

Dietary Patterns Among Patients with Diabetes Mellitus at Risk of Diabetic Foot Wounds at Kalimanah Public Health Center in 2026

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Abstract

Diabetes mellitus is a chronic metabolic disease that can cause various complications, one of which is diabetic wounds. An inappropriate diet can lead to unstable blood glucose levels, thereby increasing the risk of developing diabetic wounds. Based on a preliminary study at Puskesmas Kalimanah, it was found that the eating patterns of diabetes mellitus patients are still varied, prompting the author to conduct this research. The objective of this study is to understand the dietary patterns of diabetes mellitus patients with a risk of diabetic wounds at Puskesmas Kalimanah in 2026. The method used is descriptive quantitative with a cross-sectional approach. The research population consisted of 205 diabetes mellitus patients, with a sample of 32 respondents selected using purposive sampling. Data analysis was conducted univariately. The research results show that the majority of respondents have a diet categorized as good, with 30 respondents (93,75%), and respondents with a poor diet amounting to 2 respondents (6,25%). The conclusion of this study is that the majority of diabetes mellitus patients with a risk of diabetic wounds at Puskesmas Kalimanah have a diet categorized as good.

Keywords: *Diabetes mellitus, Dietary Pattern, Risk of Diabetes Mellitus Wounds.*

A. INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease characterized by elevated blood glucose levels resulting from impaired insulin production or the body's inability to use insulin effectively (Wahyuni et al., 2025). This condition is characterized by hyperglycemia accompanied by disturbances in carbohydrate, fat, and protein metabolism, which may lead to various serious complications, including kidney dysfunction, visual impairment, neuropathy, and cardiovascular disease (Lestari et al., 2021). One of the complications of diabetes mellitus that requires particular attention is diabetic foot wounds, which may progress to ulcers or gangrene if not properly managed. These conditions are associated with nerve damage and impaired blood circulation, resulting in reduced sensation in the feet, delayed wound healing, and an increased risk of infection (Sulistiani & Djamaluddin, 2024).

Age is an important risk factor to consider in patients with diabetes mellitus because it is associated with an increased risk of diabetic foot wounds. In addition, peripheral neuropathy can cause a loss of protective sensation, preventing patients from recognizing trauma or injuries to their feet that may subsequently develop into diabetic foot ulcers (Wahyudi et al., 2026). The International Diabetes Federation reported that approximately 463 million people aged 20–79 years were living with diabetes mellitus in 2019. This figure was projected to increase to 578 million by 2030

and reach 700 million by 2045. The prevalence of diabetes mellitus was also estimated to be high among individuals aged 65–79 years, reaching 19.9% (Gurning et al., 2025). Meanwhile, the World Health Organization (WHO, 2024) reported that the prevalence of diabetes mellitus among adults aged 18 years and older reached 14% in 2022. Diabetes mellitus also contributes to various complications and deaths, including those associated with kidney disease and cardiovascular disease related to elevated blood glucose levels.

In Indonesia, diabetic foot ulcers are among the complications that require particular attention in patients with diabetes mellitus. Munirah and Damayanti (2024) reported that approximately 15% of patients with diabetes mellitus in Indonesia are at risk of developing diabetic foot wounds. These complications may increase the risk of amputation and mortality. Diabetic foot wounds are also a significant health concern because they may necessitate hospitalization, particularly when accompanied by impaired circulation, loss of sensation, trauma, and tissue damage (Alkendhy et al., 2021). The Ministry of Health of the Republic of Indonesia (2024) similarly reported that the prevalence of diabetic ulcers reached approximately 15% of all patients with diabetes mellitus in Indonesia. These findings highlight the importance of effective diabetes management and complication prevention through appropriate disease management strategies.

In Central Java Province, diabetes mellitus is one of the non-communicable diseases with a substantial number of reported cases. The Central Java Provincial Health Profile indicated that diabetes mellitus ranked third among non-communicable diseases in 2023, accounting for 9.59% of reported cases, or approximately 669,000 newly reported cases (Central Java Provincial Health Office, 2024). In Purbalingga Regency, the number of diabetes mellitus cases has also increased considerably in recent years. Data reported by the Purbalingga Regency Government (2024) showed that the number of cases increased from 2,444 in 2019 to 13,117 in 2021. This situation highlights the need to strengthen diabetes management efforts, including education on healthy lifestyles and complication prevention.

