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ORIGINAL RESEARCH

Family Coping Strategies and Quality of Life of Patients with Type-2 Diabetes Mellitus in Primary Health Care in Indonesia

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Abstract

Background: The intricate caregiving responsibilities undertaken by family caregivers in the care of patients with chronic diseases induce stress, potentially reducing the family's ability to provide effective care. In instances where family caregivers of patients with type-2 diabetes mellitus (T2DM) are unable to employ effective coping mechanisms, there exists the potential for an adverse impact on the patient's quality of life.
Purpose: This study aimed to analyze the relationship between family coping strategies and the quality of life of patients with T2DM undergoing treatment in primary health care in Malang, Indonesia. Additionally, it sought to investigate the influence of demographic factors on both family coping strategies and the quality of life of these patients.
Methods: The study employed an observational analytic design with a cross-sectional approach. The participants included 327 individuals with T2DM and 327 family caregivers, selected from 16 primary healthcare centers using cluster random sampling techniques. Data were collected using the COPE Brief questionnaire to assess coping strategies and the DQOL (Diabetes Quality of Life) questionnaire to measure the quality of life. Statistical analysis was conducted using the Spearman rank test and multivariable logistic regression.
Results: The findings of the study revealed that a majority of family caregivers employed adaptive coping strategies (93.9%), while a significant proportion of individuals with T2DM reported having a good quality of life (84.1%). The analysis demonstrated a positive relationship between family coping strategies and the quality of life among T2DM patients. Specifically, better family coping strategy was associated with higher quality of life in T2DM patients (p=0.000; r=0.447; α=0.05). Also, a comprehensive demographic analysis revealed that education significantly influences both the variables of family coping strategies and patient quality of life, with odds ratios of 1.284 and 1.561, respectively.
Conclusion: The research findings emphasize the mutual influence between family coping strategies and quality of life of T2DM patients. Nurses should prioritize attention to demographic factors such as education, age, gender, and duration of diabetes to enhance family coping strategies and improve the patients' quality of life.

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1. Introduction

Diabetes mellitus remains a global health issue with a persistently high incidence. According to the International Diabetes Federation, approximately 425 million adults aged 20 to 79 have diabetes mellitus, and it is estimated that this number will reach 629 million by 2045 (International Diabetes Federation [IDF], 2021). In 2015, the death toll due to diabetes mellitus in Indonesia was 185 thousand people, making it the seventh country worldwide with the largest population affected by diabetes mellitus (Cho et al., 2018). Data from the Basic Health Research reveals that in East Java province, patients with type-2 diabetes mellitus (T2DM) rank among the top 10 in Indonesia, with a prevalence of 6.8% (Basic Health Research of East Java, 2018). Malang has a notably higher mortality rate among T2DM patients compared to other cities in East Java, standing at 2.3%; this rate is attributed to low consumption of fruits and vegetables, coupled with insufficient physical activity (Ministry of Health of the Republic of Indonesia [MoHRI], 2018). A preliminary study conducted from January to July 2019 gathered data indicating that 1,787 individuals in Malang are diagnosed with T2DM every month (Department of Health of East Java, 2023).

The high incidence of T2DM has resulted in various adverse impacts, both physical and psychological, for sufferers and their families. Physically, T2DM sufferers experience macro and microangiopathy (Brunner & Suddarth, 2010). Psychologically, they endure anxiety, anger, grief, shame, guilt, hopelessness, and depression (Bhat et al., 2020). Anxiety arises due to sufferers feeling helpless or unable to overcome the problem (Bhat et al., 2020). Long-term dependence on T2DM treatment alters lifestyles, interaction patterns, and family habits, leading to boredom and stress among caregiving families (Kalra et al., 2018). The illness experienced by family members becomes an unexpected situational stressor, leading to health problems within the family, often referred to as family illness (Mahler et al., 2022). Families can overcome these challenges if they have effective coping mechanisms.

