Medical and Health Journal
Volume 5, Issue 2, 2026, pp. 338-350
e-ISSN: 2807-3541
Open Access: https://jos.unsoed.ac.id/index.php/mhj

Overview of Adherence Diet Management in Type 2 Diabetes Mellitus Patients at Kabila Public Health Center

Nurain Jusuf[1], Zuhriana K. Yusuf[2], Sitti Fatimah M. Arsad[3*]
[1] Department of Nursing, Gorontalo State University, Gorontalo City, Indonesia
[2] Department of Medicine, Gorontalo State University, Gorontalo City, Indonesia
[3] Department of Nursing, Gorontalo State University, Gorontalo City, Indonesia

ARTICLE INFO

Article history:
Received December 9, 2025
Revised December 11, 2025
Accepted February 2, 2026
Available online February 8, 2026

Keywords:
Type 2 Diabetes Mellitus, Diet Management, Compliance

ABSTRACT

Diet is a crucial part of managing type 2 diabetes mellitus. One way to achieve this is by following the 3J (Type, Amount, and Schedule) of dietary management. Dietary adherence remains variable, even though patients receive regular education through the PROLANIS program. Dietary non-compliance can result in uncontrolled blood glucose levels and an increased risk of chronic complications. This study aims to describe the 3J diet management compliance in type 2 Diabetes Mellitus patients at the Kabila Community Health Center. This study used a descriptive quantitative design. The research variable was 3J diet management compliance. The population was 289 type 2 DM patients, and a sample of 75 respondents selected using accidental sampling techniques. The instrument used was a 3J diet compliance questionnaire. Data were analyzed univariately using frequency distribution to describe the level of respondent compliance. The results of the study based on indicators, compliance with the type of diet showed that 45 respondents (60.0%) were non-compliant, the number of calories showed that 41 respondents (54.7%) were non-compliant, while the meal schedule showed that 47 respondents (62.7%) were compliant. These findings illustrate that most patients still experience difficulties in managing the type and amount of food, even though they have been quite good at complying with the meal schedule. The Community Health Center is advised to conduct monitoring activities and further research is suggested to develop peer tutoring-based intervention methods.

1. INTRODUCTION

Health is a fundamental aspect of people's lives and is one of the main concerns in national development. Diabetes mellitus is a chronic, long-term condition and is included in the four main types of non-communicable diseases that are a priority focus globally (Arsad *et al* ., 2023) . According to *the World Health Organization* (WHO) in 2024 , diabetes is the direct cause of 1.6 million deaths and 47% of all deaths due to diabetes occur before the age of 70 years. According to *the International Diabetes Federation* (IDF) in 2024 diabetes sufferers worldwide in 2024 Approximately 589 million adults (20-79 years) are living with diabetes.

The prevalence of diabetes mellitus in Southeast Asia is 78.3 million. Indonesia is the only country in the top 10 list of the highest number of diabetes mellitus sufferers in the world, with a total of 19.5 million sufferers. Data from the Gorontalo Provincial Health Office in 2023 shows that the area with the highest number of diabetes mellitus cases is Bone Bolango Regency with 5,469 cases. Data obtained from the Bone Bolango Regency Health Office in 2024 shows that the highest number of diabetes mellitus sufferers is at the Kabila Community Health Center, namely 425 people and those registered as PROLANIS members are 289 people.

Based on the diabetes mellitus data above, it shows an increase in diabetes mellitus cases in Indonesia, which can be triggered by lifestyle changes and factors that contribute to the high prevalence of diabetes mellitus (Yuniartika et al ., 2021). As a result, it can impact various body organ systems over a certain period of time, which can cause microvascular complications including damage to the nerves (neuropathy), kidneys (nephropathy), and eyes (retinopathy).

*Corresponding author
E-mail addresses: sittifatimah@ung.ac.id (Sitti Fatimah M. Arsad)

Meanwhile, macrovascular complications include heart disease, stroke, and disorders of the peripheral blood vessels (Rif'at et al ., 2023). Therefore, diabetes mellitus control can be done by controlling stress/illness, diet, physical exercise, education, knowledge, and information sources related to diabetes mellitus. One important factor in the successful management of diabetes mellitus is dietary regulation, because an inappropriate diet can cause increased blood glucose levels in diabetes mellitus sufferers (Elok Kurniasari & Wachidah Yuniartika, 2024).

Dietary management can be regulated through diet. Diet is an important component in the management of type 2 diabetes mellitus, in addition to physical activity, antidiabetic medication, and education (Dwika & Kusuma, 2022). One way to regulate diet is by paying attention to diet management (3J), namely: the number of calories needed, a meal schedule that must be adhered to, and the types of food that must be considered. Diabetes mellitus sufferers must know and understand what types of food can be consumed freely, and which must be limited. Sufferers must get used to eating at the right time and pay attention to the ideal proportions of nutrients such as carbohydrates, protein, fat, cholesterol, fiber, salt, and sweeteners that must be consumed, in addition to eating according to a schedule. This is intended to cause changes in blood glucose levels in diabetes mellitus sufferers. It is hoped that by calculating the amount, type of food, and the right schedule, blood glucose levels in diabetes mellitus sufferers will remain stable (Amran et al ., 2023).

Diabetes mellitus is an incurable disease, but proper management through dietary adjustments can prevent complications. Dietary adherence is a key factor in successful diabetes management. Adherence is a patient's adherence to and discipline in following the recommended diet. If a patient is able to regulate their portion sizes, choose appropriate foods, and adhere to mealtimes determined by healthcare professionals, they are considered compliant with the diet. Conversely, if a patient fails to control their portion sizes, consumes inappropriate foods, and fails to maintain a regular meal schedule, they are considered non-compliant with the diabetes diet (Maulidya, 2024).

