THE RELATIONSHIP BETWEEN DIET COMPLIANCE AND CHANGES IN BLOOD SUGAR LEVELS OF DIABETES MELLITUS PATIENTS IN THE WORK AREA OF HIANG COMMUNITY HEALTH CENTER IN KERINCI REGENCY IN 2024

Ema Gusnaini[1], Soviarni[2], Devfi Herlina[3]
Bina Insani Sakti Nursing Academy, Sungai Penuh City, Jambi
gusnainiema35@gmail.com / 05.hannan2014@gmail.com / Kurniawanharimurti04@gmail.com

ABSTRACT

Diabetes Mellitus is a complex chronic disease that occurs due to abnormalities in insulin secretion, insulin action, or both, causing the body to experience disturbances in the metabolism of carbohydrates, proteins, and fats which results in blood glucose levels tending to increase or hyperglycemia. This research aims to determine the relationship between diet adherence and changes in blood sugar levels of diabetes mellitus patients in the Hiang Community Health Center working area, Kerinci Regency in 2024. This research uses a correlational quantitative research design. The sample in this study was 31 respondents and sampling took 10-15% of the total population. The independent variable is diet compliance, while the dependent variable is blood sugar levels. Statistical tests use the Chi-Square test. The results of the study showed that there were 15 respondents (48.4%) who adhered to their diet and 14 respondents (45.2%) changed blood sugar levels in diabetes mellitus patients to normal. The Chi-Square statistical test shows that the P value = 0.007 <α = 0.05, which means Ha is accepted. This research concludes that there is a relationship between Diet Compliance and changes in blood sugar levels of diabetes mellitus patients in the Working Area of the Hiang Community Health Center, Kerinci Regency in 2024. It is hoped that diabetes mellitus patients and their families will know that to achieve normal blood sugar levels, they need to increase diet compliance. Suggestions for authors are expected to increase insight, knowledge, and skills, and for educational institutions, it is hoped that they can provide information and scientific expertise for students of the Bina Insani Sakti Nursing Academy regarding the relationship between diet compliance and changes in blood sugar levels in diabetes mellitus patients, for the community health center, it is hoped that the community health center will provide education and information to diabetes mellitus patients, meanwhile, it is expected that future researchers who will research the same theme can develop this research with other independent variables.
Keywords:Diabetes Mellitus, Diet Compliance, Blood Sugar Levels

INTRODUCTION

Diabetes is one of the many diseases that threaten the lives of many people. Unfortunately, although many people have diabetes, some of them are not aware of its presence. They never undergo examination and treatment to overcome diabetes, people know Diabetes Mellitus. But actually, there are still several other types of Diabetes. Diabetes can kill someone by destroying the Blood Vessels in the body. Usually, the damage begins before someone undergoes a diabetes examination. Complications of diabetes can also cause death. Diabetes is usually associated with other silent-killer diseases and it is possible that someone not only has diabetes, but also hypertension, heart disease, and high cholesterol. All of these diseases are usually related to a person's lifestyle (Tjahjadi, 2017: 01).

Diabetes Mellitus (DM) is a complex chronic disease caused by increased blood sugar (glucose) levels continuously due to insulin deficiency involving carbohydrate, protein, and lipid metabolism and the development of macrovascular, microvascular, and neurological complications. The frightening consequences of DM are that patients will have a high risk of cardiovascular disease, kidney disease, ruptured blood vessels, heart attacks, strokes, foot ulcers, infections, amputations, and overall risks. DM is also a disease that shows increased glucose due to insulin deficiency which can

cause macrovascular, microvascular, and neurological complications (Parliani, et al. 2021: 09). Based on the World Health Organization (WHO, 2023) DM is defined as a chronic disease that occurs when the pancreas does not produce enough insulin or when the body cannot use the insulin produced effectively. Insulin is a hormone that regulates blood glucose. Hyperglycemia, also called increased blood glucose or increased blood sugar, is a common effect of uncontrolled diabetes and over time causes serious damage to many body systems, especially the nerves and blood vessels (WHO, 2023).

