

EFFORTS TO IMPROVE KNOWLEDGE OF TYPE 2 DIABETES MELLITUS (DM) DIETS AT X HOSPITAL: A CASE STUDY

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ABSTRAK

Type 2 diabetes mellitus (DM) is a chronic disease with an increasing prevalence and a risk of serious complications if left uncontrolled. One of the main pillars of DM management is diet control based on the 3J principle (amount, type, and schedule). However, low patient knowledge remains an obstacle to diet compliance and blood glucose control. This study aims to determine efforts to improve dietary knowledge in patients with Type 2 Diabetes Mellitus through diet education based on the 3J principle at Hospital X. Method: The study used a case study design with a descriptive approach. The research subjects were three type 2 DM patients who met the inclusion criteria, namely being able to communicate well and able to read and write. The intervention in the form of DM dietary education based on the 3J principle was carried out directly using lectures and question and answer sessions for approximately 15 minutes. Knowledge levels were measured before and after the intervention using a DM dietary knowledge questionnaire that had been tested for validity. The data were analyzed descriptively. Results: All subjects experienced an increase in knowledge scores with an average increase of 3–4 points. Two patients improved from the poor knowledge category to the good category, while one patient improved from the poor category to the adequate category. In addition, all patients experienced a decrease in fasting blood glucose (FBG) values after the intervention, indicating an improvement in glycemic control in the short term. Conclusion: Diabetes Mellitus diet education based on the 3J principle effectively improves the knowledge of type 2 DM patients and has the potential to support blood glucose control. Brief and structured education can be an applicable nursing intervention to improve patients' self-care abilities in managing chronic diseases.

Keywords: Type 2 Diabetes Mellitus, 3J diet, Health Education, Patient Knowledge

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PENDAHULUAN

Diabetes mellitus (DM) is a chronic disease characterized by hyperglycemia due to impaired insulin secretion, insulin resistance, or both (Prabowo et al., 2021). Uncontrolled hyperglycemia can cause serious damage to various body systems, particularly the nerves and blood vessels, and increase the risk of cardiovascular complications, nephropathy, neuropathy, and vision impairment (Roglic & World Health Organization, 2024). Type 2 DM is the most common type and generally occurs in adults due to insulin resistance and decreased insulin production.

Diabetes is a chronic metabolic disease characterized by elevated blood glucose (or blood sugar) levels, which over time cause serious damage to the heart, blood vessels, eyes, kidneys, and nerves. The most common type is type 2 diabetes, usually in adults, which occurs when the body becomes resistant to insulin or does not produce enough insulin. In the past three decades, the prevalence of type 2 diabetes has increased dramatically in countries of all income levels. Type 1 diabetes, formerly known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin on its own. For people with diabetes, access to affordable treatment, including insulin, is critical to their survival (Hartono & Ediyono, 2024).

Globally, the number of people with diabetes continues to increase. In 2022, 529 million people were living with diabetes, with a global prevalence of 6.1% and the highest rates occurring in older age groups. The (World Health Organization, 2024) reports that diabetes is a direct cause of approximately 1.5 million deaths and contributes to increased mortality from cardiovascular disease and kidney disease (Ningrum et al., 2025). The International Diabetes Federation (IDF) also reports that more than 79% of people with diabetes live in developing countries, and this number is expected to continue to increase until 2045. In Indonesia, diabetes is one of the major health problems. According to the International Diabetes Federation, Indonesia ranks fifth in the world with approximately 19.47 million people living with diabetes, and this number is estimated to increase to 28.57 million by 2045. The 2018 Riskesdas survey showed that the prevalence of diabetes among people aged ≥ 15 years was 2%, an increase from 1.5% in 2013. The prevalence of diabetes based on blood sugar tests even reached 8.5% (Kurnia et al., 2025). This condition shows that the burden of diabetes in Indonesia is increasing and requires effective and sustainable control strategies.

One of the main pillars in managing type 2 DM is proper diet management. The 3J diet principle (quantity, type, and schedule) plays an important role in maintaining stable blood glucose levels and preventing complications. However, patient compliance with the diet remains a challenge. Many patients feel bored, stressed, and find it difficult to maintain a healthy diet consistently (Prabowo et al., 2021). Patients' lack of understanding about the diabetic diet leads to mistakes in food selection, portion control, and irregular meal schedules.

The level of knowledge is a fundamental factor that influences patients' behavior in undergoing treatment and care. Good knowledge will encourage patients to be more disciplined in adopting a healthy lifestyle, including managing their diet (Putri et al., 2025). Research by (Kurnia et al., 2025) shows a significant relationship between knowledge level and diet adherence in type 2 DM patients. Patients with a good level of knowledge tend to be more compliant in following their diet and are able to control their blood glucose levels more optimally.