Based on research by Nur (2023), the results showed that the majority of respondents were in the non-compliant category, namely 54 people (55.7%), while respondents were in the compliant category numbered 43 people (44.3%). These results indicate that the majority of Diabetes Mellitus sufferers in the Hutaimbaru Community Health Center work area still do not comply with dietary recommendations. Non-compliance with diet in diabetes mellitus patients can result in uncontrolled blood glucose levels, thereby increasing the risk of chronic complications such as heart disease, blood vessel disorders, kidney failure, and even death (Tirfie et al ., 2020).

This aligns with Alvionita's (2019) study of 33 type 2 diabetes patients at Panti Waluya Sawahan Hospital, which found that 51.5 percent of diabetes patients did not adhere to the hospital's recommended diet. This indicates that the majority of diabetes patients were not following dietary recommendations and had uncontrolled blood glucose levels.

Based on the results of initial observations at the Kabila Health Center in June 2025, of the 9 respondents interviewed, namely participants who participated in PROLANIS, all explained that they already knew about the 3J diet such as limiting the amount of sugar-containing foods and rice consumed, healthy types of food such as vegetables and fruit, eating 3 times a day, and regularly receiving education from health workers through the PROLANIS program. 2 people explained that they followed the doctor's recommendations such as regulating the portion of rice to be eaten and the meal schedule which was arranged every 08.00, 12.00 and 19.00 and limiting the consumption of cakes. On the other hand, 7 other people, despite having the same knowledge, were unable to resist the urge to consume foods that should be avoided, sometimes liking to increase food portions and eating after 22.00. Based on interviews with PROLANIS health workers at the Kabila Health Center, it has become a monthly SOP in PROLANIS activities to educate patients to maintain dietary patterns including paying attention to the required food calories, foods that need to be avoided and limited and the right meal times. Seeing this condition, it is important to further examine the picture of compliance with the 3J management diet in type 2 diabetes mellitus patients at the Kabila Community Health Center.

This indicates that although respondents with type 2 diabetes mellitus at the Kabila Community Health Center already know about the types of food that are recommended and those that should be avoided, the number of calories needed and the appropriate meal schedule and each PROLANIS activity has received education, these respondents still do not follow the recommendations that have been set by health workers and their knowledge about good diabetes management. Seeing this condition, it is important to further examine the picture of compliance with the 3J management diet in patients with type 2 diabetes mellitus at the Kabila Community Health Center.

2. METHOD

This research is a descriptive quantitative study. This research was conducted at the Kabila Community Health Center in September-October 2025 in accordance with the established PROLANIS schedule and the sample suitability that has been met. The population in this study were all patients with Type 2 Diabetes Mellitus at the Kabila Community Health Center, totaling 289 people. The sample used in this study amounted to 75 people who were determined using the accidental sampling technique .

The data collection tool used was a dietary compliance questionnaire. The questionnaire was compiled based on the 3J diet principle (correct type, correct amount, and correct schedule), with a total of 20 statements. In the correct type aspect, there are 8 statement items consisting of 6 favorable statements (numbers 1, 3, 4 , 6, 7, 8) and 2 unfavorable statements (numbers 2 and 5). The correct amount aspect consists of 7 statement items, namely 5 favorable statements (numbers 9, 10, 13 , 14, 15) and 2 unfavorable statements (numbers 11 and 12). The correct schedule aspect includes 5 statement items, consisting of 2 favorable statements (numbers 16 and 18) and 3 unfavorable statements (numbers 17, 19, 20). Each statement is answered using a frequency scale, namely always (SL) if done 5–7 times a week, often (SR) if done 1–4 times a week, sometimes (KK) if done 1–2 times a week, and never (TP) if not done at all. The answer scores are then added up and categorized into two groups, namely compliant if the respondent gets a non-compliant score if the score is <75% (20-59) of the total answers, and >75% (60-80) the score is compliant with the 3J diet.

3. RESULT AND DISCUSSION

Result

Kabila Community Health Center is a health care facility located on Jalan Sawah Besar, Oluhuta Village, Kabila District, Bone Bolango Regency. This community health center is one of 20 community health centers in Bone Bolango, covering an area of 193.45 km^2. Kabila District itself comprises 12 villages, each comprising five sub-districts .

Respondent Characteristics

In this study, 75 respondents were selected from the Kabila Community Health Center work area. From all the respondents, we obtained a description of their characteristics, including age, gender, marital status, income, education, duration of diabetes, family history of diabetes, and family support . This can be seen in the following table:

Table 1. Respondent Characteristics Based on Demographic Data

Characteristics	(n)	(%)
Age		
Adults (age <26-45)	4	5.3
Early old age (ages 46-55)	27	36.0
Late elderly (ages 56-65)	28	37.4
Seniors (age >65)	16	21.3
Total	75	100.0
Gender		
Man	10	13.3
Woman	65	86.7

Total	75	100.0
Marital status		
Not Married	2	2.7
Marry	59	78.6
Widower	2	2.7
Widow	12	16.0
Total	75	100.0
Income		
<UMP	58	77.3
≥UMP	17	22.7
Total	75	100.0
Education		
Elementary School	30	40.0
Junior High School	11	14.7
Senior High School	27	36.0
D3/Equivalent	7	9.3
Total	75	100.0
Long Suffering		
< 5 Years	39	52.0
≥ 5 Years	36	48.0
Total	75	100.0
Family History of DM		
There is	52	69.3
There isn't any	23	30.7
Total	75	100.0
Family Support		
Yes	57	76.0
No	18	24.0
Total	75	100.0

Source: Primary Data, 2025

From the results of the study of the distribution of respondents based on demographic data, it is known that of the 75 respondents, the age group of most respondents shows that there are 28 respondents (37.4%) in the late elderly group (56–65 years), 65 respondents (86.7%) are female, 59 respondents (78.7%) who show married marital status, 58 respondents (77.3%) with income <UMP, 30 respondents (40.0%) with elementary school education level, 39 respondents (52.0%) who have suffered <5 years, 52 respondents (69.3%) who have a family history of diabetes mellitus, 57 respondents (76.0%) who receive family support.

