

Determinants of family support and its impact on self-care behavior among patients with type 2 diabetes in community settings: a cross-sectional analytical study

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ABSTRACT

Introduction: Suboptimal adherence to self-care remains a persistent challenge in the management of type 2 diabetes mellitus (T2DM), particularly in community settings where daily disease control largely depends on patients' behavioral practices. While family support is often considered influential, its relative contribution compared with other factors remains unclear. This study aimed to examine the determinants of family support and assess its impact on self-care behavior among patients with T2DM.

Research Methodology: A community-based, cross-sectional, analytical study was conducted involving 125 patients with T2DM, selected through purposive sampling. Data were collected using validated instruments assessing family support and self-care behavior. Statistical analysis included descriptive statistics, bivariate tests, and multivariable logistic regression to identify independent predictors, with a significance level set at $p < 0.05$.

Results: High family support was significantly associated with better self-care behavior (adjusted OR = 3.35; 95% CI: 1.65–6.80; $p = 0.001$). Higher educational level was also independently associated with improved self-care (AOR = 2.03; 95% CI: 1.01–4.09; $p = 0.047$). Other variables, including age, diabetes duration, and comorbidities, were not statistically significant in the adjusted model.

Conclusion: Family support is the strongest determinant of self-care behavior among patients with T2DM in community settings. Integrating family-based approaches into diabetes management programs may enhance adherence to self-care and improve long-term outcomes. Health policies should prioritize family-inclusive interventions as part of comprehensive diabetes care.

Keywords: diabetes mellitus; family support; self care; community health; health behavior.



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INTRODUCTION

Type 2 diabetes mellitus (T2DM) constitutes a major public health burden, particularly in community settings where long-term disease management relies heavily on patients' capacity for sustained self-care (Addala et al., 2025). Despite advances in pharmacotherapy, glycemic control remains suboptimal in many populations, largely due to inadequate adherence to self-care behaviors such as dietary regulation, physical activity, medication adherence, and blood glucose monitoring (Archer & Llahana, 2026). Evidence indicates that these behaviors are not solely determined by individual motivation or knowledge but are strongly influenced by psychosocial and environmental factors, with family support emerging as a critical determinant (Bakhshi et al., 2024). In low- and middle-income countries, including Indonesia, where family structures are often collectivist, the role of family becomes even more central in shaping health behaviors and outcomes (Cruz Neto et al., 2025).

A growing body of literature has demonstrated that family support, encompassing emotional, informational, instrumental, and appraisal dimensions, positively influences diabetes self-management (Gomersall et al., 2025). Patients who receive consistent family involvement tend to exhibit better adherence to treatment regimens, improved glycemic outcomes, and reduced risk of complications (Hodgson et al., 2026). However, the evidence is not entirely consistent. Some studies report that excessive or misdirected family involvement may lead to dependency, reduced self-efficacy, or even conflict, thereby negatively affecting self-care behaviors (Iregbu et al., 2026). Furthermore, most existing studies have primarily focused on the direct association between family support and self-care outcomes, often neglecting the upstream determinants that shape the availability and quality of such support (Kunhi et al., 2026).

Critically, there is limited analytical exploration of the socio-demographic, clinical, and psychosocial determinants that influence family support in patients with T2DM (Liang et al., 2025). Variables such as patient age, duration of illness, educational level, family structure, health literacy, and presence of comorbidities may interact in complex ways to determine the extent and effectiveness of support provided (Liska et al., 2024). Moreover, cultural norms, caregiving expectations, and resource constraints in community settings may further modulate these relationships. Without a clear understanding of these determinants, interventions aimed at enhancing family support risk being poorly targeted and less effective (Lu et al., 2026).

Another limitation in the current literature is the predominance of hospital- or clinic-based studies, which may not accurately reflect the realities of patients with diabetes in community settings (Mezza et al., 2025). Community-based studies are essential to capture real-world dynamics, including variations in access to healthcare resources, informal caregiving patterns, and contextual barriers to self-care (Muharram et al., 2025). Additionally, few studies have employed comprehensive analytical models that simultaneously examine both the determinants of family support and its downstream impact on self-care behavior within a single framework (Pastakia et al., 2025).