Family coping is defined as an active process when families utilize existing family resources and develop behaviors that will strengthen family units and reduce the impact of stressful life events (Amador-marín & Guerra-martín, 2017). Sanjaya (2023) highlighted that a positive response from the family and its subsystems in addressing diabetes mellitus-related issues involves dietary management. This adaptation not only applies to the sufferers but also necessitates adjustments within families to alleviate the burden on the patients; the better the family coping, the higher the level of adherence to diabetic management. However, families may not always have effective or competent coping mechanisms in dealing with the problems of sick family members. NANDA explains that the declining family coping signifies the inadequacy and ineffectiveness of the family in assisting sufferers to manage and master the adaptive tasks related to health problems (NANDA, 2020). Some related factors include demographic characteristics (Rondhianto et al., 2020), prolonged illness, and deprivation of supportive abilities from the family, lack of information on the family, and inadequate family understanding of the health problems faced by the family. Maladaptive family coping can significantly impact quality of life (QoL) (Bou, 2023).

Quality of life is defined as an individual's perception of their position within the cultural context and value system in which they live, encompassing their relationship with their goals, expectations, standards, and life focus (WHO, 2012). This concept includes several dimensions, such as physical function, psychological function, social function and environment. Quality of life is a predictor in patients with chronic diseases, so that it becomes a major competency in the goals of long-term care interventions, improving patient welfare, and productivity. The decreased QoL of T2DM patients is caused by long-term drug consumption, hospital admissions, disease burden, complications, and early death (Alaof et al., 2022). A study by Teli (2017) showed that T2DM patients experienced declines in all aspects, including physical function, mental function, pain, general health and role changes where all components showed a value of < 80. This indicates a decline in the QoL of T2DM patients. The significance of improving the QoL of T2DM patients is related to their response to therapy and disease progression. Low QoL can worsen complications and can lead to disability or death (Abdul et al., 2020).

Family caregivers in the long term often experience fatigue when accompanying patients (Kang et al., 2020). They may tend to neglect tasks, fall into monotonous routines, ignore or overlook older patients, and experience stress and depression (Sherman, 2019). Moreover, inadequate relationship patterns contribute to suboptimal caregiving roles, impacting the quality of life for the patients (Kalra et al., 2018). This situation is exacerbated by the insufficient intervention and support provided to family caregivers by primary health nurses, resulting in a lack of knowledge and skills. In Indonesia, primary health efforts primarily focus on individuals with T2DM, overlooking the potential involvement of families in community health initiatives. The challenges faced by families with T2DM patients undergoing outpatient care in primary health care settings are getting increasingly complex. The intricate caregiving responsibilities undertaken by family caregivers arise from constrained social support and limited access to information sources aimed at enhancing knowledge and skills. The paucity of literature offering guidance to family caregivers adversely affects their coping mechanisms, ultimately impacting the quality of life of T2DM patients. Therefore, this study was conducted to analyze the relationship between family coping strategies and the quality of life of patients with T2DM undergoing treatment in primary health care. Additionally, it sought to investigate the influence of demographic factors on both family coping strategies and the quality of life of these patients.

2. Methods

2.1 Research design

This research was an analytic observational study with a cross-sectional approach. This study explored the occurrence and underlying reasons for the health phenomenon by analyzing the dynamics of correlations between different phenomena or between risk factors and outcome factors. Data were collected or approached at a single point in time to understand the relationships and interplay between these factors.

2.2 Setting and samples

This research was conducted from March to June 2020 in the working areas of 16 public health centers (PHCs) in Malang, Indonesia, spanning five districts. The study involved T2DM family caregivers and patients. Inclusion criteria for family caregivers encompassed individuals residing in the same household as a person with T2DM, having familial ties (blood relationship, adoption, or marriage), being over 17 years old, and possessing proficient verbal communication skills. On the other hand, family exclusion criteria comprised families or family caregivers who were unwell or had health issues, whether infectious (e.g., TB) or non-infectious (e.g., diabetes, hypertension, stroke), and elderly caregivers aged over 60. For patients, the inclusion criteria involved enrollment in the *Prolanis* program (an Indonesian initiative educating and supporting individuals with non-communicable diseases like diabetes and hypertension, focusing on nutrition, lifestyle changes, medication adherence, and regular health check-ups for overall health improvement and complication prevention), independence, proficient reading abilities, and possession of health insurance. The exclusion criteria were patients who had not attended the *Prolanis* program in the last two months, those with other physician-diagnosed conditions (such as hypertension, stroke, osteoarthritis, or heart disease), and those living alone at home.