Univariate Analysis

Based on the research results, the results of univariate analysis were obtained based on the variables of dietary compliance and 3J management dietary compliance in the following table:

Table 2. Distribution of 3J Diet Management Compliance Variables

Category	Types of Food		Number of Calories		Meal Schedule	
	n	%	n	%	n	%
Obedient	30	40.0	34	45.3	47	62.7
Not obey	45	60.0	41	54.7	28	37.3
Total	75	100	75	100	75	100

Source: Primary Data, 2025

The results of the 3J diet management compliance are presented in Table 2 regarding the distribution of 3J diet management compliance variables from 75 respondents with type 2 diabetes mellitus at the Kabila Community Health Center. The results in this table indicate that the

highest compliance category is found in the meal schedule indicator, namely 47 respondents (62.7%), food type (45 respondents (60.0%), and the quantity indicator (41 respondents (54.7%).

Table 3. Distribution of Diet Compliance for 3J Diet Management

3J Management Diet Compliance	Frequency (n)	Percentage (%)
Obedient	28	37.3
Not obey	47	62.7
Total	75	100

Source: Primary Data, 2025

Based on the data in table 3 regarding compliance with the 3J management diet from 75 respondents with Type 2 Diabetes Mellitus at the Kabila Community Health Center, it shows that there are 28 respondents (37.3%) who comply with the 3J management diet, and 47 respondents (62.7%) who do not comply with the 3J management diet.

Discussion

Diet is a crucial component in the management of type 2 diabetes mellitus, alongside physical activity, antidiabetic medication use, and education. Dietary adherence is a behavioral trait that reflects the alignment of established dietary recommendations with those implemented in daily life. Dietary adherence indicates the extent to which diabetes mellitus patients adhere to a healthy diet in accordance with diabetes mellitus dietary recommendations (Elya & Nurdin, 2020).

The results of the study indicate that the level of compliance with the 3J diet management in general among type 2 diabetes mellitus patients at the Kabila Community Health Center is still relatively low. Of the 75 respondents, 47 (62.7%) did not adhere to the 3J diet principles, which include regulating the amount, schedule, and type of food, while only 28 (37.3%) adhered to the 3J diet. This finding indicates that the majority of patients have not been able to implement a diet according to the 3J diet provisions.

Dietary non-compliance is a serious problem for people with diabetes mellitus because it can lead to increased blood sugar levels, which can worsen the condition and lead to serious complications. Therefore, people with diabetes mellitus are advised to adhere to the 3J diet principles to maintain controlled glucose levels. Dietary adherence plays a crucial role in successful diabetes management and preventing complications. Blood sugar imbalances, whether too high (hyperglycemia) or too low (hypoglycemia), can cause problems for vital organs such as the eyes, kidneys, liver, and brain, and can even be fatal if not promptly addressed (Rahmatiah et al ., 2022).

Diet Management Compliance Based on Appropriate Type Indicators

Based on the results of data analysis on 75 respondents with Type 2 Diabetes Mellitus at the Kabila Community Health Center, it was found that the level of non-compliance with the 3J diet management was most common in the first indicator, namely food types. A total of 45 respondents (40.0%) showed non-compliance in this indicator. Non-compliance was particularly evident in question number 1, where 35 respondents still consumed foods high in sugar, fat, and salt, and in question number 3, where 28 respondents had not used special sweeteners for diabetes as a substitute for regular sugar.

This indicates that respondents still have difficulty limiting their consumption of non-recommended foods, such as fried foods, cakes, bread, and fast food, and still consume pure sugar without alternatives. This condition indicates that a diet high in sugar and fat remains a dominant habit, which has the potential to worsen blood glucose control by increasing the glycemic load and accelerating insulin resistance. Nevertheless, 41 respondents have demonstrated compliance with the food type indicator, particularly in question number 8 regarding limiting the consumption of foods such as salted eggs and salted fish.

According to PERKENI (2021), diabetes mellitus patients are advised to consume foods containing complex carbohydrates (brown rice, corn, boiled potatoes), lean protein, and increased

fiber from vegetables and fruits with a low glycemic index. Dietary compliance is measured by the extent to which a person consistently adheres to the established behaviors, as determined by the rules. This can be done by limiting the consumption of foods high in fat, sweeteners, and excess carbohydrates, and consuming fiber-rich foods, fruits, and vegetables according to the portions needed by the body and recommended by health professionals (Rahmawati et al ., 2024).

Dietary restrictions for people with diabetes not only focus on reducing sugar intake but also include controlling the consumption of high-fat foods, such as side dishes and fried snacks. Furthermore, people with diabetes are advised to choose healthier cooking methods, such as boiling, steaming, and baking (Elya & Nurdin, 2020). According to the American Diabetes Association (2024) recommendations, several dietary patterns that have been shown to be beneficial in diabetes management include low-fat, low-carbohydrate, and vegetarian diets. The American Diabetes Association also recommends that, regardless of carbohydrate count, focus on high-quality, nutrient-dense, high-fiber, and minimally processed carbohydrate sources. These include vegetables, fruits, legumes, whole grains, and dairy products such as milk and yogurt.

Factors that can cause non-compliance with this type of food are dominated by age, gender, education level, and income. Based on the characteristics data, non-compliance was more common among elderly respondents, namely 28 respondents (37.3%) were in the late elderly group (56–65 years) and 27 respondents (36.0%) were included in the early elderly group (46–55 years). In the 46-65 year age group, there were 34 respondents who were non-compliant with this type of food and 21 respondents who were compliant with this type of food. Age is the time span of a person starting from birth to their birthday. In developing countries, most people with diabetes mellitus are between 45-64 years old.

