

OVERVIEW OF KNOWLEDGE OF TYPE 2 DIABETES MELLITUS PATIENTS ABOUT THE 5 PILLARS OF DIABETES MELLITUS MANAGEMENT AT SUAKA INSAN HOSPITAL BANJARMASIN

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Abstract

Diabetes Mellitus is a group of metabolic diseases characterized by hyperglycemia that occurs due to abnormalities in insulin secretion. The implementation of the five (5) Pillars of Diabetes Mellitus in Indonesia has been implemented since 2011, but its implementation is still optimal where DM sufferers find it difficult to implement it with their disease conditions, this could be related to the information received whether it can be digested properly. Purpose: To describe the knowledge of Type 2 Diabetes Mellitus patients about the 5 Pillars of Diabetes Mellitus Management at Suaka Insan Hospital, Banjarmasin. Method: The research is descriptive quantitative with 32 respondents, that choose with total sampling. The research instrument used was a valid and reliable knowledge questionnaire. Using frequency distribution data analysis. Result: This study has knowledge of patient diabetes mellitus in the sufficient category of 17 people (53%), while 14 respondents are included in the Less category (44%), and 1 respondent is included in the Good category (3%). Conclusion: The majority of knowledge of type 2 diabetes mellitus patients about the 5 Pillars is in the Sufficient category. Health workers maximize health education about the 5 Pillars according to needs, especially for the Elderly.

Keyword: Diabetes mellitus, Type 2, 5 Pillars

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Introduction

The implementation of the five (5) pillars of Diabetes Mellitus management in Indonesia has been established since 2011; however, its execution remains suboptimal as DM patients frequently encounter difficulties in adhering to these regimens given their medical conditions. Consequently, this complexity often leads to treatment burnout and non-compliance with the various regulations associated with Diabetes Mellitus management (Romadhoni, 2023). Diabetes Mellitus itself comprises a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, which stems from diminished pancreatic function, thereby elevating blood glucose levels in the body (Abror, 2022). Currently, DM stands as one of the most prevalent chronic diseases affecting populations worldwide.

A study by Handayani (2016) stated that DM has currently escalated into an epidemic, as evidenced by a two- to three-fold increase in cases over the last decade. In Indonesia, data from the World Health Organization (WHO) ranked Diabetes Mellitus as the sixth leading cause of death, with a prevalence of 6% out of a total population of 258 million people. DM-related

mortality reached 48,300 deaths among the population aged 30–69 years, and 51,100 deaths among individuals aged 70 years and older. Furthermore, Indonesia ranked fourth globally in DM incidence, following India, China, and the United States, a trend driven by aging populations, increased body weight, and lifestyle changes (WHO, 2016).

In addition to ranking fourth in global DM prevalence, Australian biochemical and biomedical experts noted that nearly 25% of diabetic patients in Indonesia suffer from diabetic foot ulcers, which account for 85% of all diabetes-related amputations. According to DM experts in Indonesia, DM—particularly diabetic ulcers—represents the most frequent case requiring hospitalization. The associated mortality rate ranges from 17% to 23%, while the amputation rate spans between 15% and 30% (PdPersi, 2011).

Moreover, data from 2023 indicated a total of 150 DM patients, consisting of 72 outpatients and 78 inpatients. Meanwhile, data from January to May 2024 recorded 53 DM patients, comprising 27 outpatients and 26 inpatients. To prevent these complications and reduce mortality rates among DM patients, proper and timely clinical management is imperative (Perkeni, 2011).

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In addition to dietary management, another crucial component is pharmacological therapy; adherence and regularity in taking anti-diabetic medications constitute key efforts in maintaining glycemic control and preventing complications. Non-adherence to the treatment regimens prescribed by physicians or other healthcare professionals can significantly exacerbate the patient's clinical condition. Furthermore, routine blood glucose monitoring serves as a pivotal pillar in DM management to evaluate whether therapeutic targets have been achieved. Implementing these five (5) pillars can substantially enhance the quality of life of DM patients. However, the successful execution of these pillars heavily relies on the patient's health literacy and knowledge regarding diabetes management. Chen et al. (2015) posited that adequate knowledge empowers patients to determine the best self-management practices for controlling their condition. Nevertheless, DM patients are highly susceptible to psychological stress when adhering to dietary programs, which subsequently impairs their dietary compliance. In line with this, Bader et al. (2019) emphasized that a patient's level of knowledge concerning DM

management and prevention directly determines the severity and progression of the disease complications they experience.

