



The Relationship Between Health Locus of Control and Diet Compliance in Diabetes Patients Type 2 Mellitus at Tilongkabila Community Health Center

Salwa Aulia Madiha¹, Ita Sulistiani², Gusti Pandi Liputo^{3*}

^{1,2,3}Program Studi Ilmu Keperawatan, Fakultas Olahraga Dan Kesehatan, Universitas Negeri Gorontalo

*Corresponding Author: E-mail: gusti@ung.ac.id

Article Info

Article history:

Received 12 Oct, 2025

Revised 21 Dec, 2025

Accepted 08 Jan, 2026

Keywords:

Health Locus of Control, Diet Compliance, Type 2 Diabetes Mellitus

ABSTRACT

This study aims to determine the relationship between Health Locus of Control and compliance with diet in Diabetes Mellitus (DM) patients at Tilongkabila Community Health Center. This research is a quantitative study. The research design I used in this study is correlational with a cross-sectional approach, which is carried out to see the relationship between the variables found. The level of dietary compliance in type 2 diabetes patients at the Tilongkabila Community Health Center shows that of the 74 respondents, there is 1 respondent (1.4%) who is not compliant, 57 respondents (77.0%) are quite compliant, and 16 respondents (21.6%) are compliant. The level of Health Locus of Control (HLOC) in the respondents consists of 13 respondents (17.6%) in the low category, 47 respondents (63.5%) in the moderate category, and 14 respondents (18.9%) in the high category. There is a relationship between Health Locus of Control and dietary compliance, where patients with a better HLOC show a tendency for higher dietary compliance.

INTRODUCTION

Non-communicable diseases are the largest group of diseases causing death in Indonesia. One of the non-communicable diseases causing high mortality in Indonesia is diabetes mellitus. Diabetes mellitus is often caused by an unhealthy lifestyle (Wijayanti, 2023).

In 2022, the World Health Organization (WHO) revealed that diabetes mellitus (DM) is one of the most common diseases globally. It also ranks fourth as a primary focus of degenerative disease research in various countries (WHO, 2022).

Diabetes Mellitus is often called the "silent killer" because it can strike without warning and be fatal for sufferers. Many people with diabetes are unaware they have it. Furthermore, diabetes is also called the "Mother of Diseases" because it triggers various other serious conditions such as hypertension, heart disease, blood vessel disorders, stroke, kidney failure, and even blindness (Hilda Chairani et al., 2025).

According to the WHO, by 2024, approximately 537 million adults worldwide will be living with diabetes. This number continues to grow year after year. In fact, between 1990 and 2022, the prevalence of diabetes in adults increased dramatically from approximately 10.5% to 14%. This increase occurred most frequently in low- and middle-income countries, demonstrating that diabetes is no longer an individual problem but has become a major challenge for public health systems worldwide (WHO, 2024).

According to data from the International Diabetes Federation (IDF), by 2024 it is estimated that there will be around 589 million adults aged 20–79 years worldwide living with diabetes.

This figure demonstrates the high global prevalence of diabetes, which is a serious health concern. Even more alarming is the IDF's projection that this figure will continue to rise significantly, reaching 853 million sufferers by 2050. The prevalence of diabetes mellitus in Southeast Asia is 78.3 million. Of these countries, Southeast, Indonesia is the only country included in the list of the top 10 countries with the highest number of diabetes mellitus sufferers in the world, with the number of sufferers reaching 19.5 million sufferers (Federation, 2024).

In 2023, the prevalence of DM in Indonesia experienced a sharp increase. The Indonesian Health Survey (SKI) recorded a surge in diabetes prevalence from 5.7% in 2007 to 11.7% in 2023. This surge reflects the increasingly serious burden of the disease in society. In fact, this situation places Indonesia as the country with the fifth highest number of diabetes sufferers in the world (Litha, 2024).

Based on data obtained from the Gorontalo Provincial Health Office, it states that Gorontalo residents who suffered from DM in 2023 were in Bone Bolango Regency with a total of 5,469 cases, followed by Gorontalo Regency with 4,547 cases, North Gorontalo Regency with 2,825 cases, Pohuato Regency with 1,671 cases, Gorontalo City with 1,426 cases, and Boalemo Regency with 1,281 cases (Gorontalo Provincial Health Office, 2023).

Bone Bolango Regency ranks first in terms of the highest number of DM sufferers in Gorontalo Province, with a recorded number of DM sufferers receiving standardized services in 2025 totaling 2,179 people spread across various Community Health Centers. The highest number of DM sufferers in Bone Bolango Regency was found at the Tilongkabila Community Health Center with a total number of DM sufferers from various age groups of 278 people, then the second highest was at the Kabila Community Health Center with 249 people suffering from DM, and the third highest number of sufferers was at the Tapa Community Health Center with 214 people suffering from DM (Bone Bolango Health Office, 2025).

The increasing prevalence of diabetes mellitus (DM) is influenced by several interrelated factors, including age, family history, diet, and physical activity. As we age, the function of our body's systems declines, including insulin sensitivity, which contributes to increased blood glucose levels. Family history is also an important factor, especially when a close family member, such as a parent or sibling, also has diabetes, due to the genetic predisposition that can be passed on. Furthermore, unhealthy diets, such as high-sugar foods, fast food, and irregular eating habits, have been shown to increase the risk of diabetes mellitus.

Not only that, lack of physical activity can also worsen this condition, because the body is no longer able to metabolize glucose optimally, which is then stored as fat and strengthens insulin resistance (Iriyanti et al., 2022).

Diabetes mellitus management is carried out through five interrelated main pillars: education, physical activity, nutritional management (diet), self-monitoring of blood sugar, and the use of oral antidiabetic medications (OADs) (Prawinda et al., 2024). Nutritional management is an effort to regulate food intake to maintain a balance according to the body's needs. In diabetes mellitus management, dietary management is a crucial component (Dwika and Kusuma, 2022).

Nutritional management (diet) for diabetes sufferers, also known as Medical Nutrition Therapy (MNT), which is a strategy for regulating eating patterns focused on helping control blood glucose levels, achieving ideal body weight, and reducing the risk of complications (Prevention, 2024). Compliance with the diet is essential for people with diabetes, with the goal of maintaining stable blood glucose levels.

Compliance in diet describes the extent to which patients are willing to follow a diet according to the recommendations of doctors and medical personnel that have been determined (Hilda Chairani et al., 2025). Dietary adherence is influenced by a number of factors, including predisposing factors such as individual characteristics and psychosocial aspects, reinforcing factors such as support from family and health workers, and enabling factors including the availability of services and distance to health facilities (Meidiah Dwitami et al., 2024).

Dietary non-compliance in type 2 diabetes patients remains a serious problem in successful disease management. Research shows that approximately 75% of diabetes sufferers Not following the recommended diet. This situation illustrates that most patients still struggle to consistently regulate the types of food consumed, portion sizes, and meal schedules. The impact cannot be ignored, as dietary non-compliance directly contributes to unstable blood glucose levels and becomes a gateway to various chronic complications, such as stroke due to cerebral blood vessel damage, kidney failure due to progressive kidney damage, coronary heart disease, blindness due to diabetic retinopathy, and even limb amputations due to non-healing wounds.

This fact confirms that dietary compliance issues are not simply a lack of discipline, but a crucial determinant of the quality of life of type 2 diabetes patients (Mudawati et al., 2025). Therefore, it is important to examine the psychological factors that influence adherence behavior, one of which is through the concept of Health Locus of Control (HLOC).