In older individuals, there is a decrease in mitochondrial activity in cells. This is caused by the decline in mitochondrial activity in muscle cells due to increased fat levels in the muscles, which triggers insulin resistance (Harefa & Lingga, 2023). Furthermore, the impact of the aging process also affects the physical. In the elderly, there can be a decline in the nervous system, namely a weakening of sensory and motor perception abilities in the central nervous system, which can lead to a decline in cognitive function, which can lead to memory loss and difficulty understanding complex dietary recommendations, which can reduce adherence to healthy eating in patients with type 2 diabetes mellitus (Mardiana & Sugiharto, 2022).

This is supported by research by Wilson et al . (2024) which showed that 61.3% of elderly patients (>55 years) had difficulty following healthy food recommendations, compared to only 38.7% of younger patients (<45 years). This was due to decreased cognitive function and difficult-to-change eating habits. Research by Alfiyah et al . (2024) also stated that age and long-standing habits influence changes in eating behavior in people with diabetes. In addition, based on the diabetes care guidelines by the American Diabetes Association (2022) for the elderly, it is emphasized that diabetes management in the elderly requires special attention to the medical, functional, and social aspects of conditions that can affect the patient's ability to carry out the recommended dietary regimen, thus explaining why non-compliance is more often found in the elderly group.

Nur's (2023) research also found that the majority of respondents with diabetes mellitus were aged 55–65 years (53.6%), and this age group showed lower levels of dietary compliance compared to younger age groups. The study explained that at this age, patients experience a decreased ability to adapt to lifestyle changes, including managing calorie intake and choosing foods in accordance with medical recommendations.

The results of this study also showed that the level of non-compliance with dietary intake was more dominant among female respondents than male respondents. The majority of female patients (65 respondents) were female, more dominant than male patients (10 respondents) (13.3%). Among females, there were 40 non-compliant respondents and 25 respondents who were compliant with dietary intake. This is because women with diabetes mellitus are physically at greater risk of increasing their body mass index than men (Sitorus et al ., 2024). This finding aligns with several previous studies that have shown that women tend to have more difficulty controlling the types of food they consume, especially sweet foods. Research by Feraco et al .

(2024) revealed differences in food preferences between men and women, with women tending to have a higher preference for sweet and high-energy foods than men.

In a study by Nisa et al . (2023), it was shown that respondents who did not adhere to the diet consisted of 58 women (64.5%) and 32 men (35.6%). This is also in accordance with the results of a study conducted by Gal et al . (2024) which showed that women with type 2 diabetes mellitus had slightly higher diet quality than men, but were also more susceptible to emotional eating behaviors that can disrupt the recommended diet routine. Research conducted by Piloto & Nugraheni (2024) showed that female respondents were the most dominant group, amounting to 78 people (54.9%). This indicates that women tend to have higher emotional stress, which can increase the tendency to experience emotional eating. In addition, women also exhibit emotional eating behavior more often and tend to choose snacks or fast food compared to men. This is supported by research by Rosenqvist et al . (2025) which showed results that 47.9% of women reported eating due to stress, while only 15.3% of men did so. Women showed higher levels of stress-induced eating than men.

In this study, the income of type 2 diabetes mellitus patients at the Kabila Community Health Center was below the minimum wage (UMP) for approximately 58 respondents (77.3%), compared to 17 respondents (22.7%) who had incomes above the UMP. In terms of diet, a good economic condition can make it easier for someone to implement and maintain a diet that suits their needs. Conversely, if the economy is not in good condition, someone may experience difficulties in implementing an ideal diet, for example due to limited funds to buy healthy food ingredients or follow the recommended diet program. This condition is evident from the research findings that in the income group below the UMP, there were 38 respondents who were non-compliant and 20 respondents who were compliant with the type of food. This can hinder the success and consistency in implementing the diet (Laia et al ., 2023).

A family's ability to purchase food depends on their income, which can determine the quality and quantity of food consumed. Low-income families generally spend a large portion of their income on basic food needs. Due to their unstable and relatively low income, they are often unable to meet balanced nutritional needs, including purchasing relatively expensive foods such as fruits and vegetables (Fitriyani et al ., 2023). This is in line with research by Nash et al . (2024), which shows that dietary patterns and quality are influenced by food prices. Healthy foods (fruits, vegetables, and quality protein sources) generally have a higher cost, making them less affordable for low-income groups, which risks compromising the quality of intake for diabetes patients.

Research conducted by Lewis et al . (2021) also showed that lower socioeconomic groups have limited access to healthy food. Although readily available, high prices lead them to choose cheaper, less nutritious foods. This finding is supported by research conducted by Eng et al . (2022), which found that 79.4% of low-income Malaysians considered price a major factor in food choices, resulting in low fruit and vegetable consumption.

The results of this type of indicator were also dominated by education, showing that the majority, approximately 30 respondents (40%), had an elementary school education. Within this elementary school education group, there were 22 non-compliant respondents and 8 compliant respondents, indicating that respondents with lower education levels tended to have difficulty implementing a proper diet. People with higher education levels typically have more knowledge about health, and education also influences a person's physical activity because it is related to their work (Arania et al ., 2023).

Poor dietary management can be caused by respondents' lack of knowledge regarding the importance of maintaining a healthy diet to prevent complications from type 2 diabetes mellitus. A person's knowledge is closely related to their level of education, as education is a learning process that can change individual behavior toward improving their quality of life. The higher a person's education level, the easier it is to receive, understand, and apply information to their daily behavior and lifestyle, including adhering to diabetes diet management. Individuals with higher education tend to have more extensive knowledge than those with lower education, as education is a crucial foundation for successful treatment (Ernawati et al ., 2020).

In a study by Susanti & Bistara (2020), it was found that the majority of respondents had an elementary school education (50%), so limited knowledge about dietary management could be

a factor triggering increased blood sugar levels. This is also in line with research conducted by Ernawati et al . (2020) who found that the majority of patients had a low education level, namely 27 people (84.38%). Therefore, non-compliance in carrying out dietary management could be caused by a lack of individual knowledge about the importance of maintaining a diet to prevent complications from type 2 diabetes mellitus.

