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## **The Relationship Of Diet Compliance With Blood Sugar Levels In Type 2 Diabetes Mellitus Patients**

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### **ABSTRACT**

**Purpose :** This study aims to determine the relationship between dietary adherence and blood sugar levels in patients with type 2 diabetes mellitus at the UPTD Panawangan Health Center. **Methods :** This research method uses a cross-sectional study approach, with a sample of 80 respondents, as well as a proportional random sampling technique, and the measuring instrument used is a questionnaire and a digital blood sugar checker (Easy Touch GCU 3 in 1). **Results :** The results of the analysis of this study showed that most of the respondents adhered to the diet as many as 41 people (51.25%), who did not comply as many as 39 people (48.75%). The results of the statistical analysis of Rank Spearman obtained a  $p$  value of  $0.000 < 0.05$ , so that  $H_a$  could be accepted. **Conclusion :** The conclusion in this study is that there is a relationship between dietary adherence and blood sugar levels in diabetes mellitus patients at the UPTD Panawangan Health Center, Ciamis Regency.

**Key words:** Diet Compliance, Blood Sugar Levels

### **Introduction**

The last few decades have seen changes in nutrition and diets around the world combined with an increase in sedentary behavior. Diabetes is a complex chronic disease and requires treatment. Sustainable medical strategy in reducing multi-factor risk beyond glycemic control (American Diabetes Association, 2018).

Based on Riskesdas data, the number of diabetes mellitus sufferers in Indonesia ranks seventh with diabetes mellitus sufferers of 10,700,000 million people. While the largest number is in West Java Province, namely 1,078,857 people in 2020.

Based on West Java Open Data the number of people with diabetes mellitus in West Java Province is 1,078,857 people in 2020 from each Regency and City with an average value of 963,656 people each year in the last 2 years, including in the Ciamis Regency area

there are people with diabetes mellitus as many as 69,113 people in 2019 and there were 79,252 people with diabetes mellitus in 2020 there was an increase in the number of people with diabetes mellitus by 10,139 people or 12.79% from the previous year.

Based at the outcomes of the initial survey of researchers primarily based on facts from the Ciamis District health workplace for semester one (January 2019 to June 2019) the variety of humans with diabetes mellitus in Ciamis Regency was 27,483 humans. According to Rohimah's research (2023) that more than half of the people of Ciamis Regency have risk factors for not eating enough vegetables and fruit, bad cholesterol levels, and bad stomach circumference. Based on Widya (2015) Diet control is one of the important things in the management of diabetes mellitus. Without adequate dietary adjustments, diabetic patients are likely to experience various complications of diabetes, both macroangiopathy, microangiopathy, and neuropathy. According to Gunawan (2021) data shows that there are 68,566 people with hypertension in Ciamis Regency in 2020, diabetes and hypertension often occur together and may have some of the same causes.

The UPTD of the Panawangan Health Center is included in the top 10 health centers with the highest number of diabetes mellitus sufferers in the work area of the Ciamis District Health Office, the target of diabetes mellitus sufferers at the UPTD Panawangan Health Center is 462 people with program achievements of only 240 people (51.9%). Data from UPTD Panawangan Health Center until the end of September 2019, there were 272 DM sufferers who had been screened and received regular treatment. Data on patients seeking treatment at the UPTD Panawangan Health Center in Ciamis Regency for the last 3 months to October 2022 included 1178 patients.

There are various problems that arise from diabetes mellitus if not handled properly, which can cause various complications in organs such as the eyes, heart, kidneys, blood vessels and nerves which will endanger the lives of people with diabetes mellitus. Based on Pramayudi (2021) One thing the most important thing for diabetes mellitus patients is controlling blood sugar levels need to understand the things that affect the level of control blood sugar. Control of blood sugar levels in patients with diabetes mellitus is related with dietary pattern or meal planning factors, because nutrition has a relationship with diabetes mellitus

Based on Al-Salmi (2022) in the Omani medical magazine, dietary adherence of T2DM patients can also face 3 other difficult situations. First, the diabetic weight-reduction plan must be particularly designed to healthy the patron's weight, glucose level, and the type and stage of the disorder. 2d, government scientific and exclusive food plan gives many T2DM weight-reduction plan plans. 1/3, at the side of the improvement of dietary technology, the idea of a diabetes-pleasant diet is likewise growing. This will be puzzling for humans with diabetes. Therefore, only about 25% of people with T2DM follow their healthy diet.

