THE RELATIONSHIP OF KNOWLEDGE AND DIET COMPLIANCE WITH BLOOD SUGAR LEVELS IN DIABETES MELLITUS PATIENTS IN THE POLYCLINIC ROYAL PRIMA JAMBI HOSPITAL IN 2023

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ABSTRACT

The World Health Organization (WHO) reports that 422 million people globally suffer from DM as of May 2020 and based on this data, Indonesia is ranked fourth with the highest number of DM sufferers after China, India and the United States. Based on the same report, it is estimated that in 2030 there will be 21.3 million DM sufferers in Indonesia. The incidence of DM in Jambi Province in the 2013 Riskesdas results was 1.2%, then increased to 1.4% in 2018. This study aims to determine the relationship between knowledge and dietary compliance with blood sugar levels in diabetes mellitus patients at the Royal Hospital Polyclinic. Prima Jambi City. This research is a quantitative study using cross sectional research. This research was conducted at the Royal Prima Hospital, Jambi City and was carried out in August 2023. The population of this study were outpatients at the Royal Prima Hospital, Jambi City. The sampling technique was taken using an accelerated sampling technique of 85 respondents. Data processing was carried out using univariate and bivariate analysis using the Chi Square test. The research results showed that there was no significant relationship between knowledge and dietary compliance with blood sugar levels at the Royal Prima Hospital, Jambi City. It is hoped that the Royal Prima Hospital will need to provide/create an educational program for DM patients who seek treatment at the Internal Medicine Polyclinic.

Keywords: Knowledge., Diet Compliance., Blood Sugar Levels., Diabetes Mellitus.

INTRODUCTION

Diabetes Mellitus (DM) is a chronic metabolic disorder characterized by increased blood glucose (Hyperglycemia) caused by an imbalance between insulin supply and demand. Insulin in the body is needed to facilitate the entry of glucose into cells so that it can be used for metabolism and cell growth. Reduced or absent insulin causes glucose to be retained in the blood and causes an increase in blood glucose. Meanwhile, cells become deficient in glucose, which is very important for cell survival and function. [1]

The World Health Organization (WHO) reports that 422 million people globally suffer from DM as of May 2020, and based on this data, Indonesia ranks fourth with the highest number of DM sufferers after China, India and the United States. Based on the same report, it is estimated that in 2030 there will be 21.3 million DM sufferers in Indonesia. [2]

The national prevalence of DM based on Riskesdas at ages >15 years is 2.0%. The incidence of DM in Jambi Province in the 2013 Riskesdas results was 1.2%, then increased to 1.4% in 2018. [3]

The Ministry of Health's 2020-2030 health development program as a whole focuses on 4 programs, one of which is Control of Non-Communicable Diseases (Hypertension, Diabetes Mellitus, Obesity and Cancer) and priority activities are promotive and preventive including pro-active activities outside the health center building, primary care, and family approach strategies. [4]

Data on Diabetes Mellitus Sufferers in the Internal Medicine Polyclinic at Royal Prima Hospital, Jambi City 2020-2023 saw an increase in the number of visits to the clinic for diabetes mellitus sufferers. In 2020 there were 78 cases, then in 2021 there were 138 cases, an increase of 60 cases, while in 2022 there were 878 cases, an increase of 499 cases and in 2023 from January to July 2023 there were 637 cases. [5]

Factors that influence controlling blood sugar levels are knowledge and diet compliance, if not controlled properly there will be uncontrolled decreases and increases in blood sugar levels. [6] Knowledge determines a person's behavior towards food so that they can control and control blood sugar levels. Knowledge is usually preceded by knowing, then actions that are based on knowledge and will be better than actions that are not based on knowledge. [7]

Dietary non-compliance is a very serious problem. Due to diet non-compliance, blood sugar levels will increase. For this reason, diabetes mellitus sufferers are advised to adhere to diet therapy, abbreviated as 3J, namely on the right schedule, right amount and right type. [8] Dietary compliance is an important aspect for success in managing and controlling blood sugar levels. Thus, DM patients must follow and comply with the diet management program in accordance with the provisions of the health team in order to

achieve optimal metabolic control, because patient compliance with diet is the main component of success in managing diabetes mellitus. [9]