Diet Management Compliance Based on Accurate Quantity Indicators

Based on the data analysis, the level of compliance with the 3J diet management, based on the second indicator, namely calorie intake, showed that more respondents were non-compliant. In this study, 41 respondents (54.7%) did not comply with the recommended food intake, while 34 respondents (45.3%) did comply with the recommended food intake.

Most respondents were unable to control their portion sizes according to their body's needs, which was generally influenced by the habit of eating large portions and a lack of knowledge about calorie intake. This non-compliance was more evident in question number 10, which limits carbohydrate intake to a maximum of 130 grams, where 35 respondents still did not limit their carbohydrate consumption properly. Furthermore, in question number 11, 24 respondents still frequently added snacks between meals. However, there was a positive aspect to this indicator, namely in question number 13, where 35 respondents actually complied by always adding vegetables to each portion of their meal.

According to PERKENI (2021), carbohydrates are recommended to comprise 45–65% of total energy intake, with a priority on high-fiber carbohydrate sources. Meanwhile, fat intake should be around 20–25% of total calorie needs and no more than 30% of total daily energy. However, many patients still consume large portions of simple carbohydrates, such as white rice, without considering the high glycemic index and tend to eat based on old habits.

According to the American Diabetes Association (2023), managing food quantity and portion size is an important part of medical nutrition therapy for people with diabetes. The ADA recommends consuming carbohydrates from nutrient-dense, high-fiber sources, with a minimum of 14 grams of fiber per 1,000 kcal, and from minimally processed foods such as non-starchy vegetables, fruits, nuts, and whole grains. Furthermore, people with diabetes are advised to replace sugary drinks with water or low-calorie beverages, limit sodium intake to 2,300 mg per day, and choose a diet rich in unsaturated fats from fish, nuts, and seeds.

A study by Febriana & Fayasari (2023) showed that more than half of diabetes patients were unable to control the amount of food they ate because they felt hungry quickly and were not used to measuring portions. Similar results were also presented by Upreti et al . (2024) who found that 53% of type 2 diabetes patients in Nepal had poor dietary practices, especially regarding food quantity. This condition can lead to insulin resistance, a condition where insulin levels are actually sufficient, but the body's cells are not sensitive to its action. As a result, insulin is unable to help the process of glucose entry into cells and glucose remains in the bloodstream unutilized by the tissues, thus causing increased blood sugar levels or hyperglycemia (American Diabetes Association, 2020; Novitasari et al ., 2022).

Some patients also report difficulty measuring food portions because they are not accustomed to using standard measurements. According to Upreti et al . (2024), diabetes patients in low-education communities often don't understand the concept of "balanced portion sizes," making it difficult to implement appropriate meal planning.

This study also indicates that responses to calorie management may differ based on the length of time a person has lived with the disease. The results of this study indicate that respondents were predominantly those with a duration of <5 years, namely 39 respondents (52.8%). In this category, there were 26 respondents who were non-compliant and only 13 respondents who were compliant with food management. This is in line with research by Jannasch et al., (2024) which showed that diabetes duration is an important predictor of dietary compliance, where patients with a longer duration are more likely to follow dietary recommendations more consistently. Thus, the newly diagnosed group (<5 years) potentially has an immature adaptation to calorie management, so they are more likely to show a higher level of non-compliance with calorie management than the group with a longer duration of disease.

This is also supported by the results of Windiramadha's (2024) study which showed that the longest duration of suffering was less than 5 years, as many as 37 (57.8%) respondents, many of whom were non-compliant with the 3J diet management. Long-term sufferers of diabetes mellitus tend to have better dietary compliance because they have developed a deeper understanding of the importance of dietary management in controlling their disease. Patients who have had diabetes mellitus for a long time may also have experienced negative consequences of dietary non-compliance, such as health complications, which then motivates them to be more disciplined in following the diet plan (Chairani et al ., 2020).

Based on the results of this study, it is also dominated by a family history of diabetes mellitus, which shows that 52 respondents (69.3%) have a family history of type 2 diabetes mellitus. This condition can affect the level of adherence to the diet, because individuals who have a family history of diabetes should have a higher awareness of the importance of dietary management, because they have witnessed the impact of disease complications on family members. However, in reality, unhealthy family consumption patterns are often imitated, thus affecting compliance with the amount of food.

Research by Siagian et al . (2025) showed a significant relationship between family history and dietary habits with the incidence of Type 2 Diabetes Mellitus, where individuals with a family history of diabetes mellitus were 14 times more likely to experience irregular eating patterns and high calorie consumption than those without a family history. A similar study by Nugraha et al . (2024) also showed that family history and dietary habits were dominant factors influencing the risk of diabetes mellitus and the level of compliance in maintaining a diet.

Diet Management Compliance Based on Accurate Schedule Indicators

Based on the results of the analysis of 3J diet management compliance data on the third indicator, namely the food schedule that must be followed, it shows that 47 respondents (62.7%) comply with the 3J diet management compliance, meaning that most respondents have been able to follow a regular meal schedule according to the 3J diet recommendations. This compliance is especially evident in question item number 16, namely eating behavior according to the schedule set out in the meal management program, where there are 31 respondents who often follow the recommended meal times. However, non-compliance is also still found in certain aspects, especially in question item number 20, namely the habit of eating rice more than three times a day, where 27 respondents do not comply.

Maintaining a proper meal schedule means spacing meals properly, with approximately three hours between main meals and snacks. Main meals are typically at 6:00 AM, 12:00 PM, and 6:00 PM, while snacks are served at 9:00 AM, 3:00 PM, and 9:00 PM. This meal schedule is crucial for people with diabetes mellitus because it allows for more stable digestion and absorption (Alkhulaifi & Darkoh, 2022).