One important aspect of diabetes mellitus management is the implementation of an appropriate dietary pattern. Inappropriate dietary habits can lead to unstable blood glucose levels and increase the risk of both acute and chronic complications. Kanda and Tanggo (2022), as cited in Amna (2024), explained that inappropriate dietary patterns may contribute to unstable blood glucose levels in patients with diabetes mellitus. Dietary management through appropriate food selection is therefore an important strategy for helping control blood glucose levels and preventing complications (Amna et al., 2024). In addition to its role in glycemic control, dietary intake is also associated with the nutritional status required to maintain tissue health.

Inappropriate dietary patterns may make blood glucose levels more difficult to control and potentially interfere with wound healing. Poor glycemic control can affect the delivery of oxygen and nutrients to tissues and increase the risk of chronic wounds in patients with diabetes mellitus. Therefore, appropriate dietary management is an

important component of diabetes care and may help reduce the risk of diabetic wound complications (Rassi et al., 2023). A study by Amalia & Agustina (2023) found a significant association between dietary patterns and the incidence of diabetes mellitus in the working area of Medan Johor Public Health Center ($p < 0.05$). Similarly, Sibagariang & Lumban Gaol (2022) identified significant associations between dietary patterns ($p = 0.023$) and physical activity ($p = 0.012$) and the incidence of diabetes mellitus. Meanwhile, Amna et al. (2024) investigated the relationship between dietary patterns and diabetic gangrene. These findings highlight the relevance of dietary management in diabetes care. However, dietary patterns among patients at risk of diabetic foot wounds still need to be examined in relation to the characteristics of specific populations and healthcare settings.

A preliminary study conducted at Kalimanah Public Health Center on March 11, 2026, identified 205 patients with diabetes mellitus, six of whom had diabetic wounds. These findings indicate that wound complications have occurred among patients with diabetes mellitus in the health center's service area, while other patients also require attention to risk factors that may contribute to the development of complications. Assessing dietary patterns is necessary to obtain an overview of patients' eating habits as an important aspect of disease management and efforts to prevent complications.

Based on this background, this study aimed to describe the dietary patterns of patients with diabetes mellitus who were at risk of developing diabetic wounds at Kalimanah Public Health Center in 2026. Specifically, the study described patients' dietary patterns according to good and poor categories and examined respondent characteristics, including age, educational level, and duration of diabetes mellitus. The findings are expected to provide useful information for patients, families, and healthcare professionals regarding the importance of dietary management in diabetes care and support efforts to prevent diabetic wound complications.

B. METHODS

This study employed a quantitative method with a descriptive design and a cross-sectional approach. A quantitative descriptive design was used to describe the research subjects based on actual conditions through statistical (Wulandari, 2023), while the cross-sectional approach involved collecting data at a single point in time or during a specific observation period (Sofya et al., 2024). The study was conducted at Kalimanah Public Health Center on May 20, 2026. The study population consisted of all patients with diabetes mellitus who attended examinations and follow-up visits at Kalimanah Public Health Center during the study period. Participants were selected using purposive sampling, in which respondents were recruited based on predetermined considerations and eligibility criteria (Notoatmodjo, 2023).

The inclusion criteria comprised patients diagnosed with type 2 diabetes mellitus, aged 40–80 years, with or without diabetic wounds, who were willing to participate by signing an informed consent form and were able to communicate effectively and complete the questionnaire appropriately. The exclusion criteria

included patients aged below 40 or above 80 years, patients diagnosed with type 1 diabetes mellitus, those who were absent during data collection or unwilling to sign the informed consent form, those unable to communicate effectively or complete the questionnaire, and those who withdrew from the study before its completion. The single study variable was dietary patterns among patients with diabetes mellitus, encompassing food types, food quantity or portion sizes, meal frequency, and regularity of meal schedules (Dekanawati et al., 2023).

The research instrument was a structured questionnaire adapted from Lase (2024), consisting of demographic information and 20 items assessing dietary patterns among patients with diabetes mellitus. The demographic data included age, highest educational attainment, and duration of diabetes mellitus. Dietary patterns were assessed using a Guttman scale with binary response options of “Yes” and “No.” For positively worded statements, “Yes” was assigned a score of 1 and “No” a score of 0. Conversely, for negatively worded statements, “Yes” was assigned a score of 0 and “No” a score of 1. Positive statements appeared in items 1 and 11–18, whereas negative statements appeared in items 2–10, 19, and 20. The total score was calculated by summing the scores for all questionnaire items. Dietary patterns were subsequently classified as good (scores of 10–20) or poor (scores of 0–9), following the categorization adapted from Lase, (2024). The instrument was reported to have undergone reliability testing, with a Kuder–Richardson Formula 20 (KR-20) coefficient of 0.966.