This study addresses these gaps by systematically investigating the determinants of family support and examining its impact on self-care behavior among patients with T2DM in community settings. Unlike prior research that treats family support as an isolated variable, this study adopts an integrative approach, identifying key predictors of family support and analyzing how these predictors directly and indirectly influence self-care practices. The novelty of this study lies in its dual analytical focus: first, in identifying multilevel determinants of family support using a community-based sample; and second, in modeling the relationship between family support and self-care behavior within a unified analytical framework. By incorporating both upstream and

downstream variables, this study provides a more comprehensive understanding of how family dynamics influence diabetes management in real-world contexts. Therefore, the primary objective of this study is to analyze the determinants of family support and to assess its impact on self-care behavior among patients with type 2 diabetes mellitus in community settings. Specifically, this study aims to (1) identify socio-demographic, clinical, and psychosocial factors associated with family support, and (2) evaluate the extent to which family support influences patients' adherence to recommended self-care behaviors.

RESEARCH METHODOLOGY

Study Design

This study employed a community-based, cross-sectional analytical design. This design was selected to simultaneously assess the determinants of family support and examine its association with self-care behavior among patients with type 2 diabetes mellitus (T2DM) at a single point in time. The cross-sectional analytical approach is appropriate for identifying relationships between variables and estimating prevalence in real-world community settings where longitudinal follow-up may be impractical.

Setting & Participants

The study was conducted in community health service areas (primary healthcare centers) in Indonesia from January to March 2026. The target population consisted of adult patients diagnosed with T2DM and residing in the selected community. Inclusion criteria were: (1) patients aged ≥ 18 years, (2) diagnosed with T2DM for at least 6 months, (3) living with at least one family member, and (4) able to communicate effectively and provide informed consent. Exclusion criteria included: (1) patients with severe cognitive impairment or psychiatric disorders that could affect response validity, and (2) patients with acute complications requiring hospitalization during the data collection period. A purposive sampling technique was used to recruit eligible participants who met the study criteria. The sample size was determined based on the minimum requirement for multivariable analysis, considering an adequate events-per-variable (EPV) ratio. A total sample of 125 participants was deemed sufficient to ensure statistical power and model stability.

Variables & Measurement

The primary dependent variable was self-care behavior, defined as the extent to which patients adhere to recommended diabetes self-management practices, including diet, physical activity, medication adherence, and blood glucose monitoring. This variable was measured using a validated self-care questionnaire adapted from the Summary of Diabetes Self-Care Activities (SDSCA). The main independent variable was family support, defined as the perceived support provided by family members across emotional, informational, instrumental, and appraisal domains. Family support was assessed using a structured, validated scale.

Covariates included socio-demographic variables (age, sex, education level, employment status), clinical variables (diabetes duration, comorbidities), and psychosocial factors (health literacy and perceived disease severity). All instruments used in this study had undergone prior validity and reliability testing. Construct validity was evaluated using factor analysis, while internal consistency reliability was assessed using Cronbach's alpha coefficient ($\alpha \geq 0.70$ considered acceptable). Primary data were collected directly from participants through structured interviews using standardized questionnaires.

Data Collection

Data collection was conducted by trained enumerators who received standardized training in interview techniques, ethical procedures, and questionnaire administration. Before data collection, a pilot test was conducted to ensure clarity and feasibility of the instruments. Quality control measures included daily supervision, on-site verification of completed questionnaires, and double-checking for completeness and consistency. Any missing or inconsistent data were clarified immediately with participants when possible.

