



The Relationship of The Level of Knowledge with Diet Compliance in Patients with Type 2 Diabetes Mellitus

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Article Info	Abstract
Article history: Received 23 August 2024 Revised 12 February 2026 Accepted 12 February 2026 Available online 15 August 2026 Keywords: Knowledge; Diet; Compliance; Diabetes Mellitus Correspondence: fernandoaspril24@gmail.com How to cite this article: Asprilla Fernando, Maulidya Septiany, Tina Handayani Nasution. The Relationship of The Level of Knowledge with Diet Compliance in Patients with Type 2 Diabetes Mellitus. MAGNA MEDIKA Berk Ilm Kedokt dan Kesehat. 2026; 13(2): 129–137	Background: Diabetes mellitus is a chronic disease that is most commonly found in people in the world. Most DM patients do not follow the recommended diet; adherence is very difficult and requires knowledge to help patients adapt to changes. Objective: To determine the relationship between the level of knowledge and diet compliance in patients with Type 2 Diabetes Mellitus Methods: The research method used was a non-experimental cross-sectional design. The technique used is purposive sampling. The research sample comprised 43 individuals with DM at Ulin Hospital in Banjarmasin. Data collection uses a questionnaire. Test the analysis using the Chi-Square test. Results: The research showed that the majority of respondents had a low level of knowledge (18 respondents, 41.87%), and most sufferers did not adhere to the diet (24 respondents, 55.8%). The results of the analysis show a relationship between knowledge level and diet compliance among Type 2 DM patients at Ulin Hospital, Banjarmasin, with a Chi-Square test value of 0.001. Conclusion: There is a relationship between the level of knowledge and dietary compliance of Type 2 Diabetes Mellitus patients at the Endocrine Sub-Specialist Polyclinic, Diabetic Foot Care, Internal Medicine, Ulin Hospital, Banjarmasin.

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INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder caused by the pancreas's failure to produce adequate insulin. Based on the cause, diabetes mellitus is classified into three types: type 1, type 2, and gestational diabetes mellitus (Ministry of Health of the Republic of Indonesia, 2020). A person is diagnosed with diabetes if their fasting plasma glucose is ≥ 126 mg/dL. Fasting is a condition of no calorie intake for at least 8 hours ¹.

The prevalence of DM sufferers in 2021 is 536.6 million people (10.5%) in the world suffering from DM, and it is estimated that this will continue to increase to 783.2 million people (12.2%) in 2045. Southeast Asia ranks 1st. -The 3rd largest number of DM sufferers in the world is 90.2 million people. Indonesia ranks 5th among 10 Southeast Asian countries in terms of the number of DM sufferers, with 19.5 million people ². In 2023, the prevalence of diabetes mellitus is based on doctors' diagnoses across all age groups by province: in South Kalimantan, there are 13,299 cases; in West Kalimantan, 17,713 cases; and in North Kalimantan, 2,300 cases ³. Based on medical records from Ulin Hospital in Banjarmasin in 2020, the number of inpatients with diabetes mellitus was 297, while the number of outpatients was 267.

Appropriate management of diabetes mellitus is very necessary to prevent an increase in the number of diabetes mellitus sufferers. Management is grouped into five pillars. The pillars of management are education, food planning (diet), physical exercise, medication, and checking blood glucose levels ⁴. Dietary management of type 2 diabetes mellitus has short-

term goals, namely eliminating complaints of type 2 diabetes mellitus, improving quality of life, reducing acute complications, and long-term goals, namely preventing and inhibiting the progression of macrovascular and microvascular complications. The ultimate goal of the type 2 diabetes mellitus diet is to reduce the morbidity and mortality of type 2 diabetes mellitus sufferers ⁵. Apart from that, diet is expected to improve the quality of life of sufferers. However, the problem that is often found is that DM sufferers do not comply with the recommended diet. Based on the research results, patient compliance with drug therapy tends to be better than lifestyle changes, such as exercise and diet ⁶.