The concept of Health Locus of Control (HLOC) stems from the psychological theory of locus of control developed by Wallston in the 1970s. This theory emphasizes that actions taken consciously and based on a belief in the importance of health can help prevent disease and improve well-being. If a person believes they can maintain their health through personal behavior and decisions, this is called internal HLOC. Conversely, external HLOC arises when an individual perceives their health to be determined by factors beyond their control, such as a lack of information, personal habits, or limitations in taking action (Lindström et al., 2022).

Dietary adherence is a crucial aspect of managing type 2 diabetes, yet in practice it often remains a challenge for patients. Research conducted by (Adhanty, Ayubi, and Anshari, 2021) shows a tendency for the internal and powerful others dimensions of HLOC to improve dietary adherence, while the chance dimension

tend to weaken it. A similar finding was seen in a study (Ayatollah, Bagus, and Adriani, 2024), which found that patients with higher HLOC levels exhibited relatively better eating behaviors compared to patients with lower HLOC.

Research (Meidiah Dwitami, T. Eltrikanawati, 2024) also showed that respondents with low HLOC were more likely to not follow dietary rules than those with high HLOC. These studies suggest that HLOC has the potential to be a factor influencing dietary adherence patterns in patients with type 2 diabetes, warranting further investigation.

While previous research has focused on aspects of eating behavior and glycemic control in general, studies specifically addressing dietary adherence in people with type 2 diabetes are relatively limited. Yet, dietary adherence is one of the most crucial components of diabetes management, as it directly relates to stable blood glucose levels and the prevention of complications. Most previous studies have focused on broad eating behaviors or linked health locus of control to clinical indicators such as blood glucose levels, leaving dietary adherence understudied. In this study, the focus is directed at dietary compliance as the main variable by using instruments that have been modified according to the local context and community habits.

Based on initial observations at the Tilongkabila Community Health Center, it was discovered that of the 10 diabetes mellitus patients who regularly participated in the PROLANIS program, the majority still did not comply with the recommended diet. Although education on diabetes management, including dietary adjustments, had been provided repeatedly by health workers, participants reported that following the diet remained difficult. They admitted to having difficulty maintaining a regular daily diet, both in terms of the type and quantity of food. This situation provides a strong rationale for further research into psychological factors, such as health locus of control, which may play a role in determining patient compliance with the diet in the Tilongkabila Community Health Center's work area.

RESEARCH METHODS

This research is quantitative. The research design I used in this study was correlational with a cross-sectional approach, which was carried out to determine the relationship between the variables found (Nursalam, 2016). Correlational research aims to determine the relationship between a person's characteristics or the existence of another, or correlational research essentially aims to determine and determine the extent of variation in one or more other factors based on the correlation coefficient (Kholidah, 2023), while the cross-sectional approach method is a type of research that emphasizes the measurement or observation of independent and dependent variable data only once at a time (Herdiani 2021). This method was used to determine the relationship between Health Locus of Control and dietary compliance in Diabetes Mellitus patients at the Tilongkabila Community Health Center. The study was conducted in the Tilongkabila Community Health Center, Bone Bolango Regency, in October 2025. A sample size of 74 people was used. Data Analysis Techniques

Univariate Analysis

Univariate analysis is an analysis technique that focuses on a single variable. Through this process, unstructured raw data will be processed, organized, and summarized to produce clearer, more meaningful, and easier-to-understand information (Donsu, 2020). Univariate analysis in this study will be conducted using a frequency distribution table covering respondent characteristics, health locus of control variables, data obtained through the Multidimensional Health Locus of Control Scale (MHLC) questionnaire. The questionnaire is divided into three dimensions, namely Internal HLC, Chance HLC, and Powerful Others HLC. Each dimension consists of six items with a score range between 6 and 36. The scores obtained are then grouped into three categories, namely low, medium, and high, so this variable is analyzed using an ordinal scale. Meanwhile, the variable undergoing dietary compliance data was obtained from the dietary compliance questionnaire consisting of 18 questions with alternative answers always, often, rarely, and never. Questions consist of positive and negative questions with categories of bad, enough, and good so that they are also analyzed using an ordinal scale.

Bivariate Analysis

Bivariate analysis is a data analysis used to identify the relationship between two variables: the independent variable (which influences) and the dependent variable (which is influenced) (Donsu, 2020). The bivariate analysis in this study aimed to determine the relationship between health locus of control and diet adherence. Since both variables are categorized as ordinal data, the Spearman Rank Test was used.

RESULTS**Characteristics Respondents**

Table 1 Respondent characteristics based on age

No	Age	frequency (n)	percentage (%)
1.	Adults (30-49 years)	20	27.0
2.	Late Adulthood (50-59 years)	26	35.1
	Young Elderly (60-69 years)		
3.	Elderly (70-79 years)	21	28.4
4.	Older Adults (>80 years)	6	8.1
5		1	1.4
Total		74	100

Based on Table 1, it can be concluded that the age of the respondents in this study was mostly 50-59 years old (late adults) totaling 26 respondents (35.1%), and a small number were aged >80 years (old elderly) totaling 1 (1.4%). Overall, the number of respondents in this study was 74 respondents (100%)

Respondent characteristics based on duration of suffering

Table 2 Respondent characteristics based on length of suffering

No Longer Suffering	frequency (n)	percentage (%)
1. <5 Years	55	74.3
2. ≥5 Years	19	25.7
Total	74	100

Based on table 2, it can be concluded that the duration of Diabetes Mellitus suffered by the respondents in this study was mostly <5 years, amounting to 55 respondents (74.3%) and a small number of respondents suffered from Diabetes Mellitus for ≥5 years, amounting to 19 respondents (25.7%).

Respondent characteristics based on family history

Table 3 Respondent characteristics based on family history

No Family History	frequency (n)	percentage (%)
1. There isn't any	46	62.2
2. You	12	16.1
3. Father	2	2.7
4. Mother	5	6.8
5. Mother father	2	2.7
6. Husband	2	2.7
7. Child	4	5.4
8. Wife	1	1.4
Total	74	100

Based on table 3, it can be concluded that the Family History of Disease in this study was mostly that there was no family history of disease, amounting to 46 respondents (62.2%) and a small number of respondents had a history of family disease in the wife, amounting to 1 respondent (1.4%).

Respondent characteristics based on medical history

Table 4. Respondent characteristics based on medical history

No Medical History		frequency (n)	percentage (%)
1.	There isn't any	15	20.3
2.	Hypertension	32	43.2
3.	Cholesterol	8	10.8
4.	Gout	3	4.1
5.	Hypertension, Cholesterol	11	14.8
6.	Uric Acid, Cholesterol	3	4.1
7.	Heart, Cholesterol	2	2.7
Total		74	100

Based on table 4, it can be concluded that the medical history in this study was mostly respondents who had a history of hypertension, amounting to 32 respondents (43.2%) and a small number of respondents had a history of heart disease, cholesterol, amounting to 2 respondents (2.7%).

Univariate Analysis

Frequency distribution of respondents based on Health Locus of Control

Table 5. Frequency distribution of respondents based on Health Locus of Control

No.	Health Locus of Control	frequency (n)	percentage (%)
1.	Low	13	17.6
2.	Currently	47	63.5
3	Tall	14	18.9
Total		74	100

Based on table 5 in this study, the majority of respondents have a moderate Health Locus of Control with a total of 47 respondents (63.5%), and a small portion of Health Locus of Control is in the low range with a total of 13 respondents (17.6%).

