitative Strand Selection (n=30)

Patients were recruited using convenience sampling for a single-session sensory evaluation. No baseline or standard diabetic diet control group was utilized in this phase. The inclusion criteria required a T2DM diagnosis, age between 18–70 years, stable glycemic status within the past three months, and an interest in regional culinary modification.

Exclusion Criteria (Both Strands)

Individuals were excluded if they presented with end-stage renal disease (ESRD) or severe diabetic complications requiring specialized medical liquid diets, had cognitive impairments or active psychiatric conditions that hindered interview participation or sensory grading, or possessed known food allergies to any of the ingredients used in the regional recipes (e.g., tilapia fish, banana blossom, or specific local herbs).

Research Instruments

The instruments were developed through an integrative review of Transcultural Nursing literature and initially validated by a panel of three experts in nursing and clinical nutrition (CVI > 0.80) as a preliminary validation step, though construct validity and test-retest reliability were not formally assessed in this pilot phase, which is consistent with foundational steps in developing new clinical nursing tools (Polit & Beck, 2020).

Semi-structured Interview Guide

Anchored in Leininger's Sunrise Enabler, this guide focused on technological, religious, social, and economic factors influencing dietary behaviors. The guide consisted of open-ended questions designed to elicit deep "lived experiences" regarding cultural staples and barriers to dietary adherence.

Nutritional Satisfaction Questionnaire

A 5-point Likert scale was used to evaluate five culturally congruent domains: (1) Visual Appearance, (2) Taste Palatability, (3) Ingredient Accessibility, (4) Ease of Preparation (utilizing traditional kitchen technology), and (5) Perceived Health Benefits.

Structure and Scoring

The questionnaire comprised 15 items (3 items per domain), with responses ranging from 1 (Very Dissatisfied) to 5 (Very Satisfied). Total scores ranged from 15 to 75, where higher scores indicated greater sensory and cultural acceptability.

Interpretation

Scores were categorized into three levels of satisfaction: 61–75 (Highest satisfaction), 46–60 (High satisfaction), and ≤ 45 (Moderate to low satisfaction).

Reliability

The internal consistency of the instrument was confirmed with a Cronbach's alpha coefficient of 0.82 based on the pilot test with 30 participants; however, establishing reliability on the same pilot sample rather than an independent sample introduces circularity, which is acknowledged as a limitation.

Data Collection and Recipe Development

Following ethical approval from the Institutional Review Board of Naresuan University (COA No. 156/2024), data collection and recipe development proceeded in three systematic phases:

Phase I

Discovery (Qualitative Strand): In-depth interviews (30–45 minutes) were conducted by the principal researcher in private counseling rooms at local primary care units to ensure confidentiality. This phase aimed to identify "cultural staples," "sugar attachment" behaviors, and barriers to adherence.

Phase II

Synthesis and Development: Utilizing the qualitative themes identified in Phase I, the research team co-created the regional food recipes. The specific selection of the two recipes (Banana Blossom Salad and Sour Curry with Lotus Stem) was directly grounded in the findings from Theme 1, Theme 5, and Theme 6. Nutritionists utilized standard food exchange matrices to substitute refined sugars and high-GI carbohydrates with minimal amounts of low-GI palm sugar and indigenous, high-fiber components.

Phase III

Evaluation (Quantitative Strand): This phase took place at the community health center's demonstration kitchen. Participants tasted standardized portions of the developed recipes and immediately completed the Nutritional Satisfaction Questionnaire to capture short-term hedonic acceptability.

Data Analysis

Qualitative Analysis

Audio-recorded interviews were transcribed verbatim and analyzed using Colaizzi's (1978) seven-step descriptive phenomenological method (Streubert & Carpenter, 2011), supported by iterative thematic coding principles to ensure data reliability and interpretive depth (Braun & Clarke, 2021). During the analysis, cultural emic terms such as "Kwan-Phit" (flavor soul) and "Yat-Sanan" (health relatives) organically emerged from the participants' verbatim transcripts to describe their unique dietary and social experiences.

Quantitative Analysis

Descriptive statistics (frequencies, percentages, means, and standard deviations) were analyzed using SPSS version 26.0 to evaluate short-term satisfaction levels and sensory acceptability. Consistent with the study

design lacking a control group or empirical clinical measurements, no inferential statistics were utilized in this phase.

Ethical Considerations

Ethical approval was granted by the Institutional Review Board of Naresuan University, Thailand, with reference number COANo. 156/2024 on 15th May 2024.

