

# LITERATURE REVIEW: KNOWLEDGE LEVEL, DIETARY ATTITUDE TO INCREASED BLOOD GLUCOSE IN PEOPLE WITH DIABETES MELLITUS

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## ABSTRACT

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### Keyword:

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### Abstract:

Diabetes mellitus is a disease that many people suffer from, coupled with this disease it is also a degenerative disease which has a mortality rate of 3% each year. To control blood glucose levels, it is necessary to improve diet, one of which is by choosing the right foods. Apart from that, knowledge and attitudes about diet can influence increasing blood glucose levels in diabetes mellitus sufferers. The purpose of this study was to understand the relationship between the level of knowledge and the attitude of eating patterns towards increasing blood glucose levels in people with diabetes mellitus in the community. This research is an analytical research based on literature studies and article searches through online search sites, namely through the Indonesian library site and searches using Google Scholar, EBSCO, Science Direct. This study found that the higher the level of knowledge of Diabetes Mellitus patients about diet, their blood sugar tends to be well controlled, because diabetes mellitus patients with a high level of knowledge tend to easily implement the management of diabetes mellitus in their daily lives.

### Abstrak:

*Diabetes melitus merupakan penyakit yang banyak sekali di derita oleh masyarakat, ditambah dengan penyakit ini juga merupakan penyakit yang sifatnya adalah degenerasi yang memiliki tingkat kematian mencapai angka 3% setiap tahunnya. Untuk melakukan pengontrolan terhadap kadar glukosa pada darah maka perlu dilakukan perbaikan pada pola makan, yang salah satunya dengan memilih makanan yang tepat. Selain itu faktor pengetahuan dan sikap tentang pola makan dapat berpengaruh terhadap peningkatan kadar glukosa darah pada penderita diabetes mellitus. Tujuan penelitian ini untuk memahami relasi tingkat pengetahuan dengan sikap pola makan terhadap peningkatan kadar glukosa darah pada penderita diabetes mellitus pada kalangan masyarakat. Penelitian ini merupakan penelitian analitik yang didasari pada studi literatur dan pencarian artikel melalui situs pencarian online yaitu melewati situs perpustakaan Indonesia dan penelusuran menggunakan berupa Google Scholer, EBSCO, Science Direct. Penelitian ini mendapatkan bahwa Semakin tinggi tingkat pengetahuan pasien Diabetes Melitus tentang pola makan maka, gula darahnya akan cenderung terkontrol dengan baik, sebab pasien diabetes melitus dengan tingkat pengetahuan yang tinggi cenderung dengan mudah mengimplementasikan penanganan diabetes melitus dalam kehidupan sehari-hari, selain itu, pengambilan sikap juga menjadi faktor yang penting dalam menangani diabetes melitus.*



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## INTRODUCTION

Diabetes mellitus (DM) is a term that refers to diabetes in the general public which is a clinical condition that describes the function of the pancreas that is disrupted to produce enough insulin for the body or also something that describes the condition of the body when it cannot use insulin effectively. A sign of diabetes mellitus is high glucose levels with limited metabolism substances body disturbed [1].

According to data from Diabetes *Federation International* (DFI), DM is a global conflict that continues to increase from every time in Indonesia and Indonesia. In 2019 it is estimated that at least at the age of 20-79 years there are 9.3% or 463 million people in the world suffering from diabetes of the entire total population, at the same age rising to 10.2% or 578 million people. Based on gender, the number of DM data in 2019 was 9% in women and 9.65% in men. The amount of DM data increases with age. At the age of 65-79 years there are 19.9% or 111.2 million people suffering from diabetes. The number of people with DM is predicted to increase to 578.4 million people in 2030 and 700.2 million people in 2045 [2].

Data from the World Health Organization (WHO), the highest number of DM sufferers in the age period of 20-79 years in 2019 is China with 98.4 million people, followed by India with 65.1 million people, then the United States with 24.4 million people, and other countries such as Brazil, Russia, Japan, and so on. Even in Japan, there are predictions that DM cases will increase rapidly in 2030 to reach 21.3 million. Even though currently the number of DM sufferers in Japan is 7.2 million. Indonesia itself is a country that is in the 7th position out of 10 countries with a case rate of 10.7 million people. In Southeast Asia, Indonesian is only one of them [3].