Furthermore, the researcher conducted interviews with 10 DM patients, consisting of 6 males and 4 females. Among them, six patients (2 females and 4 males) stated that they obtained information regarding DM management from peers and friends, specifically concerning dietary and beverage restrictions; they also believed that adhering to dietary limitations rendered regular medication adherence unnecessary. Additionally, 2 out of 4 patients reported that they did not engage in physical exercise due to a lack of information regarding suitable exercises for DM patients, particularly for those presenting with diabetic foot ulcers. Regarding blood glucose monitoring, 4 male patients admitted to being reluctant to check their blood sugar levels out of fear of high results. Meanwhile, 3 out of 4 female patients acknowledged that they had not yet adhered to the recommended dietary guidelines.

These findings align with a study by Marbun et al. (2021), which demonstrated that the implementation of the 5 pillars of DM management significantly improved individuals' knowledge ($p=0.000$). This was evidenced by a post-intervention increase in knowledge scores; the intervention group showed a mean post-test score of 8.08, up from a pre-test mean of 4.44. In comparison, the control group exhibited a pre-test mean score of 4.12 and a post-management mean score of 6.28.

Furthermore, Romadhoni (2023) reported that the majority of patients possessed a good level of knowledge regarding the 5 pillars of diabetes mellitus management, accounting for 55 participants (90.2%), while only 5 participants (8.2%) presented with poor knowledge. This high level of awareness is likely multi-factorial, potentially driven by active educational initiatives from healthcare providers and heightened patient self-awareness regarding their illness and lifestyle. Nevertheless, a discrepancy remains prevalent in clinical practice; despite possessing adequate knowledge about DM and its management, many patients intentionally choose not to adhere to the prescribed therapeutic regimens.

METODE

This study employed a descriptive quantitative research design. The sample consisted of 32 patients diagnosed with Type 2 Diabetes Mellitus (T2DM), selected using a total sampling technique. Data collection utilized a questionnaire evaluating respondents' knowledge of the 5 pillars of diabetes management. The instrument had been previously validated, yielding corrected item-total correlation values ranging from 0.451 to 0.874, which exceeded the critical r -table value of 0.349, thereby confirming its validity. Furthermore, the reliability test demonstrated a reliability coefficient (r) of 0.758, which is greater than the standard threshold of 0.70, indicating that the instrument is highly reliable.

Results

1. Respondent Characteristics

Table 1.1 Frequency Distribution of Respondent

Characteristics	Frequency (n)	Percentage (%)
Age (Years)		
36–45	2	6.0
46–55	16	50.0
56–65	13	41.0
> 65	1	3.0
Gender		
Female	24	75.0
Male	8	25.0
Educational Attainment		
Elementary School	5	16.0
Junior High School	10	31.0
Senior High School	13	41.0
Bachelor's Degree / Graduate	4	12.0
Duration of Treatment		
1 Year	1	3.0
1–3 Years	5	16.0
> 3 Years	26	81.0
Knowledge Level		
Good	1	3.0
Sufficient / Moderate	17	53.0
Poor	14	44.0
Total	32	100.0

Based on the results, the most dominant age characteristic among the respondents was early elderly (46–55 years old), accounting for 50%, followed by late elderly (56–65 years old) at 41%, early adulthood (36–45 years old) at 6%, and seniors (>65 years old) at 3%. Regarding gender distribution, the majority of the respondents were female ($n = 24$, 75%), while males accounted for 25% ($n = 8$). In terms of educational attainment, the largest proportion of participants had a senior high school education ($n = 13$, 41%), followed by junior high school ($n = 10$, 31%), elementary school ($n = 5$, 16%), and a bachelor's degree ($n = 4$, 12%). Furthermore, the data on the duration of treatment revealed that the vast majority of respondents had been undergoing treatment for more than 3 years ($n = 26$, 81%), whereas 16% ($n = 5$) had been in treatment for 1–3 years, and only 3% ($n = 1$) for 1 year. Finally, the univariant analysis of knowledge levels demonstrated that more than half of the respondents possessed a sufficient level of knowledge ($n = 17$, 53%), followed by a poor knowledge level ($n = 14$, 44%), and a good knowledge level ($n = 1$, 3%).

