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Research Article

A Family Empowerment Model Based on Family-Centered Care (FCC) in Managing Type 2 Diabetes Mellitus in Rural Communities

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ABSTRACT

Type 2 diabetes mellitus (T2DM) presents complex challenges among older adults in rural communities due to limited health literacy, inadequate access to healthcare services, and deeply rooted cultural practices. Family involvement is often essential, yet remains unsupported by structured interventions. This study aimed to develop a culturally contextual Family Empowerment Model, grounded in Family-Centered Care (FCC), to improve Type 2 diabetes mellitus (T2DM) self-management among older adults in rural communities. An exploratory design rooted in qualitative inquiry was used to gain a comprehensive understanding of participants' experiences, involving 21 participants (older adults, family caregivers, and health workers) from Sukamaju Village, Tasikmalaya, Indonesia. Data collection was conducted using semi-structured interviews and group discussions, followed by thematic analysis guided by Braun and Clarke's framework. Four main themes were identified: (1) family as the first line of care, (2) cultural and spiritual values in caregiving, (3) need for empowerment and health literacy, and (4) community health workers as bridging agents. These findings informed a structured empowerment model encompassing family roles, cultural alignment, health education, and community engagement. The FCC-based Family Empowerment Model offers a comprehensive, culturally appropriate approach to improve T2DM care in rural areas. It has the potential to enhance self-care capacity, reduce caregiver burden, and strengthen community-based health systems.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is one of the most prevalent chronic diseases globally, with an increasing incidence among older adults, particularly in rural communities. Older individuals are especially vulnerable due to declining physiological functions, limited access to healthcare services, and a higher risk of complications. Virtič Potočnik et al. (2024) emphasized that managing T2DM in older adults requires not only clinical interventions but also comprehensive approaches that consider psychosocial and environmental aspects (Virtič Potočnik et al., 2024).

Rural communities face unique challenges in diabetes management, including under-resourced healthcare infrastructure, low health literacy, and deeply rooted cultural values. Curtis et al. (2024) found that health literacy interventions in such settings often fall short of achieving sustainable outcomes unless they involve strong family and community participation (Curtis et al., 2024). In these contexts, family members play a pivotal role in supporting individuals with chronic illnesses; however, they are rarely engaged systematically in the care process.

Emerging research highlights the importance of family engagement in type 2 diabetes mellitus (T2DM) self-management. Family support has been associated with improved treatment adherence, healthier lifestyle practices, and enhanced emotional well-being. Munir and Suprajitno (2025) found that emotional, instrumental, and informational support from family members significantly contributes to a better quality of life among individuals with T2DM (Munir, 2025). These forms of support not only promote emotional stability and treatment adherence but also empower patients in self-management. However, Meiliana et al. (2024) reported that family caregivers, particularly in rural areas, often experience substantial emotional and physical burdens due to limited training, inadequate support, and the absence of structured interventions (Meiliana et al., 2024).

Moreover, traditional values such as communal solidarity, spirituality, and local customs significantly influence self-care behaviors and the acceptability of health interventions. Desse et al. (2024) found that culturally incongruent health programs are often poorly received or unsustainable in rural populations (Desse et al., 2024). Therefore, the development of culturally tailored, family-based empowerment models offers a promising approach to enhance diabetes care outcomes.

Family-Centered Care (FCC) is a theoretical framework that positions the family as an active partner in healthcare. It emphasizes mutual respect, open communication, and shared decision-making between healthcare professionals and family members (Kuo et al., 2012). In rural settings, the FCC provides a relevant foundation for empowering families to support diabetes management effectively, while respecting cultural norms and addressing resource limitations. From a nursing and public health perspective, care models should not only be evidence-based but also contextually aligned with family and community dynamics. Supporting this, a systematic review and meta-analysis by Makmuriana et al. (2024) demonstrated that family-centered nursing significantly improves glycemic control (reducing HbA1c by an average of 1.2%), enhances medication adherence, and supports lifestyle modifications (Makmuriana et al., 2024).