Non-compliance with diet management for DM patients is caused by several factors, including education, knowledge, boredom with treatment and the desire to recover, resulting in complications. Therefore, the diabetes mellitus diet must be carried out according to the recommended program. Patients must learn special skills to care for themselves every day to avoid sudden decreases or increases in blood glucose levels, besides that they must also have preventive lifestyle behaviors to avoid long-term diabetic complications. [10]

The consensus on the management and prevention of DM in Indonesia states that the 4 main pillars in managing diabetes mellitus are education, medical nutritional therapy, physical exercise and pharmacological intervention. The aim of these 4 pillars is to maintain blood sugar (glucose) levels at normal levels (no hypoglycemia/hyperglycemia). DM sufferers who do not comply with the 4 pillars of management will have uncontrolled blood sugar levels and complications will occur such as stroke, kidney failure, heart failure, blindness and even have to undergo amputation if a limb suffers from a wound that is difficult or the blood cannot drain. Complications can arise due to patient non-compliance in carrying out diet management therapy programs, use of drugs. [11]

Compliance with a diet is the hope of every diabetes mellitus sufferer. This means that every diabetes mellitus sufferer must be able to carry out their doctor's recommendations so that diabetes mellitus remains under control. In practice, compliance is defined as the level at which the patient carries out the treatment methods and behavior recommended by the doctor or paramedic, as recommended for diabetes mellitus sufferers who experience treatment failure, this can be caused by various factors including not following a good diet.[12]

Nursihhah's research [13] on the relationship between dietary compliance and controlling blood sugar levels in diabetes mellitus patients. Univariate and bivariate analysis used the chisquare statistical test. There is a significant relationship between dietary compliance and value (p=0.000). Therefore, support from family and health workers can increase diabetes mellitus patients' knowledge in controlling blood sugar levels by providing information about diabetes mellitus management so that they can change attitudes and behavior.

The initial survey was conducted by researchers on Monday 3 – 5 August 2023 on 10 diabetes mellitus patients who came for treatment at the Royal Prima Hospital Polyclinic, Jambi City. The results of the GDS examination were 6 people with GDS > 180 mg/dl and 4 people with GDS < 180 mg/dl. Based on the results of interviews, 2 patients said they rarely checked their blood sugar except when they came to health services such as the health center or hospital and 3 patients said they knew their diabetes mellitus diet by making plans regarding the type and amount of food they would eat every day, 5 people The patient said they had not/didn't have a plan regarding the type and amount of food they would eat every day, then 2 patients said they were bored with treatment and their desire to recover, resulting in complications and uncontrolled blood sugar. The aim of this research is to determine the relationship between knowledge and diet adherence and blood sugar levels in diabetes mellitus patients at the Royal Prima Hospital Polyclinic, Jambi City in 2023.

MATERIAL AND METHODS

This research is quantitative research using a questionnaire. This research was conducted in the Internal Medicine Polyclinic working area of Royal Prima Hospital. In this study, respondents will have their blood sugar measured, then fill out a diabetes mellitus knowledge and diet compliance questionnaire. The population in this study was all diabetes mellitus patients who visited the Internal Medicine Polyclinic at Royal Prima Jambi Hospital, totaling 637 people with a sample of 85 people. To determine the sample size, the Lameshow formula is used as follows:

Information :
n = Sample size
N = Number of population in the study = 637 Z = Degree of trust 95% = 1,96

$$n = \frac{Z^2 \cdot P(1-P) \times N}{d^2(N-1) + Z^2 \times P \times (1-P)}$$

P = Populati
$$n = \frac{1,96^2 \times 0,5(1-0,5) \times 637}{0,1^2 \times (637-1) + 1,96^2 \times 0,5 \times (1-0,5)}$$

$$= \frac{3,8416 \times 0,5 \times 0,5 \times 637}{0,01 \times 636 + 0,9604}$$

on proportion 50% = 0,5
d = Research precision10% = 0,1
Based on the figures above, the minimum sample size is:

= 85 respondents

The sampling technique in this research used purposive sampling technique. Data collection was carried out by measuring blood sugar using a glucometer and filling out a questionnaire. The results of this research will be analyzed univariately and bivariately. Univariate analysis in this study obtained an overview of the distribution of each variable studied, namely age, gender, education, blood sugar, knowledge of diet compliance. Bivariate analysis in this study revealed the relationship between knowledge and dietary compliance with blood sugar levels. The test used in this research is the chy-square test.

