



The Correlation between Self-Care and Quality of Life in Type 2 Diabetes Mellitus Patients at the Sei Rampa Health Center

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| <p>Track Record Article</p> <p>Revised: 13 December 2025 Accepted: 27 January 2026 Published: 31 March 2026</p> <p>How to cite: Nasution, S. L. R., Lubis, W. A., Girsang, E., & Sekali, A. K. (2026). The Correlation between Self-Care and Quality of Life in Type 2 Diabetes Mellitus Patients at the Sei Rampa Health Center. <i>Contagion: Scientific Periodical Journal of Public Health and Coastal Health</i>, 8(1), 35–46.</p> | <p style="text-align: center;">Abstract</p> <p><i>Type 2 diabetes mellitus (T2DM) can substantially reduce patients' quality of life (QoL). Self-care is expected to lessen this burden, but evidence across key self-care domains in primary care is still limited. This study aims to identify how strong and significant the relationship between these two variables is: self-care and quality of life. A sequential explanatory mixed-methods study was conducted at the Sei Rampa Community Health Center. Quantitatively, 136 T2DM patients completed a survey; Pearson's correlation tested associations between five self-care domains (diet, physical activity, medication therapy, availability of blood-glucose monitoring equipment, and diabetes knowledge) and QoL. Qualitatively, in-depth interviews with eight patients explored daily self-care experiences; transcripts were coded and thematically analyzed using CAQDAS/NVivo following the Miles and Huberman framework. Ethical approval was granted by Universitas Prima Indonesia. All self-care domains were significantly associated with better QoL ($p < 0.001$). Interview data explained the quantitative patterns: diet adherence was constrained by financial limitations, eating habits, and limited healthy menu variety; physical activity was generally light and inconsistent due to fatigue, age, motivation, and family support; medication adherence was relatively high but lapses occurred without reminders; routine glucose monitoring was uncommon because glucometers and strips were costly and health literacy was limited; and stronger diabetes knowledge, often reinforced by family, supported more consistent self-care behaviors. Programs should strengthen feasible diet and activity routines, support adherence with reminders, expand affordable access to glucometers/strips, and intensify education by engaging family support to improve QoL.</i></p> <p>Keywords: <i>T2DM, Self-Care, Quality of Life, Medication Adherence, Glucose Monitoring, Primary Care.</i></p> |
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INTRODUCTION

Type 2 diabetes mellitus is the most common type of diabetes, with its high prevalence worldwide with more than 90% of all diabetes cases worldwide (Abdul et al., 2020; M. K. Ali et al., 2022; Nanda & Sharma, 2022). The IDF states that the countries with the highest number of patients include China with 116.4 million people, India with 77 million people, and the United States with 31 million people. These three countries ranked in the top three in 2019, while Indonesia ranks fifth globally with 18 million people affected in 2020 (IDF, 2021; Pavkov et al., 2022). As the only country in Southeast Asia on the list, there must be serious attention on the diabetes preventive measures in Indonesia (Kemenkes RI, 2020).

According to the 2018 Basic Health Research, the provinces with the highest rates of diabetes in Indonesia are DKI Jakarta (3.4%), East Kalimantan (3.1%), Yogyakarta (3.1%), and North Sulawesi (3%). North Sumatra is ranked 12th, with a diabetes prevalence of 2% (Badan Kebijakan Pembangunan Kesehatan, 2023). The number of people with diabetes mellitus in North Sumatra is increasing every year. Based on data obtained from the North Sumatra Health Office, from 2017 to 2018, there were 18,458 people with type 1 diabetes mellitus and 54,843 people with type 2 diabetes mellitus (Balitbangkes RI, 2018). In 2019, the Medan City Health Office recorded 27,075 DM patients, of which 85% were aged >55 years and 70% were women, spread across 39 community health centers in the city of Medan. This data shows that DM in North Sumatra is relatively high (Pinem et al., 2025). The increase in the number of diabetes mellitus cases has led to an increase in complications experienced by type 2 diabetes mellitus patients. Complications arising from diabetes include blood vessel disorders and nervous system disorders, or neuropathy (Tomic et al., 2022).