FCC-based interventions have demonstrated effectiveness in enhancing daily diabetes management routines, such as healthy eating, regular exercise, and blood sugar monitoring

Despite growing evidence on the importance of family involvement in diabetes care, there is a lack of structured, culturally contextualized empowerment models grounded in Family-Centered Care (FCC), particularly in rural Indonesian settings. This study addresses that gap by developing and evaluating an innovative

FCC-based family empowerment framework tailored to the needs and cultural contexts of rural communities—a novel approach not previously explored in existing literature. The findings aim to inform the design of sustainable, community-based interventions that enhance family engagement in chronic disease management.

METHOD

Methodological Approach

This study adopted an exploratory qualitative approach to investigate the roles and needs of families in supporting Type 2 diabetes management among older adults in rural areas.

The qualitative approach was chosen to gain in-depth insights into the sociocultural dynamics that influence family involvement, which serve as the foundation for developing a family empowerment model grounded in the Family-Centered Care (FCC) framework.

Research Site and Participant Profile

This study took place in Sukamaju Village, a rural setting within the service area of a community health center in Tasikmalaya City, West Java, Indonesia.

This village was selected due to its limited access to specialized diabetes care and the strong role of family structures in elderly care, making it an appropriate setting for exploring family-based diabetes management.

Twenty-one participants were intentionally selected using purposive sampling, comprising :

1. Seven older adults who had been living with type 2 diabetes mellitus (T2DM) for a minimum duration of one year
2. Seven primary family caregivers are actively involved in their daily care, and
3. Seven local healthcare providers, including community nurses and health cadres, each with a minimum of one year of experience in rural health services.

Participants were selected using purposive sampling with the following inclusion criteria:

1. older adults aged ≥60 years who had been diagnosed with T2DM for at least one year,
2. primary family caregivers who were actively involved in the patient's daily care, and
3. local healthcare providers (including community nurses and health cadres) having no less than one year of practical involvement in community settings.

Data collection proceeded until saturation was achieved, indicated by the absence of new themes or meaningful insights.

Data Collection

Data collection involved semi-structured in-depth interviews and focus group discussions (FGDs), guided by an interview framework grounded in FCC principles. Interviews were conducted face-to-face at participants' homes or community health posts, depending on their convenience and preference.

All interviews and discussions were audio-recorded with participants' permission, transcribed word-for-word, and anonymized to maintain confidentiality. Researchers also documented field notes to capture contextual observations and non-verbal expressions that could enrich the data.

Instrument

The primary research tool was a semi-structured interview guide, constructed using the FCC framework and informed by prior studies on family roles in chronic illness management. The guide comprised open-ended prompts designed to explore the following key areas: (1) family duties and roles in diabetes care, (2) challenges encountered by caregivers, (3) cultural and spiritual factors influencing caregiving, and (4) perceived needs for support, training, and empowerment. Two qualitative experts assessed the interview guide, followed by pilot testing with two families to ensure

clarity, cultural appropriateness, and contextual relevance.

Data Analysis

Thematic analysis was conducted based on Braun and Clarke's six-step approach (2006), which included (Braun & and Clarke, 2006): data familiarization, initial coding, theme identification, theme refinement, theme definition and labeling, and final report development. Coding was conducted inductively by two independent researchers using NVivo 12. Differences in coding were settled via researcher discussion and consensus-building.

To enhance the trustworthiness of the study, the following strategies were employed:

1. Member checking, to validate findings with participants
2. Peer debriefing, to reduce individual researcher bias
3. Triangulation, across participant groups (patients, caregivers, health providers) and data sources (interview, FGD, field notes)

Ethical Considerations

Although the study did not require formal ethical clearance due to its non-interventional nature, all research activities adhered to standard ethical principles.

Participants received detailed explanations regarding the study's objectives, procedures, the voluntary basis of their involvement, and their right to discontinue participation at any stage. Written consent was secured from all participants before commencing data collection activities. Participant anonymity and data confidentiality were upheld throughout the entire study.

RESULTS

Participant Characteristics

The study included 21 participants, consisting of 7 older adults diagnosed with type 2 diabetes mellitus (T2DM), 7 family caregivers, and 7 community health providers (nurses and health cadres) working in Sukamaju Village, Tasikmalaya City, Older adults had a mean age of 67.1 years (SD = 3.6), and the majority were female (57.1%). Most had completed secondary education (42.9%), while the rest had either primary or tertiary qualifications. Caregivers were mostly female (57.1%) with an average age of 43.9 years (SD = 6.5). The length of caregiving spanned from one year to more than seven years, with the highest proportion (42.9%) providing care for 4 to 6 years.