Frequency distribution of respondents based on dietary compliance

Table 6. Frequency distribution of respondents based on dietary compliance

No.	Diet Compliance	frequency (n)	percentage (%)
1.	Not obey	1	1.4
2.	Quite Compliant	57	77.0
3	Obedient	16	21.6
Total		74	100

Based on table 6 in this study, the majority of respondents' dietary compliance was quite compliant with a total of 57 respondents (77.0%), and a small proportion of respondents who were not compliant with a total of 1 respondent (1.4%).

Bivariate Analysis

The Relationship Between Health Locus of Control and Diet Compliance in Diabetes Patients Type 2 Mellitus in the Tilongkabila Community Health Center Area

Table 7. Relationship between Health Locus of Control and Diet Compliance in Type 2 Diabetes Mellitus Patients in the Tilongkabila Community Health Center Area

Health Locus Of Control	Compliance Diet Control (HLC)						Total		Results Value statistics	Test P-
	Not Compliant		Enough Compliant		Compliant					
	N	%	N	%	N	%				
Low	1	7.7	12	92.3	0	0	13	100	0,000	
Currently	0	0	41	87.2	6	12.8	47	100		
Tall	0			28.6	10	71.4	42	100		
Total	1	0.14	457	77.0	16		74	100		

Based on table 7 above, the results of the data analysis show that the majority of respondents have moderate HLOC with 41 respondents (87.2%) having moderate dietary compliance and a small number of respondents having low HLOC with 1 respondent (7.7%) not having adequate dietary compliance.

The results of the statistical test using Spearman rank obtained a p-value (0.000) smaller than $\alpha = 0.05$ or p-value < α value so it was concluded that H1 was accepted, meaning that there was a relationship between Health Locus of Control and compliance with a diet in diabetes mellitus sufferers.

Relationship	rhitung	P-value	Decision
between Health Locus of Control	.556**	.000	H0 is rejected
and Diet Compliance	.556**	.000	H0 is rejected

Based on the table above, the results of the data analysis show a correlation coefficient (r) of .556, which is moderate between Health Locus of Control (HLC) and Diet Compliance. The significance value of .000 is greater than $\alpha = 0.05$, meaning there is a statistically significant relationship between the two variables. The results of the statistical test using Spearman rank obtained a p-value (0.000) which is smaller than $\alpha = 0.05$ or p-value < α value so it is concluded that H1 is accepted, meaning that there is a relationship between Health Locus of Control and compliance with a diet in diabetes mellitus sufferers.

DISCUSSION

Level of compliance with diet in type 2 diabetes mellitus patients at Tilongkabila Community Health Center Based on the results of a study conducted on 74 respondents with type 2 diabetes mellitus at the Tilongkabila Community Health Center, it was found that 57 respondents (77.0%) had moderate dietary compliance, 16 respondents (21.6%) had moderate dietary compliance, and 1 respondent (1.4%) had poor dietary compliance. From these results, it can be concluded that the majority of respondents had a fairly good level of dietary compliance.

Compliance is the level of patient behavior that is directed towards instructions or directions given in any form of therapy found, whether diet, exercise, medication, or keeping appointments with the doctor. According to Hartono in Esti Windusari (2013), diabetes diet compliance is adherence to the food and drink consumed by diabetes patients every day to maintain health and accelerate the healing process. This diet consists of 3Js: the right schedule, the right type, and the right amount (Nursihah and Wijaya 2021).

Based on the Theory of Planned Behavior (TPB) developed by psychologist Icek Ajzen in 1985 as an extension of the Theory of Reasoned Action (TRA) created by Ajzen and Fishbein in 1975, it explains and predicts human behavior based on rational cognitive processes, where individuals considering the consequences before acting. This theory emphasizes that behavior is not entirely voluntary, but rather influenced by perceived behavioral control. In a healthcare context, the TPB is often used to understand patient adherence to regimens such as diet, particularly in chronic diseases such as type 2 diabetes mellitus (DM), where dietary adherence is crucial for glycemic control and preventing complications.

The results of the study conducted on type 2 diabetes mellitus sufferers at the Tilongkabila Community Health Center with a total of 74 respondents, obtained that as many as 57 respondents (77.0%) had

fairly compliant diet compliance, this can be seen based on the respondents' answers that most of them showed that most of the respondents had tried to implement the recommended diabetes diet even though they were not completely consistent and they tried to maintain regular meal times, even though in certain conditions they still experienced delays or changes in meal schedules due to daily activities.

This is in line with research conducted by Adhanty, Ayubi, and Anshari (2021), which found that the average value of respondent compliance was 66.23 on a scale of 100, where this figure represents that respondent compliance is in the sufficient category.

The level of compliance is in the sufficient category based on research found that respondents aged 50-59 years have a fairly compliant level of compliance, namely 20 respondents. This is because in theory, individuals aged 50-59 years generally have a better awareness of their health conditions compared to younger ages. At this stage, a person begins to feel the long-term impact of chronic diseases such as diabetes mellitus, so that the urge arises to make changes in health behavior, including regulating diet.

This explains why most respondents have shown efforts to comply with the recommended diet. However, according to health behavior change theories (the Health Belief Model and the Theory of Planned Behavior), although perceptions of disease vulnerability and severity tend to increase in this age group, long-established lifestyle habits act as barriers to achieving optimal adherence. In early old age, dietary patterns, food preferences, and social habits that have been in place for many years are relatively difficult to completely change, so dietary adherence is often moderate rather than high.

Based on research conducted by Abose et al., (2024), it was shown that late adult patients have a better level of dietary compliance because they have experienced the direct impact of blood sugar fluctuations and an increased risk of complications. This is also in line with research by Rohmah Puriana Khusnaa (2023) which found a significant relationship between age and dietary compliance, where patients aged ≥ 45 years were quite or much more compliant in following dietary recommendations than younger age groups. Therefore, it can be concluded that age plays a role in shaping thought patterns, disease experiences, and motivation in maintaining dietary compliance.

Several studies have found that older respondents tend to demonstrate better dietary adherence than younger respondents. This is because with increasing age, the perceived threat of chronic complications that can arise from diabetes, such as heart disease or kidney damage, increases. This greater perception of risk is what makes older patients more disciplined in their diet.

Besides age, the duration of diabetes mellitus can also influence a person's level of adherence. The study found that 44 respondents with diabetes mellitus (<5 years) had moderate adherence to the diet, while 13 respondents with diabetes mellitus (>5 years) had moderate adherence.

The results of this study align with research conducted by Yulia (2019), which showed a relationship between the duration of DM and dietary adherence. Yulia stated that the longer a person has DM, the greater the tendency to consume unhealthy foods, not follow a diet program, and experience boredom.

A medical history is also a factor that can influence a person's level of compliance. Based on the results of the study, 33 respondents with a moderate level of compliance had a history of several medical conditions besides diabetes.

These results align with various studies showing that medical history, including a previous history of diabetes mellitus (DM), complications, and comorbidities such as hypertension or dyslipidemia, can influence patient adherence to treatment and diet. Patients with a longer medical history or who have experienced complications generally have a higher awareness of the importance of adherence, thus tending to be more compliant with diet and therapy. This is demonstrated in studies revealing that patients with a history of DM complications demonstrate higher adherence to diet because they feel more responsible for maintaining their health to prevent worsening of their condition. This finding is supported by journals reporting that prior medical history is positively correlated with adherence to DM management, as more complex disease experiences increase patient awareness of risks and motivation to comply with health recommendations (Nursihhah and Wijaya 2021).

A history of underlying medical conditions, or comorbidities, is an important characteristic that can influence patient adherence to a diabetes diet. In people with type 2 diabetes, common comorbidities include hypertension, dyslipidemia, heart disease, and obesity.