Complications of DM can affect all aspects of the patient's life and increase the risk of complications such as heart disease, stroke, neuropathy in the feet, which can increase the incidence of infectious foot ulcers and even the need for amputation, retinopathy, and kidney failure, and can be life-threatening and even fatal if not treated immediately and controlled properly (Maida et al., 2022). Diabetes mellitus patients who experience complications will see a decrease in life expectancy, a decline in quality of life, and an increase in morbidity rates (Raditya et al., 2022). When diabetes leads to complications, patients tend to live shorter lives, feel less healthy and less able to enjoy daily activities, and face more frequent or severe health problems.

One important factor that can improve the quality of life for patients with type 2 diabetes is good self-care (Supriadi et al., 2025). Self-care includes following a healthy diet, regularly checking blood sugar, exercising, having access to testing equipment, and receiving proper education (Kiçaj et al., 2025). It refers to actions carried out independently by patients to meet their own needs without relying on others (Eriyani et al., 2025). For diabetes management, self-care involves diet control, physical activity, blood sugar monitoring, taking medication, and ensuring the availability of testing tools to prevent complications and keep blood glucose stable (Sari et al., 2023). Although self-care for chronic diseases can be complex, it is essential for successful long-term management (Oglio et al., 2021). It also helps patients develop coping skills to deal with challenges caused by chronic illness (Lee et al., 2022). Research by Saragih et al. (Saragih et al., 2022) supports this, showing that diabetes patients who practice self-care

experience positive lifestyle changes in attitudes and behaviors, which prevent complications and improve overall quality of life—physically, psychologically, socially, and spiritually.

Thus, it is important to study more closely how self-care relates to quality of life. This research aims to measure how strong and meaningful that relationship is, and to provide a foundation for developing interventions that improve self-care. Strengthening self-care can help enhance quality of life, especially for people in vulnerable groups such as patients with chronic diseases, the elderly, and other at-risk populations.

METHODS

To examine the link between self-care and quality of life, this study used a mixed-methods sequential explanatory design, combining both numbers-based (quantitative) and experience-based (qualitative) approaches. First, the quantitative phase measured statistical relationships between different aspects of self-care and quality of life in patients with type 2 diabetes. Then, the qualitative phase explored patients' personal views and daily experiences with self-care to give deeper insight into the findings. The study was conducted in October 2025 at the Sei Rampah Community Health Center, Serdang Bedagai Regency, North Sumatra. The population consisted of all registered T2DM patients receiving treatment at the health center. The sample size was calculated using the minimum sample formula for the Pearson correlation test with a 95% confidence level ($\alpha = 0.05$) and 80% power. The calculation yielded 124 respondents; to anticipate nonresponse or incomplete data, a 10% addition was applied, resulting in a final sample of 136 respondents.

The qualitative phase involved 8 purposively selected informants based on variability in gender, age, and treatment adherence to ensure data richness. Inclusion criteria were: (1) diagnosed with T2DM for ≥ 1 year, (2) aged ≥ 30 years, (3) able to communicate well, and (4) willing to participate. Exclusion criteria included patients with severe complications or cognitive impairments.

The main research instrument was a structured questionnaire adapted from the Summary of Diabetes Self-Care Activities (SDSCA) to assess five domains: diet, physical activity, medication adherence, blood glucose monitoring, and diabetes knowledge, along with the WHOQOL-BREF instrument to measure quality of life. The instruments were translated, culturally adapted, and tested for validity and reliability in a pilot study of 30 respondents with similar characteristics. All items demonstrated acceptable construct validity ($r > 0.30$) and internal consistency reliability (Cronbach's $\alpha = 0.82$).