The healthcare providers had a mean age of 35.3 years (SD = 5.8) and were mostly female (71.4%). The majority held tertiary education qualifications (71.4%) and had more than one year of experience providing community-based healthcare in rural settings.

These participant characteristics reflect the sociocultural context of rural communities, where strong family structures and community-based care play an essential role in managing chronic illnesses such as T2DM.

Thematic Findings

Thematic analysis identified **four main themes**, each with several subthemes and supporting participant quotes.

Theme 1: Family as the First Line of Care

This theme highlights how family members serve as the most immediate and consistent support system in managing T2DM among older adults. They provide daily care, medication support, and motivation, often without formal health training.

Subtheme 1: Daily Practical Support

Family members help with meals, daily routines, and clinic visits.

> *"I always remind my mother to take her medicine and prepare her meals according to what the nurse taught us."* **(Caregiver 03)**
>
> *"Every morning, I help my father walk to the front yard and check his sugar level."* **(Caregiver 02)**
>
> *"My daughter cooks differently now so I can eat healthier."* **(Older Adult 06)**

Subtheme 2: Medication Monitoring and Encouragement

Caregivers encourage treatment adherence and ensure medication schedules are followed.

"Even though my sugar level goes up and down, my son checks on me every day and brings me to the clinic." **(Older Adult 01)**

"I remind my husband every night about his insulin injection." **(Caregiver 01)**

"If my children didn't help, I would often forget to take my medicine." **(Older Adult 07)**

Subtheme 3: Family Dependency on Informal Knowledge

Care is often based on experience or shared community practices, not formal guidance.

"Without my daughter's help, I wouldn't know what to eat or how to inject insulin." **(Older Adult 05)**

"We just follow what the neighbors do, because we're not really trained." **(Caregiver 04)**

"Sometimes I get confused about food portions, I just guess." **(Caregiver 06)**

Theme 2: Cultural and Spiritual Values in Caregiving

Caring for family members is deeply rooted in cultural expectations and religious beliefs, shaping the caregiver's sense of duty and identity.

Subtheme 1: Care as a Religious/Moral Duty

Caregivers view caregiving as spiritual devotion.

"I believe that looking after my sick husband is part of my worship. I do it sincerely." (Caregiver 01)

"This is part of my responsibility as a child, and I do it with prayer." (Caregiver 03)

"We believe that caring for our parents is a way to receive blessings." (Caregiver 05)

Subtheme 2: Cultural Expectations and Traditions

Family traditions and gender roles influence caregiving responsibility.

"Taking care of my father is part of my duty as his child. It's our family tradition." (Caregiver 06)

"In our family, the eldest daughter always looks after the elders." (Caregiver 07)

"Our culture expects the young to respect and care for the old." (Older Adult 03)

Subtheme 3: Social Identity and Respectability

Caregiving enhances a family reputation in the community.

"Our village teaches us to help our elders. It's what we've always done." (Health Cadre 02)

"People respect you more if you take good care of your parents." (Caregiver 02)

"When I care for my mother, others in the village praise our family." (Caregiver 04)

Theme 3: Need for Empowerment and Health Literacy

Many families struggle with a lack of knowledge and skills, expressing a strong desire for community-based education and support tools.

Subtheme 1: Knowledge Gaps in Self-Care

Participants lack understanding of diet, symptoms, and disease management.

"I don't really understand which foods are safe or dangerous. I just guess sometimes." (Older Adult 04)

"We never learned about symptoms or how to respond." (Caregiver 05)

"My mother thinks medicine is enough, but doesn't check her sugar." (Caregiver 07)

Subtheme 2: Demand for Localized Education

Participants want culturally appropriate and accessible education.

"We need more sessions, maybe in the village hall, that teach us how to take care of our parents properly." (Caregiver 05)

"Posters or leaflets in Sundanese would help us understand better." (Caregiver 06)

"It's easier when someone explains it directly in the local dialect." (Older Adult 02)

Subtheme 3: Limited Access to Training Resources

Health workers and families lack access to materials and tools.