Consistent with Al-Salmi (2022) dietary adherence is the key to T2DM management and first-line treatment. Nutrition tips are character and are usually given in the context of clinical advice. A healthy daily weight loss program includes a minimum of 400 g (3-5 servings) of fruits and vegetables and significantly less free sugar (<10% of typical energy intake) and fat (<30% of overall strength consumption). Despite the validated benefits of a healthy diet, adherence in patients with T2DM remains low.

Patients with diabetes mellitus need to routinely manipulate their blood sugar stages according to a predetermined agenda, so that the cost in their blood sugar degrees is thought to save you disturbances and headaches which can get up in order that there's a quick and suitable treatment. (Tandra, 2008). It is supported by using Mona's studies (2012) which indicates that there is a relationship among the frequency of giving dietary consultations and dietary compliance in people with diabetes mellitus.

Based on the above, it encourages researchers to conduct research between the relationship between diabetes mellitus dietary adherence and blood sugar levels in type 2 diabetes mellitus patients at the UPTD Panawangan Health Center, Ciamis Regency, so that it can provide additional information to health workers and the public in the management of diabetes mellitus.

## Methods

This type of research is research using a cross sectional approach. This study emphasizes the time of measurement and the independent and dependent variables only once at a time. In this study the technique of data collection, namely two variables or dietary compliance variables and blood sugar level variables were taken at the same time. The independent variable in this study is dietary adherence. The dependent variable in this study is blood sugar levels. The population in this study were all individuals with diabetes mellitus, totaling 393 people. The sample in this study was 80 people. The sampling technique used in this research is proportional random sampling technique.

## Results

**Table 1. Distribution of Diet Compliance in Diabetes Patients**

No	Diet Compliance	Frequency	Percentage
1.	Obey	41	51,25 %
2.	Not Obey	39	48,75 %
Total		80	100 %

Based on the following table, the dietary compliance of diabetes mellitus patients is mostly 41 people (51.25%) adherents and 39 people (48.75%) are non-adherent.

**Table 2. Distribution of Blood Sugar Levels in Diabetic Patients**

Value of Blood Sugar Levels	Number of Respondents
Normal <110 mg/dl	0
Pra Diabetes 110 – 126 mg/dl	0
Diabetes >126 mg/dl	80

The results are based on the following table that all respondents had blood sugar levels > 126 mg/dl with diabetes status, with the lowest blood sugar level the respondent was 134 mg/dL, and the highest respondent's blood sugar level was 543 mg/dL.

**Table 3. Relationship of Dietary Compliance with Blood Sugar Levels**

Dietary Compliance	Blood Sugar Levels				Total	
	Normal		Abnormal			
	f	%	f	%	f	%
Obey	0	0	41	51,25	41	51,25
Not Obey	0	0	39	48,75	39	48,75
	0	0	80	100	80	100

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*Spearman's rho*  $\alpha = 0,05$  diperoleh  $p = 0,000$ ;  
 $r = -0,690^{**}$

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The correlation between dietary adherence and blood sugar levels was tested using a correlation test using Spearman's ranks, from the results obtained it was known that the  $p$  value = 0.000, because the  $\rho$  value = 0.000 < 0.05, it can be interpreted that there is a significant relationship between dietary compliance variables and blood sugar levels in people with diabetes mellitus, from the results obtained above the Correlation Coefficient number produced, namely  $r = -0.690^{**}$ , meaning that the level of correlation strength or relationship is strong, the criterion for the level of correlation strength with a value of 0.51 – 0.75 is If there is a strong relationship, then the relationship between the two variables of dietary compliance with blood sugar levels in people with diabetes mellitus has a strong relationship, the Correlation Coefficient above is negative, namely  $r = -0.690^{**}$ , so the direction of the variable relationship is negative.

## Discussion

### 1. Respondent Characteristics of Type 2 Diabetes Mellitus Patients at UPTD Panawangan Health Center

The results of this study identified the characteristics of the respondents with the result that most of the respondents with diabetes mellitus were aged more than 45 years as many as 70 people (87.5%). The number of respondents in this study were mostly female as many as 62 people (77.5%), according to Laquatra (2004) because women have a high body fat composition compared to men so that women are more easily at risk of obesity.