The sample size in this study was determined using the Isaac and Michael formula (Sugiyono, 2013). The research population, derived from the average patient visits during the period of January-December 2019, consisted of 1,787 individuals. A margin of error of 0.05 was applied, resulting in a sample size of 327 for each group, encompassing both T2DM patients and their family caregivers. This study used probability sampling with cluster random sampling technique. The initial data on the number of T2DM patients was sourced from the Malang Health Service. Subsequently, the proportion of the sample size for each public health center was calculated.

2.3 Measurement and data collection

Data collection involved the utilization of the COPE Brief questionnaire for coping strategies, originally developed by Carver and adapted into Indonesian by Latifah (2020). Additionally, the Diabetes Quality of Life (DQoL) questionnaire, initially developed by the Diabetes Control and Complications Trial (DCCT) Research Group and adapted into Indonesian by Wicaksana et al. (2021), was used. Both instruments were tested for validity and reliability by the researchers on 20 patients with T2DM at a primary health care center in Dau, Malang Regency. The Brief-COPE is a 28 item self-report questionnaire designed to measure effective and ineffective ways to cope with stressful life events. This instrument consists of three dimensions: emotion focused coping, problem focused strategies, and dysfunctional strategies with answer choices using a Likert scale of never=1, sometimes=2, often=3, and always=4. The COPE Brief questionnaire underwent validity and reliability testing, yielding the Pearson correlation validity test results ranging from 0.496 to 0.905, all surpassing the threshold of 0.349, and demonstrated reliability assessed using Cronbach's alpha, resulting in a value of 0.755. The coping mechanism scores ranged from a minimum of 28 to a maximum of 112. Coping strategies were categorized into two groups: adaptive and maladaptive. This categorization was made based on the average total score, with coping mechanisms having an average score ≤ 70 categorized as maladaptive, and those with a total score > 70 categorized as adaptive (Sandra et al., 2022).

The DQoL instrument consists of 46 core items, encompassing four indicators: satisfaction with treatment, impact of treatment, concerns about future diabetes impact, and concerns about social and work issues. The scale provides five answer choices: very satisfied=5, moderately satisfied=4, neither=3, moderately dissatisfied=2, and very dissatisfied=1. The DQoL questionnaire underwent validity and reliability testing, resulting in Pearson correlation validity test values ranging from 0.64 to 0.87, all exceeding 0.349, and demonstrated reliability using Cronbach's alpha with a value of 0.88. Quality of life scores range from a minimum of 46 to a maximum of 276. A total score ≤ 184 indicates poor QoL, while a score > 184 indicates good QoL.

The data collection process began with submitting a permit to the Malang City Health Office, followed by coordination with the persons in charge of the *Prolanis* program to obtain data on T2DM sufferers. Patient data were collected during their visits to primary health care services, while data from family caregivers were obtained through home visits conducted with the assistance of community health volunteers. Before completing the questionnaires, respondents received an explanation about the research's aims and objectives and were requested to willingly participate by signing a research consent form.

2.4 Data analysis

The data were analyzed using SPSS (Version 22.0. IBM Corp, Armonk, NY, USA). Descriptive analyses were conducted for the family caregiver and patients sociodemographic data. Bivariate analysis to examine the relationship between family coping and patient quality of life was performed using the non-parametric Spearman rank test. For the analysis of demographic factors affecting both variables, multivariate analysis was employed. This involved utilizing multiple logistic regression with a corrected confidence level (CI) set at 95%.

2.5 Ethical considerations

This study obtained ethical approval from the Health Research Ethics Committee, Faculty of Medicine, Universitas Brawijaya, under ethical clearance number 06/EC/KEPK/01/2020. Prior to their participation, participants provided their consent by signing an informed consent form.