These comorbid conditions can increase the risk of complications and worsen the course of the disease, thus influencing patients' awareness and motivation to adhere to their diet. In this study, patients with comorbidities tended to demonstrate better dietary adherence than those without comorbidities.

This is in line with research by Dwitami (2024), which explains that the presence of comorbidities such as hypertension and obesity makes patients more motivated to adhere to a diet because they directly experience the negative impacts of an uncontrolled diet. Patients with comorbidities also receive more frequent further education about the dangers of consuming excessive salt, high-fat foods, and simple sugars, thereby increasing adherence to the recommended diet. Furthermore, another study by Sari & Widodo (2022) also shows that comorbidities such as hypertension and dyslipidemia are significantly associated with dietary adherence in DM patients. In their study, they found that patients with comorbidities are more aware of the

importance of limiting sodium, saturated fat, and calories, so they are more likely

to consistently follow the 3J diet. The study also emphasized that patients with multiple comorbidities generally have a higher level of concern about further complications such as stroke and heart disease, thus increasing motivation to maintain a healthy diet.

Based on the results of research conducted on type 2 diabetes mellitus sufferers at the Tilongkabila Health Center with a total of 74 respondents, it was found that as many as 16 respondents (21.6%) had compliant diet compliance, this can be seen based on respondents' answers that several respondents had tried to follow the dietary recommendations given by health workers, such as no longer consuming sugar, maintaining food portions, following the recommendations given, maintaining body weight and maintaining eating patterns.

This is in line with research conducted by Fauziyyah, Indah, and Nur (2025), the results of the study were obtained from 80 respondents, only 14 people (18%) were assessed as compliant with the type 2 DM diet. This is influenced by the respondents' characteristics, particularly their marital status. The research found that 43 respondents with a married marital status had a moderately compliant level of knowledge. Married respondents generally have stronger emotional and instrumental support from their partners, making it easier for them to adhere to the recommended diet.

Married individuals tend to be more obedient because their partners play a role in reminding them of meal schedules, helping to prepare healthy food, and providing motivation to control their eating habits. These findings align with research by Al-Salmi (2022), which explains that education level is significantly associated with dietary adherence in people with type 2 diabetes mellitus. The journal states that patients with low education levels tend to have inadequate knowledge of diabetes and nutrition, resulting in lower levels of dietary adherence. Conversely, patients with higher education levels have better understanding of dietary recommendations and self-management skills, including the ability to read food labels and choose foods with a low glycemic index. Al-Salmi also emphasized that education is one of the strongest predictors of dietary adherence behavior in diabetes patients, because the higher the patient's education level, the more likely they are to understand the benefits of diet in controlling blood sugar levels and preventing long-term complications.

In addition to education level, family history of the disease can also be a factor contributing to dietary non-compliance in DM patients. For some respondents, the presence of family members with DM actually led patients to perceive the condition as "normal" or common within the family, thus lowering the perceived threat of DM complications. This low risk perception can reduce motivation to consistently adhere to dietary recommendations. Furthermore, research shows that if families do not model good eating habits or even have unhealthy habits, such as frequently consuming high-sugar foods, patients tend to imitate these habits, resulting in low dietary compliance (Rahmawati, Simamora, and Pelawi 2024).

A study by Rahmawati, Simamora, and Pelawi (2024) found that patients with a family history of diabetes but without positive behavioral support from family members were more likely to be non-compliant with their diet. This suggests that family history is not only a biological factor, but also relates to the social environment and family behaviors that play a role in shaping a patient's eating habits.

Based on the research conducted, it shows that although most patients have tried to follow dietary recommendations, the overall level of compliance is still not optimal.

The condition of "quite compliant" describes that respondents carry out some components of the 3J diet (Schedule, Amount, Type), but not consistently. Some respondents still experience difficulties in arranging meal schedules, limiting portions, or avoiding foods high in sugar and simple carbohydrates.

The characteristics of respondents in this study indicate several important factors that can influence adherence to diet in type 2 diabetes mellitus sufferers. Of the various aspects analyzed, the most prominent factors that influence adherence include age, education level, family support through marital status, history of comorbidities, and duration of DM.

Overall, this study shows that the level of compliance with diet in type 2 diabetes mellitus patients at Tilongkabila Community Health Center is in the fairly compliant category.

Although most patients have attempted to implement dietary recommendations, adherence has not been consistent across all aspects of dietary management. Various characteristics of respondents, such as age, education level, family support, presence of comorbidities, and duration of diabetes, have been shown to play a role in shaping dietary adherence behavior. These factors influence how patients perceive their disease, increase motivation to avoid complications, and strengthen their ability to manage their daily diet. Overall, the results of this study confirm that dietary adherence is determined not only by patient knowledge, but also by clinical experience, social conditions, and environmental support.

Thus, increasing dietary compliance in diabetes patients requires a comprehensive approach, including ongoing education, family empowerment, and management, more optimal comorbidities so that patients can maintain an appropriate diet pattern on an ongoing basis.

Health Locus of Control Level in Type 2 Diabetes Mellitus Patients at Tilongkabila Community Health Center Based on the results of research conducted on 74 type 2 diabetes mellitus sufferers at the Tilongkabila Community Health Center, it was found that most of the respondents were in the moderate Health Locus of Control (HLOC) category, namely 47 respondents (63.5%), while 14 respondents (18.9%) were in the

high HLOC category and 13 respondents (17.6%) were in the low HLOC cat This study shows that the majority of patients have a fairly good belief that their health condition can be influenced by the actions and behaviors they carry out, although this belief is not yet completely strong.

A moderate HLOC indicates that patients have a sufficient level of awareness and self-control regarding diabetes management, but still need to improve their self-confidence and consistency in implementing healthy behaviors, including dietary adherence. Meanwhile, a small proportion of patients fall into the high HLOC category, indicating a group that has a strong belief that their health is highly dependent on personal effort. Conversely, the low HLOC group reflects patients who still feel that their health condition is determined more by external factors such as fate, luck, or other people, resulting in low self-control.

This proportion indicates that the HLOC level in type 2 diabetes patients at the Tilongkabila Community Health Center still needs to be improved, considering that a high HLOC is a crucial factor in supporting successful chronic disease management. Patients with a good HLOC tend to be more motivated to control their lifestyle, including diet, physical activity, and medication adherence. Therefore, strengthening patients' perceptions of self-control through ongoing education and support from healthcare professionals and families can help consistently improve patients' self- management behaviors.

Based on research conducted on 74 respondents with type 2 diabetes mellitus at the Tilongkabila Community Health Center, the majority of respondents, 47 (63.5%), fell into the moderate Health Locus of Control (HLOC) category. This may be influenced by various individual characteristics that shape their perceptions of health control.

One of the most influential characteristics is age. The study found that 16 late-adult respondents (50-59 years old) had moderate HLOC levels. Older patients tend to have a better understanding of their illness due to their greater experience in dealing with changes in their physical condition and the impact of health behaviors. This research aligns with research by Susilowati A (2022), which showed that the age group >50 years old tends to have a higher internal locus of control due to longer experience and educational exposure. Older patients are more aware that behavioral changes such as diet, physical activity, and regular medication significantly impact their health.

Besides age, gender also plays a role in the formation of HLOC. The study found that 39 female respondents had moderate HLOC, and 8 male respondents had moderate HLOC. Several national studies have found that women are more likely to have a powerful others locus of control, which is the belief that their health is influenced by others, such as family or healthcare professionals. This is evident in the research of Wardani & Fitria (2022), which explains that women often rely more on social support in managing chronic diseases such as diabetes. Conversely, men more often exhibit internal HLOC tendencies, as they feel more responsible for decisions related to their health.