Adhering to a diet is key to successful management of diabetes mellitus. Diabetes management includes 5 pillars, one of which is food planning ¹. Dietary compliance among patients with type 2 diabetes mellitus is based on the belief that following health workers' diabetes dietary recommendations is necessary. Dietary compliance is the key to successful management of type 2 diabetes mellitus ⁷. Dietary compliance in people with type 2 diabetes mellitus plays an important role in stabilizing blood sugar levels, and compliance itself is crucial for developing a routine that helps patients follow Media Gizi Pangan's eating plan. According to Lopula-lan, compliance can be very difficult and requires supportive factors such as family support, knowledge, and motivation, so that patients can adapt to the changes made by taking the time and opportunities needed. Behavior based on knowledge will be easier to implement than behavior that is not based on knowledge ⁸.

According to Ernawati et al., improper diet

management may be due to the respondent's lack of knowledge about the importance of maintaining a diet to avoid complications of Diabetes Mellitus⁹. This is in line with research conducted by Fitriana and Eka Asvita, which shows a relationship between knowledge and diet compliance, as respondents with good knowledge have the worst risk management when they do things incorrectly¹⁰. This means that respondents with good knowledge will be diligent in dieting to recover from this disease. Patient knowledge about diabetes mellitus is a tool that can help patients manage diabetes mellitus throughout their lives¹¹.

Based on the results of a preliminary study, which was carried out on July 5, 2021, on 10 Diabetes Mellitus patients in the Sub Specialist Polyclinic, Endocrine-Foot Care, Diabetic Internal Medicine, and the Geriatric Polyclinic room, Ulin Hospital, Banjarmasin, using 5 questions from the Level of Knowledge questionnaire and 5 statements. In the diet compliance questionnaire, 6 patients gave 4 incorrect answers on the level-of-knowledge questionnaire, and on the 5-item diet adherence questionnaire, 6 people stated that they rarely or never follow a diabetes mellitus diet. Based on this background and the problems, researchers are interested in conducting a study titled "The Relationship between Level of Knowledge and Diet Compliance in Type 2 Diabetes Mellitus Patients at Ulin Hospital, Banjarmasin."

METHODS

The research uses a correlational analysis method with a cross-sectional approach. The research respondents were 43 patients with diabetes mellitus in the Endocrine Sub-Specialist Polyclinic - Diabetic Foot Care in Internal Medicine and the Geriatric Polyclinic room at Ulin Hospital, Banjarmasin. Respondents were selected using purposive sampling techniques and research sample criteria. Research data were collected using a knowledge questionnaire and a diet compliance questionnaire and analyzed using the Chi-Square test. The research has received ethical approval from the ULM FKIK Ethics Committee (No. 157/KEPK-FK ULM/EC/VII/2023) and the Ulin Banjarmasin Hospital Ethics Committee (No. 177/VIII-Reg Research/RSUDU/23).

RESULTS

In Table 1, the proportion of respondents in the early elderly age group (45-55 years) was higher, at 16 respondents (37.2%). By gender, the majority of respondents were female, totaling 25 (58.1%). The highest educational grouping of respondents was high school level, with 17 respondents (39.5%). Based on the duration of Diabetes Mellitus, the most common was short duration (<5 years), with 27 respondents (62.8%). Table 2 shows that the majority of respondents have a low level of knowledge, namely 18 respondents (41.87%). Across all 15 knowledge questionnaire items, correct answers ranged from 53% to 81%.

Table 1. Distribution of Respondents Based on the Characteristics of Respondents Suffering from Type 2 Diabetes Mellitus at the Endocrine-Foot Care Diabetes Internal Medicine Sub-Specialist Polyclinic

Respondent Characteristics	Frequency (N)	Percentage (%)
Age		
Early adulthood (26-35 years)	8	18,6%
Late adulthood (36-45 years)	9	20,9%
Early elderly (45-55 years)	16	37,2%
Late elderly (56-65 years)	7	16,3
Seniors (≥ 65 years)	2	4,7%
Total	43	100%
Gender		
Man	18	41,9%
Woman	25	58,1%
Total	43	100%
Level of education		
Elementary School (SD-SMP)	11	25,6%
D1-D4/S1	15	34,9%
Total	43	100%
Long Suffering from Diabetes Mellitus		
Short Duration (< 5 years)	27	62,8%
Medium Duration (5-10 years)	14	32,6%
Long Duration (> 10 years)	2	4,7%
Total	43	100%

*Source: Aprilla, 2024***Table 2.** Distribution of Respondents Based on Level of Knowledge of Respondents Suffering from Type 2 Diabetes Mellitus at the Sub-Specialist Polyclinic Endocrine-Foot Care Diabetes Internal Medicine

