The relationship of diabetes knowledge and self-care practices among patients with type 2 diabetes mellitus

By Rizki Hidayat

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Abstract

Background: Diabetes Mellitus (DM) is a disease characterized by increased blood glucose levels and cannot be cured so it requires self-care. DM self-care is a program that must be carried out throughout the life of DM sufferers. DM self-care aims to optimize metabolic control, optimize quality of life, and prevent acute and chronic complications. Good knowledge and self-care consisting of good diet, physical exercise, medication, and education can control blood sugar levels and prevent complications of type 2 DM.

Purpose: To determine the relationship between knowledge and self-care in patients with type 2 diabetes mellitus.

Method: Descriptive correlational research design with a cross-sectional approach. The study population was patients with type 2 diabetes mellitus in the work area of the Pasar Rebo District Health Center, East Jakarta, totaling 690 patients, carried out in November-December 2023. The sampling technique used the Accidental Sampling technique with the Slovin formula and a sample of 87 respondents was obtained. The research instrument used the Diabetes Knowledge Questionnaire (DKQ-24) for the knowledge questionnaire and the Summary of Diabetes Self Care Activity (SDSCA) for the self-care questionnaire. Data analysis used the univariate and bivariate Chi Square alternative tests.

Results: Respondents with poor knowledge resulted in poor self-care of 30 respondents (53.6%), while respondents with good knowledge resulted in good self-care of 16 respondents (51.6%). The results of the Chi-Square test showed a significant p value of 0.001 (<0.05).

Conclusion: There is a significant relationship between knowledge and self-care in type 2 DM patients with a p value of 0.001.

Keywords: Diabetes Mellitus (DM) Type 2; Knowledge; Self-care.

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease characterized by hyperglycemia and glucose intolerance that occurs because the pancreas does not produce adequate insulin or because the body cannot use the insulin produced effectively (Kurnia & Fitri, 2023). Diabetes mellitus is divided into several types, namely type 1 DM, type 2 DM, gestational diabetes mellitus, and several other types. Type 2 DM is characterized by hyperglycemia that occurs due to the inability of body cells to respond to insulin, thus encouraging the body to increase insulin production

(Sarkar, Akter, Das, Das, Modak, Halder, & Kundu, 2019).

The occurrence of type 2 DM can be related to obesity, age, ethnicity, and family history. Efforts to improve a healthy lifestyle with a balanced diet, regular physical activity, quitting smoking, and maintaining ideal body weight can be done in the treatment of this type of DM (Spurr, Bally, Bullin, Allan, & McNair, 2020). Insulin injections can be given if oral drug therapy cannot control hyperglycemia. However, the exact cause of type II DM is not yet known.

Genetic factors are also thought to play a role in the process of insulin resistance. Non-insulin dependent diabetes mellitus is a milder and more heterogeneous group of diabetes, mainly found in adults, but can sometimes occur in childhood (Mancusi, Izzo, di Gioia, Losi, Barbato, & Morisco, 2020).

In 2019, DM caused 1.5 million deaths and 48% of all deaths due to DM occurred before the age of 70 years with a total of 536.6 million sufferers. The Southeast Asian region, especially Indonesia, is ranked 3rd with a prevalence of 11.37%. Indonesia is ranked 7th out of 10 countries with the largest population, which is 10.7 million people (World Health Organization, 2021). Jakarta is one of the areas with the highest prevalence of diabetes in Indonesia. The prevalence increased from 2.5% to 3.4% in 2018, namely from a total of 10.5 million people, around 250 thousand Jakarta residents suffer from diabetes. The high prevalence of DM in the area is due to the large population and the availability of many blood sugar testing facilities, so it is easy to detect (Astuti, 2022). East Jakarta is in the second highest position for DM sufferers. Based on the 1st and 2nd quarter reports of the non-communicable disease program of the East Jakarta City Health Office in 2021, DM still occupies the second highest position in the recapitulation of non-communicable disease visits in East Jakarta, which is 57,190 visits. Pasar Rebo District Health Center, East Jakarta City is the third health center out of ten districts with the highest number of DM visits in East Jakarta, which is 6,536 visits from January to June 2021. At the Pasar Rebo District Health Center, DM cases ranked second out of the ten most common diseases in 2021 from January to June, which was 7,982 cases (43.51%). However, the achievement of minimum service standards for DM sufferers in 2021 was still low, which was 34.4% (Resti & Cahyati, 2022).