Dietary compliance is a positive and expected behavioral change so that the healing process of the disease is faster and more controlled. Lifelong diet management for DM patients becomes something tedious if the patient does not have a strong understanding and awareness of maintaining their health. The expected change in dietary behavior for DM patients is to want to make changes to their eating patterns from irregular to planned diets (Ramadhina, Aura 2022). Compliance can be very difficult and requires supportive factors for compliance to be successful. These supporting factors are family support, knowledge, and motivation to become accustomed to the changes made by arranging to take the time and opportunity needed to adjust (Martin, 2022).

The prevalence of patients with diabetes mellitus in the world is still quite high. Based on population-based data, the incidence of diabetes mellitus in the world is around 10.5% or 537 adults (20-79 years) living with diabetes. The total number of people with diabetes is expected to increase to 46% or 643 million in 2030 and 783 million in 2045. More than 3 out of 4 adults live in low- and middle-income countries. Diabetes is responsible for 6.7 million deaths in 2021 - 1 death every 5 seconds. Diabetes causes health spending of at least USD 966 billion - an increase of 316% over the past 15 years. 541 million adults suffer from Impaired Glucose Tolerance (IGT), which puts them at high risk for developing type 2 diabetes (IDF, 2022).

In the 10th edition of the IDF atlas, it is stated that in Indonesia, the estimated population of adult diabetes aged 20-79 years is 179,720,500, so if calculated from these two numbers, it is known that the prevalence of diabetes at the age of 20-79 years is 10.6%. In other words, if calculated in the 20-79 age group, 1 in 9 people have diabetes. The burden of health costs per year for people with diabetes aged 20-79 years in Indonesia is 323.8 USD. When compared to other countries, the costs dedicated to diabetes care in Indonesia are much smaller. Let's take an example, for example a country close to Indonesia, Australia, the cost used for diabetes services is 5,944 USD per person, while Brunei Darussalam uses funds of 901.3 USD per person. The death rate related to diabetes in the age group of 20-79 years in Indonesia is estimated at 236,711. Meanwhile, the proportion of undiagnosed diabetes patients in the age group of 20-79 years is 73.7% (IDF, 2022).

Based on RISKESDAS data (2018), the prevalence of Diabetes Mellitus cases in Indonesia was 1.5% in 2013 and increased to 2 in 2018. The highest prevalence of Diabetes Mellitus in Indonesia is in DKI Jakarta with 3.4% of cases. The prevalence of Diabetes Mellitus cases in Jambi was 1.3%, increasing to 1.7% in 2018 and the lowest in NTT with 0.9% (Mulyati, Sri 2023).

According to the Jambi Provincial Health Office (2020), the number of Diabetes Mellitus sufferers in Jambi was recorded at 52,282 people. One of the regencies in Jambi with the highest number of Diabetes Mellitus sufferers is Kerinci Regency with 14,353 sufferers, followed by Muaro Jambi with 6,849 sufferers and the last was Bungo Regency with 2,980 sufferers (Mulyati, Sri 2023).

Based on data taken from the Kerinci Regency Health Office in 2021 there were 5,230 cases of Diabetes Mellitus and in 2022 there were 2,560 cases of Diabetes Mellitus recorded, then in 2023 there were 7,492 cases of Diabetes Mellitus (DM) and blood sugar checks had been carried out (Kerinci Regency Health Office 2023)

Based on data obtained by researchers at the Hiang Health Center, the number of Diabetes Mellitus patients in 2021 was 88 patients, in 2022 there was an increase of 278 patients and in 2023

there was an increase again from the previous year, namely 310 patients and blood sugar checks had been carried out.

