



# Relationship between Knowledge Level and Compliance with Dietary in Elderly Patients with Diabetes Mellitus in Karang Rejo Village, Langkat Regency

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<p><b>Track Record Article</b></p> <p>Accepted: 26 January 2024 Revised: 07 February 2024 Published: 22 March 2024</p> <p><b>How to cite :</b> Tinah, &amp; Triwibowo, C. (2024). Relationship between Knowledge Level and Compliance with Dietary in Elderly Patients with Diabetes Mellitus in Karang Rejo Village, Langkat Regency. <i>Contagion: Scientific Periodical Journal of Public Health and Coastal Health</i>, 6(1), 421–431.</p>	<p style="text-align: center;"><b>Abstract</b></p> <p><i>Elderly refers to a more advanced phase of a physiological process marked by a decline in the body's capacity to adjust to external pressures. One contributing factor to the rise in Diabetes Mellitus is a deficiency of understanding, which can subsequently influence the adoption of harmful behaviors. Health providers propose dietary behavior as a means to normalize blood sugar levels in elderly individuals with Diabetes Mellitus. The objective of this The aim of this research is to examine the relationship between levels of knowledge and adherence to dietary recommendations among elderly adults diagnosed with diabetes mellitus who live in Karang Rejo Village, Langkat Regency. In this study, a quantitative approach is employed, utilizing a cross-sectional research design. The present investigation was carried out at Karang Rejo Village, located in the Langkat Regency, spanning from February to October 2023. The research sample consisted of 780 older individuals diagnosed with Diabetes Mellitus, residing in Karang Rejo Village, Langkat Regency. The study utilizes a basic random sampling technique to ensure that each participant has an equal probability of being chosen for the sample, without considering their individual features. Consequently, the sample size for this study consisted of 42 old individuals. The primary instrument employed for data collection in this study was a questionnaire. The present study employed bivariate analysis chi-square test for data analysis, and utilized software help in the form of SPSS version 20 for data processing. The findings indicated a statistically significant correlation (<math>p\text{-value} = 0.001</math>) between the extent of knowledge and adherence to dietary recommendations among older individuals diagnosed with diabetes mellitus residing in Karang Rejo Village, Langkat Regency. There is an aspiration for the senior population to enhance their knowledge and engage with information sourced from health centers and various social media platforms.</i></p> <p><b>Keywords: Compliance, Dietary, Elderly, Knowledge</b></p>
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## INTRODUCTION

Elderly refers to individuals who are 60 years of age or older. The term "elderly" refers to individuals who have reached the end of a particular stage of life. The demographic categorized as older typically experiences a phenomenon known as the Aging process or the process of aging (Yanti et al., 2020).

Diabetes mellitus is a chronic disease caused by Diabetes Mellitus disease caused by several factors, namely by an unhealthy lifestyle such as an unhealthy dietary. One example of an unhealthy lifestyle is eating foods that contain a lot of sugar or fat, little carbohydrates, and rarely do physical activity. Besides contributing to being the leading non-communicable illness cause of mortality worldwide, diabetes also lowers a person's quality of life due to complications

from the condition and reduces productivity at work, which can result in lower income (Marasabessy et al., 2022).

Diabetes mellitus is a non-communicable disease that causes the highest mortality rate in the world. (WHO, 2020). The World Health Organization (WHO) reports that 422 million adults worldwide have diabetes mellitus, which represents an increase of approximately 8.5% in the adult population. The disease is estimated to be the cause of 2.2 million deaths, with a portion of these deaths occurring before the age of 70, particularly in low- and middle-income countries. By 2023, the number of people with diabetes mellitus is expected to rise by an additional 600 million (WHO, 2023).