3. Results

3.1 Demographics characteristics

Table 1 shows the characteristics of family caregivers, indicating that the majority were <45 years of age, amounting to 158 (48.3%) respondents. Among them, 317 (96.9%) were Muslims, 168 (51.4%) were male, 159 (48.6%) had completed senior high school education, and 188 (57.5%) were entrepreneurs. Table 1 also shows the characteristics of T2DM patients, highlighting that the majority were aged between 45 and 65 years, totaling 207 respondents (63.3%). Among these patients, 317 (96.9%) were Muslims, 263 (80.4%) were female, 169 (51.7%) had an elementary school education level, 225 (68.8%) were unemployed, 195 (59.6%) had a diabetes duration of less than five years, and 189 (57.8%) had blood sugar levels ranging from 100 to 200 mg/dl.

Table 1. Demographic characteristics of family caregivers and patients with T2DM

Demographic characteristics	Family caregivers		Patients	
	f	%	f	%
Age (years)				
<45	158	48.3	7	2.1
45-65	123	37.6	207	63.3
>65	46	14.1	113	34.6
Religion				
Islam	317	96.9	317	96.9
Christian	7	2.1	7	2.1
Catholic	3	0.9	3	0.9
Gender				
Male	168	51.4	64	19.6
Female	159	48.6	263	80.4
Education				
No School	1	0.3	2	0.6
Elementary School	71	21.7	169	51.7
Junior High School	54	16.5	76	23.2
Senior High School	159	48.6	65	19.9
College	42	12.8	15	4.6

Table 1. Continued

Demographic Characteristics	Family Caregiver		Patients	
	f	%	f	%
Employment				
Unemployed	120	36.7	225	68.8
Laborer	9	2.8	3	0.9
Farmers	1	0,3		
Government employees	9	2.7	4	1.2
Entrepreneur	188	57.5	95	29.1
Diabetes Duration				
<5 years			195	59.6
>5 years			132	40.4
Blood Sugar Results				
<100 mg/dl			8	2.4
100-200 mg/dl			189	57.8
>200 mg/dl			130	39.8

3.2 Distribution of family coping strategies and quality of life patients

Table 2 indicates that the majority of families employed adaptive coping mechanisms, totaling 307 respondents (93.9%), while 20 respondents (6.1%) utilized maladaptive coping strategies. These outcomes were based on the respondents' responses in the coping strategy questionnaire. Furthermore, the table reveals that 275 T2DM patients (84.1%) had a good quality of life (QoL), while 52 patients (15.9%) had a poor QoL.

Table 2. Distribution of family coping strategies and quality of life of T2DM patients

Variables	f	%
Family Coping Strategies		
Adaptive	307	93.9
Maldaptive	20	6.1
Quality of Life		
Good	275	84.1
Poor	52	15.9

3.3 Analysis of the relationship of coping strategies and quality of life

Table 3 shows that among the 275 respondents with good QoL, 271 (98.5%) used adaptive coping strategies, and only 4 (1.5%) respondents used maladaptive coping methods. The research findings also indicated that 69.2% exhibited adaptive family coping strategies, despite their reported poor QoL. Additionally, the table shows the correlation between family coping strategies and the QoL of T2DM patients, indicating a significant positive association: the better the family coping, the higher the QoL of T2DM patients (p=0.000; r=0.447; α=0.05).

Table 3. Analysis of the relationship of coping strategies and quality of life

Coping Strategies	Quality of Life						Correlation Coefficient	*p*-value
	Good		Not Good		Total			
	f	%	f	%	f	%		
Adaptive	271	98.5	36	69.2	307	93.9	0.447	0.000
Maladaptive	4	1.5	16	30.8	20	6.1		

3.4 Demographic factors affecting family coping strategies and patient QoL

Based on Table 4, it is evident that demographic factors such as age, gender, and education significantly influenced family coping strategies ($p<0.05$). Similarly, age, gender, education, and diabetes duration were identified as demographic factors influencing the patient QoL ($p<0.05$).

A detailed demographic analysis indicates that education plays a dominant role in the family coping strategy variables and patient QoL (OR: 1.284 and 1.561).