Another highly influential characteristic is education level. Education is closely related to health literacy, namely the ability to understand information about diseases and treatments. The study found that 31 respondents had completed elementary school and 2 respondents had completed a bachelor's degree. Patients with higher education were better able to understand the mechanisms of diabetes, how medications work, and the impact of daily behavior on blood sugar. This finding is supported by research conducted by Lindström, M., (2022), which states that higher education improves patients' analytical skills, thereby strengthening their internal HLOC. Education plays a role in fostering patients' belief in their ability to control their health condition through appropriate behavior.

Research by El-Saadany et al. (2011) showed that respondents with lower levels of education had lower internal HLOC and were more likely to believe that health was influenced by external factors or luck. This finding aligns with the MIDUS Study by Christie et al. (2024), which reported that lower education was associated with increased external HLOC and contributed to poorer health outcomes. Thus, primary school education was more often associated with high external or chance HLOC, rather than internal HLOC.

Based on research conducted on 74 respondents with type 2 diabetes mellitus at the Tilongkabila Community Health Center, the majority of respondents (14 respondents, 18.9%) were in the high Health Locus of Control (HLOC) category. This can be influenced by various individual characteristics that shape their perceptions of health control. One of the most influential characteristics is marital status.

The study found that 12 respondents with married marital status had high levels of HLOC. Marital status and duration of illness are sociodemographic factors that play a role in shaping a person's Health Locus of Control (HLOC).

Marital status is closely related to the level of social support a patient receives, particularly from their spouse. Good spousal support can increase a patient's belief that their health is under their own control, thus strengthening their internal HLOC. However, in some cases, married patients are more dependent on their spouse for health-related decisions, which can lead to a tendency toward powerful others HLOC, the belief that their health condition is largely controlled by others.

On the other hand, individuals who are not married or living alone can have high internal HLOC if they are independent in self-care, but lack of social support can also increase the chance of HLOC, namely the belief that health is influenced by luck or destiny (M Lindström and Rosvall 2025).

Marital status is closely related to family support. Married patients generally receive more support in the form of meal planning, medication reminders, and assistance during check-ups. Research conducted by Setiyawati (2023) shows that family support is associated with an increased powerful others locus of control, where patients believe that others play a role in the successful management of diabetes. Although not directly influenced by marital status itself, the spousal support inherent in that status makes marriage a factor impacting the formation of HLOC.

Furthermore, the duration of diabetes also significantly influences HLOC. Patients who have lived with diabetes for a long time have direct experience with changes in blood sugar levels, minor complications, and the benefits of dietary adherence. This experience reinforces the belief that their health depends on their own actions. This is evident in research by Fadillah & Sudirman (2021), which found that the longer patients have diabetes, the stronger their internal locus of control develops. Patients learn to recognize body signals and understand the cause-and-effect relationship between diet, physical activity, and glucose control.

Long-term chronic illness also significantly correlates with HLOC formation. Patients who have lived with the disease for a long time tend to have more experience managing symptoms, managing diet, taking medications, and interacting with healthcare professionals.

Positive and adaptive experiences during the course of the disease can enhance internal HLOC, as patients perceive their efforts as yielding tangible results. However, in patients who experience complications, health instability, or treatment failure despite efforts, the belief that the disease is beyond their control can develop, increasing the likelihood of HLOC or dependence on powerful others. Thus, the duration of suffering can be a factor that strengthens internal HLOC or, conversely, increases external HLOC, depending on the patient's subjective experiences while living with the disease (Gaber and Abdel-Latif 2022).

Based on research conducted on 74 respondents with type 2 diabetes mellitus at the Tilongkabila Community Health Center, the majority of respondents, 13 (17.6%), fell into the low Health Locus of Control (HLOC) category. This can be influenced by various individual characteristics that shape their perception of health control. One factor is medical history.

A history of comorbidities, especially long-term chronic conditions requiring ongoing treatment, such as diabetes, hypertension, or heart disease, can significantly impact Health Locus of Control (HLOC). Patients with multiple illnesses often experience uncertainty about their health, inconsistent therapy outcomes, and physical and emotional exhaustion after repeated treatments.

This experience can make patients feel that their disease condition is beyond their control, thus decreasing internal HLOC and increasing chance HLOC (the belief that health is determined by random factors or fate) and powerful others HLOC (the belief that health is controlled by doctors or health professionals). Research conducted by Helmer et al. (2014) showed that the higher the disease burden, the lower the perception of self-control over health, and the higher the tendency towards external HLOC, especially chance HLOC. This study confirms that complex chronic diseases can undermine patients' sense of control because they feel that personal efforts are insufficient to change their health condition (Berglund, Lytsy, and Westerling 2024).

Furthermore, a family history of illness can influence the level of HLOC. This is because individuals who grow up in families with multiple members with chronic illnesses (e.g., diabetes, hypertension, stroke) tend to form the belief that the disease is "hereditary" or "inevitable in the future." This belief can lead to the emergence of a chance HLOC, namely the belief that health is determined by genetic factors, fate, or destiny, rather than personal effort. Furthermore, a classic study by Wallston & Wallston (1981) showed that the experience of illness within the family is one of the origins of the formation of external HLOC in individuals, because they observed that family members continued to experience illness despite efforts to maintain their health. Another

study by Aroian et al. (1981) also found that a family history of illness correlated with an increased chance of HLOC, particularly in individuals who perceive illness as "unavoidable." Thus, a family history of illness not only increases the perception of risk but can also decrease the belief that oneself plays a significant role in controlling one's health (Wallston 2020).

Based on the results of the research data processing, the Internal Health Locus of Control (IHLOC) dimension was the highest category among respondents, compared to the Powerful Others HLOC (PHLOC) and Chance HLOC (CHLOC) dimensions. This IHLOC dominance indicates that the majority of type 2 diabetes mellitus patients at the Tilongkabila Community Health Center have a strong belief that their health condition and disease course are greatly influenced by personal actions, behaviors, and decisions in daily life. These beliefs include regulating diet, regularity in taking medication, monitoring blood sugar levels, physical activity, and compliance with other medical recommendations.

The dominant IHLOC in this study also indicates that most patients have reached a stage of disease acceptance, where they no longer view diabetes as a disease that appears suddenly or is caused by uncontrollable external factors. Instead, patients begin to understand the cause-and-effect relationship between their behavior and changes in symptoms or blood sugar levels. Patients with a high IHLOC are typically better able to connect everyday events, such as consuming high-carbohydrate foods or being inactive, with their

blood sugar spikes. This makes them more motivated to improve their lifestyle (Salsabilla et al. 2024).

With a strong IHLOC, patients tend to be more active in diabetes management and have better motivation to maintain lifestyle changes. This finding is positive, as a high IHLOC is closely associated with successful chronic disease management, particularly in terms of dietary adherence, medication adherence, and other self-care behaviors.

The high IHLOC in this study can be a basis for health workers to continue an educational approach based on patient empowerment, so that the self-control beliefs that have been formed can be further improved. This is in line with research conducted by Kamran et al. (2014) in patients with type 2 diabetes in Iran, which showed that internal HLOC scores were significantly higher than chance HLOC and powerful others HLOC scores. Respondents with higher education showed increased internal HLOC scores, indicating that health knowledge and literacy play a significant role in strengthening perceptions of self-control over health. This study also confirmed that DM patients with high IHLOC were more compliant with diet, physical activity, and blood sugar management (Morowatisharifabad et al. 2019).