The number of diabetics in the population between the ages of 20 and 79 has been identified by the International Diabetes Federation (IDF) as representing 10 of the world's most populous nations. With 116.4 million, India, and the US having the largest populations, respectively, are China, India, and the US. Out of the seven areas in the world, the Arab-North African and Western Pacific countries had the highest rates of diabetes among those aged 20 to 79, with 12.2% and 11.4%, respectively. According to IDF estimations, the prevalence of diabetes in 2020 will be 9.65% in males and 9% in women based on gender. As the population ages, the prevalence of diabetes is predicted to rise to 19.9%, or 111.2 million people aged 65 to 79. It is estimated that by 2030, there will be 578 million, and by 2045, there will be 700 million (International Diabetes Federation, 2021).

The assessment of Indonesia's contribution to the prevalence of diabetes cases in Southeast Asia is necessary, as it is the sole country in the region included in the aforementioned list. Indonesia ranks seventh among the top ten countries with the highest number of patients, with a total of 10.7 million individuals (International Diabetes Federation, 2021). North Sumatra province exhibits a notable prevalence of diabetes mellitus within the Indonesian context, as evidenced by a diagnosis rate of 2/3% by medical professionals based on symptomatic assessment. Consequently, North Sumatra province ranks in the top 10 regions in Indonesia with the highest incidence of diabetes mellitus (Indonesian Ministry of Health, 2020).

The prevalence of Diabetes Mellitus in North Sumatra Province has been steadily rising year. According to data sourced from the North Sumatra Health Office, the prevalence of Diabetes Mellitus in North Sumatra in 2019 was reported to be 249.519 individuals. Among these individuals, 144.521 individuals, accounting for 57.92% of the total, sought healthcare services. Conversely, the remaining 104.998 individuals did not seek medical attention (Public Health Office of North Sumatra Province, 2020).

The most common complication in people with diabetes mellitus is skin and foot problems, usually in the form of wounds that do not heal. Prolonged blood sugar overload can damage blood vessels, neurons, eyes, kidneys, and the cardiovascular system. Heart attack and stroke, end-stage renal failure, severe foot infections (which can cause gangrene and necessitate amputation), and sexual dysfunction are among the complications. Therefore, maintaining a nutritious diet, getting regular exercise, and following the Diabetes Mellitus diet plan are the best ways to prevent problems from developing from the disease (David et al., 2023)

Diabetes Mellitus dietary adherence to food planning is one of the challenges in managing Diabetes Mellitus. To help clients incorporate dietary habits into their lifestyle, behavioural therapy, family and group support and counselling on the Diabetes Mellitus dietary are highly recommended. Non-compliance with dietary in patients with Diabetes Mellitus is one of the risk factors for metabolic disorders in the body, causing blood sugar levels to increase and become uncontrolled, which has an impact on survival (Rahmadina et al., 2022).

Based on research results Bistara et al., (2018), The findings indicate a positive correlation between dietary knowledge and dietary compliance among patients diagnosed with Diabetes Militus. Specifically, those with a strong understanding of their nutritional needs tend to exhibit higher levels of adherence to their prescribed dietary regimen. Based on the research results Pahrul et al., (2020), this study demonstrates a noteworthy correlation between knowledge and dietary adherence among elderly people diagnosed with Diabetes Mellitus.

According to the findings of a preliminary study conducted by researchers, interviews were conducted with 8 old individuals. The study revealed that 2 elderly individuals possessed a level of knowledge classified as good, while 2 elderly individuals had a level of knowledge classified as sufficient, 3 elderly people who obeyed the dietary but sometimes patients consumed foods that were not allowed and 1 elderly person did not obey the dietary because the economy was mediocre so they could not carry out the dietary properly.