Table 4. Demographic factors affecting family coping strategies and patient QoL

Variables	B	SE	OR	95%CI	*p*
Family Coping					
Age	2.754	0.936	1.025	0.231;1.657	0.03*
Religion	0.753	1.875	0.491	0.167;1.235	0.31
Gender	3.050	0.836	1.142	0.371;1.631	0.01*
Education	3.671	0.625	1.284	0.873;1.762	0.00*
Employment	0.835	1.736	0.081	0.218;1.716	0.25
Constant	5.41 2	1.976			
Quality of Life					
Age	2.614	0.946	1.075	0.314;1.572	0.04*
Religion	0.437	2.651	0.573	0.131;1.325	0.71
Gender	2.937	0.637	1.351	0.172;1.732	0.02*
Education	3.736	0.621	1.561	0.758;1.835	0.00*
Employment	0.536	2.472	0.024	0.182;1.372	0.61
Diabetes Duration	2.853	0.635	1.181	0.371;1.691	0.02*
Blood Sugar	0.518	2.4528	0.093	0.142;1.182	0.67
Constant	5.64 2	1.872			

*The study reveals a relationship between demographic characteristics and research variables

4. Discussion

This study investigated the relationship between family coping strategies and QoL of patients with T2DM, alongside exploring demographic influences. The findings revealed a positive link between effective family coping strategies and higher QoL in T2DM patients. Additionally, our analysis highlighted education as a key factor significantly impacting both family coping strategies and patient QoL.

4.1 Family coping strategy

The results of this study indicate that almost all family caregivers employed adaptive coping strategies in providing care for family members with T2DM. Adaptive coping refers to individual efforts to deal with stressors in a positive, rational, and constructive manner (Hapunda, 2022). Theis finding aligns with a study conducted by Mustamu et al. (2020), which stated that 82.9% of family coping falls under the “positive” category while caring for family members with T2DM. Another study showed that more than half (61.4%) of families caring for children with chronic diseases have adaptive coping strategies (Setyoadi et al., 2023). The process of adaptive family coping in dealing with chronic illnesses involves a series of steps and strategies undertaken by the family to address the physical, emotional, and social challenges that arise in relation to the family member’s chronic health condition.

Based on the analysis in this study, family coping strategies can be influenced by factors such as age, gender, and education. The study results show that 85% of family caregivers fall into the adult age category. Mature caregivers are expected to have emotional maturity, good planning and decision-making skills, and the ability to provide positive support in caring for sick family members. These factors contribute to adaptive coping strategies within the family (Mogueo & Defo, 2022). Family coping strategies are also influenced by the gender of the family caregivers. The study results show that more than half (51.4%) of family caregivers are males. Men and women have different responses when faced with problems. Men generally enjoy challenges and even think that problems can provide positive motivation. Women have a negative awareness of the presence of problems; for women, problems can trigger negative hormones that cause stress, anxiety, and fear. Family coping strategies tend to be adaptive when the caregiver is male, as men can think positively when faced with problems (Rico-Blázquez et al., 2022).

The demographic factor of education has the greatest contribution to family coping strategies, as the research results showed that more than half (60.4%) of family caregivers have a high school and college education levels. Education can influence a person to have planning and decision-making skills in life. The higher the level of education, the more positive mindset is formed, resulting in better control over stressors, as individuals become more responsive to information and have more knowledge to implement adaptive family coping strategies (Bekele et al., 2022).

Family coping in caring for patients with T2DM involves a dynamic process in which family members collectively respond to the challenges and demands associated with managing diabetes within the household (Luthfa & Ardian, 2019). It is important to remember that each family has different needs and challenges in dealing with T2DM. The support and assistance required may vary depending on the health condition, social support, and available resources. It is essential for family caregivers to seek appropriate support and resources to help them overcome the challenges that arise throughout the journey of T2DM. Findings of this study also highlight the importance of considering diabetes knowledge, family support, the role of nurses, coping skills, and family empowerment in enhancing family coping.