The study used both primary and secondary data. Primary data were obtained directly from respondents through questionnaire completion, whereas secondary data were obtained from the medical records of patients with diabetes mellitus at Kalimanah Public Health Center. Data collection involved questionnaires, observation, and documentation review to obtain information on dietary patterns and the number of patients with diabetes mellitus (Rahman et al., 2023). The research procedure began with obtaining research permission from the educational institution and Kalimanah Public Health Center, followed by coordination with the health center regarding the data collection schedule. The researcher then explained the study objectives to prospective respondents and provided informed consent forms. After consent had been obtained, the questionnaires were distributed to respondents for completion and subsequently collected. The researcher also retrieved relevant medical record data, checked the completeness of the collected information, and prepared the data for analysis.

Data processing involved four stages: editing, coding, scoring, and tabulating. Editing was performed to assess the completeness, clarity, and consistency of respondents’ answers. Coding involved converting responses into numerical codes according to the Guttman scale scoring system. Scoring was conducted by summing the scores of all questionnaire items to determine each respondent’s dietary pattern category. Tabulating involved presenting the processed data in frequency distribution tables. Data were analyzed using univariate analysis to describe respondents’ characteristics according to age, educational attainment, and duration of diabetes mellitus, as well as to describe dietary patterns according to the good and poor

categories (Nurdewi., 2022). The results were presented as frequencies and percentages and subsequently interpreted narratively with reference to relevant theories and previous research findings (Cahyaningrum & Gunawan, 2025).

The study adhered to research ethics principles, including beneficence, respect for human dignity, informed consent, justice, autonomy, and confidentiality. These principles were implemented by considering the potential benefits and risks of the study, respecting respondents' rights to make decisions regarding participation, obtaining informed consent after providing an explanation of the study, ensuring fair treatment of all respondents, allowing participants to participate voluntarily or withdraw from the study, and maintaining the confidentiality of respondents' information and data (Saidin et al., 2023)

C. RESULTS AND DISCUSSION

1. Respondent Characteristics

Table 1. Frequency Distribution of Respondent Characteristics Based on Demographic Data of Patients with Diabetes Mellitus at Kalimanah Public Health Center in 2026

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
40–50	5	15.6
51–60	14	43.8
61–70	11	34.4
71–80	2	6.3
Total	32	100.0
Educational Attainment		
Did not complete primary school	2	6.3
Primary school	12	37.5
Junior high school	6	18.8
Senior high school	12	37.5
Total	32	100.0
Duration of Diabetes Mellitus		
Less than 1 year	1	3.1
1–5 years	15	46.9
6–10 years	5	15.6
11–15 years	5	15.6
16–20 years	2	6.3
More than 20 years	4	12.5
Total	32	100.0

Source: Primary Data, 2026

Table 1 shows that the largest proportion of respondents belonged to the 51–60-year age group, comprising 14 respondents (43.8%). This was followed by the 61–70-year age group, with 11 respondents (34.4%), and the 40–50-year age group, with 5

respondents (15.6%). The smallest proportion was found among respondents aged 71–80 years, comprising 2 respondents (6.3%).

Regarding educational attainment, 12 respondents (37.5%) had completed primary school, and another 12 respondents (37.5%) had completed senior high school. Meanwhile, 6 respondents (18.8%) had completed junior high school, while 2 respondents (6.3%) had not completed primary school. In terms of the duration of diabetes mellitus, the majority of respondents had been living with the disease for 1–5 years, accounting for 15 respondents (46.9%). Five respondents (15.6%) had experienced the disease for 6–10 years, and another 5 respondents (15.6%) for 11–15 years. Furthermore, 4 respondents (12.5%) had been living with diabetes mellitus for more than 20 years, 2 respondents (6.3%) for 16–20 years, and 1 respondent (3.1%) for less than 1 year.

Based on Table 1, the largest proportion of respondents were aged 51–60 years, comprising 14 respondents (43.8%). This finding indicates that most respondents were in the 51–60-year age group, which falls within the pre-elderly category in the Indonesian context. This age group may be vulnerable to diabetes-related complications, including diabetic wounds. As individuals age, degenerative processes may lead to reduced glucose metabolism, impaired blood circulation, and decreased tissue function (Arimaswati et al., 2022). This finding is consistent with the study by Arimaswati et al. (2022), which identified age as one of the risk factors for diabetic ulcers. Patients with diabetes mellitus aged over 60 years were reported to have a higher risk of developing diabetic ulcers than younger patients.