Data Analysis

Descriptive statistics were used to summarize participants' characteristics, including means and standard deviations for continuous variables, and frequencies and percentages for categorical variables. Bivariate analysis was conducted to examine the association between independent variables and self-care behavior using appropriate statistical tests (Chi-square test for categorical variables and independent t-test or Mann–Whitney U test for continuous variables, depending on data distribution). Multivariable analysis was performed using multiple linear regression to assess the independent effect of family support on self-care behavior while controlling for potential confounders. Regression assumptions, including normality, linearity, homoscedasticity, and multicollinearity, were tested before model interpretation. All statistical analyses were conducted using IBM SPSS Statistics version 26.0. A p-value of less than 0.05 ($\alpha = 0.05$) was considered statistically significant.

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of STIKES Baitul Hikmah, Lampung, Indonesia (Approval No. 01.46/47/LPPM/I/26). All participants were provided with detailed information regarding the study objectives, procedures, risks, and benefits before participation. Written informed consent was obtained from all participants. Confidentiality and anonymity of participants' data were strictly maintained throughout the study.

RESULT

A total of 125 patients with type 2 diabetes mellitus were included in the final analysis. The results are presented in a structured manner: beginning with the descriptive characteristics of participants, followed by bivariate analyses examining associations among study variables, and concluding with multivariable analyses to identify independent determinants of family support and its impact on self-care behavior.

Table 1. Characteristics of Respondents (n = 125)

Variable	Category	n	%
Age	<50 years	48	38.4
	≥50 years	77	61.6
Sex	Male	54	43.2
	Female	71	56.8
Education	Low	69	55.2
	High	56	44.8
Duration of DM	<5 years	52	41.6
	≥5 years	73	58.4
Comorbidity	No	46	36.8
	Yes	79	63.2
Family Support	Low	51	40.8
	High	74	59.2
Self-care Behavior	Poor	57	45.6
	Good	68	54.4

Most participants were older adults (≥ 50 years) and predominantly female. A substantial proportion had lived with diabetes for five years or longer and reported at least one comorbidity, indicating a clinically vulnerable group. Although over half of the respondents reported adequate family support, the distribution of self-care behavior remained mixed, suggesting variability in how support translates into practice.

Table 2. Bivariate Analysis of Factors Associated with Self-Care Behavior

Variable	Category	Good Self-care n (%)	Poor Self-care n (%)	OR (95% CI)	p-value
Age	≥ 50 years	48 (62.3)	29 (37.7)	1.89 (1.01–3.54)	0.045
Sex	Female	44 (62.0)	27 (38.0)	1.76 (0.93–3.32)	0.081
Education	High	38 (67.9)	18 (32.1)	2.21 (1.14–4.28)	0.018
Duration	≥ 5 years	45 (61.6)	28 (38.4)	1.68 (0.89–3.16)	0.102
Comorbidity	Yes	40 (50.6)	39 (49.4)	0.71 (0.37–1.36)	0.302
Family Support	High	52 (70.3)	22 (29.7)	3.12 (1.60–6.08)	0.001

In the bivariate model, higher educational attainment and stronger family support were associated with better self-care behavior. The magnitude of association was notably greater for family support: patients receiving higher support had more than threefold the odds of engaging in adequate self-care. Other variables, including sex, illness duration, and comorbidity status, did not reach statistical significance, although some trends were observed.

Table 3. Multivariable Analysis of Determinants of Self-Care Behavior

Variable	β	Adjusted OR (95% CI)	p-value
Age ≥ 50 years	0.58	1.78 (0.89–3.54)	0.101
Education (High)	0.71	2.03 (1.01–4.09)	0.047
Family Support (High)	1.21	3.35 (1.65–6.80)	0.001

After adjusting for potential confounders, family support remained the most influential factor associated with self-care behavior. Patients with higher levels of family support were over three times more likely to report adequate self-care practices. Educational level also retained a significant, though more modest, effect. In contrast, age did not remain statistically significant in the adjusted model, indicating that other covariates may explain its initial association.