Based on an initial survey conducted by researchers at the Hiang Health Center, from the results of interviews conducted by researchers with 10 Diabetes Mellitus patients, 7 people said that their illness was due to irregular eating patterns, excessive stress, hereditary and non-compliance with the recommended diet and the remaining 3 people were compliant with the recommended diet and often consulted or controlled their illness at health services once a month (HIANG HEALTH CENTER, 2024).

According to research conducted by (Yuli Nur Magfiroh, et al. 2023), namely the Relationship between Diet Compliance and Changes in Blood Sugar Levels in Diabetes Mellitus Patients at the Jambon Health Center, Ponorogo Regency, the results of the research data showed that the majority, namely 18 people (72%) of the study respondents had compliance with the compliant category, while with the non-compliant criteria as many as 7 respondents (28%). In connection with the results, more respondents with diet compliance with the compliant criteria were because patients received counseling about diet programs according to the recommendations of health workers while undergoing treatment at the Jambon Health Center.

According to research conducted by (Nursihhah, Melani & Dwi Septian Wijaya 2021), namely the Relationship between Diet Compliance and Blood Sugar Level Control in Type 2 Diabetes Mellitus Patients at Karyamedika Hospital, Bantargebang, Bekasi, the results of the research data showed that the distribution of respondents based on diet compliance, most respondents were non-compliant (69.2%) and a small number of respondents were compliant (30.8%). Based on the results of statistical tests that respondents who were compliant with diet and controlled blood sugar (77.3%), while respondents who were not compliant with diet and uncontrolled blood sugar (92.9%), the results of statistical tests with the Chi-square test obtained a p-value of (0.000) <α (0.05), meaning that there is a significant relationship between diet compliance and blood sugar control. In addition, the OR value of 44.686 shows that respondents who are not compliant with the diet have a 44.686 times greater risk of uncontrolled blood sugar compared to respondents who are compliant with the diet.

Therefore, researchers are interested and have conducted a study entitled " ***The Relationship Between Diet Compliance and Changes in Blood Sugar Levels Of Diabetes Mellitus Patients In The Work Area Of Hiang Community Health Center In Kerinci Regency In 2024****". With this diet compliance education, it is hoped that it can help the community regulate their diet according to DM dietary needs and this is expected to help normalize blood sugar levels in people with DM.*

RESEARCH METHODS

The type of research used by researchers is quantitative. The research design or plan used is non-experimental using a descriptive correlational design with a cross-sectional approach, which is a study to study the relationship between two variables. With this study, the prevalence or effect of a phenomenon (dependent variable) will be obtained about the cause (independent variable). This study aims to determine the relationship between diet compliance and blood sugar levels changes in diabetes mellitus patients in the work area of Hiang Community Health Center in Kerinci Regency in 2024. In this study, the population was all men and women with Diabetes Mellitus in the Hiang Health Center Area, Kerinci Regency, the data obtained were 310 people (2023 data). The place of this research was carried out in the Hiang Health Center work area, Kerinci Regency. This research was conducted in June 2024.

The sampling technique according to Arikunto (2020), namely by taking 10-15% of the population. So the sample size obtained was 10% of 310 people, namely 31 respondents.
The criteria for respondents are:

1. *Inclusion Criteria*
   The inclusion criteria in the study are as follows:
   a. *Willing to be a research respondent*
   b. *Patients diagnosed with Type II Diabetes Mellitus in the Hiang Health Center Work Area*
   c. *Able to communicate well and read.*
   d. *Adult patients (> 24 years)*
2. *Exclusion Criteria*
   a. *Not willing to be a respondent*
   b. *Patients with mental disorders*
   c. *Patients who have complicated diseases such as kidney, heart disorders, and stroke.*

In this study, a validity test has been conducted. The validity test in this study was carried out in the work area of the Tanah Kampung Health Center. The results of the validity test used in the questionnaire on the relationship between dietary compliance and changes in blood sugar levels in patients with diabetes mellitus were obtained with a calculated r in the range of 0.649-0.955> from the r table of 0.444. Test decision: If the calculated r is greater than the Ho table, it is rejected, meaning that the variable is valid.