Efforts to increase knowledge can be made through structured health education. (Mardiana et al., 2025) proved that pocketbook-based health education effectively increased nutritional diet knowledge in diabetic patients. In line with this, (Ningrum et al., 2025) reported that education on diet and physical activity patterns can improve the knowledge and behavior of diabetic patients in families under the care of community health centers. Appropriate education enables patients to understand their disease, increase motivation, and encourage sustainable changes in health behavior. In addition to knowledge, self-management skills are also essential in controlling DM. Self-management enables patients to develop problem-solving skills, increase self-efficacy, and apply knowledge in their daily lives. (Prabowo et al., 2021) stated that increased dietary knowledge and self-management contribute to reduced stress levels and increased patient compliance in following a type 2 DM diet.

Initial observations at Hospital X show that some type 2 diabetes patients still do not adhere to the recommended diet and continue to consume foods high in sugar. This condition indicates the need for systematic and easy-to-understand educational interventions to improve patient knowledge. Nurses have a strategic role as educators in providing health education to patients during their treatment. Therefore, an effective intervention is needed to improve dietary knowledge in type 2 DM patients as a preventive measure to prevent complications and improve patients' quality of life. Based on this description, this study was conducted with the title "Efforts to Improve Dietary Knowledge of Type 2 Diabetes Mellitus (DM) at Hospital X" as a form of contribution to strengthening the role of nursing education in chronic disease management.

METHODS

This study used a case study design with a descriptive approach. The study was conducted on patients with type 2 diabetes mellitus (DM) undergoing treatment at Hospital X. Research subjects were selected based on inclusion criteria, namely patients who were able to communicate well and could read and write. There were three subjects in this study with a diagnosis of type 2 DM. The intervention provided was diabetes mellitus diet education based on the 3J principle (amount, type, and schedule of meals). The education was conducted directly to patients using lectures and question and answer sessions lasting approximately 15 minutes. Knowledge levels were measured before and after the intervention (pre-test and post-test) using a DM diet knowledge questionnaire that had been adapted from an instrument that had previously been tested for validity. The data obtained were analyzed descriptively to describe changes in patients' knowledge levels after being given diabetes mellitus diet education.

RESULTS

This study involved three patients with type 2 diabetes mellitus (DM) who were treated at Royal Hospital. The characteristics of the respondents included age, gender, education level and comorbidities. All respondents were male, aged 51–60 years, and had a bachelor's degree (S1). Two respondents had comorbid hypertension and one respondent had no comorbidities.

Table 1.
Patient Characteristics

No	Initials	Gender	DM Type	Education Level	Comorbidities
1	Mr. K/53 years old	Male	DM Type 2	Bachelor's Degree	Hypertension
2	Mr. M/ 60 years old	Male	DM Type 2	Bachelor's Degree	-
3	Mr. C/51 Male	Male	DM Type 2	Bachelor's Degree	Hypertension

Table 2.
Level of Knowledge Pre and Post Education was Provided Results

No	Patient Code	Pre-test Score	Category	Post-test Score	Category
1	P1	4	Poor	8	Good
2	P2	5	Sufficient	9	Good
3	P3	3	Poor	7	Good

Table 3.
Blood Glucose Level Pre and Post Education was Provided Results

No	Patient Code	Pre-test Score	Category	Post-test Score	Category
1	P1	220 mg/dl	High	185 mg/dl	Normal
2	P2	250 mg/dl	High	189 mg/dl	Normal
3	P3	220 mg/dl	High	129 mg/dl	Normal

Based on table 2, before the DM dietary education intervention, two patients were in the poor knowledge category and one patient was in the adequate category. After dietary education based on the 3J principle, all patients experienced an increase in their knowledge scores. Two patients improved to the good category and one patient improved to the adequate category. In addition, there was a decrease in GDS scores in all patients after the intervention. These results indicate that providing direct DM dietary education can improve patients' understanding of regulating the amount, type, and schedule of meals as part of controlling type 2 diabetes mellitus.

DISCUSSION

The results of this case study confirm that Diabetes Mellitus diet education based on the 3J principle is an effective strategy in improving the knowledge of type 2 DM patients, even in a relatively short intervention period. The increase in knowledge scores in all patients shows that the lecture and question-and-answer methods are able to strengthen patients' understanding of the proper amount, type, and schedule of meals.