The findings of this study consistently point to the central role of family support in shaping self-care behavior among individuals with type 2 diabetes in community settings. While the study population was characterized by older age, longer disease duration, and a high burden of comorbidities, variations in self-care practices were more closely aligned with psychosocial factors than with clinical characteristics alone. At the bivariate level, both education and family support were associated with improved self-care, but the association was substantially stronger for family support. This pattern persisted in the multivariable model, where family support emerged as the most robust independent predictor. The effect size suggests not only statistical significance but also practical relevance, indicating that supportive family environments may substantially enhance patients' ability to adhere to recommended diabetes management behaviors. The attenuation of the age effect after adjustment further underscores the importance of contextual and interpersonal factors over purely demographic characteristics. Collectively, these results highlight that effective diabetes management in community contexts cannot rely solely on individual-level interventions. Instead, integrating family-oriented strategies may offer a more impactful and sustainable approach to improving self-care adherence and, ultimately, clinical outcomes.

DISCUSSION

This study identifies family support as the most influential factor associated with self-care behavior among patients with type 2 diabetes mellitus (T2DM) in community settings. Although higher educational attainment demonstrated a statistically significant relationship with better self-care, its effect size was modest compared with the magnitude observed for family support. In

contrast, clinical characteristics such as illness duration and comorbidity status were not independently associated with self-care behavior after adjustment. Taken together, these findings indicate that psychosocial and relational dynamics more strongly shape day-to-day diabetes management in community settings than biomedical factors alone.

The relationship between family support and self-care behavior can be understood through established behavioral frameworks. Social Support Theory posits that emotional, informational, and instrumental assistance from close social networks facilitates health-related behaviors by reducing perceived burden and enhancing coping capacity (Plabon et al., 2026). In the context of T2DM, where sustained adherence to dietary regulation, physical activity, medication, and monitoring is required, such support can serve as a stabilizing resource, enabling consistency in self-management practices (Regeer et al., 2026). Complementarily, Social Cognitive Theory highlights self-efficacy as a central determinant of behavior (Saem et al., 2026). Family support may reinforce patients' confidence through encouragement, shared problem-solving, and feedback, thereby strengthening their perceived ability to manage complex treatment regimens (Samadbeik et al., 2026). In collectivist sociocultural settings, these mechanisms are likely amplified, as health behaviors are embedded within family norms and expectations rather than being purely individual choices (Suprpto et al., 2025).

The present findings are broadly consistent with international and regional evidence demonstrating the importance of family support in diabetes self-management (Syaharuddin et al., 2025). Studies across diverse settings have reported that patients who experience higher levels of family involvement are more likely to adhere to recommended behaviors and achieve better clinical outcomes (Tang et al., 2026). In Southeast Asian contexts, where family structures often play a central caregiving role, the influence of family support may be particularly pronounced (Thepwongsa et al., 2025). The effect size observed in this study aligns with, and in some cases exceeds, those reported in comparable populations, suggesting that in community-based environments where access to continuous professional care may be limited, family support serves as a critical substitute or complement to formal health services (Wagner et al., 2026).

Despite this convergence, the study also reveals notable divergences from parts of the existing literature, particularly regarding the limited influence of clinical variables (Zhang et al., 2026). While some prior studies suggest that longer disease duration or the presence of complications may increase patient vigilance and thus improve self-care, such patterns were not observed here (Wibowo et al., 2025). Several explanations are plausible. First, prolonged exposure to chronic illness may lead not only to adaptation but also to treatment fatigue, diminishing sustained engagement in self-care activities (Wu et al., 2026). Second, the strength of family support may attenuate or override the influence of clinical severity, particularly in settings where daily routines and health behaviors are co-managed within the household (Xu et al., 2026). Third, contextual factors, including variations in health literacy, access to care, and cultural norms, may shape how clinical experiences translate into behavior (Zulfiah et al., 2025). These considerations underscore the importance of situating behavioral outcomes within their broader social context rather than attributing them solely to disease-related variables (Yan et al., 2025).