Based on the above background regarding Diabetes Mellitus, the most common complications are heart attack and stroke, end-stage renal failure, severe foot infections (which can cause gangrene and result in amputation), and sexual dysfunction. The researchers also conducted interviews with a sample of 8 elderly individuals. The findings revealed that 2 elderly individuals exhibited a level of knowledge falling within the "good" category, while 2 elderly individuals demonstrated a level of knowledge falling within the "sufficient" category. Additionally, 3 elderly individuals adhered to the prescribed dietary guidelines, albeit occasionally consuming prohibited foods. Lastly, 1 elderly individual did not comply with the dietary regimen due to the prevailing mediocre economic conditions, which hindered their ability

to effectively manage their dietary needs. So the formulation of the problem in this study is "Is there a relationship between the level of knowledge and compliance with dietary in elderly people with Diabetes mellitus in Karang Rejo Village, Langkat Regency". The general purpose of this study was to determine the relationship between the level of knowledge and compliance with the dietary in elderly people with Diabetes mellitus.

## **METHODS**

This research employs quantitative research methods, specifically descriptive correlational analysis, within a cross-sectional research design. The objective is to elucidate the association between the level of knowledge and compliance with dietary advice between elderly individuals diagnosed with Diabetes Mellitus residing in Karang Rejo Village, Langkat Regency.

This research will be conducted in Karang Rejo Village, Langkat Regency to the elderly with Diabetes Mellitus patients in February - October 2023. The population in this study were all elderly people diagnosed with Diabetes Mellitus who were taken as many as 780 people in January to December 2022 taken from Community Health Center data.

The sampling technique that will be used in this study is to use simple random sampling technique, namely the sampling method where each individual has the same opportunity to be sampled without considering the characteristics of the individual. Taken with the slovin formula. So, the number of samples to be studied in this study were 42 people.

This study used a questionnaire with the level of knowledge of the Diabetes Mellitus dietary with 12 questions and a 10 question dietary compliance questionnaire aimed at measuring the level of knowledge and dietary compliance. This study encompasses two distinct forms of data, namely primary data and secondary data. Primary data refers to data that is collected directly from individuals by means of questionnaires or checklist sheets, which include inquiries pertaining to dietary awareness among the older population. While secondary data is data obtained by researchers from Community Health Center medical records in the form of the number of elderly people with Diabetes Mellitus in Karang Rejo Village.

This research utilised bivariate analysis using the chi-square test to examine the association between knowledge level and dietary compliance in elderly people with Diabetes Mellitus in the form of cross tabulation. In processing and analyzing data using the SPSS version 23 software program.

## RESULTS

In this study describes demographic characteristics, the level of knowledge provided and dietary compliance in elderly people with Diabetes Mellitus, can be seen in the table below :

**Table 1. Frequency Distribution Based on Characteristics of Respondents in Karang Rejo Village, Langkat Regency in 2023**

Characteristics	Frequency	%
<b>Age</b>		
60 – 65	24	57.1
66 – 70	13	31.0
71 – 75	3	7.1
76 – 80	2	4.8
<b>Total</b>	<b>42</b>	<b>100.0</b>
<b>Gender</b>		
Male	17	40.5
Female	25	59.5
<b>Total</b>	<b>42</b>	<b>100.0</b>
<b>Education</b>		
Elementary school	8	19.0
Junior high school	7	16.7
Senior High School	23	54.8
Bachelor	4	9.5
<b>Total</b>	<b>42</b>	<b>100.0</b>
<b>Work</b>		
Farmer	29	69.0
Employee	3	7.1
Housewife	9	21.4
Private	1	2.4
<b>Total</b>	<b>42</b>	<b>100.0</b>
<b>Long Suffering from Diabetes Mellitus</b>		
5 – 10 years	29	69.0
11 – 15 years	13	31.0
<b>Total</b>	<b>42</b>	<b>100.0</b>

*\*Source: Primary data 2023*

Based on Table 1. the distribution of respondent characteristics can be explained that the age of respondents with Diabetes Militus is the age range of 60 - 65 years, totaling 23 people (57.1%). While based on the gender of the elderly with diabetes mellitus, women are more dominant with a total of 25 people (59.5%), the education level of the elderly respondents with diabetes mellitus is mostly high school, totaling 23 people (54.8%). The occupation of older adults with Diabetes Militus is mostly farmers, as many as 29 people (69.0%); based on the length of time suffering from Diabetes Militus, the most a span of more than 5 - 10 years, totalling 29 people (69.0%).