The reliability test in this study was carried out in the work area of the Tanah Kampung Health Center. The results of the reliability test on the questionnaire on the relationship between dietary compliance and changes in blood sugar levels in patients with diabetes mellitus were Cronbach Alpha = 0.975 (> 0.5). Test decision: If Cronbach alpha> 0.5 means that the variable is reliable.

What was done in this study on respondents was to observe patient dietary compliance and patient blood sugar levels. Determination of diet compliance and blood sugar levels by adding up the score values with the following interpretations: Compliant if the score is (60-71), non-compliant if the score is (30-36), and Controlled: (100-140 mg/dL), uncontrolled: (>140mg/dL).

In this study, interviews were conducted with respondents such as building a relationship of mutual trust with respondents and asking for identities such as name, age, gender, address, last education, complaints felt by respondents, health history of respondents, and so on. In this study, researchers measured blood sugar levels and distributed questionnaires. By reading and giving questionnaires directly to patients to fill out the questionnaire. After filling out the questionnaire, the researcher checked again what the patient had filled in so that it could be processed into the SPSS application

RESEARCH RESULTS

1. Univariate Analysis

Based on the results of a study conducted in June 2024 in the Hiang Health Center Work Area, Kerinci Regency, regarding the relationship between dietary compliance and changes in blood sugar levels of diabetes mellitus patients in diabetes mellitus patients, with a sample size of 31 people.

a. *Diet Compliance in Diabetes Mellitus Patients in the Hiang Health Center Work Area, Kerinci Regency*
   The results of the study conducted on 31 respondents in patients with Diabetes Mellitus, obtained groups of respondents who were compliant and non-compliant with varying compliance according to individual energy needs which can be seen in table 1

Table 1 Frequency Distribution of Diet Compliance in Diabetes Mellitus Patients

in the Hiang Health Center Work Area, Kerinci Regency, 2024

Diet Compliance	*F*	*%*
Compliant	*15*	*48,4*
Non-Compliant	*16*	*51,6*
Total	*31*	*100,0*

Based on table 1, there are 15 people (48.4%) who adhere to their diet, while there are 16 people (51.6%) who do not adhere to their diet.

b. *Control of blood sugar levels in diabetes mellitus patients in the working area of the Hiang Health Center, Kerinci Regency in 2024*

Table 2 Frequency Distribution of Blood Sugar Level Control in Diabetes Mellitus Patients in the Hiang Health Center Working Area in 2024

Blood Sugar Level Control	*F*	*%*
Controlled	*14*	*45,2*
Uncontrolled	*17*	*54,8*
Total	*31*	*100,0*

Based on table 2, the number of people with controlled blood sugar levels in Diabetes Mellitus sufferers was 14 people (45.2%), while the number of people with uncontrolled blood sugar levels in Diabetes Mellitus sufferers was 17 people (54.8%).

2. Bivariate Analysis

The relationship between dietary compliance and changes in blood sugar levels of diabetes mellitus patients in the working area of The Hiang Health Center, Kerinci Regency can be seen in table 3

Table 3 Relationship between dietary compliance and blood sugar levels of diabetes mellitus patients in the working area of the Hiang Health Center, Kerinci Regency in 2024

		Total Blood Sugar Level Control		*Total*	*P Value*
		Controlled Uncontrolled	*Controlled Uncontrolled*		
Diet Compliance	*Compliant*	*11*	*4*	*15*	*0,007*
		35,5%	*12,9%*	*48,4%*	
	Non-Compliant	*3*	*13*	*16*	
		9,7%	*41,9%*	*51,6%*	
Total		*14*	*17*	*31*	
		45,2%	*54,8%*	*100,0%*	

Based on Table 3 above, it is known that the compliance variable with the compliance indicator has controlled blood sugar levels, namely 11 (35.5%) and the compliance variable with the compliance indicator has uncontrolled blood sugar levels of 4 people (12.9%). Then the compliance variable with the non-compliant indicator has controlled blood sugar levels of

3 people (9.7%) while the compliance variable with the non-compliant indicator has uncontrolled blood sugar levels of 13 people (41.9%).