RESULTS

Table 1. Characteristics of Respondents

No	Parameters	Amount	%
1	Age		
	40-60 Years	61	71.8
	>60 Years	24	28.2
2	Gender		
	Woman	55	64.7
	Man	30	35.3
3	Education		
	elementary school	10	11.8
	Junior high school	15	17.6
	Senior high school	51	60.6
	College	9	10.6
4	Blood sugar		
	Poor ≥ 180mg/dL	43	50.6
	Medium 145-179mg/dL	26	30.6
	Good <145mg/dL	16	18.8
5	Knowledge		
	Low	8	9.4
	High	77	90.6
6	Dietary Compliance		
	Not obey	30	35.3
	Obedient	55	64.7

Based on the table above, it can be seen that of the 85 respondents, 61 (71.8%) respondents were aged 40-60 years. On average, 55 (64.7%) respondents were female, 51 (60.6%) respondents had a high school education. Meanwhile, the majority of respondents have high knowledge, 77 (90%) respondents and diet compliance, namely 55 (64.7%) respondents.

$$= \frac{611,7748}{7,3204} = 84,57$$

Table 2. Relationship between Knowledge and Diet Compliance with Blood Sugar Levels

Parameters	blood sugar						Amount		R value
	Bad		Medium		Good				
	n	%	N	%	n	%	N	%	
Knowledge									0.381
Low	3	3.5%	2	2.4%	3	3.5%	8	9.4%	
High	40	47,1%	24	28,2%	13	15,3%	77	90.6%	
Dietary Compliance									0.756
Not obey	14	16.5%	9	10.6%	7	8.2%	30	35.3%	
Obedient	29	34.1%	17	20%	9	10.6%	55	64.7%	

Based on the table above, it can be seen that of the 85 respondents with the highest percentage with high knowledge and poor results, there were 40 (47.1%) respondents. The results of further statistical tests obtained a p value of 0.381 > 0.05 so it can be concluded that there is no significant relationship between knowledge and the results of respondents' blood sugar levels at the Internal Medicine Polyclinic, Royal Prima Jambi Hospital in 2023. Results of the analysis of the relationship between respondents' diet compliance with the results of the respondents' blood sugar levels, it was found that out of the 85 respondents with the highest percentage of compliance and poor results were 29 (34.1%) respondents. The results of further statistical tests obtained a p value of 0.756 > 0.05 so it can be concluded that there is no significant relationship between compliance with the results of the blood sugar levels of respondents at the Royal Prima Jambi Hospital.

DISCUSSION

The Relationship between Knowledge and Blood Sugar Levels in DM Patients at the Internal Medicine Polyclinic at Royal Prima Jambi Hospital in 2023

The results of the analysis of the relationship between respondents' knowledge and the results of respondents' blood sugar levels at the Internal Medicine Polyclinic at Royal Prima Jambi Hospital in 2023 showed that out of the 85 respondents with the highest percentage with high knowledge and poor results, 40 (47.1%) respondents were.

The results of further statistical tests obtained a p value of 0.381>0.05 so it can be concluded that there is no significant relationship between knowledge and the results of respondents' blood sugar levels at the Internal Medicine Polyclinic, Royal Prima Jambi Hospital in 2023. The results of this study are in line with research which was carried out by Tri Ardianti [14] with a statistical test result of p value 0.230, which means there is no relationship between knowledge and the results of blood sugar levels. Good knowledge does not guarantee good patient action regarding efforts to control blood sugar levels. Because actions come from his own desires and motivation, the patient's awareness and application of healthy living behavior is still lacking, which results in less control of blood sugar levels.