**Table 2. Frequency distribution based on the level of knowledge of respondents regarding the Diabetes Mellitus Dietary in Karang Rejo Village, Langkat Regency, 2023**

Knowledge level	Frequency	%
Good	28	66.7
Enough	11	26.2
Not enough	3	7.1
<b>Total</b>	<b>42</b>	<b>100.0</b>

\*Source: Primary data 2023

Based on Table 2. obtained a good level of knowledge there are 28 people (66.7%), a sufficient level of knowledge 11 people (26.2%) and (lack of knowledge level there are 3 people (7.1%).

**Table 3. Frequency distribution based on adherence to the Diabetes Mellitus Dietary in Karang Rejo Village, Langkat Regency, 2023**

Diabetes Mellitus Dietary Compliance	Frequency	%
Obedient	23	54.8
Not obey	19	45.2
<b>Total</b>	<b>42</b>	<b>100.0</b>

\*Source: Primary data 2023

Based on Table 3. The frequency distribution above shows that respondents' compliance with the Diabetes Mellitus dietary is around 23 people (54.8%) and there are 19 people (45.2%) who are not compliant.

**Table 4. Relationship between level of knowledge and adherence to dietary among elderly people suffering from diabetes mellitus in Karang Rejo Village, Langkat Regency**

Knowledge	Diabetes Mellitus Dietary Compliance				Total		p-value
	Obedient		Not obey		F	%	
	f	%	f	%			
Good	20	47.6	8	19	28	100.0	<b>0.001</b>
Enough	3	7.1	8	19	11	100.0	
Not enough	0	0	3	7.3	3	100.0	
<b>Total</b>	<b>23</b>	<b>54.7</b>	<b>19</b>	<b>46.3</b>	<b>42</b>	<b>100.0</b>	

\*Source: Primary data 2023

Table 4. shows that of the 42 respondents who had a level of knowledge about the Diabetes Mellitus dietary in the good category and complied with the Diabetes Mellitus dietary as many as 20 respondents (47.6%). Respondents who had a level of knowledge in the good category and did not comply with the Diabetes Mellitus dietary were 8 respondents (19%).

The findings of the statistical tests indicate a significant correlation between the level of knowledge and dietary compliance in the elderly with Diabetes Mellitus in Karang Rejo Village, Langkat Regency from these results it is found that a good level of knowledge of the Diabetes Mellitus dietary can affect Diabetes Mellitus dietary compliance.

## DISCUSSION

### **Relationship between Knowledge Level and Adherence to Diabetes Mellitus Dietary**

High levels of sugar in the blood can be a consequence of diabetes mellitus, a chronic disorder that compromises the body's capacity to make or use insulin properly (Park et al., 2023). A good understanding of the disease and the importance of maintaining a healthy dietary can have a positive impact on blood sugar control and the general well being of the patient (Sami et al., 2017).

The acquisition of knowledge plays a crucial role in the effective treatment of Diabetes Mellitus, particularly in relation to dietary factors. However, the capacity of individuals to independently navigate their everyday lives, regulate their condition, and mitigate the adverse effects of the disease is commonly referred to as self-management (Prabowo et al., 2022).

Based on the results of the study, it shows that there is a relationship between the level of knowledge and dietary compliance in the elderly with diabetes mellitus ( $p$ -value = 0.001). Consistent with existing research, there exists a notable correlation between knowledge and dietary adherence between individuals diagnosed with Diabetes Mellitus (Paragita et al., 2022; Muhammada et al., 2022; Massiani et al., 2023). Furthermore, it is also in line with the results of research Wibisana et al., (2021) The chi-square statistical test produced data indicating a statistically significant association between the level of knowledge and compliance with dietary implementation among patients diagnosed with diabetes mellitus, as evidenced by a  $p$ -value of 0.004 ( $p < 0.05$ ).

