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Original Article

FAMILY KNOWLEDGE ABOUT CARE FOR DIABETES MELLITUS PATIENTS IN THE TRENGGALEK COMMUNITY HEALTH CENTER WORK AREA

Zevina Dwi Andini1), Elok Yulidaningsih2)*, Rahayu Niningasih(3), Edi Yuswantoro (4)
1,2,3,4) D3 Nursing Study Program, Ministry of Health Polytechnic Malang Trenggalek Campus, Indonesia
*Corresponding Author, E-mail: elok_yulidaningsih@poltekkes-malang.ac.id

ABSTRACT

Background. Diabetes Mellitus (DM) is a chronic metabolic disease that imposes significant burdens on health care and the socio-economic aspects of communities. Family involvement as primary caregivers is crucial for effective DM management through activities such as diet regulation, medication reminders, and blood sugar monitoring. The family's knowledge of including its definition, causes, symptoms, and management, is vital for patient recovery. Misunderstandings about care practices can lead to poor glycemic control and hasten complications, primarily due to inadequate education and limited access to primary care. The purpose of this study was to determine family knowledge about care for patients with Diabetes Mellitus.

Research Method. The research design used in this study was descriptive quantitative, with one variable, namely family knowledge about care for patients with diabetes mellitus. The sampling technique used was purposive sampling with a sample size of 24 people. The study was conducted from March 2, 2025, to March 22, 2025, in the Trenggalek Community Health Center work area, in Sambirejo Village.

Findings. The results showed that family knowledge about care for DM patients in the Trenggalek Community Health Center work area in 2025, most (63%, 15 respondents) had good knowledge.

Conclusion. Family knowledge about care for patients with diabetes mellitus, namely by strengthening family education programs at the community health center level, developing educational materials that are easy to understand, and practical coaching programs for the use of glucometers.

Keywords: Diabetes Mellitus, Family, Care, Knowledge.

BACKGROUND

Diabetes Mellitus (DM) is a chronic metabolic disease that gradually places a large burden on the health care system and the socio-economic life of society [1]. At the household level, the success of DM management is greatly influenced by the role of the family as the primary caregiver who carries out most of the daily care activities such as diet management, medication reminders, blood sugar monitoring, and wound care [2]. Families' ignorance or misconceptions about proper care practices can worsen glycemic control and accelerate the occurrence of complications, so the real problem stems from low educational capacity and access to primary care [3]. Geographical and socio-economic conditions in rural areas such as the Trenggalek Community Health Center work area also influence the family's capacity to provide care, including limited access to monitoring equipment, access to healthy food, and variations in the level of family health literacy.

Nationally and globally, the prevalence of DM shows a significant increasing trend, resulting in an economic burden and a greater need for preventive and curative interventions [4]. At the local level, although specific prevalence data from the Trenggalek Community Health Center area require further data collection, initial findings from primary care indicate a distribution of DM patients requiring intensive family support for daily disease management. The impact of this lack of family knowledge is not only on clinical aspects such as poor blood sugar control and micro- and macrovascular complications, but also on patients' quality of life and the burden of care for other family members [5]. Therefore, the scale of the problem is not only individual health, but is related to family dynamics and the primary care system.

The problem of family knowledge regarding DM care in the study area tends to be cumulative and is related to several chronological factors; first, the increase in the number of DM cases in recent years without being accompanied by the addition of family education programs; second, the limitations of counseling programs at community health centers which are generally one-way packages and lack of scheduling; and third, family economic constraints that limit access to healthy tools and food so that care practices are often inconsistent [6]. This cycle leads to a persistent gap between clinical recommendations and home practice, necessitating more systematic interventions. Initial observations during the study period (March–April 2025) indicated that while some families had received basic information, significant gaps existed in self-monitoring and foot care practices.

Based on the problem description and scale above, this study aims to describe the level of family knowledge regarding DM patient care in the Trenggalek Community Health Center (Puskesmas) working area and identify the knowledge domains most in need of educational intervention. The research contribution is expected to be practical, providing local evidence that can be used by the Puskesmas to design contextual and targeted family education modules, forming the basis for planning home visit programs and practical training on glucometer use, and serving as a reference for further research testing the effectiveness of family education interventions. The findings are also expected to assist local health policymakers in establishing primary care priorities oriented towards empowering family caregivers.

RESEARCH METHODS

This study used a quantitative descriptive design aimed at describing the level of family knowledge regarding DM patient care. This approach was chosen to obtain an objective picture through numerical data collection and descriptive analysis [7]. The single variable was the level of family knowledge regarding DM patient care, which was measured using a questionnaire with 20 questions. The questionnaire results were measured on a nominal scale of true (1) and false (0). The measurement results were categorized into three categories: Good Knowledge (76% - 100%), Sufficient Knowledge (56% - 75%), and Poor Knowledge (<56%). In addition, the respondents' demographic characteristics, such as age, gender, education, occupation, and relationship with the patient, were also measured. The study was conducted from March to April 2025 in the Trenggalek Community Health Center (Puskesmas) working area, which includes several assisted villages. This location was chosen due to the high number of diabetes patients requiring family support in daily care.