The results of this study also suggest that although coping strategies can be adaptive for families, the quality of life for individuals with T2DM may not always be good. Several factors can affect the quality of life of T2DM patients, including complications, stress, and psychological well-being (Alaof et al., 2022). Complications associated with T2DM can significantly impact the quality of life (Teli, 2017). Additionally, stress and anxiety related to managing the condition and daily life can also affect the overall well-being of people with T2DM (Kalra et al., 2018). It is important to note that the quality of life of T2DM patients can vary among individuals and is influenced by various factors such as the severity of the condition, access to health services, social support, and individual coping mechanisms. Therefore, it is critical to provide comprehensive support and interventions to address the specific needs and challenges faced by individuals with T2DM.

4.2 Quality of life of patients with T2DM

The research results indicate that patients with T2DM have a "good" quality of life. This finding is reinforced by the study of Abualhommos et al. (2022), which stated that 73.8% of T2DM patients have a good quality of life. Improving the quality of life is considered the ultimate goal of chronic disease care programs (Ritter & Bonsaksen, 2019). The quality of life of patients with T2DM encompasses various dimensions, reflecting the impact of the disease on the daily lives of patients. Several demographic factors influencing the quality of life of T2DM patients include age, gender, education, and duration of illness. The results of this study show that almost all T2DM patients are classified as pre-elderly and elderly. Elderly individuals with T2DM may experience a decline in physical function (Amin et al., 2022). According to the study conducted by Wylie et al. (2022), aging is associated with a decrease in physical strength due to muscle weakening, impacting activities related to physical fitness and contributing to a decline in the quality of life for T2DM patients.

This study reveals that gender demographic factor also affected the quality of life of T2DM patients. In this study, the majority (80.4%) of patients are female. T2DM is more prevalent in women than in men, attributed to the decline in estrogen hormones due to menopause. Changes in hormone levels after menopause can lead to fluctuations in blood sugar levels. The higher percentage of fat accumulation in women than in men can reduce insulin sensitivity in muscles and the liver. Also, the difference in physical function between men and women influences the quality of life of T2DM patients (Ciarambino et al., 2022).

The finding of this study also showed that education level has a dominant contribution to the quality of life of T2DM patients. Abualhommos et al. (2022) suggest that education level is not related to the occurrence of T2DM but has an influence on the quality of life of T2DM patients. Previous research results highlight the significance of the education level as a crucial variable, indicating that respondents with higher education generally experience a better quality of life compared to those with lower education (Alshayban & Joseph, 2020). Disease duration is also found to be a contributing factor to the quality of life among T2DM patients. Specifically, results show that a disease duration of less than five years is associated with a better quality of life. However, the quality of life for T2DM patients with a disease duration of less than five years can vary, depending on individual factors and the management of the disease (Alaof et al., 2022).

However, it is important to remember that the experience of quality of life can differ among individuals. Nevertheless, there are other factors that can influence the quality of life of T2DM patients with an illness duration of less than five years. These factors may include blood sugar control level, complications related to T2DM, and the level of adherence to the recommended treatment and lifestyle changes (Sari et al., 2018). Therefore, it is crucial to maintain good disease management, including following the treatment plan recommended by the doctor, maintaining a healthy diet, engaging in regular exercise, and managing stress. With proper management and adequate support, T2DM patients with an illness duration of less than five years can achieve a good quality of life.

4.3 Family coping strategies and quality of life

The results of this study indicate a positive correlation between effective family coping strategies and the improvement of the quality of life (QoL) in patients with T2DM. This finding aligns with a study conducted by Dewi et al. (2020), which revealed a significant correlation between coping mechanisms and QoL with a p-value of 0.003 ($\alpha>0.05$). The coping mechanisms employed by family caregivers play a crucial role in influencing the quality of life of T2DM patients. The support and coping mechanisms provided by family caregivers can have a significant impact on the patients' quality of life.