Knowledge level	Frequency (N)	Percentage (%)
Good	13	30,23%
Moderate	12	27,90%
Less	18	41,87%
Total	43	100%

*Source: Aprilla, 2024***Table 3.** Distribution of Respondents Based on Diet Compliance Respondents Suffering from Type 2 Diabetes Mellitus at the Endocrine-Foot Care Diabetes Internal Medicine Sub-Specialist Polyclinic

Dietary Compliance	Frequency (N)	Percentage (%)
Obedient	19	44,2%
Not obey	24	55,8%
Total	43	100%

Source: Aprilla, 2024

Table 4. The relationship between the level of knowledge and diet compliance in Type 2 Diabetes Mellitus sufferers at the Endocrine Sub-Specialist Clinic, Diabetic Foot Care, Internal Medicine, Ulin Hospital, Banjarmasin

Knowledge level	Dietary Compliance		Analysis Results
	Obedient	Not obey	
Good	10	3	0,001
Moderate	6	6	
Less	3	15	

Source: Aprilla, 2024

In Table 3, the results showed that the majority of respondents did not adhere to the Diabetes Mellitus diet, namely 24 people (55.8%). Apart from that, from the results of the questionnaire, it was found that of the 43 respondents in the most rare item, 53% of the patients stated that they ate more than three times every day, while in the most rare item, 58.1% stated that they consumed food that contains a lot of oil every day. high in fat, such as fast food, fried foods, intestines, and liver. Of the remaining schedule items, at most 60.5% never stated that the patient did not record the food menu every day.

Based on the analysis of Table 4, the relationship between the level of knowledge and the dietary compliance of Type 2 Diabetes Mellitus patients at the Endocrine-Foot Care, Internal Medicine, Sub-Special Polyclinic, Ulin General Hospital, Banjarmasin is shown. Based on 43 respondents, the Chi-Square test yielded a value of 0.001, indicating a relationship between the level of knowledge and dietary compliance among Type 2 Diabetes Mellitus patients at the Endocrine-Foot Care, Internal Medicine, and Endocrine Specialist Polyclinic, Ulin Hospital, Banjarmasin. So the result obtained is that H_0 is rejected and H_a is accepted.

DISCUSSION

Level of Knowledge of Type 2 Diabetes Mellitus Patients

Based on the research results, 13 of the 43 respondents had good knowledge of diabetes mellitus and dietary therapy in patients with type 2 diabetes. Factors that influence a person's knowledge are experience and level of education. Knowledge is the result of knowing and will occur when sensing a particular object. Knowledge is obtained from sensing through the senses of sight, hearing, smell, taste, and touch ¹². The longer the respondent suffers from diabetes mellitus, the more their experience of the disease will increase. Experience will expand one's knowledge. The more experience a person has, the higher their knowledge. The higher education a person obtains will increase their intellectual level, making it easier to acquire information more quickly and effectively. Research also found that 18 of 43 respondents had insufficient knowledge. This was due to the patient's lack of curiosity about the disease they were suffering from, so they were less or even not interested in finding out, and even though they were given direction and knowledge about diabetes, they did not even pay attention ¹³. Knowledge is very important for DM sufferers because research shows it can help them

achieve goals, anticipate and respond naturally to their condition, and avoid complications.

Diet Compliance in Type 2 Diabetes Mellitus Patients

Based on the results obtained, the diet compliance of Type 2 Diabetes Mellitus patients at the Endocrine Sub-Specialist Polyclinic, Diabetes Foot Care, Internal Medicine, Ulin Hospital, Banjarmasin, showed that the majority of respondents were not compliant with the diabetes mellitus diet, namely 24 people (55.8%). The results of this study are consistent with those reported by Widyastuti, showing that 60.1% of patients with Type 2 diabetes mellitus did not comply with the diet program. Meanwhile, research conducted by Nasrul Hadi also showed that 58.3% of respondents did not comply with the diet ¹⁴.