DISCUSSION

Knowledge is a determining factor in how an individual thinks, feels, and acts (Dulistiawati, 2017). It serves to reorganize and transform inconsistent perceptions into consistent ones, thereby achieving a favorable outcome. Furthermore, knowledge is influenced by education, age, experience, and information sources (Notoatmodjo, 2012).

In the management of patients with diabetes mellitus (DM), there are five main pillars consisting of pharmacology, education, dietary planning, physical exercise, and blood glucose monitoring. In this study, the respondents' sufficient knowledge level was closely linked to the education, exercise, and dietary pillars. Based on the item-by-item analysis of the questionnaire, the sufficient knowledge category (53%) was primarily driven by the respondents' correct answers to items P1, P3, P4, and P5. These items defined diabetes mellitus and assessed knowledge regarding whether DM is a hereditary disease. Additionally, respondents demonstrated a reasonably good understanding of unfavorable items, such as P7, P11, P12, P13, and P14, which discussed recommended exercises for DM patients, their impacts, and prescribed dietary guidelines.

These findings were further corroborated by interviews with several respondents. Participants who had undergone treatment for more than one year clearly understood the definition of DM and its risk factors, specifically noting heredity. The respondents also emphasized that individuals with DM must strictly manage their dietary intake to prevent spikes in blood glucose levels.

Diabetes mellitus is a serious chronic disease that occurs either when the pancreas does not produce enough insulin—a hormone that regulates blood sugar or glucose—or when the body cannot effectively utilize the insulin it produces. Possessing adequate knowledge is crucial in shaping the health behaviors and actions of DM patients. A good level of knowledge regarding blood glucose levels among diabetics is often attributed to their active participation in community health center (Puskesmas) activities (Marbun et al., 2023).

When examining the questionnaire items regarding exercise (P7 and P8), regular daily physical activity and structured physical exercise (3–4 times a week for approximately 30 minutes) constitute one of the fundamental pillars in managing type 2 diabetes. Regarding the dietary pillar, diabetic patients with hypertension need to reduce their sodium/salt intake. Artificial sweeteners may be consumed in moderation; non-nutritive artificial sweeteners that are safe and acceptable for diabetic patients were correctly identified by the respondents in items P12 and P13. One of the most crucial strategies to manage diabetes is proper nutrition, as emphasized in the dietary management pillar of diabetes.

To prevent complications and manage diabetes, it is recommended to limit the intake of food and beverages high in sugar, calories, and fats—such as processed foods, pastries, ice cream, and fast food—to a maximum of 40 grams per day (equivalent to 9 teaspoons of sugar). Concurrently,

patients should increase their intake of whole grains, fruits, vegetables, and legumes, which are rich in dietary fiber and complex carbohydrates. Furthermore, regular physical exercise offers numerous benefits, including diabetes prevention. Physical exercise plays an essential role as a pillar of diabetes mellitus management. During physical training, muscles become more active, increasing membrane permeability and blood flow. Consequently, more capillary membranes open up, activating a higher number of insulin receptors and triggering a shift in muscle energy utilization (Romadhoni, 2023).

These questionnaire items corroborate that, on average, the respondents possessed sufficient knowledge, as evidenced by their dietary adjustments, such as reducing excessive sugar and carbohydrate consumption, sourcing sweetness exclusively from fruits, and abstaining from tea, coffee, or random sweet snacks. When correlated with educational attainment, the respondents who demonstrated a sufficient level of knowledge consisted of 5 individuals with a senior high school education, 5 with a junior high school education, 3 with a bachelor's degree, and 3 with an elementary school education. This finding aligns with a study by Cho and Fordyce (2019), which indicated that individuals with higher educational levels tend to have better health literacy and knowledge compared to those with lower educational attainment.

The absence of a significant correlation between educational attainment and knowledge level in this study may be attributed to confounding factors, such as learning motivation. Notably, five respondents with only a junior high school education demonstrated a sufficient understanding of the five pillars of diabetes mellitus (DM) management. This aligns with the researchers' field observations, which indicated that despite their lower formal education, these individuals consistently attended clinic appointments, actively listened to medical advice from physicians and nurses, and strived to integrate

these recommendations into their daily routines. The respondents reported experiencing tangible health benefits from adhering to these practices; for instance, dietary compliance contributed to stable blood glucose levels, while regular physical exercise enhanced their overall physical comfort and well-being.