Quantitative data were analyzed using SPSS version 26, employing bivariate analysis with the Pearson Product-Moment Correlation test to determine the relationship between self-

care domains and QoL. For the qualitative phase, data were collected through in-depth, semi-structured interviews. Analysis used Computer-Assisted Qualitative Data Analysis Software (CAQDAS) NVivo 12 Plus following the Miles and Huberman (2014) framework: data reduction, coding, data display, and conclusion drawing.

This study obtained ethical approval from the Research Ethics Committee of Universitas Prima Indonesia (No. 095/KEPK/UNPRI/X/2025). The sequential explanatory mixed-methods approach used in this study ensured methodological robustness by combining quantitative associations with qualitative depth, enhancing both validity and contextual interpretation.

RESULTS

Table1. The Correlation between Self-Care Diet and Quality of Life with Type 2 Diabetes Mellitus Patients at the Sei Rampah Community Health Center in Sei Rampah

| Self-Care Diet | Quality of Life for Type 2 Diabetes Mellitus Patients | | | | | | p value |
|---|---|------|-------------|------|-------|------|---------|
| | Good | | Not so good | | Total | | |
| | f | % | f | % | f | % | |
| Good | 48 | 35,3 | 12 | 8,8 | 60 | 44,1 | 0,000 |
| Not so good | 13 | 9,6 | 63 | 46,3 | 76 | 55,9 | |
| Self-Care Physical Activity | Good | | Not so good | | Total | | p value |
| | f | % | f | % | f | % | |
| | Good | 50 | 36,8 | 9 | 6,6 | 59 | |
| Not so good | 11 | 8,1 | 66 | 48,5 | 77 | 56,6 | |
| Self-Care Medication Therapy | Good | | Not so good | | Total | | p value |
| | f | % | f | % | f | % | |
| | Good | 49 | 36,0 | 15 | 11,0 | 64 | |
| Not so good | 12 | 8,8 | 60 | 44,1 | 72 | 52,9 | |
| Self-Care Availability of KGD Examination Equipment | Good | | Not so good | | Total | | p value |
| | f | % | f | % | f | % | |
| | Available | 51 | 37,5 | 12 | 8,8 | 63 | |
| Not available | 10 | 7,4 | 63 | 46,3 | 73 | 53,7 | |
| Self-Care Knowledge | Good | | Not so good | | Total | | p value |
| | f | % | f | % | f | % | |
| | Good | 48 | 35,3 | 9 | 6,6 | 57 | |
| Not so good | 13 | 9,6 | 66 | 48,5 | 79 | 58,1 | |

Across all five domains, better self-care and enabling resources corresponded with a higher proportion of respondents reporting good quality of life (QoL), with statistically significant relationships (all $p < 0.001$). However, to strengthen the quantitative interpretation, the correlation coefficients (r) were also calculated using the Pearson Product-Moment Correlation test, indicating the strength and direction of associations between each self-care domain and QoL. The correlation between self-care diet and QoL was strong and positive ($r = 0.654$; $r^2 = 0.43$; $p < 0.001$), meaning that 43% of QoL variation could be explained by dietary self-care.

Similarly, physical activity was strongly correlated with QoL ($r = 0.611$; $r^2 = 0.37$; $p < 0.001$), suggesting that patients who regularly engaged in exercise tended to report higher

QoL. The medication therapy domain also demonstrated a moderate-to-strong positive correlation ($r = 0.598$; $r^2 = 0.36$; $p < 0.001$), reflecting the crucial role of adherence in achieving stable glucose levels and better well-being. The availability of blood-glucose examination equipment exhibited a moderate positive correlation ($r = 0.563$; $r^2 = 0.32$; $p < 0.001$), indicating that access to monitoring devices supports better disease control and life satisfaction.

Lastly, diabetes knowledge had the strongest correlation with QoL ($r = 0.672$; $r^2 = 0.45$; $p < 0.001$), showing that informed patients manage their condition more effectively and perceive greater well-being. Overall, these findings confirm that all self-care domains are significantly and positively associated with QoL among T2DM patients. Higher self-care capability, particularly in knowledge and diet management, was linked with better overall quality of life. These results quantitatively validate the robustness of the sequential explanatory mixed-methods design, providing a solid foundation for the subsequent qualitative exploration of patient experiences.