Knowledge itself is the patient's ability to understand and apply dietary patterns to control blood sugar levels. The more the patient applies the knowledge he has, the results obtained in the application of controlling blood sugar levels will be good or within normal limits, and vice versa, the results will be bad if the patient does not apply the knowledge he has to control his blood sugar levels.[15]

Apart from that, many DM sufferers have a good level of knowledge because it is triggered by several factors that influence the knowledge itself, such as mature age and a high educational background, thereby increasing the respondent's analytical ability regarding knowledge about DM risk factors, as well as sufferer experience factors. DM for several years and has made several efforts such as controlling sugar consumption. [16]

Research conducted by Amalia [17] states that an individual who has a high level of education will find it easier to receive information and reflect the level of ability to understand and receive information. An individual's knowledge and educational status are closely related. The higher a person's educational status, the more knowledge they will gain.

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Apart from the patient's own knowledge, to control blood sugar levels so that they are within normal limits, there must be support from family such as husband/wife, children, and other close relatives to remind each other and provide positive advice and support so that the patient remains enthusiastic about implementing a good diet pattern. and can share information with close relatives regarding controlling blood sugar levels. [18]

Researchers assume that respondents with high knowledge tend to absorb the information provided by health workers so that they have awareness of maintaining their health. Respondents should be able to look for information regarding food menus that do not trigger an increase in blood sugar levels and not be too ignorant about the knowledge they have gained in maintaining health and blood sugar levels so that they remain stable within normal limits.

The Relationship Between Diet Compliance and Blood Sugar Levels in DM Patients at the Internal Medicine Polyclinic at Royal Prima Jambi Hospital in 2023

The results of the analysis of the relationship between respondents' diet compliance and the results of respondents' blood sugar levels at the Internal Medicine Polyclinic at Royal Prima Jambi Hospital in 2023 showed that of the 85 respondents with the highest percentage of compliance and poor results were 29 (34.1%) respondents.

The results of further statistical tests showed that the p value was $0.756 > 0.05$ so it could be concluded that there was no significant relationship between compliance with the results of respondents' blood sugar levels at the Royal Prima Jambi Hospital.

The results of this study are not in line with research conducted by Tri Ardianti [14] with statistical test results of p value 0.000, there is a significant relationship between compliance with the results of respondents' blood sugar levels. Compliant patients will have their blood sugar levels controlled, with continuously controlled blood sugar levels they will be able to prevent acute complications and reduce the risk of long-term complications. On the other hand, for patients who are not compliant, their blood sugar levels will become uncontrolled, this will result in complications.

Diet therapy is one of the pillars of diabetes mellitus management which is a difficult challenge for diabetes sufferers in controlling dietary compliance. Diet modifications can be made by avoiding excessive calorie intake and a high-fat diet by consuming complex carbohydrates, fruit and vegetables. [19]

Patient compliance has different levels of compliance, if the patient controls blood sugar levels with only occasional compliance in controlling food intake containing dietary sugar, this will have an impact on poor results, as well as being indifferent to daily food intake.

These days and physical conditions will make the condition worse and increase blood sugar levels. [20]

Researchers assume that dietary compliance in the low category can occur due to employment/income factors. This is because someone who has a high income is more likely to buy food that meets the recommended diabetes diet. Respondents should pay more attention to the factors that cause an increase in blood sugar levels. It is best if the patient has good compliance and is accompanied by a strong intention for the patient's recovery in controlling blood sugar levels, and most importantly the support of the family and surrounding environment also supports the patient's recovery.

CONCLUSIONS AND SUGGESTIONS

It was found that there was no relationship between knowledge and diet adherence and blood sugar levels in diabetes mellitus patients at the Royal Prima Hospital Polyclinic, Jambi City in 2023. It is hoped that the results of this research will be able to develop the results of this research so that they can be used as a reference for conducting research using variable analysis. different.

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