These findings underscore that formal education does not inherently reflect an individual's intrinsic motivation to acquire knowledge beyond structured academic environments. An individual with limited formal schooling but a high aptitude for learning can develop extensive expertise in a specific health domain. Ultimately, learning predispositions and cognitive engagement remain highly individualized.

Conversely, the poor knowledge category (44%) was heavily influenced by the respondents' misconceptions regarding items P2 and P6. Specifically, a significant number of participants incorrectly believed that diabetes mellitus (DM) is not a hereditary/genetic disease and that

physical exercise does not cure DM but rather exacerbates the condition. Demographically, the respondents who held these misconceptions were predominantly over 46 years old and had a formal educational background limited to elementary or junior high school. In relation to exercise, the advanced age of these respondents may explain their perspective, as older individuals are often more vulnerable to physical fatigue, leading them to perceive exercise as non-essential or counterproductive. Furthermore, an individual's knowledge level is closely linked to their education; a higher level of formal schooling is expected to enhance the absorption of health-related information, particularly concerning DM management. Another notable misconception was observed in item P15, where respondents assumed that routine blood glucose monitoring is only necessary when a patient's physical condition drops or deteriorates. This perception is highly inaccurate, as diabetic patients are required to monitor their blood glucose levels routinely and in accordance with healthcare providers' guidance. Regular blood glucose testing is imperative to maintain optimal glycemic control. For patients with relatively stable blood glucose levels, periodic evaluations may be conducted every three months, while routine checks can be performed weekly or monthly. Monitoring blood glucose is a critical component of diabetes management to determine whether therapeutic goals have been achieved. Furthermore, physicians generally recommend more frequent monitoring for patients with comorbidities—such as cardiovascular disease, stroke, or obesity—as well as those with a family history of diabetes (Abror, 2022).

These quantitative findings were corroborated by qualitative data from interviews with several respondents. Participants revealed that their non-compliance with routine health facility visits for blood glucose monitoring was primarily due to logistical and perceptual barriers. Some respondents noted a lack of social support to accompany them to the clinic, while others reported difficulties riding a motorcycle independently due to physical limitations. Additionally, a prevalent misconception persisted among the respondents, who questioned the necessity of medical check-ups as long as they felt asymptomatic or physically healthy.

In this study, the good knowledge category represented only a small fraction of the sample (3%). The single respondent who demonstrated a good level of knowledge was a 65-year-old male with a senior high school education who had been undergoing treatment for 1–3 years. Qualitative insights revealed that this individual paid meticulous attention to his dietary regimen, actively restricting excessive sugar and carbohydrate intake. He also maintained his physical health by engaging in morning walks. Furthermore, the respondent noted that he used to exercise regularly and had a parental history of diabetes mellitus (DM). His past experience accompanying his parents to medical appointments had provided him with prior exposure and deep insights into the definition of DM, recommended dietary guidelines, physical activities, routine check-ups, and the

critical importance of medication adherence.

Within the five pillars of diabetes management, the dietary pillar emphasizes the "3J" principle (Jointly managing Jumlah/amount, Jenis/type, and Jadwal/schedule), which must be balanced with the patient's body mass index (BMI) to determine nutritional status. Successfully adhering to this dietary regimen requires optimal health literacy and access to reliable information. According to Khasanah et al. (2019), exposure to new information establishes a novel cognitive foundation that shapes an individual's attitudes toward health behaviors. Regular exposure to adequate information from various sources significantly enhances an individual's knowledge base. Consequently, a good level of knowledge positively impacts diabetic patients by enabling better self-management and treatment compliance. Adequate knowledge also motivates patients to adhere strictly to their treatment regimens and follow medical advice from healthcare professionals, thereby maintaining stable blood glucose levels (Prastiwi & Purwanti, 2021).

Conclusion

Based on the findings regarding the knowledge level of diabetes mellitus patients concerning diabetic foot exercises at the Specialist Outpatient Clinic of Suaka Insan Hospital Banjarmasin, it can be concluded that the majority of respondents possessed a sufficient level of knowledge (53%), followed by a poor knowledge level (44%), and only a minor proportion demonstrated a good level of knowledge (3%).

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