In the era of national health insurance, the partner village development program, type 2 DM became one of the social security administration programs that changed its name to the Chronic Disease Management Program. Chronic Disease Management Program is a proactive and integrated program that involves health worker participants, especially nurses, to provide services to the community. One of the roles of nurses is as an educator, the highest indicator of the role of nurses as educators is in the blood sugar monitoring indicator,

then also involves health facilities, especially health centers and health insurance which aims to encourage patients with chronic diseases to achieve optimal quality of life. In addition to improving the quality of life of patients, this program is also expected to reduce the risk of complications and can utilize costs effectively and rationally. Prolanis consists of 6 activities, namely medical consultations, education, SMS gate-away, home visits, club activities, and health status monitoring (Raraswati, Heryaman, & Soetedjo, 2018).

Knowledge is a person's insight into a particular topic, so it plays an important role in behavior. Knowledge about DM is a support that can help patients undergo diabetes therapy, so the better the patient understands their disease, it is expected to help change behavior and have an impact on their body condition which can be controlled and live better, for example by maintaining stable blood sugar levels (Chew, Shariff-Ghazali, & Fernandez, 2014; Petroni, Brodosi, Marchignoli, Sasdelli, Caraceni, Marchesini, & Ravaioli, 2021).

Self-care in patients with type 2 DM is the ability of individuals, families, and communities to improve health, prevent disease, and disability with or without support from health care providers (Kong & Cho, 2020). Blood sugar level problems worsen in DM patients because they are influenced by lack of health care awareness, time constraints, lack of personal motivation, lack of compliance, lack of guidelines, and education about DM patient care. The five main pillars in managing self-care in patients with type 2 DM include diet, physical activity (exercise), foot care, pharmacological therapy/taking DM medication, monitoring blood sugar levels. This needs to be supported by the patient's ability to start and carry out activities independently through self-care activities (World Health Organization, 2009; Degefa, Wubshet, Tesfaye, & Hirigo, 2020).

Based on previous research, it was shown that out of 72 DM patients, most of them had poor knowledge, which was 51.4 (Pahrul, Afriyani, & Apriani, 2020). In line with other studies, out of 41 DM patients, 48.8% had poor knowledge about DM (Handayani, Anggraini, & Prabowo, 2024). This shows that there are still many DM patients who lack knowledge about the DM diet. DM patients who have a poor understanding of diabetes will find it difficult to control their disease condition and have an impact on their

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quality of life. Self-care plays an important role in improving the quality of life and well-being of DM sufferers. If self-care is carried out effectively, the patient's blood sugar levels can be controlled and the quality of life is achieved optimally. The more routine self-care is carried out, the blood sugar levels will be within the normal range, so that complications due to DM do not occur (Cita, 2019; Babazadeh, Dianatinasab, Daemi, Nikbakht, Moradi, & Ghaffari-Fam, 2017). The self-care behavior of DM patients in previous studies also showed that as many as 103 respondents (66.5%) had moderate self-care behavior. Meanwhile, in other studies, as many as 25 respondents (16.1%) had poor self-care behavior (Windani, Abdul, & Rosidin, 2019; Sidabutar, 2016).

Based on a preliminary study conducted by researchers, the number of patients at the Pasar Rebo District Health Center from January to November 2023 was 690 people divided into 8 chronic disease management groups (prolanis). In addition, researchers also conducted interviews using questionnaires regarding the level of knowledge and self-care in patients during the preliminary study, the results of the study showed that 7 out of 10 patients had insufficient knowledge and 8 out of 10 patients had insufficient self-care.

RESEARCH METHOD

The research design used is descriptive correlational with quantitative research type and cross sectional approach. The research population was type 2 DM patients in the working area of Pasar Rebo District Health Center, East Jakarta, totaling 690 patients, conducted in November-December 2023. The sampling technique used accidental sampling technique with the Slovin formula and obtained a sample of 87 respondents.

The sample inclusion criteria were type 2 DM patients without wounds or complications, able to read and write and willing to be respondents and follow the research stages until the end. The exclusion criteria themselves were patients who were sick or had disabilities that caused them to be unable to stand and concentrate. The independent variable in this study was knowledge, while the dependent variable was self-care.

The research instrument used was the Diabetes Knowledge Questionnaire (DKQ-24), a questionnaire on patient knowledge about diabetes consisting of 24 question items. The measurement of the DKQ-24 questionnaire was done by summing up all questions from no. 1-24, questions with correct answer choices (4, 16), wrong answers and don't know (0). The category of poor knowledge if the score is <56, a score of 56-75 is sufficient, and a score of 76-100 is good.