Increased blood glucose levels are often associated with incorrect diet settings. A diet interpreted as an effort to regulate the amount, type and schedule of food in an

effort to make good health, maintained nutrition, and prevent various other diseases, and encourage healing in diseases. A good diet will be seen from a balanced nutritional figure with all nutritional needs met [4].

In addition to diet, according to Insiyah and Hastuti, 2016 that the problem to overcome DM is low knowledge from people about things that cause increased blood sugar levels. Therefore, efforts that can be made are to choose and improve the right diet. From the results of research shows that dietary adherence in DM sufferers is still diverse due to limited knowledge about DM disease [5].

According to Perdana et al [6], mentioning that patient insight into DM is a means that can encourage patients to help in dealing with diabetes healing. With so many DM patients who are aware of DM treatment, patients can control their own disease conditions so that their condition will be much better and their quality of life will improve. The results showed that relaxation has meaning from the level of insight into glucose control. This means that the respondent group has accumulated knowledge. Its glucose levels were more controllable than those of respondents with little knowledge [5]. The attitude possessed by DM sufferers is very important because it will help DM sufferers in taking the right attitude in acting, thinking and trying to manage their disease and can also control blood sugar [5].

## RESEARCH METHODS

This type of research is analytical research based on literature studies. Through this technique, theories that have relevance to the problems in the research can be explained to be a reference for discussion in the research results. This organization is sourced from searching various international journals and national journals, in the form of full text PDF. This literature review also uses help through online sites, namely the Indonesian national library website and searches using Google

Choler, EBSCO, Science Direct. There are 20 journals that have information whose

explanations are very complete and all data are thoroughly reviewed in good speech

**RESULTS AND ANALYSIS**

**RESULTS**

**Table 1.**  
**Journal Search Results**

<b>N o.</b>	<b>Rese arch</b>	<b>Sample</b>	<b>Title</b>	<b>Results/conclusion</b>
1.	[7]	90 people	Level Relationships Knowledge with Controlled Levels Blood sugar in patients DM Type II at RSUD AWS	In this study, there was a good level of knowledge as many as 46 respondents (51.1%), enough 27 respondents (30.0%), less 17 respondents (18.9%). This research shows that out of 90 good control people amounting to 58 (64.4%) people, controversyl medium 17 (18.9%) respondents, bad control 15 (16.7%) respondents. From the results of bivariate <i>p value</i> $0.000 < 0.05$ . There is a correlation from the level of knowledge on controlling blood sugar levels in patients with type II diabetes.
2.	[8]	67 people	The relationship between the level of knowledge of diabetes mellitus and GDS levels in patients with diabetes mellitus puskesmas Menteng Palangkaraya	In this study, through the <i>Willcoxon</i> Test data can be obtained a meaningful relationship from DM knowledge to blood sugar when DM patients whose <i>p value is</i> $0.000 < 0.05$ It can be known that, someone with a good level of knowledge will have the willingness to implement
3.	[9]	17 people	Relationship Between Diabetes Knowledge, Glycemic Control, and Associated Health Conditions	This research shows a correlation of knowledge and implementation of a healthy lifestyle on blood sugar control when Type 2 DM patients with <i>p values of</i> $0.03 < 0.05$ . Type 2 DM patients who have high knowledge and a healthy lifestyle tend to have blood sugar that can be controlled.
4.	[10]	310 people	Level of Knowledge in Patients with Type 2 Diabetes Mellitus and its Relationship with Glycemic Levels and Stages of Grief According to Kübler-Ross	In this study analyzed almost all respondents had a lack of knowledge on blood sugar levels that could not be controlled, these sugar levels could trigger complications from Type 2 DM. This proves that there is a relationship between the level of knowledge and blood sugar levels, where a <i>p value of</i> $0.000 < 0.05$ was obtained in the multivariate regretion test
5.	[11]	96 people	Correlations Between A1C and Diabetes Knowledge, Diabetes Numeracy, and Food Security in a Vulnerable Type 2 Diabetes Population	This research shows a correlation between the level of DM knowledge on blood sugar levels HbA1C and healthy eating patterns for Type 2 DM patients with <i>p values of</i> $0.003 < 0.05$ . The results of this study suggest that most respondents have controlled HbA1C blood sugar levels and a healthy diet following DM diit this goes hand in hand with the level of knowledge about DM owned by patients, where most patients $>50\%$ have a good level of knowledge
6.	[12]	75 people	Reality vs Illusion: Knowledge, Attitude and Practice among Diabetic Patients	This research found a correlation between the level of DM knowledge on blood sugar levels. In this study, a <i>p value of</i> $0.007 < 0.05$ was obtained and the data showed that most respondents had a level of knowledge that was less related to DM. Therefore, there is no attitude and behavior.