Several studies have shown a significant correlation between the coping mechanisms of family caregivers and the quality of life of T2DM patients (Cyran-Grzebyk et al., 2023; Dewi et al., 2020; Freeman-Hildreth et al., 2019). Well-applied coping strategies align with the family's desires in caring for T2DM patients, thereby enhancing the quality of life through comprehensive family support. Maintaining close contact with healthcare providers, where families receive information about diabetes care, enables the family to be a solution to every problem faced by patients (Powers et al., 2020). Furthermore, the coping mechanisms applied by family caregivers can significantly influence the quality of life of T2DM patients. Effective coping strategies, such as emotional support, collaborative problem-solving, and active involvement in patient care, can enhance the quality of life of T2DM patients. Grover et al. (2016) showed that coping strategies can impact the quality of life of children and adolescents with type-1 diabetes caregivers, indicating that coping strategies can also significantly affect the quality of life of T2DM patients. Therefore, it is essential to pay attention to the coping mechanisms applied by family caregivers in efforts to improve the quality of life of T2DM patients.

Coping mechanisms can influence an individual's quality of life. In this context, coping refers to the strategies an individual uses to deal with stress, challenges, or problems in daily life (Hapunda, 2022). When someone employs effective coping mechanisms, they tend to have a better quality of life. Some studies indicate that positive coping mechanisms, such as social support, problem-solving, and adaptation, can improve an individual's quality of life (Dewi et al., 2022; Hapunda, 2022; Mojahed et al., 2019). Social support from families, friends, or the community can provide crucial emotional and practical support in facing life's challenges. Effective problem-solving helps an individual address problems constructively, while good adaptation allows an individual to adjust to changes and face difficult situations.

In the context of T2DM, effective coping mechanisms can help patients face challenges related to disease management, such as maintaining a healthy diet, exercising, and managing stress (Adu et al., 2019). Support from family and the medical team can also play a crucial role in improving the patient's quality of life (Pamungkas et al., 2017). However, it is important to remember that each individual has different coping mechanisms, and what works for one person may not be the same for another. It is also crucial to note that every family has unique needs and dynamics. Therefore, an effective approach to improving adaptive family coping may vary. In this regard, consulting with healthcare professionals, such as doctors or nurses, can assist in designing strategies that suit the family's needs and situation (Hood et al., 2018). Additionally, the quality of life is influenced by other factors such as health conditions, social environment, and genetic factors (Dendup et al., 2018). Improving adaptive family coping can positively impact the quality of life of patients with T2DM.

5. Implications and limitations

The study results provide several important implications regarding family nursing practice. The families are the main target in community health initiatives because they have the potential to enhance the health of family members with chronic illnesses like T2DM. Managing T2DM necessitates prolonged treatment to maintain blood sugar levels within normal limits, change healthier behavior, and increase adherence to treatment. Long-term care requires good family coping skills in making the best decisions for sick family members. Within primary health care settings, community nurses play a pivotal role in enhancing the knowledge and abilities of family caregivers in caring for sick family members at home. The knowledge and skills acquired will assist in enhancing family caregiver coping. The promptness and accuracy of the family in making decisions regarding the care needs of family members with T2DM will contribute to improving the patient's quality of life.

This study has limitations. It only focused on families dealing with T2DM in the community, limiting its scope to urban areas and failing to represent rural settings. Consequently, the study's conclusions might not be generalizable to cases other than T2DM. In addition, because this study uses a descriptive cross-sectional design, it cannot infer causality between variables or follow changes over time.

6. Conclusion

Based on the research results, it can be concluded that there is a positive relationship between effective family coping strategies and the improvement of the quality of life of T2DM patients. Demographic factors, including age, gender, and education, play a significant role in influencing family coping strategies. Similarly, demographic elements such as age, gender, education, and diabetes duration have an impact on the patient's quality of life. Among these factors, educational background is identified as having the greatest contribution to influencing both family coping and the patient's quality of life in the context of T2DM. The findings suggest a recommendation for nurses to prioritize attention to demographic factors such as education, age, gender, and duration of diabetes in order to enhance family coping strategies and improve the overall quality of life for patients with T2DM. Additionally, the study proposes further research that focuses on improving the quality of life for individuals with T2DM, emphasizing considerations of the condition's severity, access to health services, social support, and individual coping mechanisms.

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Author contribution

All authors (SS, FE, JH, FR, NDK, YS and DDSLI) contributed substantially to the study design, data collection, analysis, and interpretation of results. All authors drafted and revised the article, approved the published version, and agreed to be accountable for all aspects of the work.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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