Dietary compliance greatly influences the healing process of diabetes mellitus. Factors that influence dietary compliance include knowledge, attitudes, and family support. DM sufferers need to be reminded of the importance of regular eating patterns, including meal schedules, portion sizes, and food choices ¹⁵. Diabetes mellitus sufferers are strongly encouraged to eat regularly and in appropriate portions. The meal schedule for people with diabetes mellitus must always be followed. People with diabetes mellitus can eat 6 times: 3 main meals and 3 snacks ¹.

Based on the results of the dietary compliance questionnaire, many respondents answered "never" to the statement "the habit of controlling blood sugar levels at health centers / other health services to determine dietary needs." It is very important to conduct diabetes screening both independently and through

health services, such as community health centers and hospitals, so that sufferers can receive an early diagnosis and begin treatment promptly, minimizing the risk of complications and other adverse events. ^{16,17}.

Based on the dietary compliance questionnaire results, many respondents reported rarely consuming foods rich in vitamins and minerals. For people with diabetes, it is very important to understand how the food they consume affects blood glucose. Consuming foods rich in vitamins and minerals is also beneficial for people with diabetes, especially those that are natural and contain significant amounts of antioxidants. Types of food that contain these ingredients include fruits and vegetables, and they are recommended as antioxidants ¹⁸.

Based on the results of the diet compliance questionnaire, many respondents reported never recording their daily food menus. The food schedule for patients with diabetes must be arranged so that blood sugar remains within normal limits ¹⁹. The eating schedule for diabetics has been determined to be 3 large meals (morning, afternoon, and evening), with snacks between them, spaced about 3 hours apart. ²⁰. Setting regular meal times aims to reduce the burden on the body to digest food. This arrangement trains digestion so that sufferers can determine and regulate their hunger ¹⁸.

Relationship between Knowledge Level and Diet Compliance in Type 2 Diabetes Mellitus Patients

According to this study, there is a relationship between knowledge level and dietary compliance among patients with Type 2 diabetes mellitus at Ulin Hospital in

Banjarmasin, South Kalimantan. The strength of the relationship is sufficient, and the direction is positive. This can be interpreted as the better the level of knowledge, the more compliant diabetes mellitus patients will be in following their diet. Cognition, or knowledge, plays an important role in shaping a person's habits. Research shows that knowledge is the basis for a person's behavior.

High levels of knowledge, especially about health, will make people aware of the importance of maintaining health. Apart from that, high levels of knowledge will promote compliance with health programs and ensure that the illnesses they suffer from can be managed effectively. On the other hand, people with low levels of education tend to lack health knowledge, resulting in indifference toward maintaining their health.

In this study, as in research by Marshal et al., knowledge is related to the nutritional management of diabetes mellitus. Knowledge makes a person attentive and forms a careful attitude to maintain his condition. In this case, DM sufferers will maintain their lifestyle, including eating the right foods and following the recommended diet program. It can be concluded that the higher the patient's knowledge, the more information they obtain. A lot of information and knowledge will form good attitudes and behavior. This research is also in line with Nakamireto's research, which found a relationship between dietary compliance and the level of dietary knowledge among patients with type 2 diabetes mellitus (p-value 0.000) ²¹.

CONCLUSION

The research showed a relationship between knowledge level and dietary compliance among patients with diabetes mellitus at Ulin Hospital (p-value: 0.000). The majority of respondents had poor knowledge (18 people, 41.87%), while 12 people had moderate knowledge (27.90%) and 13 people had good knowledge (30.23%). The majority of respondents were non-compliant: 24 (55.8%), while 19 (44.2%) adhered to the diabetes diet.

Research suggestions are aimed at respondents, health agencies, and further research. Suggestions for respondents to increase their knowledge about the diabetes mellitus diet, which can increase compliance with their diet. Suggestions for health agencies to increase nurses' knowledge so they can provide health education and motivate patients with diabetes mellitus to follow a diet. Suggestions for further research to better understand the factors that influence dietary compliance.

REFERENCES

1. Perkumpulan Endokrinologi Indonesia. Pedoman Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 Dewasa di Indonesia 2021 [Internet]. Jakarta: PB PERKENI; 2021. Available from: www.ginasthma.org.
2. International Diabetes Federation. International Diabetes Federation (IDF) Diabetes Atlas 10th Edition. 10th, editor. Vol. 102, Diabetes Research and Clinical Practice. International Diabetes Federation; 2021.