The data collection tool for DM self-care behavior uses the Summary of Diabetes Self Care Activities (SDSCA) questionnaire sheet. This questionnaire consists of 17 questions including; 6 items of questions about diet, 2 items of questions about physical exercise (sports), 5 items of questions about foot care, 2 items of questions about taking medication, and 2 items of questions about blood sugar monitoring. The scoring system in this questionnaire uses a numeric scale with a scoring range of 1 week (0-7 days). If the score is ≤ 64.87 then the self-care category is poor, while if the score is > 64.87 then the self-care category is good.

Data analysis uses univariate to describe the frequency distribution of each variable and bivariate to see the relationship between independent and dependent variables. The statistical test used is the alternative Chi Square test. This research has obtained ethical approval from the research ethics committee of Pasar Rabo Regional General Hospital with letter number: 6668/DL.01.

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RESEARCH RESULTS

Table 1. Distribution Characteristics of Respondent (N=87)

Variables	Results
Age (n/%)	
(Mean±SD)(Range)(Years)	(61.632±7.773)(40-70)
40-60	26/29.9
>60	61/70.1
Gender (n/%)	
Male	36/41.4
Female	51/58.6
Education (n/%)	
Uneducated	2/2.3
Elementary School	14/16.1
Junior High School	14/16.1
Senior High School	25/28.7
College	32/36.8
Employment (n/%)	
Government Employees	16/18.4
Self-Employed	16/18.4
Farmer	10/11.5
Retired	16/18.4
Other	29/33.3
Knowledge (n/%)	
Poor	35/40.3
Moderate	29/33.3
Good	23/26.4
Self-care (n/%)	
Poor	56/64.4
Good	31/35.6

Based on Table 1. the frequency distribution of respondents by age, the majority were >60 years old as many as 61 respondents (70.1%) and female respondents as many as 51 (58.6%). Furthermore, for education, the majority of respondents had a college education as many as 32 (36.8%) with other jobs as many as 29 respondents (33.3%). The majority of respondents had poor knowledge as many as 35 (40.3%) and poor self-care as many as 56 (64.4%).

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Table 2. The Relationship between Knowledge and Self-care in Type 2 DM Patients (N=87)

Variables	Self-care		p-value
	Poor (n=56)	Good (n=31)	
Knowledge (n/%)			
Poor	30/53.6	5/16.2	
Moderate	19/33.9	10/32.2	0.001
Good	7/12.5	16/51.6	

Table 2. shows that respondents who have less knowledge will result in poor self-care as many as 30 respondents (53.6%), while respondents who have good knowledge will result in good self-care as many as 16 respondents (51.6%). The results of the chi-square test show a significant p value of 0.001 (<0.05) which means Ha is accepted and Ho is rejected, so it can be interpreted that there is a relationship between knowledge and self-care in type 2 DM patients.

DISCUSSION

Type 2 Diabetes Mellitus is a metabolic disorder characterized by increased blood glucose levels due to impaired insulin production or insulin dysfunction in the human body (Sarkar et al., 2019). The incidence of type 2 DM is associated with excess weight, obesity, age, ethnicity, and family history. Efforts to improve a healthy lifestyle with a balanced diet, regular physical activity, quitting smoking, and maintaining ideal body weight can be done in the management of this type of DM. Insulin injections can be given if oral drug therapy cannot control hyperglycemia.

The increasing number of DM sufferers, most of whom are type 2 DM, is related to several factors, namely unmodifiable risk factors, modifiable risk factors, and other factors. DM is related to unmodifiable risk factors, including a family history of DM (first degree blood relations), age ≥ 45 years, ethnicity, history of giving birth to a baby with a birth weight > 4000 grams or a history of having suffered from gestational DM, and a history of giving birth to a baby with a low birth weight (<2.5 kg) (Patil & Gothankar, 2019). Modifiable risk factors include obesity based on BMI ≥ 25 kg/m2 or waist circumference ≥ 80 cm in women and ≥ 90 cm in men, lack of physical activity, hypertension, dyslipidemia, and unhealthy diet. Other risk factors associated with diabetes are people with polycystic ovary syndrome (PCOS), people with metabolic syndrome have a

history of impaired glucose tolerance (IGT) or impaired fasting blood glucose (FDPT), have a history of cardiovascular disease such as stroke, CHD, or Peripheral Artery Disease (PAD), alcohol consumption, stress factors, smoking habits, gender, coffee and caffeine consumption (Teede, Tay, & Joham, 2021).