The study population was all families caring for DM patients in the Trenggalek Community Health Center (Puskesmas) working area. The study sample was determined using a purposive sampling technique based on inclusion criteria: families living in the same house as DM patients, acting as primary caregivers, and willing to be respondents. Exclusion criteria included families who could not read and write. A total of 24 families met the criteria. The research instrument was a closed-ended questionnaire compiled based on literature and DM care guidelines, covering five domains: dietary management, physical activity, drug therapy, blood sugar monitoring, and wound/foot care[14]. The questionnaire was tested for content validity by three nursing experts and its reliability through a pilot test with a Cronbach's alpha of 0.78. Other tools included a glucometer to verify blood sugar monitoring, and an observation form to assess the condition of the care environment.

The first step was to obtain official permission from the Community Health Center and ethical approval. Data collection was then conducted by visiting the respondents' homes. The researcher explained the purpose of the study and requested written informed consent. Respondents then completed a questionnaire with the researcher's guidance if necessary. Environmental observations were conducted to support the questionnaire findings. Afterward, the data were coded and processed using univariate analysis to obtain frequency distributions and percentages. This study has obtained official permission from the Head of the Trenggalek Community Health Center with letter number 000.9.2/342/406.010.11.001/2025 dated April 12, 2025. All respondents were given an explanation and signed an informed consent. Data confidentiality is guaranteed, and the research results are used only for scientific purposes.

FINDINGS

This study involved 24 families who were the primary caregivers of DM patients. The majority of respondents were female, aged 31–59, and had a junior high school education. The analysis showed that 63% of families had good knowledge, 12% had sufficient knowledge, and 21% had poor knowledge. The domain with the highest score was diet management, while the domains with the lowest scores were self-monitoring of blood sugar and foot care. This indicates a knowledge imbalance between domains that needs to be addressed through focused educational interventions.

Table 1. Respondent Characteristics Based on Age

Variable	n	%
Age 20-30	3	12,5%
Age 31-59	18	75%
Age ≥60	3	12,5%
Total	24	100%

Based on the table above, data shows that the age characteristics of families caring for DM patients are that the majority, 75% (18 respondents), are aged 31-59 years.

Table 2. Respondent Characteristics Based on Gender

Variable	n	%
Men	11	46%
Women	13	54%
Total	24	100%

Of the 24 respondents, 11 (46%) were male and 13 (54%) were female, indicating a slight female preponderance as caregivers in this sample. This distribution suggests that caregiving roles within the family in the study context tend to be played by both sexes, with a minority preference for males and a slight majority for females.

Table 3. Respondent Characteristics Based on Last Education

Variable	n	%
Elementary School	8	33%
Junior High School	9	38%
Senior High School	6	25%
College	1	4%
Others	0	0%
Total	24	100%

The 24 caregiver respondents showed the following distribution of educational levels: 8 (33%) had elementary school education, 9 (38%) had junior high school education, 6 (25%) had high school education, and 1 (4%) had college education; there were no respondents in other categories. This distribution shows that the majority of caregivers had secondary or lower education (elementary–junior high school: 71%), while caregivers with higher education were relatively few. This is important because education level is closely related to the ability to understand written health materials and translate them into daily care practices.

Table 4. Respondent Characteristics Based on Occupation

Variable	n	%
Unemployed	1	4%
Self-Employed	9	38%
Civil Servants	0	0%
Laborers	3	13%
Farmers	4	16%
Others	7	29%
Total	24	100%

Of the 24 caregiver respondents, the distribution of occupations showed a variety of employment opportunities: 1 person (4%) was unemployed, 9 people (38%) were self-employed, 3 people (13%) were laborers, 4 people (16%) were farmers, and 7 people (29%) were in other categories (e.g., small market traders, other informal workers). No respondents were civil servants. The dominance of self-employment and informal employment indicates that many caregivers have irregular working hours and often depend on daily availability to earn a living. This condition has implications for their availability of time to participate in educational activities scheduled during formal working hours and is also related to the family's economic capacity to purchase equipment/access to care.

Table 5. Respondent Characteristics Based on Relationship with Family

Variabel	n	%
Husband/Wife	12	50%
Siblings	2	8%
Children	10	42%
Others	0	0%
Total	24	100%

Of the 24 caregiver respondents, 12 (50%) were the patient's husband or wife, 10 (42%) were the patient's children, and 2 (8%) were siblings. There were no respondents in the "other" category (e.g., in-laws, grandchildren, or non-nuclear family members). The predominance of spouses as caregivers reflects the involvement of spouses in chronic disease management at home, who generally share emotional closeness and direct responsibility for daily care. The high proportion of children as caregivers (42%) indicates that caregiving responsibilities are also largely assumed by the next generation, particularly if the patient is elderly or the patient's partner has physical limitations. Meanwhile, the small proportion of siblings (8%) indicates that support from the extended family is relatively limited, possibly due to distance or time constraints.