7.	[13]	100 people	Correlation of Disease Knowledge with Adherence to Drug Therapy, Blood Sugar Levels and Complications Associated with Disease among Type 2 Diabetic Patients	This research shows a meaningful relationship in the level of knowledge and also adherence to taking medication in patients for fasting blood sugar levels and complications in patients with DM. This is evidenced by the results of the Chi-square test which shows a <i>p value of 0.000 &lt; 0.05</i> . Respondents in this study have an adequate level of knowledge so that they can implement a healthy lifestyle that causes controlled blood sugar levels. Likewise with adherence to taking medications that they apply with the aim of minimizing the occurrence of complications
8.	[14]	142 people	Level Relationships Knowledge, Attitudes and Diet with Blood Sugar Levels in Diabetes Mellitus Patients in the Working Area of Sudiang Health Center Makassar City	In this study the results of statistical tests in this study prove that there is a significant relationship between knowledge and blood sugar ( <i>p value 0.000</i> ), besides that there is a significant relationship on attitudes and blood sugar levels ( <i>p value 0.000</i> ), there is also a significant relationship on diet and blood sugar levels ( <i>p value 0.000</i> )
9.	[15]	46 people	The Relationship of Family Knowledge and Attitudes with Controlled Blood Sugar Levels in Type 2 Diabetes Mellitus Patients (Study at Kediri Regency General Hospital)	This research shows a correlation of knowledge on family attitudes on controlling blood sugar levels whose <i>p value is 0.001 &lt; 0.05</i> control of blood sugar levels in patients with type-2 diabetes is given an influence on knowledge and attitude factors. There is a correlation of knowledge and family attitudes on controlling blood sugar levels of type 2 DM patients, namely the level of knowledge and type 2 DM sufferers have results that are directly inversely proportional to HbA1C blood sugar levels, with high knowledge and a lifestyle that tends to be healthy, blood sugar can be controlled.
10	[16]	100 people	The relationship between knowledge, family support With blood sugar levels of patients with Type 2 DM	This study showed a correlation between the level of knowledge and support from family for blood sugar levels during Type 2 DM patients, where the level of knowledge was related to the patient's blood sugar levels with <i>p values of 0.001 &lt; 0.05</i> . From the results of data analysis, it was found that most respondents had a high level of knowledge so that the data showed that, most respondents had a controlled GDS.
11	[17]	218 people	Association of diabetes knowledge with glycemic control and self-care practices among Pakistani people with type 2 diabetes mellitus	In this study, it was suggested that there was a significant relationship between knowledge and attitudes on HbA1C blood sugar levels for Type 2 DM patients at the knowledge level with <i>p values of 0.000 &lt; 0.05</i> . Type 2 DM patients have adequate knowledge of the prevention, treatment, and management of DM tend to have blood sugar levels that can be controlled when compared to patients with less knowledge. Likewise, the attitude of DM patients who apply a healthy lifestyle and DM tends to have blood sugar levels that can be controlled, when compared to patients who are not wise. Adequate knowledge related to prevention, treatment and management of DM tends to have controlled HbA1C blood sugar levels compared to patients with less knowledge.