Table 2. Interview Results Based on Research Themes and Subthemes

| Code | Subtheme | Theme | Interview Excerpt | Conclusion |
|------|---|--|--|---|
| K1 | Individual perceptions of the overall quality of life | General Perceptions of Quality of Life | “I feel that my life is still good, even though I can't be as active as I used to be. The important thing is that I can eat regularly and don't have frequent flare-ups.” (Informant II) | The quality of life of patients varies, depending on their physical condition, social support, and ability to adapt. |
| K2 | Level of satisfaction with health conditions | General Perceptions of Quality of Life | “Sometimes I get tired quickly, but I'm grateful that my blood sugar is stable now.” (Informant VI) | Health satisfaction is related to blood sugar stability and treatment adherence. |
| K3 | Ability to perform activities and daily energy levels | Physical Functions and Energy | “I still go for a morning walk every day, even if only for a short time. Otherwise, my body feels stiff.” (Informant I) | Physical activity is influenced by blood sugar control and physical condition; patients with personal monitoring devices tend to be more disciplined. |
| K4 | Dependence on medication and control | Physical Functions and Energy | “If I forget to take my medicine for just one day, my body immediately feels weak. So I never miss a dose.” (Informant III) | Drug dependence is considered normal, but regular monitoring is important for physical stability. |

| Code | Subtheme | Theme | Interview Excerpt | Conclusion |
|------|--|--|--|---|
| K6 | Frequency of use of blood glucose monitoring devices | Physical Functions and Energy | Informant I used the device almost every day, Informant VI 4–5 times/week, while others rarely or never used it. | The frequency of examinations varies; regular monitoring increases awareness and control of physical condition. |
| K7 | Understanding how to use the tool | Physical Functions and Energy | Informants I and VI understood how to use the tools correctly; the others did not know or recorded incorrectly. | Practical education is essential to ensure that self-examination is performed correctly and safely. |
| K8 | Challenges in using the tool | Faktor Pendukung dan Penghambat Kualitas Hidup | Cost, availability of strips, and fear of seeing blood are cited as the main obstacles. | Economic and psychological factors are barriers; affordable tools are needed. |
| K9 | Support from family and friends | Social Relationships and Environmental Support | “My child always reminds me to eat and take my medicine. So I don't feel alone.” (Informant II) | Social support strengthens treatment adherence and zest for life. |
| K10 | Social activities and community participation | Social Relationships and Environmental Support | “I attend the elderly health center every month, so I can chat and exercise together.” (Informant I) | Social participation maintains patients' psychological well-being and motivation. |
| K11 | Adaptation strategies for disease | Factors Supporting and Hindering Quality of Life | “I try not to stress out, attend religious classes, and manage my diet every day.” (Informant VII) | Adaptation strategies help maintain quality of life, including blood sugar control and psychological stability. |

The sequential explanatory mixed-methods approach in this study was designed to strengthen interpretation through integration between the quantitative correlations and qualitative thematic findings. The quantitative analysis revealed that all self-care domains, diet, physical activity, medication adherence, availability of blood-glucose monitoring devices, and diabetes knowledge, were significantly and positively correlated with quality of life (QoL) (all $p < 0.001$). The strength of these associations ranged from moderate to strong ($r = 0.563$ – 0.672), indicating that improvements in self-care behaviors substantially enhanced patients' QoL.

The qualitative results, analyzed through NVivo 12 Plus using the Miles and Huberman framework, provided contextual explanations for these statistical relationships. Integration of both data strands demonstrated clear convergence and complementarity:

1. Diet Self-Care ($r = 0.654$). The correlation indicates a strong positive relationship, which was elaborated in interviews (K1–K2) where patients described how maintaining regular meals and avoiding symptom relapse contributed to perceived well-being. However,

economic limitations and monotonous menus reduced adherence, clarifying why not all patients with good knowledge achieved optimal outcomes.