Participation was strictly voluntary, and written informed consent was obtained from all participants prior to data collection, detailing their right to withdraw at any time without affecting their standard care. Confidentiality and anonymity were rigorously maintained through the pseudonymization of all transcripts and data sets (e.g., P01, N01), with securely encrypted data storage accessible only to the primary research team. The study adhered strictly to the ethical principles outlined in the Declaration of Helsinki regarding the protection of human subjects.

RESULTS

The study utilized a mixed-methods approach to explore the dietary behaviors of diabetic patients and develop culturally appropriate food recipes. The results are categorized into three primary phases: behavioral analysis, recipe development, and satisfaction assessment.

Thematic Analysis of Dietary Behaviors and Healthcare Context

The qualitative strand identified six major themes that explain why dietary habits persist within this local culture:

Theme 1: Pre-diagnosis Lifestyle and "Sugar Attachment": Participants viewed sugar not just as a nutrient, but as a "flavor soul" (Kwan-Phit) necessary for palatability.

"All my preferred foods always taste sweet. Well, every vegetable dish needs additional sugar, so does curry dish... I also like and eat lots of fruits, especially mangosteen and durian."

"I eat all day long... I love fried banana, coffee drinks, cake, and Thai coconut pudding."

Theme 2: Post-diagnosis Self-Care and Dietary Adaptation: Adaptation was often motivated by the fear of "becoming a burden" (dialysis) rather than a proactive health goal.

"I started to eat less... I also eat less at dinner. My health condition has improved a lot."

"I focus more on natural herbs such as ginger and garlic. I also take medicine as prescribed."

Theme 3: The Nursing Role in Communal Healthcare: Nurses are viewed as "Health Relatives" (Yat-Sanan), making them ideal cultural brokers.

"The nurses here don't just give orders; they understand our community and act like family, helping us adjust our local ingredients safely without completely abandoning our traditional tastes."

Theme 4: Perception of Regional Nutrition: There is a cultural misconception that "natural" local foods are always safe, leading to the overconsumption of high-sugar local fruits like durian or maprang.

"I assumed that because durian and ripe mangoes are natural fruits from our own orchards, they wouldn't harm me, so I ate them freely, which caused my blood sugar to spike severely."

Theme 5: Knowledge Deficit and Educational Demand: Patients expressed a desire for a "Local Exchange List" that matches the Phuwadol Model's logic but uses Phitsanulok ingredients.

"I am very interested... because it will be useful for self-care and taking care of others in the family."

Theme 6: Availability of Local Raw Materials: The geographical context of Phitsanulok provides an abundance of low-GI aquatic plants and herbs.

"Most in this area love chili sauce and boiled vegetables because it's easy and convenient... ingredients"

can be sourced in our village.”

Development of Culturally Congruent Food Recipes

Based on the interview data and nutritional literature, two regional recipes were developed. These recipes emphasize low-glycemic index (GI) ingredients and balanced macronutrients. Crucially, the cultural congruence of these recipes is rooted in Phitsanulok's riverine ecology, where aquatic plants (lotus stem) and indigenous flora (banana blossom) have historically served as dietary staples shared communally, satisfying the "emic" cultural identity while adhering to "etic" clinical restrictions.

2.1 Banana Blossom Salad (Yum Hua Plee)

- **Energy Content:** 126 kcal per serving. This caloric values represents the comprehensive total calculation of all ingredients within the recipe, including the main vegetable, seasonings, and lime juice, calculated using standard Thai Food Composition Tables.
- **Nutritional Strategy:** Banana blossoms provide high fiber for glucose regulation, while palm sugar is used in minimal amounts as a low-GI alternative to refined sugar.
- **Key Benefits:** High in antioxidants and fiber; supports weight and stress control.

2.2 Sour Soup with Lotus Stem and Tilapia Fish (Kaeng Som Sai Bua)

- **Energy Content:** 171 kcal per serving. This value is a complete caloric synthesis of all recipe components (the fish, lotus stems, curry paste, and seasonings combined), derived from standardized nutritional databases rather than direct laboratory analysis.
- **Nutritional Strategy:** Tilapia provides high-quality lean protein, while lotus stems are used to provide dietary fiber and satiety.
- **Key Benefits:** Low fat, high protein, and rich in Vitamin A and C from local herbs.