"Sometimes the families are confused about medication schedules and blood

sugar checks. We try to help but we also need tools and materials." (Nurse 01)

"We don't have enough glucometers to loan out to families." (Health Cadre 04)

"There's no diabetes education program here, just occasional visits." (Nurse 03)

Theme 4: Community Health Workers as Bridging Agents

Community health workers are trusted figures who support families, though they face workload and resource limitations.

Subtheme 1: Trust and Social Proximity

Families trust community health workers because they are close and familiar.

"I think the community depends on us not just for health services but also advice. It's a big responsibility." (Health Cadre 05)

"Families always come to us first when something's wrong." (Health Cadre 01)

"We know the families personally, so they trust us more than outsiders." (Nurse 04)

Subtheme 2: Constraints in Resource and Time

Limited staff and time impact service quality.

"We visit homes when we can, but there are too many patients and too few of us." (Health Cadre 03)

"Sometimes we don't have enough time to follow up regularly." (Nurse 02)

"The health post is short-staffed, so we must prioritize emergencies." (Nurse 05)

Subtheme 3: Supportive but Under-Equipped Role

Health workers lack sufficient training and tools for optimal support.

"Families trust us, but sometimes we don't have enough leaflets or glucose kits to give them." (Nurse 02)

"We need ongoing training, especially about elderly care." (Health Cadre 06)

"We try our best, but we need more support from the health office." (Nurse 06)

Table 1. Summary of Themes and Subthemes

Main Themes	Subthemes
1. Family as the First Line of Care	**1.** Daily Practical Support **2.** Medication Monitoring and Encouragement **3.** Family Dependency on Informal Knowledge
2. Cultural and Spiritual Values in Caregiving	1. Care as a Religious/Moral Duty 2. Cultural Expectations and Traditions 3. Social Identity and Respectability
3. Need for Empowerment and Health Literacy	1. Knowledge Gaps in Self-Care 2. Demand for Localized Education 3. Limited Access to Training Resources
4. Community Health Workers as Bridging Agents	1. Trust and Social Proximity 2. Constraints in Resource and Time 3. Supportive but Under-Equipped Role

Model Development

Thematic insights generated from this study guided the formulation of a Family Empowerment Model rooted in Family-Centered Care (FCC), tailored to support older adults living with type 2 diabetes mellitus (T2DM) in rural areas.

The model is structured around four core domains, each aligned with the themes and subthemes identified through qualitative analysis:

1. Strengthening the Role of Families as Primary Caregivers

Derived from the theme *"Family as the First Line of Care"*, this domain focuses on increasing the capacity of family members to deliver basic diabetes care through:

1. Practical skill-building (meal prep, foot care, glucose monitoring),
2. Use of visual tools (charts, checklists), and
3. In-home caregiving guides adapted for low-literacy settings.

Key strategies:

1. Develop home-based care modules;
2. Introduce daily care logbooks for medication and symptom monitoring;
3. Conduct caregiver skills training sessions at the village level.

2. Integrating Cultural and Spiritual Values in Care

Reflecting the theme *"Cultural and Spiritual Values in Caregiving"*, this domain leverages local traditions and religious beliefs to promote sustainable care. It frames caregiving as both a family obligation and a spiritual practice.

Key strategies:

1. Incorporate religious leaders and cultural figures in caregiver education;
2. Use values-based messaging in health promotion (e.g., filial duty, community respect);
3. Develop materials in local languages that align with cultural norms.

3. Enhancing Health Literacy through Culturally Adapted Education

Based on the theme *"Need for Empowerment and Health Literacy"*, this domain addresses gaps in diabetes knowledge and promotes self-care literacy.

Key strategies:

1. Monthly education sessions using local dialects and visual aids;
2. Develop diabetes education flipcharts and leaflets with contextualized content;
3. Provide basic toolkits (glucose log, healthy diet guide) for families.

4. Strengthening Community Health Worker Engagement

Grounded in the theme *"Community Health Workers as Bridging Agents"*, this domain acknowledges the role of cadres and nurses as essential connectors between families and the health system.