2. Physical Activity ($r = 0.611$). Quantitative significance aligned with qualitative narratives (K3–K4), where respondents emphasized that light, routine exercise improved their energy and mobility. Fatigue, age, and lack of motivation or family support explained the lower physical activity levels among some respondents, contextualizing variance within the quantitative data.
3. Medication Adherence ($r = 0.598$) – The statistical association reflected that adherence positively affects QoL. Qualitative accounts (K4, K9) revealed that patients relied on medication reminders and family encouragement, reinforcing that social support mediates adherence and thus QoL improvement.
4. Availability of Monitoring Devices ($r = 0.563$). Quantitatively moderate yet significant, this domain was clarified through qualitative insights (K5–K8) showing that patients with personal glucometers exhibited higher discipline and awareness. Barriers, such as high cost, strip availability, and fear of seeing blood, help explain why this relationship was weaker compared to others.
5. Diabetes Knowledge ($r = 0.672$). The strongest correlation quantitatively was substantiated by interview data (K7, K11), highlighting that knowledge improved self-regulation, stress management, and dietary discipline. Knowledge empowered patients to perform effective adaptation strategies and maintain psychological stability.

By combining different types of data (triangulation), this study found that patients' knowledge of self-care and support from their families play an important role in linking measurable behaviors with how patients feel about their well-being. The results show that quality of life in people with type 2 diabetes is shaped not only by clear self-care actions but also by personal, social, and environmental factors. Together, the statistical findings and patient experiences confirm that improving self-care knowledge, financial access, and social support can lead to both visible and felt improvements in quality of life. This highlights the strength of using a mixed-methods design in the study.

DISCUSSION

The analysis shows a significant relationship between dietary self-care, physical activity, medication adherence, access to glucose testing kits, and self-care knowledge with the quality of life of patients with type 2 diabetes. The integration of quantitative and qualitative findings demonstrates a strong alignment between statistical results and patients' real-life

experiences, confirming the reliability of the mixed-methods design. Interview data further support these results, showing that diet management, regular exercise, medication use, access to monitoring devices, and diabetes knowledge all contribute to well-being through both behavioral and psychosocial pathways.

Qualitative insights also reveal factors that influence variability in outcomes, such as economic challenges, fatigue, motivation, and barriers related to medical devices. Family support and self-care literacy play an important role in helping patients maintain adherence to self-care practices. Overall, these findings suggest that quality of life in type 2 diabetes patients is multidimensional, shaped not only by measurable self-care behaviors but also by social, contextual, and personal factors. Interventions that combine education, social support, and access to resources are therefore most likely to produce meaningful and lasting improvements

These findings are consistent with Orem's Self-Care Deficit Theory, emphasizing that effective self-care requires not only knowledge and skill but also environmental and resource support. The integrated results align with studies by Kiçaj et al., (2025) and Jyoti et al., (2024), both of which found significant links between dietary behaviors and QoL, moderated by socioeconomic and literacy factors. Similarly, at Sei Rampah Community Health Center, the integration of quantitative and qualitative evidence confirms that dietary self-care is both statistically significant and contextually dependent, where patients with greater self-efficacy, knowledge, and family support achieve better health outcomes and life satisfaction.

According to Malini, continuous health education and motivation for patients and their families are very important so that patients always manage themselves to improve the quality of life of type 2 diabetes mellitus patients (Malini et al., 2022). Fareydouni's findings also indicate that the role of self-efficacy and self-care can be considered in QoL. Therefore, non-pharmacological and supportive methods, such as strengthening self-efficacy and self-care, can be recommended as effective methods for improving the QoL of diabetic patients (Fareydouni et al., 2022). Rasha's study concluded that self-care guidelines have a positive impact on improving women's knowledge and self-care practices related to GDM (R. A. Z. Ali et al., 2022).