12	[18]	464 people	Diabetes knowledge, medication adherence, and glycemic control among diabetic patients : A cross- sectional study in Jordan	This study concluded that there is a significant relationship that is interrelated from the level of knowledge related to DM and patient compliance in taking OAD (Oral Anti-Diabetic) in controlling blood sugar HbA1c with <i>p value</i> $0.007 < 0.05$ . Half of the respondents in this study had a minimal level of insight and non-adherence to treatment, therefore after being examined, the blood sugar level it has HbA1C is high even up to 8%
13	[19]	71 people	Diet adherence of diabetes mellitus patients based on the level of knowledge and family support in the Sudiang Raya Health Center area	This research found a significant correlation in the level of DM knowledge on blood sugar levels. From this study, a <i>p value</i> of $0.004 < 0.05$ data showed that, most respondents were well informed and had a controllable level of 40-45%
14	[20]	125 people	Associations Between Health Literacy, Diabetes Knowledge, Self-Care Behaviors, and Glycemic Control in a Low Income Population with Type 2 Diabetes	This research shows that 50-60% of respondents have a good level of insight related to DM, have healthy living behaviors and comply with DM so that most respondents have controlled HbA1C blood sugar levels. This proves that there is a significant relationship between the level of knowledge and HbA1C blood sugar levels of Type 2 DM patients where through the results of the Chi-square test obtained <i>p values</i> of $0.000 < 0.05$
15	[21]	291 people	Modelling of diabetes knowledge, attitudes, self management and quality of life	This study shows that there is a correlation between the level of knowledge, attitudes and self-management of DM patients with blood sugar levels during Type 2 DM patients with <i>p values</i> of $0.04 < 0.05$ . Respondents in this study have a high level of knowledge about DM so that the attitudes and self-management they implement are also good, of course, everything is inseparable from the knowledge they have. With a good level of knowledge, blood sugar levels when in respondents
16	[22]	50 people	The relationship between the level of patient knowledge about diabetes mellitus diet on blood sugar control of diabetes mellitus patients in the Rose Room of Dr. Harjono Ponorogo Hospital	In this study, the results of the Spearman Rank statistical test obtained <i>p value</i> $0.002 < 0.05$ , it can be concluded that there is a relationship between the level of patient knowledge about Diabetes Mellitus Diet to Blood Sugar Control of Diabetes Mellitus patients
17	[23]	50 people	The Relationship Between the Level of Knowledge Related to Diet and Physical activity with the status of blood sugar levels in patients Diabetes Mellitus	This research shows a significant correlation with the level of dietary knowledge on the blood sugar status of DM patients <i>p value</i> 0.014, besides that there is also a significant correlation in the level of knowledge and physical activity on blood sugar levels <i>p value</i> 0.000
18	[24]	75 people	The relationship of family knowledge about diabetes mellitus diet with the patient's blood sugar levels	In this study based on the results of data analysis with the chi square test showed <i>p values</i> of $0.000 < 0.05$ , which means that there is a significance of the implications of family knowledge related to DM on the patient's blood sugar levels.

19	[25]	64 people	The relationship between the level of knowledge about diabetes mellitus and blood sugar control behavior in outpatient diabetes mellitus patients at Dr. Moewardi Surakarta Hospital	This research found that respondents had sufficient knowledge of DM as many as 15 people (50%), good knowledge as many as 14 people (47%) and less as many as 1 person (3%). Dietary behavior in DM patients obtained adequate dietary behavior, namely 17 people (61%), less 9 people (32%) and good as many as 2 people (7%). The results of bivariate analysis obtained <i>p value</i> $0.000 < 0.05$ , it can be concluded that there is a significant relationship between the Level of Knowledge and Dietary Behavior in Diabetes Mellitus Patients
20	[26]	40 people	The Relationship of Knowledge and Diet with Blood Glucose Levels in Diabetes Mellitus Patients Type 2 in the Working Area of Mangasa Health Center Makassar City	In this study the results obtained by the chi square statistical test showed that $H_0$ was rejected which means there is a significant correlation of knowledge and blood glucose levels of patients, where <i>p values are</i> $0.013 < 0.05$ , then Chi square statistical tests with fisher exact test show that $H_0$ is rejected which means there is a significant relationship between diet and blood glucose levels of patients, where <i>p value</i> $0.003 < 0.05$ .

**DISCUSSION**

Based on the results of the analysis of the relationship between the level of knowledge, dietary attitudes on increasing blood glucose levels in patients with diabetes mellitus from 20 journals in the form of the table above it can be seen that:

**The relationship of knowledge with increased blood glucose levels**

In the preparation of this literature review, there are 20 journals that will be used and 20 journals that discuss the relationship between knowledge and increased blood glucose levels, namely education being one that can affect knowledge. Knowledge is very important for education if the education is high, it will have broad level of knowledge. But keep in mind, if someone is poorly educated does not necessarily have low knowledge as well. Thus also increased self-awareness in terms of health, changing a healthy lifestyle, adherence to therapy, and quality of life. High and low blood sugar levels can affect the level of education, with less education, it will not understand a healthy lifestyle so that blood sugar levels in the body are not controlled. The importance of observing blood sugar levels is that blood sugar levels are indicators in the diagnosis of diabetes mellitus.