This study used a population with an average body mass index (BMI) for each respondent, namely 23.0-24.9 (overweight), which also had an effect on increasing blood sugar levels. This is because the accumulation of free fat is high enough that it can cause increased cell up-take of free fatty acids and trigger fat oxidation which will further inhibit the use of glucose in the muscles (Wright, 2008).

### 2. Dietary Compliance of Type 2 Diabetes Mellitus Patients at UPTD Panawangan Health Center

The results of the diabetes mellitus diet adherence study showed that the majority of respondents adhered to as many as 41 people (51.25%). The results of the researcher's interview with the respondents were that there were still non-compliant respondents because the respondents often ignored and did not reduce their consumption of sweet foods and did

not eat according to dietary recommendations even though they had used sugar substitutes, rarely consumed fruits and vegetables, did not exercise and did not control their weight.

Based on Ramadhina (2022) the diabetes mellitus diet is a non-pharmacological therapy that is highly recommended for people with diabetes mellitus. Diet has the principle of regulating eating habits according to the nutrition of people with DM and adjusting eating patterns according to individual needs while dietary compliance is the level of patient readiness to follow the recommended dietary regimen according to established rules.

### **3. Blood Sugar Levels in Type 2 Diabetes Mellitus Patients at the UPTD Panawangan Health Center**

The results of the research on blood sugar levels showed that all respondents had blood sugar levels  $> 126$  mg/dl (100%) with diabetes status, the average respondent's blood sugar level was 279.85 mg/dl, the lowest blood sugar level for respondents was 134 mg/dL, and the highest respondent's blood sugar level was 543 mg/dL.

The average respondent who has uncontrolled blood sugar levels or high blood sugar levels has poor food consumption patterns and does not pay attention to dietary guidelines recommended by health workers and on average some respondents still consume sweet foods and drinks in irregular quantities and some have large portions of food and an irregular eating schedule according to recommendations.

### **4. The Relationship between Diet Compliance and Blood Sugar Levels in Type 2 Diabetes Mellitus Patients at the Panawangan Health Center UPTD**

There is a large relationship between dietary adherence and blood sugar levels in humans with Diabetes Mellitus in the working area of the Panawangan Public Health Center, Ciamis Regency, as evidenced by the correlation effect seen from the use of Spearman's ranking, from the received output it is known that the value of  $\rho$  value =  $0.000 < \text{zero}.05$  is close to it is possible that there is a relationship that there is a large difference between the variables of dietary compliance and blood sugar levels in humans with diabetes mellitus at the UPTD Panawangan Health Center, from the results received above the Correlation Coefficient is produced, namely  $r = -0.690^{**}$ , meaning that the energy level is a strong correlation or relationship then the criterion for the level of correlation power with a value of  $0.51-0.75$  is a strong relationship, so the relationship between the 2 variables of dietary compliance with blood sugar levels in humans with diabetes mellitus is very strong. Thus, the range of the Correlation Coefficient above is bad, namely  $r = -0.690^{**}$ , so that the habit of variable relationships is bad.

The results of this study are directly proportional to the research of Febriana (2014) that it is possible for people who have good dietary adherence to be successful in managing diabetes mellitus compared to poor adherence.

According to the researcher, the solution to the presence of diabetes mellitus patients who do not comply with dietary recommendations may be to increase socialization about diabetes mellitus. Diabetes Mellitus, but not only from the level of education which is the most important factor for a person to know many things in carrying out adherence to the Diabetes Mellitus diet but the extent to which a person's behavior in implementing recommended dietary compliance such as often ignoring does not reduce consumption of sweet foods and eating not according to dietary recommendations even though they have used sugar substitutes, rarely consume fruits and vegetables, do not exercise and do not control weight.

## Conclusion

Characteristics of type 2 diabetes mellitus patient respondents in the working area of the Panawangan Health Center, Ciamis Regency, aged 45 years, were 70 people (87.5%), and the majority were female, 62 people (77.5%) Results of dietary compliance in type 2 diabetes mellitus patients 2 as many as 41 people (51.25%), while blood sugar levels > 126 mg/dl as many as 80 people (100%). There is a relationship between diabetes mellitus diet adherence and blood sugar levels in type 2 diabetes mellitus patients at the UPTD Panawangan Health Center, Ciamis Regency.

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