These findings are consistent with the research by (Novina et al., 2021), which reported that dietary education in type 2 DM patients was significantly able to overcome knowledge deficits and improve patients' ability to understand diet management. Similarly, research by (Sarumi et al., 2024) proved that diabetes management education had a positive effect on increasing the knowledge of type 2 DM patients, which in turn supported changes in health behavior. In addition to direct education methods, the use of educational media also plays an important role in the effectiveness of patient learning. (Mardiana et al., 2025) showed that pocket books improve patients' understanding of the diabetic nutrition diet because the material can be studied repeatedly. This reinforces that the success of education is not only determined by the content of the material, but also by the delivery strategy and the availability of supporting media.

The increase in knowledge gained by patients contributed to improved glycemic control, which in this case study was reflected in the decrease in GDS scores in all patients. This finding is in line with the research by (Kurnia et al., 2025) which states that the level of knowledge is significantly related to the dietary compliance of type 2 DM patients, thus having a direct impact on blood glucose control. Good knowledge encourages patients to be more disciplined in choosing foods, managing portions, and maintaining regular meal schedules.

According to (Putri et al., 2025) in their study, the majority of type 2 DM patients still have moderate levels of knowledge, even among patients with high formal education. This reinforces the case study findings that educational level does not always correlate with specific knowledge about disease management. Therefore, health education remains a primary need for DM patients regardless of their educational background. Another important aspect is the relationship between knowledge and self-management skills. (Novina et al., 2021) found a significant relationship between the level of knowledge and self-management of type 2 DM patients. Good knowledge enables patients to develop self-monitoring skills, decision-making, and adherence to therapy. This is reinforced by Prabowo et al. (2021), who stated that increased knowledge of diet and self-management can reduce stress levels and improve the quality of disease management.

The patient empowerment approach is also an important factor in the sustainability of DM management. Research by Putri et al. (in Diabetes Mellitus Management UNS) emphasizes that patient empowerment through continuous education can increase patient independence and compliance in carrying out therapy. Patients are not only recipients of information, but also key actors in controlling their disease. Meanwhile, according to (Dafriani & Dewi, 2021), many type 2 DM patients still have low to moderate levels of knowledge, which could potentially increase the risk of complications if continuous educational interventions are not carried out. These findings reinforce the urgency of the role of nurses as educators who provide structured, repeated education tailored to the individual needs of patients.

The results of (Ningrum et al., 2025) study also show that a combination of diet education and physical activity can improve both the knowledge and behavior of DM patients, thereby

accelerating disease control. This indicates that diet education can be further developed into a comprehensive education program based on a healthy lifestyle.

Thus, the results of this case study not only show a quantitative increase in knowledge but also demonstrate the potential for behavioral change and metabolic control in patients. Although the number of subjects was limited, these findings provide preliminary evidence that simple dietary education interventions can have a meaningful clinical impact if carried out consistently and integrated into nursing care.

This study shows that diabetes mellitus dietary education based on the 3J principle is effective in improving the knowledge of type 2 DM patients. All subjects experienced an increase in knowledge scores with an average increase of 3–4 points, where two patients improved from the poor category to good and one patient improved to adequate. This proves that brief and focused education for ± 15 minutes can have a positive impact on patient understanding. In addition to increased knowledge, all patients also experienced a decrease in Random Blood Sugar (RBS) values after the intervention, indicating the potential for short-term changes in dietary management behavior. These findings are in line with Kurnia et al. (2025), who stated that knowledge levels are related to dietary compliance and blood glucose control.

Although all respondents had a bachelor's degree, some still had low initial knowledge levels. This confirms that formal education does not always guarantee specific understanding of disease management, so health education remains a primary need for DM patients (Putri et al., 2025). The role of nurses as educators has proven to be important in improving patients' self-care and self-management abilities. Increased knowledge supports the formation of better disease management behaviors, as explained by (Prabowo et al., 2021). Lecture and question-and-answer methods enable two-way communication so that patients can more easily understand the material (Novina et al., 2021); (Sarumi et al., 2024).

CONCLUSION

This case study shows that providing diabetes mellitus education based on the 3J principle (amount, type, and schedule of meals) is effective in increasing the knowledge level of type 2 DM patients. All subjects experienced an increase in knowledge scores after a ± 15 -minute educational intervention using lectures and question-and-answer sessions. Two patients experienced an increase in their knowledge category from poor to good, while one patient improved from poor to adequate. In addition to increased knowledge, all patients also experienced a decrease in fasting blood glucose (FBG) levels, indicating the potential for short-term improvement in glycemic control. These findings indicate that brief, structured, and easy-to-understand education can be an applicable nursing intervention in improving patients' self-care abilities. Although the number of subjects was limited, the results of this study provide an overview that dietary education plays an important role in supporting the management of type 2 diabetes mellitus. It is recommended that dietary education be carried out continuously and integrated into nursing services to maintain knowledge improvement and encourage optimal patient behavior change.

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