3. Quantitative Satisfaction Assessment

Table 1: Demographic Characteristics of Participants (n=30)

Characteristics	Frequency (n) / Mean ± SD	Percentage (%)
Gender		
Male	15	50.0
Female	15	50.0
Age (Years)	58.4 ± 6.2	-
Education Level		
Primary Education	26	86.7
Secondary Education or Higher	4	13.3
Diabetes Duration (Years)	6.5 ± 2.1	-
HbA1c Level (%)	7.2 ± 0.4	-
Current Medications		
Metformin (Oral)	25	83.3
Combined / Others	5	16.7

As illustrated in Table 1, the baseline demographic profile of the participants ($N=30$) demonstrates a balanced gender distribution, comprising 15 male (50.0%) and 15 female (50.0%) patients. The mean age of the cohort was 58.4 ± 6.2 years, representing a predominantly middle-aged to older adult population. Regarding educational background, the majority of participants completed primary education ($n=26$, 86.7%), with only 13.3% ($n=4$) attaining secondary education or higher. Clinical characteristics revealed a mean diabetes duration of 6.5 ± 2.1 years and a baseline mean HbA1c level of $7.2 \pm 0.4\%$, reflecting mild-to-moderate glycemic control. Pharmacologically, 83.3% ($n=25$) of participants were maintained on oral Metformin monotherapy, while 16.7% ($n=5$) were prescribed combined or alternative oral hypoglycemic therapies.

Table 2: Patient Satisfaction Scores for Regional Diabetic Food Recipes (n=30)

Parameter	Banana Blossom Salad - High to Highest n (%)	Banana Blossom Salad - Moderate/Other n (%)	Sour Soup with Lotus Stem - High to Highest n (%)	Sour Soup with Lotus Stem - Moderate/Other n (%)
Visual Appearance	29 (96.7)	1 (3.3)	29 (96.7)	1 (3.3)
Food Taste	30 (100.0)	0 (0.0)	30 (100.0)	0 (0.0)
Ease of Ingredient Sourcing	30 (100.0)	0 (0.0)	30 (100.0)	0 (0.0)
Ease of Preparation (Cooking)	28 (93.3)	2 (6.7)	28 (93.3)	2 (6.7)
Perceived Health Benefits	27 (90.0)	3 (10.0)	27 (90.0)	3 (10.0)

Note: The combined 96.7% and 100% ratings reflect short-term hedonic acceptability

Quantitative assessment of sensory acceptability and feasibility revealed exceptionally high satisfaction rates across all five evaluated parameters for both regional low-GI recipe modifications (N=30). Specifically, 100.0% (n=30) of participants reported high to highest satisfaction for both Food Taste and Ease of Ingredient Sourcing across both recipes. For Visual Appearance, 96.7% (n=29) rated high to highest satisfaction, with only 1 participant (3.3%) rating moderate/other. For Ease of Preparation (Cooking), 93.3% (n=28) reported high to highest satisfaction, while 6.7% (n=2) expressed moderate satisfaction due to initial unfamiliarity with adjusted low-GI seasoning ratios. Finally, Perceived Health Benefits achieved high to highest satisfaction among 90.0% (n=27) of respondents, while 10.0% (n=3) gave a moderate rating. Overall, these findings demonstrate robust hedonic acceptability and practical community feasibility for both Banana Blossom Salad and Sour Soup with Lotus Stem.

DISCUSSION

The findings of this study demonstrate that developing culturally tailored nutritional interventions—specifically regional recipes such as Banana Blossom Salad and Sour Curry with Lotus Stem and Tilapia—directly bridges the gap between theoretical nursing frameworks and practical diabetic care. By grounding our methodology in Leininger's Culture Care Theory (specifically the "Culture Care Accommodation/Negotiation" mode) and aligning with the Clinical Practice Guideline for Diabetes 2023 and the Phuwadol Model, this study demonstrates how clinical guidelines can be operationalized within a local community context.

The qualitative themes (Themes 1–6) highlighted deep-seated cultural attachments ("Kwan-Phit" or flavor soul) and misconceptions regarding natural foods. The subsequent recipe development directly responded to these qualitative findings by utilizing indigenous low-GI ingredients (banana blossom and lotus stem) sourced from Phitsanulok's riverine ecosystem. The quantitative results (Tables 1 and 2) validated this mixed-methods synthesis, showing 90%–100% sensory acceptability across key domains. The dietary habits in Phitsanulok are not merely choices but are tied to the "riverine lifestyle" where food is shared communally. The "knowledge-to-action" gap exists because traditional CPGs often use central Thai or Western food examples that do not resonate with the Phitsanulok palate (Leininger, 2002; McFarland & Wehbe-Alamah, 2019). Furthermore, leveraging local resources mitigates barriers related to health literacy, which is increasingly recognized as a crucial social determinant in achieving compliance for chronic disease management (Nutbeam & Lloyd, 2021).