Furthermore, the better one's health knowledge, the better the behaviour in preventing diseases, such as compliance in consuming food in patients with diabetes mellitus. Knowledge is the outcome of knowing, which happens when people use their five senses sight, hearing, taste, smell, and touch to sense their environment. The majority of human information is gathered via sight and hearing. Understanding serves as a guidance for directing one's activities or behavior (Massiani et al., 2023).

The correlation between the level of knowledge and adherence to the Diabetes Mellitus diet is that the patient's understanding of Diabetes Mellitus plays a crucial role in managing the condition. Therefore, individuals with a higher level of knowledge about diabetes are more capable of effectively adhering to the prescribed dietary regimen. Moreover, it has the potential to modify behavior in order to regulate the progression of the disease, so enhancing its longevity and improving overall quality of life (Qusyairi et al.,

2022).

From the table above there are also about 8 people (19%) with a good level of knowledge category but not adherent to the dietary due to economic factors. There is no support from the family to carry out the Diabetes Militus dietary. There are about 8 people (19%) also sufficient knowledge but not adherent to the dietary because it is also due to economic factors and little information about the Diabetes Militus dietary so they cannot carry out the dietary properly. So that the knowledge of the Diabetes Militus dietary we must know information from any media because it is very useful for people with Diabetes Militus.

A good knowledge of Diabetes Mellitus helps patients understand its impact on the body and the importance of managing the disease. Patients who understand that blood sugar can be controlled through a healthy dietary and an active lifestyle tend to be more motivated to follow the recommended dietary regimen (Khasanah et al., 2019; Pane et al., 2023).

Knowledge of the types of foods that can raise or lower blood sugar levels helps patients make wiser food choices. Patients who understand the influence of carbohydrates, fats, and proteins on blood sugar can plan their meals to minimize blood sugar fluctuations (Anggi et al., 2020).

Patients with good knowledge of the importance of dietary in managing diabetes tend to be more adherent to the dietary plan that has been recommended by health professionals. An understanding of the consequences of non-adherence, such as increased risk of complications, can be an additional motivator (Baral et al., 2022). Knowledge of the relationship between weight, blood pressure, and blood sugar control helps patients understand the importance of maintaining a healthy weight and managing blood pressure (Wibisana et al., 2021).

Appropriate dietary management can also help patients control their weight, which is an important factor in the management of Diabetes Mellitus (Tuobeniere et al., 2023). Knowledge of how to monitor blood sugar regularly helps patients understand their body's response to food and physical activity. Patients who understand the importance of blood sugar monitoring can more actively engage in self-management and identify behavioral patterns that need to be changed (Adu et al., 2019; Marengke et al., 2020).

Based on the underlying research assumptions, the findings of this study support the acceptance of the hypothesis, which posits a statistically significant association between knowledge levels and dietary compliance among senior individuals diagnosed with



diabetes mellitus. This indicates that there is a positive correlation between the level of knowledge and the understanding of adhering to dietary guidelines in elderly individuals with diabetes mellitus. The researcher's research reveals that approximately 20 people (47.6%) have a good level of knowledge and adhere to the recommended dietary guidelines. Conversely, individuals with a lower level of knowledge have a lower understanding of adhering to the dietary guidelines for diabetes mellitus. Approximately 3 individuals do not adhere to the dietary guidelines due to a lack of knowledge about the dietary guidelines.

## CONCLUSIONS

The research findings indicate a relationship between the level of knowledge and dietary compliance among elderly individuals with diabetes mellitus in Karang Rejo Village, Langkat Regency in 2023.

It is hoped that the elderly can further increase knowledge and explore information from the public health center and other social media. It is hoped that Karang Rejo Village can be input and consideration for the public health center in re-improving the quality of health services at the health center for the elderly with Diabetes Mellitus problems and the health center can provide more useful information to the elderly suffering from Diabetes Mellitus.

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