Knowledge is the result of knowing, and this occurs after someone feels a certain object. Sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste, and touch. However, most knowledge is obtained through the eyes and ears (Notoatmojo, 2010). Diabetes knowledge has been identified as one of the most important factors for diabetes intervention because diabetes knowledge and self-care practices are significantly associated with glycemic control. Knowledge about the disease tends to inform patients about specific actions in the diabetes management process. Thus, the more patients know about their disease, the more likely they are to understand their disease and perform self-care practices such as diet, exercise, and blood sugar monitoring (Kugbey, Oppong Asante, & Adulai, 2017).

In addition to knowledge, there needs to be the ability to care for and self-awareness of type II diabetes mellitus clients to prevent and control lifestyle patterns and habits in finding solutions to obtain decision-making that clients use to reduce signs and symptoms of the disease. Components in increasing self-care agency include self-perception of the disease condition, self-understanding of the disease condition, self-motivation to realize and think realistically, problem solving to obtain solutions and suggestions, and actions in prevention and how to act to carry out self-care (Kogoya, et al., 2022).

Based on the results of the study, it shows a relationship between self-care knowledge in type 2 diabetes mellitus patients with a significant p value of 0.001 (p <0.05). This finding is in line with previous

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studies that also examined the relationship between the level of knowledge and self-management of chronic disease management programs in type 2 DM patients. The study also showed the results of the statistical test p value of 0.001 <0.05 so that there is a significant relationship between self-management knowledge and the behavior of type 2 DM patients (Nurasyifa, Fera, & Pratiwi, 2021).

Other studies also show that there is a significant relationship between the amount of knowledge and self-management in DM patients with a p-value of 0.000 and a correlation coefficient of 0.799 (Ningrum & Siliapantur, 2019). In this study, it was found that there were respondents with a high level of knowledge, but had low self-care activities. This is due to several factors that cause this to happen, one of which is because the determinants of a person's behavior come from the individual himself, such as personality and environmental factors. The attitude in carrying out self-care lacks motivation, so that the individual has not reached the implementation stage.

The results of this study found a low level of knowledge but good self-care activities because individuals have strong self-efficacy towards their disease and the individual gets social support from those closest to them to carry out healthy living behaviors. The level of knowledge possessed by DM sufferers is very important for managing the disease itself. The better the level of knowledge, the better the ability of DM sufferers to control their own condition. Lack of awareness of the causes of DM can be a risk factor that can worsen the patient's condition, an inappropriate lifestyle, patients can experience problems, and have a low quality of life (Gharaibeh & Tawalbeh, 2018).

Low knowledge regarding DM self-management can lead to poor blood glucose control. In addition, inappropriate treatment will also cause disease severity (Bukhsh, Khan, Sarfraz Nawaz, Sajjad Ahmed, Chan, & Goh, 2019). Other studies have also shown that DM sufferers' knowledge of self-management is relatively low, so they are at risk of complications that can harm patients, families, and the health care system (Nakidde, Kamoga, Katushabe, Luwaga, & Mwanja, 2022). Therefore, it is very important to improve patient knowledge, especially disease management.

Based on the explanation above, the researcher concluded that the knowledge of the respondents was mostly in the poor category due to the lack of willingness or curiosity to explore information related to diabetes through counseling, brochures, electronic media such as television, radio, newspapers, and the internet. This results in a lack of understanding and patients are not compliant in undergoing treatment or lack of compliant behavior in undergoing drug therapy management, so that the success of drug therapy is not optimal. The ability of respondents to carry out good self-care can maintain insulin activity and plasma sugar levels within the normal range, and minimize the possibility of complications (Amorim, de Souza, & Coelho, 2019; Pourhabibi, Mohebbi, Sadeghi, Shakibazadeh, Sanjari, Tol, & Yaseri, 2022). Respondents' self-care ability is influenced by several factors, both internal factors (education, self-agency, self-efficacy) and external factors (social support) (Mohebi, Parham, Sharifirad, Gharlipour, Mohammadbeigi, & Rajati, 2018).

CONCLUSION

Respondents' knowledge in the poor category was 5.2% and self-care in the poor category was 64.4%. There is a significant relationship between knowledge and self-care in patients with type 2 diabetes mellitus with a p value of 0.001 (<0.05).

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