This study shows that physical activity affects quality of life in two ways: biologically and psychologically. Biologically, exercise helps control blood sugar and lowers insulin resistance. Psychologically, it improves mood, builds confidence, and encourages social interaction. Regular light-to-moderate exercise, even if not intense, leads to better health outcomes than irregular or overly strenuous activity. Research by Anggraeni & Widhiyanto, (2024) also found a strong link between physical activity and quality of life, which plays an

important role in overall health. Bazpour's study further highlights that physical activity is a key self-care behavior that predicts quality of life in adults with diabetes. Therefore, programs that encourage self-care through physical activity are essential (Bazpour et al., 2021).

The findings show that family support plays an important role in linking medication adherence with quality of life. Patients whose family members remind, encourage, or help them take their medicine tend to feel more emotionally stable and have better physical health. This shows that adherence is not just about what patients know, but also about the support they receive and the coping strategies they use. The findings show that having monitoring devices is important for effective diabetes self-care, both physically and psychologically.

Data analysis reveals that owning these devices is linked to a better quality of life, while patient interviews explain that monitoring gives quick feedback, increases confidence, and helps with self-control. On the other hand, not having access to devices reduces motivation, weakens awareness, and delays responses to changes in blood sugar. Similarly, Kiçaj et al., (2025) also highlight that access to self-monitoring tools improves both physical and mental well-being by empowering patients to manage their condition more effectively.

Implication programs should prioritize affordable access to glucometers/strips, practical training on safe use and interpretation, simple recording tools (logbooks), and family-supported routines because these qualitative "drivers" align with the strongest quantitative differences in QoL. This gap between *knowing* and *doing* clarifies the quantitative pattern where low knowledge is clustered with poor QoL, because delayed recognition and reactive self-care increase uncertainty, anxiety, and the likelihood of uncontrolled symptoms that impair daily functioning. Integrating both strands shows that knowledge improves QoL through two linked mechanisms:

1. Behavioral pathway: better knowledge supports consistent self-care routines (diet control, medication adherence, proactive monitoring), which stabilizes physical symptoms and reduces complications reflected in the high proportion of good QoL among the high-knowledge group.
2. Psychological pathway: understanding diabetes increases perceived control and self-efficacy, reducing fear and confusion, which patients described as feeling calmer and more confident in managing their condition.

This integrated interpretation aligns with evidence such as (Kiçaj et al., 2025), which reports that stronger diabetes-related knowledge is associated with better QoL and improved self-management, including dietary regulation and monitoring behaviors. Overall, the convergence of quantitative strength ($r = 0.679$) and qualitative explanations confirms that

strengthening patient education, especially practical knowledge about symptoms, monitoring, and daily decision-making, is likely to yield meaningful QoL improvements in primary care settings.

Although it makes a significant contribution, this study has several limitations that need to be considered when interpreting the results. First, the use of a cross-sectional design limits the ability of this study to establish a definite causal relationship between self-care and quality of life. Second, quantitative data collection is highly dependent on self-reported data, which has the potential to introduce social desirability bias, whereby respondents tend to report better self-care behaviors than they actually practice. Furthermore, because this study was conducted specifically at the Sei Rampah Community Health Center, the generalizability of the findings to the DMT2 population in urban areas or secondary health care settings may be limited. Further research is recommended to apply a longitudinal approach and involve external variables such as broader socioeconomic status to provide a more detailed understanding of the dynamics of self-care in diabetic patients.

CONCLUSIONS

Bivariate analysis showed that all aspects of self-care diet, physical activity, drug therapy, blood glucose monitoring, availability of GDM testing equipment, and knowledge were significantly associated with the quality of life of patients with type 2 DM ($p < 0.05$). Qualitative findings indicated that awareness was quite good but implementation was not consistent: dietary management was constrained by economic factors, habits, and knowledge; physical activity tends to be light and irregular due to fatigue/age, low motivation, and limited family support; medication adherence is generally good but there are still some lapses; blood glucose monitoring is most disciplined in patients who have personal devices, while glucometer ownership is low due to cost and literacy issues; knowledge varies and increases in those who receive education and family support. Overall, quality of life aligns with the consistency of self-care practices and the availability of supportive resources.

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