Regarding educational attainment, the results showed that primary school and senior high school graduates were equally represented, with 12 respondents (37.5%) in each category. Educational attainment is an important characteristic that may influence an individual's ability to understand health information. Patients with limited formal education may require simpler and repeated health education to help them understand information about diabetes mellitus management (Safitri & Syafiq, 2022). This finding is supported by Safitri and Syafiq (2022), who demonstrated that health literacy plays an important role in patients' understanding of health information, including information related to diabetes mellitus.

In terms of disease duration, most respondents had been living with diabetes mellitus for 1–5 years, accounting for 15 respondents (46.9%). This finding indicates that the majority had a relatively short duration of disease. Nevertheless, patients with diabetes mellitus remain at risk of developing various complications if their blood glucose levels are not adequately controlled and their condition is not managed appropriately (Arimaswati et al., 2022).

Arimaswati et al. (2022) also discussed the occurrence of complications among patients with type 2 diabetes mellitus who had experienced the disease for more than 10 years. Prolonged hyperglycemia can contribute to microangiopathy and neuropathy, which may impair blood circulation and reduce sensation in the lower extremities, thereby increasing the risk of diabetic wounds.

Similarly, Ayu (2022) identified a duration of diabetes mellitus exceeding 10 years as a risk factor for diabetic foot ulcers. The longer an individual lives with diabetes mellitus, the greater the potential for chronic complications resulting from progressive damage to peripheral nerves and blood vessels.

Table 2. Frequency Distribution of Dietary Patterns among Patients with Diabetes Mellitus at Kalimanah Public Health Center in 2026

Dietary Pattern Category	Frequency (n)	Percentage (%)
Good	30	93.75
Poor	2	6.25
Total	32	100.00

Source: Primary Data, 2026

Table 2 shows that most respondents had good dietary patterns, accounting for 30 respondents (93.75%). In contrast, 2 respondents (6.25%) were classified as having poor dietary patterns. Most respondents had good dietary patterns, comprising 30 respondents (93.75%). This finding suggests that the majority of respondents reported dietary practices classified as good according to the assessment criteria used in this study. Maintaining an appropriate dietary pattern is an important component of diabetes mellitus management because it supports blood glucose control, nutritional status maintenance, and the prevention of complications, including diabetic wounds or diabetic ulcers (Kurian et al., 2023).

Dietary patterns play an important role in diabetes mellitus management because regulating food quantity, food types, and meal timing can support blood glucose control. Maintaining adequate glycemic control is particularly important for patients with diabetes mellitus because prolonged hyperglycemia can contribute to the development of complications. Gultom et al. (2026) explained that poor glycemic control is associated with the severity of diabetic foot ulcers and unfavorable clinical outcomes. Chronic hyperglycemia may impair wound-healing processes and increase susceptibility to infection.

These conditions may contribute to the risk of diabetic foot wounds through complications such as peripheral neuropathy and impaired circulation. Wahyudi et al. (2026) reported an association between peripheral neuropathy and diabetic foot ulcers. Peripheral neuropathy may increase susceptibility to foot injuries because reduced protective sensation makes it more difficult for patients to recognize trauma. Therefore, the good dietary patterns identified in this study can be considered part of diabetes mellitus management that may support blood glucose control. However, the risk of diabetic wounds remains an important complication that requires preventive measures among patients with diabetes mellitus.

The findings are also supported by Arif (2022), who reported a statistically significant relationship between dietary patterns and diabetic wound healing ($p = 0.002$). This result provides supporting evidence that dietary patterns are relevant to the management of patients with diabetes mellitus, particularly in relation to wound healing.

D. CONCLUSIONS

Based on the findings of this study on dietary patterns among patients with diabetes mellitus at risk of diabetic wounds at Kalimanah Public Health Center in 2026, it can be concluded that the majority of respondents had good dietary patterns, accounting for 30 respondents (93.75%). Regarding respondent characteristics, the largest age group was 51–60 years, comprising 14 respondents (43.8%). In terms of educational attainment, respondents with elementary and senior high school education were equally represented, with 12 respondents (37.5%) in each category. Furthermore, most respondents had been living with diabetes mellitus for 1–5 years, accounting for 15 respondents (46.9%).

This study had several limitations, including the absence of a specific observation checklist for assessing the risk of diabetic foot wounds and the relatively small sample size of 32 respondents. Consequently, the findings may not fully represent the dietary patterns of patients with diabetes mellitus at risk of diabetic wounds in the broader population. Nevertheless, the findings are expected to provide useful information for patients and healthcare professionals regarding the importance of maintaining good dietary patterns as part of diabetes mellitus management. Future studies are recommended to involve larger sample sizes, include broader study areas, and employ specific instruments to assess the risk of diabetic foot wounds to obtain more comprehensive findings.

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