The dominant factors in this indicator are marital status and family support. The majority of respondents in this study, 59 respondents (78.7%), were married. Of these, 37 respondents adhered to their meal schedule, while 22 respondents did not. This is consistent with research by Safaruddin & Permatasari (2022), which found that most diabetes mellitus patients at the Tanah Kalikedinding Community Health Center were married. Families play a role in the health status of diabetes mellitus patients. Family support positively impacts adherence to care management. Diabetes mellitus patients who receive family support tend to make healthier behavioral changes more easily than those who receive less support. Marital status can influence adherence to a proper diet, due to support from a partner who provides motivation and assistance in providing dietary needs. Husbands or wives, as the closest people to people with diabetes mellitus, play a crucial role in monitoring and reminding them about the types of food they should consume.

This is also supported by research conducted by Mphasha et al . (2022), which confirmed that spousal support plays a crucial role in diabetes management adherence. Patients with supportive partners tend to be more consistent in mealtimes and maintaining food intake compared to patients without such support. Based on research findings, respondents were often

accompanied to healthcare facilities, reminded to maintain proper meal schedules and avoid eating too late at night to maintain stable blood sugar levels.

Furthermore, the results of this study also showed that 57 respondents (76%) stated they received family support in managing their disease. In this category, 34 respondents adhered to their meal schedule and 23 respondents did not. Family support is a form of family attitude, actions, and acceptance of a family member who is experiencing illness. The success of the therapy process, both in the hospital and at home, will not be optimal without the active role and support of the family. This support is closely related to the patient's diet management. To achieve successful treatment and adherence to diet or diet management, social support is needed, one of which comes from the family of the diabetes mellitus sufferer (Amran et al ., 2023). According to research by (Safaruddin & Permatasari, 2022), DM sufferers who receive family support tend to make healthier behavioral changes more easily than those who receive less support.

Based on research conducted by Amran et al . (2023) at the Paccerakkang Community Health Center, it was shown that out of 46 respondents, 26 respondents (56.5%) had good family support, while 20 respondents (43.5%) had poor family support (no support). This is because family support is influenced by several factors, including marital status, in which respondents who are married receive more support compared to respondents who are single, widowed, or widowed.

This finding is supported by research by Dwi et al . (2024) which explains that family support is significantly related to dietary compliance in Type 2 DM patients, where patients who receive good family support are more consistent in following meal schedules and dietary recommendations compared to patients who receive less family support. Furthermore, research by Gamia et al . (2023) adds that family support and knowledge about diabetes diets play an important role in increasing patient compliance with regulating the amount and type of food consumed.

Faswita's (2023) study showed that 15 respondents (50%) were categorized as having good family support, categorizing them as compliant with dietary control. This is supported by statements from respondents at the Kabila Community Health Center, who stated that family members play an active role in supporting daily diabetes management. Family members often accompany patients during routine check-ups at the community health center and remind them of appropriate meal times.

A limitation of this study is that the researchers did not measure the calories of each respondent because each patient has different calorie needs, so this study did not calculate the number of calories needed by each respondent. The researchers did not focus on calculating the number of calories per respondent, but rather adjusted the 3J calculation, which focused on calories in general, based on the calorie standards set by PERKENI regarding the calorie limit for diabetes mellitus patients.

4. CONCLUSION

Based on the results of research on the description of compliance with the 3J management diet in type 2 diabetes mellitus patients at the Kabila Health Center, that of the 75 respondents with Type 2 Diabetes Mellitus at the Kabila Health Center, it shows that there are 28 respondents (37.3%) who comply with the 3J management diet, and 47 respondents (62.7%) who do not comply with the 3J management diet. These results indicate that most respondents do not comply with the 3J management diet in type 2 diabetes mellitus patients.

In the 3J diet management compliance is divided into 3 indicators which include the right type, the right amount, and the right schedule. In the indicator of the type of food that must be considered, the majority showed results of 45 respondents (60.0%) who did not comply, the indicator of the number of calories needed also showed results of 41 respondents (54.7%) who did not comply. For the indicator of the food schedule that must be followed, the results showed that 47 respondents (62.7%), meaning that most respondents were able to follow a regular meal schedule according to the 3J diet recommendations.

5. ACKNOWLEDGE

The researcher expresses his deepest appreciation and gratitude to the Kabila Community Health Center for the opportunity, permission, and support provided, enabling this research to be successfully conducted. He also thanks all respondents at the Kabila Community Health Center who volunteered their time and participated in this research. He also thanks the Head of the Kabila Community Health Center, along with all staff and related parties who provided assistance, cooperation, and contributions throughout the research process, ensuring its smooth running.

6. REFERENCES

Alfiyah, NS, Wowor, TJF, & Suralaga, C. (2024). Factors Associated with Diet Compliance of Type 2 Diabetes Mellitus Patients at the Pasar Minggu Community Health Center. *Malahayati Nursing Journal* , *6* (5), 2066–2080. https://doi.org/10.33024/mnj.v6i5.11442

Alkhulaifi, F., & Darkoh, C. (2022). Meal Timing, Meal Frequency and Metabolic Syndrome. *Nutrients* , *14* (9), 1–10. https://doi.org/10.3390/nu14091719

American Diabetes Association. (2023). Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2023. *Diabetes Care* , *46* (January), S68–S96. https://doi.org/10.2337/dc23-S005

American Diabetes Association. (2024). *The Latest Nutrition Recommendations For People With Diabetes* . American Diabetes Association Professional Practice Committee. Https://Glycemicindex.Com/2024/09/The-Latest-Nutrition-Recommendations-For-People-With-Diabetes/?Utm_Source

Amran, Zaenal, S., & Haskas, Y. (2023). The Relationship Of Family Support To 3j Diet Management In Type 2 Diabetes Mellitus Patients. *Jimpk: Student Scientific Journal & Nursing Research* , *3* (5), 62–70. Http://Dx.Doi.Org/10.20956/Ijas.....