Similar results were found in Oktaviani et al.'s (2021) study of type 2 diabetes patients in Indonesia, which showed that the internal HLOC value was higher than the external dimension. This study states that high IHLOC is closely related to a better quality of life, because patients feel they have control over the success of managing their disease.

Those who believe that personal actions determine their health are more consistent in diet, exercise, medication, and regular check-ups. Furthermore, research by Koizumi et al. (2017) revealed that internal HLOC has the strongest influence on self-rated health compared to other HLOC components. This cross-national study showed that individuals with high IHLOC reported better health, even among those with chronic illnesses. The effect of IHLOC was particularly strong among women, indicating that internal HLOC plays a significant role in perceiving and managing daily health (Salsabilla et al. 2024).

In populations with other chronic illnesses, such as cardiovascular disease, research by Krause et al. (2014) showed that internal HLOC remained associated with better health perceptions despite increasing disease burden. This study also reported that in a sample of adults at cardiovascular risk, IHLOC scored higher than external HLOC.

This suggests that long-term experience managing a disease strengthens self-control beliefs. Aflakseir & Zarrinpour's (2013) study of hypertensive patients also found that IHLOC scores were higher than other dimensions. Patients with high IHLOC demonstrated better disease management behaviors, including maintaining a low-salt diet, adhering to medication, and engaging in regular physical activity. This further strengthens the evidence that IHLOC is positively associated with self-management behaviors (Berglund, Lytsy, and Westerling 2024).

The Relationship Between Health Locus of Control and Diet Compliance in Diabetes Patients Mellitus at Tilongkabila Health Center

Based on the results of data analysis using the Spearman Rank test, a correlation coefficient (r) value of 0.556 was obtained, indicating a moderate correlation between Health Locus of Control (HLOC) and adherence to diet in Type 2 Diabetes Mellitus patients at the Tilongkabila Community Health Center. The significance value obtained was $p\text{-value} = 0.000$, where this value is smaller than $\alpha = 0.05$, so it can be concluded that there is a statistically significant relationship between the two variables. Thus, the hypothesis H_0 is accepted, meaning that the better a person's Health Locus of Control, the higher the level of adherence to diet. These results indicate that individuals with strong beliefs in their ability to control their health tend to be more compliant in following dietary recommendations given by health workers.

The HLOC level in type 2 diabetes patients not only describes the extent to which patients believe that their health can be controlled by themselves, but is also closely related to the three main components in the Health Locus of Control concept, namely Internal HLOC, Powerful Others HLOC, and Chance HLOC. All three have different implications for how patients manage their disease.

Patients with a high internal HLOC tend to believe that health is largely influenced by personal actions such as maintaining a healthy diet, exercising, and taking medication on time. Conversely, patients with an external HLOC are more likely to believe that health is determined by external factors such as fate, destiny, or the power of others (e.g., healthcare professionals). This perception significantly influences dietary adherence, as the 3J DM diet (schedule, amount, type) requires strong commitment and internal motivation.

A moderate HLOC indicates that the patient is aware of managing their disease but is not yet fully independent and consistent. This impacts dietary compliance, which remains moderately compliant. The main barriers stem from knowledge, eating habits, environmental influences, dependence on others, and economic circumstances. Therefore, ongoing education and strengthening of internal HLOC are necessary to optimally improve dietary compliance.

Moderate HLOCs tend to have adherence levels in the "adequate" category—not low, but not optimal either. This occurs because patients are in a transitional position between internal and external control. They recognize that personal behaviors such as diet and medication impact their health, yet still rely on health

outcomes from healthcare providers, family, or luck.

Research conducted by Wallston et al. found that individuals with a predominantly internal HLOC exhibit inconsistent health behaviors, with adherence increasing when there is direct supervision or instruction from healthcare professionals but decreasing when external control is reduced. This is consistent with findings that moderate HLOC is often associated with situational adherence, rather than sustained adherence.

Another study of diabetes mellitus patients by Putri et al. (2020) showed that patients with a moderate HLOC orientation tended to be more compliant with diet and medication when they had complaints or poor blood sugar test results, but compliance decreased when their condition was perceived as stable. This study confirms that HLOC is not yet able to encourage patients to make compliant behavior a long-term habit.

Furthermore, Kurniawan and Sari's (2019) study of chronic disease patients found that moderate HLOC was associated with moderate adherence, as patients still needed external reinforcement. Patients were not yet fully convinced that personal efforts such as strict dietary management and medication discipline were key factors in successful disease control.

In this study, patients with a high HLOC were more likely to have good dietary adherence. This is in line with the results of research conducted by Adhanty, Ayubi, and Anshari (2021), which showed that individuals with an internal HLOC have behaviors that are Improved self-care, including dietary adherence and blood sugar management. Internal HLOC encourages patients to feel empowered to control their disease through daily activities, leading to greater adherence to dietary recommendations.

On the other hand, patients with low or predominantly external HLOC were more likely to be non-compliant with their diet. This is due to the perception that the disease is caused by external factors or fate, so they do not feel the need to significantly change their diet. Meidiah Dwitami, T. Eltrikanawati (2024) found in their study that DM patients with low HLOC scores had a higher rate of dietary non-compliance than those with moderate or high HLOC. This pattern was also seen in this study, where respondents with low HLOC tended to be non-compliant or only moderately compliant with their diet.

This research is also supported by the results of a study conducted by Liputo et al. (2025) on the effectiveness of Diabetes Self- Management Education (DSME) in improving self-care and self-efficacy in type 2 diabetes patients. The study showed that structured education can increase patients' confidence in their ability to manage their diabetes. This increase in self-efficacy is an important indicator of strong self-control perceptions, which are theoretically closely related to Health Locus of Control.

(HLOC). When patients are given education that emphasizes understanding, ability, and personal control in managing diet, physical activity, and blood sugar monitoring, self-care behaviors are improved.

including significantly increased dietary adherence. This illustrates that internal HLOC operates through a mechanism of increased self-efficacy, allowing patients to perceive that their efforts directly influence health outcomes. Therefore, the DSME study findings support the belief that self-control is an important psychological factor determining dietary adherence in people with type 2 diabetes. This is in line with the findings of this study, which found a significant relationship between HLOC and dietary adherence.

The results of this study indicate that HLOC plays a crucial role in shaping dietary adherence behavior in DM patients. The higher a person's HLOC, the more likely they are to adhere to the diet. This study implies that health interventions should not only provide diet education but also incorporate psychological approaches to enhance patients' perceptions of self-control. Educational models based on empowerment, motivation, and self-management can enhance internal HLOC, ultimately improving dietary adherence.

Thus, this study confirms a relationship between Health Locus of Control and dietary adherence in type 2 diabetes mellitus patients at the Tilongkabila Community Health Center. A good HLOC, especially internal, is a determining factor for long-term success in diabetes diet management.

CONCLUSION

The level of dietary compliance in type 2 DM patients at Tilongkabila Community Health Center shows that out of 74 respondents, 1 respondent (1.4%) was non-compliant, 57 respondents (77.0%) were quite compliant, and 16 respondents (21.6%) were compliant. The level of Health Locus of Control (HLOC) in respondents consisted of 13 respondents (17.6%) in the low category, 47 respondents (63.5%) in the moderate category, and 14 respondents (18.9%) in the high category. There is a relationship between Health Locus of Control and adherence to diet, where patients with better HLOC show a tendency towards higher dietary adherence.

SUGGESTIONS

It is recommended that Tilongkabila Community Health Center strengthen its routine education program regarding diabetes management by emphasizing the importance of Health Locus of Control (HLOC) and dietary compliance.