Key strategies:

1. Establish structured home-visit schedules led by health cadres;
2. Provide refresher training for CHWs on elderly diabetes care;
3. Use mobile communication (e.g., WhatsApp groups) for caregiver follow-up.

Model Foundation and Principles

This empowerment model is underpinned by the principles of **Family-Centered Care (FCC):**

1. **Collaboration** – between families and healthcare workers in planning and care delivery;
2. **Respect and Dignity** – honoring cultural values and patient autonomy;
3. **Empowerment** – enhancing knowledge, skill, and confidence of families;
4. **Contextual Relevance** – aligning with rural resource constraints and community strengths.

Expected Outcomes

The model is designed to:

1. Improve treatment adherence and glycemic control,
2. Reduce caregiver burden,
3. Increase patient and caregiver self-efficacy,
4. Strengthen the role of rural health systems in chronic disease management.

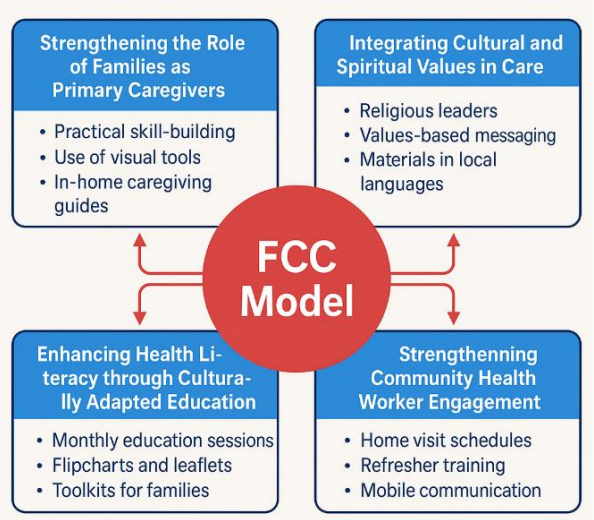

Figure 1. Conceptual Model of FCC-Based Family Empowerment in T2DM Care

DISCUSSION

This study developed a Family Empowerment Model grounded in Family-Centered Care (FCC) principles .to improve self-management of type 2 diabetes mellitus (T2DM) among elderly individuals in rural areas. The model addresses challenges faced by families and healthcare providers by incorporating cultural values and leveraging available community resources.

A key finding underscores the pivotal role of families as primary caregivers. Families are actively engaged in daily care tasks such as meal preparation, medication reminders, and emotional support. However, these caregiving practices are often guided by intuition rather than formal healthcare training. This finding is consistent with Tu and Liao (2021), who emphasized that while family involvement can improve treatment adherence and glycemic control, its effectiveness is maximized when supported by structured interventions (Tu & Liao, 2021).

Chaimongkon et al. (2025) and Huyen et al. (2024) further demonstrate that family caregivers, even without formal training, play a vital role in diabetes management in rural areas (Chaimongkon et al., 2025; Huyen et al., 2024). These results underscore the need for culturally appropriate training and health literacy initiatives to strengthen caregiver capabilities (Bui et al., 2023).

Additional evidence supports that higher caregiver competence and structured interventions are associated with improved patient outcomes in T2DM. For instance, a cross-sectional study involving 392 elderly T2DM patient–caregiver dyads in China found that caregiver competence was a significant predictor of better patient quality of life ($\beta = 0.522$) (Zan et al., 2024).

Moreover, our findings on integrating cultural and spiritual values align with broader literature highlighting the positive impact of spirituality and religious practices on diabetes self-management. A recent integrative review found that incorporating spiritual and religious elements can enhance motivation, coping, social support, and glycaemic control among individuals with diabetes (Molla et al., 2025).

Finally, the importance of culturally sensitive support resonates with a study exploring family roles in rural diabetes self-management, which emphasized that family support mechanisms—despite being informal—substantially improved self-management behaviors. The study concluded that formal training and structured family-based programs further amplify these benefits (Tang et al., 2023).

The integration of cultural and spiritual values emerged as a crucial component of the model. In rural settings, caregiving is often perceived as a moral and religious obligation. Ragavan et al. (2025), through human-centered design, found that culturally sensitive and affirming interventions improved care acceptance and reduced disparities (Ragavan et al., 2025). Involving community health workers (CHWs) and respecting local norms was associated with greater care engagement and trust.