3. Kemenkes RI. Survei Kesehatan Indonesia. Jakarta: Kementerian Kesehatan RI; 2023.
4. Damayanti S. Diabetes Mellitus & Penatalaksanaan Keperawatan. Yogyakarta: Nuha Medika; 2017.
5. Dewi T, Amir A. Kepatuhan Diet Pasien Dm Berdasarkan Tingkat Pengetahuan Dan Dukungan Keluarga Di Wilayah Puskesmas Sudiang Raya. Media Gizi Pangan. 2018;25(1):55–63.
6. Decroli E. Diabetes Mellitus Tipe 2. Padang: Universitas Andalas; 2019.
7. Simbolon Y, Triyanti, Sartika R. Faktor-Faktor yang Berhubungan Dengan Kepatuhan Diet Pada Penderita Diabetes Melitus Tipe 2 di Puskesmas Kecamatan Pasar Minggu Tahun 2018. Jurnal Kesehatan Komunitas. 2019;5(3):110–7.
8. Kartini T, Amir A, Sabir M. Kepatuhan Diet Pasien DM berdasarkan tingkat pengetahuan dan dukungan keluarga di Wilayah Puskesmas Sudiang Raya. Media Gizi Pangan. 2018;25(1):55–63.
9. Ernawati D, Harini I, Signa N, Gumilas A. Faktor Faktor yang Mempengaruhi Tingkat Kepatuhan Diet pada Pasien Diabetes Melitus Tipe 2 di Kecamatan Sumbang Banyumas. Journal of Bi-nursing. 2020;2(1):63–7.
10. Fitriana, Zeilen, Asvista S. Analisis Faktor Yang Mempengaruhi Kepatuhan Menjalankan Diet Pada Lansia Penderita Diabetes Mellitus Tipe Dua. Jurnal Keperawatan Silampari. 2021;4(2):351–8.
11. Kemenkes RI. Riset Kesehatan Dasar. Jakarta: Kementerian Kesehatan RI; 2018.
12. Pakpahan A. Metodologi Penelitian Ilmiah. Medan: Yayasan Kita Menulis; 2021.
13. Trisnadewi N, Adiputra I, Mitayanti N. Gambaran Pengetahuan Pasien Diabetes Mellitus (Dm) Dan Keluarga Tentang Manajemen Dm Tipe 2. Bali Med-ika Jurnal. 2018;5(2):5–2.
14. Salsabila, Syafira, Marni, Widiastuti A. Hubungan Tingkat Pengetahuan Dengan Kepatuhan Diet Pada Penderita Diabetes Melitus Tipe Ii Di Desa Cemeng Sambungmacan Sragen. In: Prosiding Seminar Informasi Kesehatan Nasional. 2023.
15. Suciana F, Daryani, Marwanti, Danang A. Penatalaksanaan 5 Pilar Pengendalian Dan Terhadap Kualitas Hidup Pasien DM Tipe 2. Jurnal Ilmiah Permas. 2019;9(4).
16. Kemenkes RI. Diabetes Melitus Pusat Data dan Informasi Kementerian Kesehatan RI. Jakarta: Kementerian Kesehatan RI; 2020.
17. Suhartatik S. Faktor -Faktor Yang Mempengaruhi Tingkat Kepatuhan Diet Penderita Diabetes Mellitus. Jurnal Kesehatan Tadulako. 2022;8(3):148–56.
18. Lonn E, Yusuf S, Hoogwerf B, Pogue J, Yi Q, Zinman B. Effects of vitamin E on cardiovascular and microvascular outcomes in high-risk patients with diabetes: results of the HOPE study and MICROHOPE substudy. Diabetes Care. 2002;25:1919–27.
19. Sundayana M, Rismayanti I, Devi I. Penurunan Kadar Gula Darah Pasien DM Tipe 2 Dengan Aktivitas Fisik. Jurnal Keperawatan Silampari. 2021;5(1):27–34.

20. Waspadji S. Pedoman Diet Diabetes Mellitus. Jakarta: FK UI; 2007.
21. Nakamireto G. Hubungan pengetahuan diet diabetes mellitus dengan kepatuhan diet pada pasien diabetes mellitus tipe 2 di wilayah kerja Puskesmas Gamping II Sleman Yogyakarta. [Yogyakarta]: STIKES Jenderal A. Yani; 2016.