This education can be provided through individual counseling, group counseling, and family support. Community health centers are also expected to develop ongoing mentoring programs to increase patient motivation and confidence in managing their condition.

Patients are expected to improve their understanding and awareness of the role of HLOC in daily diet management. Patients are encouraged to be more active in controlling their eating patterns, adhering to the 3J diet recommendations (type, quantity, schedule), and following education provided by healthcare professionals to better control blood sugar levels.

Future research is expected to develop other variables that influence HLOC and dietary adherence, such as social support, internal motivation, or other psychological factors.

Other researchers are also advised to use different research designs or wider populations so that the research results are more comprehensive and can be compared with conditions in other regions.

REFERENCES

- Abose, Saron, Godana Arero Dassie, and Abebe Megerso. 2024. "Adherence to Recommended Diet among Patients with Diabetes Mellitus Type 2 on Follow-up at Adama Hospital Medical College." (November): 1–9.
- Bachri, Yasherly Bachri, Rezi Prima, and Silvia Adi Putri. 2022. "Risk Factors Associated with the Incidence of Diabetic Ulcers in Diabetes Mellitus Patients at Prof. Dr. Soetomo General Hospital." *Ma.Hanafiah, Sm Batusangkar* 2022." *Journal of Research Innovation* 3(1): 4739–50.
- Berglund, Erik, Per Lytsy, and Ragnar Westerling. 2024. "The Influence of Locus of Control on Self- Rated Health in the Context of Chronic Disease: A Structural Equation Modeling Approach in a Cross Sectional Study."
- Dewi and Yuniarti. 2024. "Health Correlation of Adherence (Compliance in Taking Medication) ON THE QUALITY OF LIFE OF TUBERCULOSIS PATIENTS IN THE SOUTH KUTA COMMUNITY HEALTH CENTER UPT AREA." *MagnaSalus: Jurnal Kelebihan* 06(July): 8–19.
- Bone Bolango District Health Office. 2024. "Data on Diabetes Mellitus Patients in Bone Bolango District."
- Gorontalo Provincial Health Office. 2024. "Data on Diabetes Mellitus Patients in Gorontalo Province."
- Dureti Tirfessa1, Mitsiwat Abebe1, Jiregna Daregal and Mecha Abomal*. 2022. "Dietary Practice and Associated Factors among Type 2 Diabetic Patients Attending Chronic Follow-up in Public Hospitals, Central Ethiopia, 2022."
- Dwika, Made, and Angga Kusuma. 2022. "Diet Management in Type 2 Diabetes Mellitus Patients in Meeting Nutritional Needs: A Literature Review." *Jurnal Medika Utama* 3(2): 1841–45.
- Dwitami. 2024. "Enabling Factors in Diet Compliance in Type 2 Diabetes Mellitus Patients."
- Fadillah, M., & Sudirman, A. 2021. "Profile of Type 2 Diabetes Mellitus Patients Based on Age, Duration of Illness, and Family History." *Medika Journal of Clinical Health*.
- Gaber, Sherine, and Soha Hassan Abdel-Latif. 2022. "Effect of Education and Health Locus of Control on Safe Use of Pesticides: A Cross Sectional Random Study."
- Hartono, Suryo Ediyono. 2024. "RELATIONSHIP BETWEEN EDUCATION LEVEL, DURATION OF ILLNESS WITH KNOWLEDGE LEVEL OF 5 PILLARS OF DIABETES MELLITUS MANAGEMENT IN THE WORKING AREA OF SUNGAI DURIAN COMMUNITY HEALTH CENTER, KBU RAYA DISTRICT, WEST KALIMANTAN." 9(1): 2018–22.
- Herdiani, Febri Dolis. 2021. "Oracle Enterprise Architecture Development (OADP) Implementation In the Design of Property Asset Management Information System Architecture: Case Study of PT. Pos Properti Indonesia." *Journal of Applied Sciences, University of Jambi* 5(1): 31–38.
- Hilda Chairani, Rima Berti Anggraini, Nova Mardiana. 2025. "FACTORS RELATED TO DIETARY COMPLIANCE IN TYPE II DIABETES MELLITUS PATIENTS." *Journal of Professional Nursing Research*.
- Irjayanti P, Kurnia, Syaifuddin Zaenal, and Suhartatik. 2022. "Factors Influencing the Increase in Type 2 Diabetes Mellitus." *Journal of Nursing Student & Research* 1(6): 805–13.
- KA Wallston, BS Wallston, R DeVellis. 1978. "Development of the Multidimensional Health Locus of Control (MHLC) Scales."
- Khoirunnisa, Ramadhanty, Salim Ridwan, Agil Dhiemitra, and Aulia Dewi. 2024. "Family Support and Dietary Adherence in Individuals with Type 2 Diabetes Mellitus in Banten, Indonesia." 19(28): 27–34.,
- Kholidah, Hidayat, Jamaludin, Leksono, 4Sultan Ageng Tirtayasa University 2023. ETHNOSCIENCE STUDY IN SCIENCE LEARNING TO DEVELOP LOCAL WISDOM VALUES AND CHARACTER OF CHANOS CHANOS ELEMENTARY SCHOOL STUDENTS). THROUGH MILK SATISFIED. *Scientific Journal of Elementary Education, and ISSN*. 2023. "CORRELATIONAL RESEARCH." *Journal of Elementary Education and Social Humanities* 43(4): 342–46.