These findings align with an integrative review which concluded that spiritual and religious practices can support diabetes self-management by fostering motivation, improving coping mechanisms, strengthening social support, and encouraging healthy lifestyle choices (Molla et al., 2025). Similarly, culturally tailored DSMES programs have demonstrated significant improvements in health outcomes among ethnic minority groups (Abu & Llahana, 2025).

Additionally, descriptive studies among T2DM patients indicate .spiritually integrated diabetes self-management coaching enhanced psychological well-being and adherence to self-care practices (Moody, 2025). Complementing this, a quasi-trial evaluation found that spiritual

diabetes self-management health coaching improved psychological well-being and self-management compliance (Sari et al., 2024).

Other studies have shown that lifestyle interventions that integrate peer support, community mobilization, and culturally appropriate methods enhance outcomes in diabetes and hypertension. When programs are co-designed with local stakeholders and aligned with community values, they tend to increase engagement, adherence, and long-term behavior change (Parasuraman et al., 2024).

Rural areas continue to face structural inequities in access to diabetes self-management education (DSME). Lower participation rates compared to urban populations are due to limited services, transportation barriers, and reduced health literacy (Boswell et al., 2024). Curtis et al. (2024) evaluated a tailored health literacy intervention in rural clinics and found modest effects on A1C levels but significant improvements in diabetes knowledge among participants with low health literacy (Curtis et al., 2024). This reinforces the importance of contextually adapted education and addressing broader structural barriers to improve outcomes.

Community health workers and nurses are essential connectors between families and the health system. As trusted community members, CHWs help bridge access and trust gaps. However, their impact is limited by inadequate training, lack of supervision, and resource constraints. Ongoing support, standardized modules, and adequate supplies are essential to strengthen their roles (Gudlavalleti et al., 2024).

The model is built on FCC principles: collaboration between families and healthcare providers, respect for patient dignity and cultural beliefs, empowerment through capacity building, and contextual relevance based on rural realities. Applying these principles has demonstrated positive effects on chronic disease management outcomes and the overall quality of care (Care & Suppl, 2024).

Applying this model is expected to enhance medication adherence, glycemic control, and reduce caregiver burden. It also has the potential to strengthen the effectiveness of CHWs and promote more integrated, sustainable rural health systems. Prior evidence supports that Family-centered interventions have been shown to enhance both clinical outcomes and overall well-being among individuals living with T2DM (Rondhianto et al., 2024).

Successful implementation will require collaboration among policymakers, healthcare professionals, and community leaders. Provision of training, financial support, and culturally aligned policies are essential. Moreover, continuous monitoring and adaptation are needed to evaluate effectiveness across different community contexts.

While the model was developed in a specific rural context, its components may be transferable. Future research should assess its scalability and effectiveness across diverse settings and populations, including urban and ethnically diverse communities.

In conclusion, the FCC-based Family Empowerment Model provides a comprehensive, culturally grounded, and community-engaged framework for improving diabetes care among older adults in rural areas. By integrating family roles, spiritual-cultural values, health education, and local support systems, it offers a promising pathway for sustainable, people-centered chronic disease management.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

This study introduced a culturally contextualized Family Empowerment Model based on FCC principles to support T2DM management in older adults living in rural settings. Structured across four domains—family caregiving, cultural-spiritual integration, health literacy, and CHW support—the model addresses both individual and system-level barriers. It emphasizes that empowering families with

knowledge and tools, within their cultural context and with professional support, can significantly improve diabetes self-care and quality of life.

RECOMMENDATION

To enhance model implementation, the following recommendations are proposed:

1. Policy Integration: Health policymakers should embed the model into national chronic disease strategies, with investment in training, materials, and community-based services.
2. Capacity Building: Healthcare providers and CHWs should receive training on culturally sensitive communication and elderly care.
3. Community Engagement: Local leaders, including religious and cultural figures, should be mobilized to promote culturally congruent health practices.
4. Curriculum Development: Nursing and public health programs should integrate FCC and rural health models into their training.
5. Further Research: Longitudinal studies are needed to evaluate the model's impact on clinical outcomes, caregiver burden, and health system strengthening.

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