In addition to grouping respondents based on the categories above, there is a special grouping based on family knowledge about care for DM patients, as presented in the following table:

Table 6. Family Knowledge about Care for DM Patients

Variable	n	%
Good	15	63%
Enough	4	16%
Poor	5	21%
Total	24	100%

Of the 24 families who responded, 15 families (63%) had a good level of knowledge, 4 families (16%) were in the adequate category, and 5 families (21%) were in the poor category. The dominance of the good category indicates that most families have understood the basic principles of Diabetes Mellitus patient care, including diet management, physical activity, and adherence to drug therapy. However, the presence of 37% of respondents in the adequate and poor categories indicates that knowledge in some families is still inadequate to support optimal care at home.

DISCUSSION

The results of the study showed that caregivers were mostly in the productive age range (31-59 years), where the majority of respondents were female, where it was found that almost half of respondents had a junior high school education and almost half of respondents were self-employed, so working hours were not always fixed. The family members who most often acted as caregivers were husbands/wives (50%) and children (42%). These demographic characteristics are in line with the literature showing that household care roles are often taken on by productive-age family members and women [8]. Social role theory explains that the family members who are closest emotionally (spouses and children) tend to bear the burden of care. In addition, the social determinants of health model confirms that education and employment are predictors of access to information and resources [9]. The low level of education in most respondents indicates limited health literacy which affects the ability to understand text-based educational materials [10].

These characteristics directly impact caregivers' ability to perform caregiving tasks. Caregivers of productive age may have sufficient physical energy but are constrained by time constraints due to informal employment; while elderly caregivers (25%) are at risk of experiencing physical limitations in performing heavy caregiving tasks. Low levels of education necessitate educational approaches that utilize visual media and hands-on practice (demonstrations), rather than solely written materials. The role of spouses and children as primary caregivers opens up opportunities for nuclear-family-based interventions, such as tiered training for spouses and children to share the caregiving burden.

Compared to studies in urban contexts that report caregivers with higher levels of education, these findings indicate the need for more contextual programs in rural areas [11]. Community health center policies should consider the timing of outreach sessions (evenings/weekends), the development of short modules for informal workers, and home visits for elderly caregivers. It is also recommended to strengthen community cadre networks to support follow-up education and care practices.

The study showed a distribution of knowledge categories: good 63%, sufficient 16%, and inadequate 21%. However, when analyzed by domain, an imbalance occurred: knowledge about dietary management was relatively good (around 70% understood the principles of portion control and reducing simple sugars), knowledge about moderate physical activity (58% understood the benefits, 40% provided support), adherence to medication schedules was high but understanding of side effects was limited, glucometer ownership was low (45%), and foot care was only performed routinely by around 50% of families. These results can be analyzed using the Knowledge–Attitude–Practice (KAP) and Health Belief Model (HBM) frameworks. According to the KAP, knowledge is a prerequisite but does not always translate into practice, and attitude factors, as well as self-efficacy, determine the extent to which knowledge is applied. The HBM emphasizes perceptions of threats and benefits; if families do not perceive a real threat of complications or feel unable to perform technical actions such as blood sugar measurements, respondents may not perform these actions even if they have basic knowledge.

Several intervention studies have shown that practical family education can reduce HbA1c and increase compliance. [12]. The researchers' findings regarding weak blood sugar monitoring and foot care practices are similar to Zhu's who reported a gap between theoretical knowledge and technical skills among caregivers [13]. The difference lies in the slightly higher percentage of good categories in this study, likely due to exposure to basic education received through community health center services. Several inhibiting factors identified were: (a) limited access to equipment (glucometers and strips), (b) low functional literacy resulting in less effective written materials, (c) caregivers' limited time due to informal employment, (d) cultural norms and eating habits that influence dietary changes, and (e) lack of practical experience or direct training in technical procedures such as foot examinations.

CONCLUSION

This study concluded that family characteristics such as age, education level, occupation, and relationship with the patient influence their ability to provide care for DM patients. The majority of families have good knowledge of nutritional aspects and medication adherence, but remain weak in technical skills such as self-monitoring blood sugar and foot care. Efforts to increase knowledge must be balanced with practical skills development through tiered education programs, the use of learning media appropriate to literacy levels, and the provision of facilities to support home care practices. The active role of community health centers, including strengthening family education programs, developing easy-to-understand educational materials, and practical coaching programs for glucometer use, support from health cadres, and the involvement of all family members, are important factors in the success of DM management at the household level.

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Conflict of Interest

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