- LAKSONO, HERU, HENDRI HERIYANTO, and RISMA APRIANI. 2022. "Determinant Factors of Complications in Diabetes Mellitus Patients in Bengkulu City in 2021." *Journal of Nursing and Public Health* 10(1): 68–78.
- Lindström, M., Okada, S., & Zhang, L. 2022. "Cultural Patterns of Health Locus of Control in Asian Populations." *Asian Journal of Health Psychology*.
- Lindström, M, and M Rosvall. 2025. "Marital Status, Social Capital and Health Locus of Control: A Population-Based Study."
- Lindström, Martin, Mirnabi Pirouzifard, Maria Rosvall, and Maria Fridh. 2022. "Health Locus of Control and All-Cause, Cardiovascular, Cancer and Other Cause Mortality: A Population-Based Prospective Cohort Study in Southern Sweden." *Preventive Medicine* 161(May): 0–5.
- Litha, Yoanes. 2024. "Number of Diabetes Sufferers in Indonesia Continues to Increase. VOA Indonesia."
- Machali, Imam. 2021. *Quantitative Research Methods*.
- Manto, Onieqie Ayu Dhea, Rico Naim, and Cynthia Eka Fayuning Tjomiadi. 2022. "The Relationship Between Health Locus of Control and the Level of Glycemic Control Compliance in Type 2 Diabetes Mellitus Patients at the Banjarmasin Terminal Community Health Center." *Journal of Nursing Invention E-ISSN 2828-481X* 3(1): 67–75.
- MEIDIAH DWITAMI, T. ELTRIKANAWATI, SISKAPRATIWI. 2024. "HEALTH LOCUS OF CONTROL WITH DIET COMPLIANCE IN TYPE 2 DIABETES MELLITUS PATIENTS." *Encyclopedia of Journal* 6(2): 76–82.
- Melytania, Ety Retno Setyowati, Ana Andriana, and Kadek Dwi Pramana. 2023. "The Relationship Between Random Blood Glucose Levels and Low Density Lipoprotein (LDL) Levels in Type 2 Diabetes Mellitus Patients at the Mataram City Hospital Polyclinic." *Journal of Medicine* 8(2): 114–24.
- Morowatisharifabad, M, S Mazloomi Mahmoodabad, M Baghianimoghadam, and N Rouhani Tonekaboni. 2019. "Relationships between Locus of Control and Adherence to Diabetes Regimen."
- Mozafari, Sogol, Alan Yang, and Jason Talaei-Khoei. 2024. "Health Locus of Control and Medical Behavioral Interventions: Systematic Review and Recommendations." *Interactive journal of medical research* 13: e52287.
- Msi, Dr. Jenita Doli Tine Donsu. SKM. 2020. *Nursing Research Methodology*. PT. Pustaka Baru. Muallif. 2023. "Processing and Analysis of Quantitative Research Data."
- Mudawati, Gusti Ayu Sri, I Kadek Nuryanto, and Made Rismawan. 2025. "The Relationship Between Family Support and Diet Compliance of Type 2 Diabetes Mellitus Patients at the Internal Medicine Clinic of Sanjiwani Regional Hospital, Gianyar." *National Health Research Journal* 9(1): 1–7.
- Nasser Al-Salmi 1*, Paul Cook2 and Melba Sheila D'Souza. 2022. "Diet Adherence among Adults with Type 2 Diabetes Mellitus: A Concept Analysis."
- Nur Magfiroh, Yuli et al. 2023. "The Relationship Between Diet Compliance and Changes in Blood Sugar Levels in Diabetes Mellitus Patients at the Jambon Community Health Center, Ponorogo Regency." 1(1): 2023.
- Nursalam. 2016. *Nursing Science Research Methodology*. South Jakarta: Salemba Medika.
- Nursihhah, Melianna, and Dwi Septian Wijaya. 2021. "The Relationship Between Diet Compliance and Blood Sugar Control in Type 2 Diabetes Mellitus Patients." (Dm): 1002–10.
- Ojo, Oluwafemi Adeleke et al. 2023. "Diabetes Mellitus: From Molecular Mechanism to Pathophysiology and Pharmacology." *Medicine in Novel Technology and Devices* 19(February): 100247.
- Organization, World Health. 2022. "Diabetes Mellitus."
- Prawinda, Yulia Dwi et al. 2024. "Management of the Five Pillars of Diabetes Mellitus by Diabetics: A Phenomenological Study." *Journal Nursing Research Publication Media (NURSEPEDIA)* 3(1): 12–25.
- Prevention, Centers for Disease Control and. 2024. "Medical Nutrition Therapy. In *Diabetes Self Management Education and Support (DSMES)*." Department of Health and Human Services, National Center for Chronic Disease Prevention and Health Promotion.
- Rahmadina, Aura, Dwi Retno Sulistyarningsih, and Indah Sri Wahyuningsih. 2022. "Diabetes Mellitus (DM) Diet Compliance with Blood Glucose Levels in DM Patients at Sultan Agung Islamic Hospital, Semarang." *Sultan Agung Scientific Journal (September)*: 857–68.
- Rahmawati, Aisah Asri, Rotua Suriyany Simamora, and Arabta M Peraten Pelawi. 2024. "The Relationship Between the Level of Compliance with the 4 Pillars of Diabetes Management and the Quality of Life of DM Patients at the Danau Indah Community Health Center in 2023." 14(1): 49–59.
- Religioni, U., Barrios-Rodríguez, R., Requena, P., Borowska, M., & Ostrowski, J. 2025. "Enhancing Therapy Adherence: Impact on Clinical Outcomes, Healthcare Costs, and Patient Quality of Life. *Medicina (Lithuania)*."

- Rima Oktafiana, Abdul Khamid. 2024. "ANALYSIS OF THE RELATIONSHIP BETWEEN DIETARY THERAPY AND BLOOD SUGAR LEVELS CHANGES IN DIABETES MELLITUS PATIENTS IN THE INPATIENT WARD OF BHAYANGKARA BRIMOB HOSPITAL, KELAPA DUA, DEPOK."
- Rizal, Rosiana, Vira Ry Shandy, Mesa Sukmadani Rusdi, and Helmice Afriyeni. 2024. "A Study of Patient Satisfaction with Pharmaceutical Services at the Outpatient Pharmacy of Sungai Dareh Regional Hospital." *Journal of Exact Science Research and Studies* 3(2): 58–67.
- Rohmah Puriana Khusnaa, Heny Suseani Pangastutib, Anggi Lukman Wicaksanab. 2023. "Dietary Adherence and the Associated Factors among Indonesian Patients with Type 2 Diabetes: What Should We Be Concerned about?†."
- Romdona, Siti. 2025. "Data Collection Techniques." 3(1): 39–47.
- Salsabilla, Salwa, Lina Erlina, Ali Hamzah1, and Yosep Rohyadi. 2024. "THE ROLE OF HEALTH LOCUS OF CONTROL IN IMPROVING THE QUALITY OF LIFE OF TYPE 2 DIABETES MELLITUS PATIENTS." 4(1): 57–65.
- Sari, RP, & Widodo, A. 2022. "The Relationship Between Comorbid Hypertension and Dyslipidemia with Diet Compliance in Diabetes Mellitus Patients." *National Health Research Journal*.
- Sasmita, Anggi Marta Dwi. 2021. "Factors Influencing the Level of Treatment Compliance of Diabetes Mellitus Patients." *Jurnal Medika Utama* 02(04): 1105–11.
- Savan, Chhatrola, Dhruvi Viroja, and Avani Kyada. 2024. "An Updated Review on Diabetes Mellitus: Exploring Its Etiology, Pathophysiology, Complications and Treatment Approach." *IP International Journal of Comprehensive and Advanced Pharmacology* 9(1): 31–36.
- Setiyawati, D., Kartika, W., & Rahmah, N. 2023. "Family Support and Its Influence on Powerful Others Locus of Control in Type 2 DM Patients." *Muhammadiyah Bandung Nursing Journal*.
- Sinulingga, Elysabeth. 2024. *Ethics and Law in Nursing*. Tri Edukasi Ilmiah Foundation.
- Siti Aisyah Dwi Asri, Nur Widayati, and Latifa Aini S. 2020. "Health Locus of Control and Self Care Behavior in Patients with Type 2 Diabetes Mellitus." *Asian Community Health Nursing Research*. Sugiyono. 2024. *Quantitative, Qualitative, and R&D Research Methods*. Alfabeta.
- Susilowati, A., Widodo, A., & Prabawati, N. 2022. "The Effect of Age on Health Locus of Control in Patients with Chronic Diseases." *Muhammadiyah Indonesian Nursing Journal*.
- Tanamas, Nurhasanah Sutan, Herlina Jusuf, and Gusti Pandi Liputo. 2025. "DSME to Improve Self- Care and Self-Efficacy in Type 2 Diabetes: A Quasi-Experimental Study." 7(2): 188–96.
- Toja, Maria Elvarista, Arief Widya Prasetya, Irine Yunila Prastyawati, and Ni Ketut Suadnyani. 2023. "RELATIONSHIP BETWEEN FAMILY SUPPORT AND THE LEVEL OF DIETARY COMPLIANCE IN DIABETES MELLITUS PATIENTS AT JAGIR PUBLIC HEALTH CENTER, SURABAYA." 11(2): 103–11.
- Wallston, B.S. 2020. "Origins of Health Locus of Control Beliefs."
- Wardani, S., & Fitria, N. 2022. "Differences in Locus of Control Based on Gender in Chronic Illness Patients." *Journal of Psychology and Health Behavior*. WHO. 2024. "Diabetes."
- Wijayanti, Naqiya Fauzia. 2023. "Prevention of Non-Communicable Diseases (NCDs): Hypertension, Cholesterol, Diabetes Mellitus, and Gout." *Abdimas Universal* 3(1): 1.
-