The importance of patients knowing efforts to observe blood sugar levels through the four pillars of diabetes mellitus management so that patients are able to control their disease so that blood sugar levels become more normal and with normal blood sugar levels, diabetes mellitus can be controlled. The higher the patient's level of education, it is expected that the higher the patient's knowledge about blood sugar control diabdgbetes mellitus, so that the patient is able and understanding in consuming food and choosing food and arranging the right eating schedule.

**The relationship of attitude with elevated blood glucose levels**

In the preparation of this literature review, there are 5 journals that will be used and 5 journals that discuss the relationship between attitude and increased blood glucose levels. Increased blood glucose levels are caused because attitude is the origin of accepting and the average patient has accepted himself as a diabetic, also able to respond to his own disease by actively involving himself in paying attention to the schedule of visits / check-ups and assessing a problem that occurs and considers that it is important for himself [27]. Some factors that also support

such as good family support, experience and adequate facilities are also directly related to a person's attitude in realizing positive behavior. This shows that the average DM sufferer who is in the Sudiang work area has a positive attitude which will make it easier for sufferers to take action.

### **The relationship of diet with blood glucose levels**

In the preparation of this literature review, there are 5 journals that will be used and 5 journals that discuss the relationship between attitude and increased blood glucose levels. According to Ermawati, 2018 said that diet is a daily consumption habit where there are amounts, types and schedules of food that must be considered. Food factors are the main factors responsible as the cause of diabetes mellitus. Too much eating foods that contain carbohydrates, fats and proteins can inhibit the work of the pancreas to carry out the function of insulin secretion. If insulin secretion is inhibited then the sugar level in the blood will increase.

Modern lifestyles that often consume fast food or fast food cause an increased risk of DM, including consuming drinks containing artificial sweeteners and excessive carbohydrate consumption which can increase the risk 7% higher. Unhealthy eating patterns that are by ignoring the type, amount and schedule or frequency of consumption that can cause metabolic disorders in the body. At a time when health status is declining, nutritional fulfillment is one of the supporters of good healing.

### **The relationship between the level of knowledge, dietary attitudes with blood glucose levels in patients with Diabetes Mellitus**

The correlation between the level of knowledge of dietary behavior in increasing blood glucose in DM sufferers is known from Muhasidah, et al that the year of knowledge that blood sugar levels are

2017 provides a conclusion that there is a meaningful correlation between the level of insight in DM sufferers in the work area of the Sudiang Health Center Makassar City. There is a meaningful correlation of diet on blood sugar levels because based on the average data of DM sufferers in the Sudiang region has a high intensity of participation in educational counseling, and is followed by good knowledge and attitudes of the community to choose good food, for example consuming lots of vegetables and throwing away when compared to carbohydrates, The regularity of the meal schedule and the dose that has been determined, although in reality there are still many respondents who have not been able to run the diet program properly and correctly.

There is a meaningful correlation between the level of knowledge and blood sugar levels because knowledge is important to be the basis for the formation of one's actions. The majority of type 2 DM sufferers in the PKM area have good insight and knowledge, this situation is due to the high intensity of participation in educational activities related to the program in controlling blood sugar levels so that from these activities a good attitude can be obtained to control DM because of knowledge. The adequate level of knowledge available in DM sufferers can control the desire to implement regular DM management which has implications for behavior in controlling blood sugar levels.

This is because knowledge becomes an important area in shaping a person's behavior. This research is in line with Notoadmodjo's theory [28], which states that before the adoption of new behavior in a person, there is a continuous process, which begins with awareness, interest, consideration, starting to try, and adapting.

### **CONCLUSION**

From analyzing the relationship between the level of knowledge, dietary attitudes on increasing blood glucose levels in patients with diabetes mellitus from 20

journals, it was found that the higher the level of knowledge of Diabetes Mellitus patients about diet, the blood sugar will tend to be well controlled, because Diabetes Mellitus patients with a high level of knowledge tend to easily implement Diabetes Mellitus treatment in daily life.

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