The sensory acceptability of these regional recipes in leveraging local ingredients is consistent with the cultural approach used by Sranacharoenpong and Hanning (2011), Bureau of Nutrition (2020), and Odglun *et al.* (2023) in Northern Thailand. Theoretically, the physiological efficacy of these recipes is likely attributed to the low-glycemic index (GI) and high-fiber nature of indigenous Thai vegetables, such as banana blossom and lotus stem, which help prevent spikes in blood glucose levels.

Our study aligns with the 2023 Clinical Practice Guideline for Diabetes in Thailand by providing a practical "Phuwadol-style" application for regional settings. By using Banana Blossom and Lotus Stem—staples of the lower northern region—we move from didactic education to "Culturally Congruent Action." This transition could potentially support the prevention of the progression of diabetic nephropathy and other microvascular complications, which remain a significant burden on the Thai healthcare system (Ingsathit *et al.*, 2010). This community-based approach is supported by recent findings indicating that cultural-based health education significantly enhances self-efficacy and clinical outcomes among rural adults with diabetes (Codrington *et al.*, 2025; Nakagasien *et al.*, 2003).

Nurses in this study functioned as "cultural brokers," bridging the gap between rigorous clinical requirements and the lived experience of the patient (Leininger, 2002). By validating local culinary wisdom, nurses foster a therapeutic alliance that empowers patients, transforming didactic medical nutrition therapy into acceptable, sustainable behavioral modifications, thereby reducing the "knowledge-to-action" gap identified in previous Thai research (Piyabanditkul & Sompeerapun, 2025) and offering a practical community solution to reduce long-term microvascular and renal complications in rural Thailand.

Limitations

This study focused primarily on sensory acceptability and patient satisfaction; it did not empirically measure the Glycemic Index (GI) or clinical outcomes. Furthermore, the estimation of reliability using the same pilot sample introduces a degree of circularity in our validation process. Satisfaction levels were assessed through self-reporting, which is susceptible to social desirability bias. The quantitative evaluation relied on a small convenience sample (n=30) with no control or baseline arm, limiting generalizability.

Future Scope

Building upon the foundational findings of this study, future research should pursue several strategic directions. Randomized controlled trials or prospective cohort studies should be conducted to empirically assess postprandial blood glucose responses, glycemic index and glycemic load values, long-term changes in HbA1c levels, lipid profiles, and renal function markers, such as the estimated glomerular filtration rate and urinary albumin-to-creatinine ratio, over a period of 6–12 months. The research should also be expanded through larger, multicentre studies across diverse health districts in Thailand, particularly the Northeastern and Southern regions, to develop and validate culturally appropriate recipes suited to different local culinary practices. Furthermore, digital health interventions, including mobile applications featuring interactive local food exchange lists, and nurse-led community education toolkits should be developed for integration into primary healthcare units and diabetes self-management education programmes. Finally, longitudinal studies should examine sustained dietary adherence, self-efficacy, and health-related quality of life among patients and their informal caregivers over extended follow-up periods.

CONCLUSION

This research demonstrates that diabetic patients express high satisfaction and a strong educational demand for self-management tools when nutritional interventions actively respect and incorporate their cultural heritage. The development of regional food recipes, utilizing local resources such as banana blossom and lotus stem, serves as a highly culturally acceptable and practical strategy for dietary modification. By bridging the gap between standard clinical guidelines and the lived cultural experiences of patients, such tailored interventions can support better dietary adherence among those with T2DM. To effectively integrate these findings into practice, nurses should transition to a role of cultural brokerage. This involves using tools like the Sunrise Enabler to assess dietary habits, recognizing that behaviors such as "sugar attachment" may be deeply intertwined with social identity or religious offerings. Furthermore, nursing interventions should implement the Phuwadol Model by translating standard food exchange programs into regional recipe guides specific to the local context. Ultimately, for holistic management, nurses must ensure that these culturally congruent meals are integrated into a comprehensive care plan that equally emphasizes medication adherence and physical activity.

CRedit Authorship Contribution Statement

S.T.: Review literature, methodology and design, data collection and analysis, conclusion, and write the manuscript; **S.K.:** Review literature, methodology and design, data collection and analysis, conclusion, and write the manuscript.

AI Assistance Declaration

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) solely to support language editing and grammar refinement. The use of this tool was limited to improving the clarity and readability of the manuscript and did not involve data analysis, interpretation of findings, or the development of scientific conclusions.

Conflict of Interest

The authors declare that they have no conflict of interests.

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