Arania, R., Triwahyuni, T., Esfandiari, F., & Nugraha, Fr (2023). Relationship Between Age, Gender, And Education Level With The Incidence Of Diabetes Mellitus At The Mardi Waluyo Clinic, Central Lampung. *Journal of Economics/ Zeitschrift Fur Nationalokonomie* , *139* (3), 235–260. https://doi.org/10.1007/s00712-023-00827-w

Arsad, SFM, Djamaluddin, N., Yusuf, NAR, & Jafar, CPSH (2023). Implementation of the 5 Pillars through Family Assistance and Empowerment of Diabetes Mellitus Sufferers. *Collaborative Journal of SAINS* , *11* (November), 1596. https://doi.org/10.56338/jks.v6i11.4155

Bone Bolango District Health Office. (2025). *Bone District Health Office Data on Diabetes Mellitus Patients in Bone Bolango Regency* .

Gorontalo Provincial Health Office. (2023). *Data on Diabetes Mellitus Patients in Gorontalo Province* .

Dwi, A., Ida, A., Ratna, A., Badrul, P., & Fany, M. (2024). *Relationship between Family Support and Dietary Compliance in People with Type 2 Diabetes Mellitus Methods The type of research proposal used was correlational. This study uses a cross sectional approach. In this study, the population is people with ty* . *6* (1), 162–167.

Elok Kurniasari, & Wachidah Yuniartika. (2024). Controlling Blood Sugar Levels with Diet in Diabetes Mellitus Sufferers: Literature Review. *International Journal of Public Health* , *1* (3), 1–8. https://doi.org/10.62951/ijph.v1i3.63

Elya, RS, & Nurdin, NM (2020). *The Relationship between Diet Compliance, Physical Activity, and Stress Levels with Blood Glucose Levels in Type 2 Diabetes Mellitus Patients in…* . *3* (4), 286–294. https://repository.upnvj.ac.id/7851/

Eng, CW, Lim, SC, Ngongo, C., Sham, ZH, Kataria, I., Chandran, A., & Mustapha, FI (2022). Dietary practices, food purchasing, and perceptions about healthy food availability and affordability: a cross-sectional study of low-income Malaysian adults. *BMC Public Health* , *22* (1), 1–9. https://doi.org/10.1186/s12889-022-12598-y

Ernawati, DA, Harini, IM, & Gumilas, NSA (2020). Factors Influencing Diet Compliance Levels in Type 2 Diabetes Mellitus Patients in Sumbang District, Banyumas. *Journal of Bionursing* , *2* (1), 63–67. https://doi.org/10.20884/1.bion.2020.2.1.40

Faswita, W. (2023). The Relationship Between Family Support And Dietary Control Compliance In

Diabetes Mellitus Patients At The Binjai City Public Health Center In 2023. *Journal Of Nursing Science* , *12* (July), 136–145.

Febriana, NR, & Fayasari, A. (2023). The relationship between dietary compliance, family support, and self-motivation with blood sugar levels in diabetes mellitus patients at the Cisauk District Community Health Center, Tangerang Regency. *Indonesian Nutrition Science* , *7* (1), 21. https://doi.org/10.35842/ilgi.v7i1.411

Feraco, A., Armani, A., Amoah, I., Guseva, E., Camajani, E., Gorini, S., Strollo, R., Padua, E., Caprio, M., & Lombardo, M. (2024). Assessing gender differences in food preferences and physical activity: a population-based survey. *Frontiers in Nutrition* , *11* (February), 1–11. https://doi.org/10.3389/fnut.2024.1348456

Fitriyani, I., Kusyairi, A., & Sunanto. (2023). The relationship between dietary patterns and glucose levels in elderly people with type 2 diabetes mellitus at the Pajarakan Community Health Center, Probolinggo. *Mandira Cendikia Health Science Journal* , *2* (7), 149–156. https://journal-mandiracendikia.com/jbmc

Gal, A.M., Arhire, L.I., Gherasim, A., Graur, M., Nita, O., Dumitrascu, O., Soimaru, R.M., Popa, A.D., & Mihalache, L. (2024). Association between Diet Quality and Eating Behavior in Type 2 Diabetes Adults: A Cross-Sectional Study. *Nutrients* , *16* (13). https://doi.org/10.3390/nu16132047

Gamia, OP, Afrinis, N., & Verawati, B. (2023). The Relationship Between Knowledge and Family Support with Compliance with Diabetes Mellitus (DM) Diet in Type 2 DM Patients. *Tambusai Health Journal* , *4* (1), 15–22.

Jannasch, F., Nickel, D. V., Kuxhaus, O., & Schulze, M. B. (2024). Longitudinally changed diet quality scores and their association with type 2 diabetes mellitus and cardiovascular diseases in the EPIC-Potsdam study. *Scientific Reports* , *14* (1), 1–10. https://doi.org/10.1038/s41598-024-63899-8

Khasanah, JF, Ridlo, M., & Putri, GK (2021). Description of Diet Patterns of Amount, Schedule, and Type (3J) in Patients with Type 2 Diabetes Mellitus. *Indonesian Journal of Nursing Scientific* , *1* (1), 18–27.

Laia, B., Ginting, RIB, Zebua, JK, & Sunarti. (2023). Factors influencing dietary barriers in patients with type 2 diabetes mellitus. *Journal of Professional Nursing Research* , *5* (1), 171–178.