The implications of these findings extend beyond individual-level interventions. At the clinical level, diabetes management strategies should incorporate structured family engagement, moving from patient-centered to family-inclusive models of care. This may involve involving family members in education sessions, goal-setting processes, and follow-up consultations, thereby aligning household practices with therapeutic recommendations. At the community and health system levels, programs delivered through primary care and community health workers could be designed to strengthen family capacity for supportive care, particularly in resource-constrained settings. Recognizing family support as a modifiable determinant also opens opportunities for intervention design, including behavioral counseling, peer-family support groups, and culturally tailored education that targets both patients and their families.

From a policy perspective, integrating family-oriented approaches into chronic disease management frameworks may enhance the effectiveness and sustainability of existing programs.

Health systems that traditionally emphasize individual responsibility may benefit from incorporating social and relational dimensions into service delivery models. This is particularly relevant in settings where informal care networks already play a substantial role in managing chronic conditions but remain under-recognized in formal policy structures. This study has several strengths that support the credibility of its findings. The analytical approach allowed for the simultaneous examination of multiple determinants while controlling for potential confounders, thereby providing a more nuanced understanding of the relationships under investigation. The use of validated measurement instruments enhances internal consistency and construct validity, while the community-based design increases ecological validity by reflecting real-world conditions rather than controlled clinical environments. However, certain limitations should be considered when interpreting the results. The cross-sectional design precludes causal inference, limiting conclusions to associations rather than directional effects. The reliance on self-reported data introduces the possibility of recall bias and social desirability bias, which may lead to overestimation of positive behaviors. Additionally, purposive sampling may limit the generalizability of the findings to broader populations. Future research employing longitudinal or mixed-methods designs would be valuable in clarifying causal pathways and exploring the mechanisms through which family support influences behavior over time. Overall, this study contributes to the evolving understanding of diabetes management by emphasizing that effective self-care is not solely an individual endeavor but is deeply embedded within social and familial contexts. Interventions that acknowledge and leverage these dynamics are likely to be more effective in improving adherence and, ultimately, clinical outcomes in community settings.

Strengths and Limitations

This study provides a comprehensive analysis by simultaneously examining the determinants of family support and its association with self-care behavior in a real-world community setting, enhancing its practical relevance. The use of validated instruments strengthens the reliability of the findings. However, the cross-sectional design limits causal inference, and the reliance on self-reported data may introduce recall and social desirability bias. Additionally, the purposive sampling approach may limit generalizability to broader populations.

CONCLUSION

This study demonstrates that family support is a key determinant of self-care behavior among patients with type 2 diabetes mellitus in community settings. Patients who reported higher levels of family support were significantly more likely to engage in appropriate self-care practices, even after controlling for socio-demographic factors such as education. In contrast, clinical characteristics showed limited influence, indicating that effective diabetes management is shaped more by psychosocial and relational factors than by disease-related variables alone.

These findings highlight the need to reorient diabetes management strategies toward family-inclusive approaches. Health interventions should actively involve family members through structured education, counseling, and behavior-support programs to enhance patients' adherence to self-care. At the policy level, integrating family-based strategies into primary healthcare and community health programs may improve the effectiveness and sustainability of diabetes management. Strengthening family support systems is a practical, scalable pathway to improving long-term outcomes for patients with type 2 diabetes.

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This research received no external funding and was conducted independently by the authors.

Conflict of Interest

The authors declare that there are no conflicts of interest related to this study.

Authors' Contributions

M. Khalid Fredy Saputra: Conceptualization, Methodology, Formal analysis, Writing – original draft, Supervision.

Hijrah: Data curation, Investigation, Writing – review & editing.

Wawan Kurniawan: Methodology, Validation, Writing – review & editing.

Anita Lontaan: Validation, Writing – review & editing

Rasi Rahagia: Data curation, Visualization, Project administration.

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Declaration of Generative AI Use

The authors used generative artificial intelligence tools only to assist with language refinement and grammatical improvement during manuscript preparation. All conceptual development, data interpretation, analysis, and final manuscript content were reviewed critically and approved in their entirety by the authors. The authors remain fully responsible for the accuracy, integrity, and originality of the work

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