Lewis, M., McNaughton, S.A., Rychetnik, L., Chatfield, M.D., & Lee, A.J. (2021). Dietary intake, cost and affordability by socioeconomic group in Australia. *International Journal of Environmental Research and Public Health* , *18* (24). https://doi.org/10.3390/ijerph182413315

Mardiana, K., & Sugiharto. (2022). Overview of Cognitive Function Based on the Characteristics of Elderly People Living in the Community. *Scientific Journal of Nursing* , *8* (4), 577–584. https://doi.org/10.33023/jikep.v8i4.1283

Maulidya, R. (2024). The Relationship between Diet Compliance in Type II Diabetes Mellitus Patients and Diabetic Wound Healing. *Assyifa Journal of Islamic Nursing Science* , *9* (1), 62–68. https://doi.org/10.54460/jifa.v9i1.98

Mphasha, M.H., Mothiba, T.M., & Skaal, L. (2022). Family support in the management of diabetes patients' perspectives from Limpopo province in South Africa. *BMC Public Health* , *22* (1), 1–8. https://doi.org/10.1186/s12889-022-14903-1

Nash, S., Lee, A. J., & Lewis, M. (2024). Cost and Affordability of Habitual and Recommended Diets in Welfare-Dependent Households in Australia. *Nutrients* , *16* (5). https://doi.org/10.3390/nu16050659

Nisa, A., Arjita, PD, Mardiah, A., & Pramana, KD (2023). The Relationship Between Diet Compliance and Blood Glucose Levels in Type 2 Diabetes Mellitus Patients at the Karang Taliwang Community Health Center in Mataram. *Scientific Journal Of Health* , *05* (01), 91–101. https://jurnal.medikasuherman.ac.id

Novitasari, D., Fitriana, AS, Yantoro, AT, & Enarga, ABP (2022). Self-Management and Blood Glucose Monitoring as Strengthening Pillars of Type 2 Diabetes Mellitus Control. *Collaborative Journal of Community Service* , *2* (5), 414–422. https://doi.org/10.56359/kolaborasi.v2i5.175

Nugraha, KA, Widowati, I., Amirudin, Z., Semarang, PK, Lifestyle, S., Nugraha, KA, Widowati, I., & Amirudin, Z. (2024). The Relationship of Family History, Diet and Sedentary Lifestyle. *Jurnal Lintas Keperawatan* , 5–6.

Nur, M. (2023). *Level Of Dietary Compliance In Diabetes Mellitus (Dm) Patients In The Working Area Of Hutaimbaru Public Health Center, Padangsidimpuan City In 2023.* Aufa Royhan University.

Perkeni, (2021). Guidelines for the Management and Prevention of Type 2 Diabetes Mellitus in Adults in Indonesia 2021. *Global Initiative for Asthma* , 46. www.ginasthma.org.

Piloto, TC, & Nugraheni, F. (2024). The Relationship Between Gender and Emotional Eating in Adolescents. *Unesa Nutrition Journal* , *4* (4), 784–788.

Rahmatiah, S., Muh. Basri, Baharuddin. K, Khaerunnisa, Syahar, Yakub, & Yakub, AS (2022). The Relationship Between Dietary Compliance and Blood Sugar Levels in Patients with Diabetes Mellitus. Literature Review: The Relationship Between Dietary Compliance and Blood Sugar Levels in People with Diabetes Mellitus. *Scientific Journal of Health Diagnosis* , *17* (2), 40–45. https://jurnal.stikesnh.ac.id/index.php/jikd/article/view/1040/557

Rahmawati, M., Qodir, A., & Wulandari, AT (2024). *Dietary Compliance And Blood Glucose Levels In Type 2 Diabetes Mellitus Patients: A Cross-Sectional Study* . *5* (September), 9530–9538.

Rif'at, ID, Hasneli N, Y., & Indriati, G. (2023). Overview of Diabetes Mellitus Complications in Diabetes Mellitus Patients. *Journal of Professional Nursing* , *11* (1), 52–69. https://doi.org/10.33650/jkp.v11i1.5540

Rosenqvist, E., Kiviruusu, O., Berg, N., & Konttinen, H. (2025). Stress-induced eating and drinking and their associations with weight among women and men during 30-year follow-up. *Psychology and Health* , *40* (1), 1–16. https://doi.org/10.1080/08870446.2023.2192240

Safaruddin, S., & Permatasari, H. (2022). Family Support for Diabetes Self-Management in Type 2 Diabetes Mellitus Patients: A Systematic Review. *Journal of Community Health* , *8* (2), 195–204. https://doi.org/10.25311/keskom.vol8.iss2.1148

Siagian, FNR, Kalesaran, AFC, & Kaunang, WPJ (2025). The Relationship Between Family Medical History and Eating Habits and the Incidence of Type II Diabetes Mellitus at Bahu Community Health Center. *Prepotif: Journal of Public Health* , *9* (2), 4982–4988. https://doi.org/10.31004/prepotif.v9i2.44772

Susanti, & Bistara, DN (2020). The Relationship between Diet and Blood Sugar Levels in Patients with Diabetes Mellitus. *Journal of Vocational Health* , *3* (1), 29–34. http://journal.ugm.ac.id/jkesvo

Upreti, A.S., Aryal, B., Kuikel, J., & Sharma, M.K. (2024). Dietary practices of type 2 diabetes mellitus patients concerning Pender's health Promotion Model in Lalitpur district, Nepal. *Human Nutrition and Metabolism* , *38* (August), 200288. https://doi.org/10.1016/j.hnm.2024.200288

Wahyudin, W., Pauzi, R., Yunika, N., Setyanto, M., & Hidayah, A. (2025). The Relationship Between Blood Pressure And Blood Sugar Levels: The Moderating Role Of Age And Gender. Medical And Health Journal, 4(2), 198-203. doi:10.20884/1.mhj.2025.4.2.14571

WHO. (2024). *Global Report On Diabetes* . World Health Organization. https://www.who.int/news-room/fact-sheets/detail/diabetes

Wilson, D., Diji, AKA, Marfo, R., Amoh, P., Duodu, P.A., Akyirem, S., Gyamfi, D., Asare, H., Armah, J., Ebu Enyan, N.I., & Kyei-Dompim, J. (2024). Dietary adherence among persons with type 2 diabetes: A concurrent mixed methods study. *PLoS ONE* , *19* (5 May), 1–22. https://doi.org/10.1371/journal.pone.0302914

Windiramadhan, AP (2024). Lifestyle of Type 2 Diabetes Mellitus Patients in the Internal Medicine Polyclinic of Indramayu Regional Hospital. *Tasikmalaya Nursing Journal* , *02* (02), 30–37.