Analysis using the Chi-square test obtained a significance value of 0.228> 0.05, it can be concluded that the residual value is normally distributed, so there is a relationship between diet compliance and blood sugar control. The correlation coefficient value (r) - 0.267 means that there is a sufficient relationship (0.26 - 0.50) between Diet compliance and blood sugar control in DM patients, with a negative relationship direction because of the value.

DISCUSSION

1. Univariate Analysis

Diet Compliance with Changes in Blood Sugar Levels of Diabetes Mellitus Patients in the Hiang Health Center Work Area, Kerinci Regency.

Based on the results of the study, more respondents were categorized as non-compliant, namely 16 people (51.6%), while for compliant respondents there were 15 people (48.4%). This is because most respondents were non-compliant, both in terms of the amount of food, type of food, and meal schedule. And also an irregular meal schedule according to recommendations (Jayanti, 2020).

This study is in line with the study conducted by Suhartatik Siti in the year of research (2022) entitled "Factors Affecting Diet Compliance of Diabetes Mellitus Patients". The results of the study showed that there was a relationship between several factors above and diet compliance in diabetes mellitus patients. Diet compliance in diabetes mellitus patients can be influenced by various supporting factors. These supporting factors include education, knowledge, work, income, family support, health worker support, and self-motivation (Martin, 2022).

Based on the researcher's assumption that dietary compliance greatly influences the healing process of diabetes mellitus, diabetes mellitus sufferers are emphasized on the importance of regular eating patterns such as meal schedules, amount of food, and type of food. There are various ways to improve compliance, namely maintaining communication with health workers, getting clear information about diabetes mellitus so that patients understand instructions from health workers, and providing social support in the form of attention and advice that is useful for diabetes mellitus patients, dietary compliance increases if there is counseling about the importance of implementing a diet program according to recommendations so that blood sugar levels are within normal limits.

Controlling Blood Sugar Levels in Diabetes Mellitus Patients in the Hiang Health Center Work Area, Kerinci Regency.

Based on the results of the study, blood sugar level control was more respondents who were categorized as uncontrolled, namely 17 people (54.8%) with uncontrolled blood sugar levels on average of more than 200 mg/dl. While for respondents with controlled blood sugar levels, there were 14 people (45.2%) with controlled blood sugar levels. On average, respondents with uncontrolled blood sugar levels have poor consumption patterns by not paying attention to the DM diet guidelines recommended by health workers and there are still many respondents who continue to consume sweet foods and drinks in unlimited amounts and large portions (Jayanti, 2020).

This study is in line with the study conducted by Magfiroh, et al. (2023) with the title of the study, namely "The Relationship between Diet Compliance and Changes in Blood Sugar Levels of Diabetes Mellitus Patients at the Jambon Health Center, Penorogo Regency". The results obtained showed that the majority, namely 18 people (72%) of the study respondents had compliance with the compliant category, while with the non-compliant criteria, there were 7 respondents (28%). In connection with the results of more respondents with diet compliance with the compliant criteria, the results of more respondents with diet compliance with the compliant criteria were because patients received counseling about diet programs according to the recommendations of health workers while undergoing treatment at the Jambon Health Center.

To regulate blood sugar levels within normal limits, there are several things that diabetes mellitus sufferers need to do. First, maintain the source of calories that enter is not excessive from the body's needs, second, improve insulin sensitivity and third, improve insulin resistance (Amir, 2023: 40). To improve lifestyle, continuous education is needed. People with diabetes mellitus must receive education about the disease they suffer from, nutrition, exercise, care during illness, use of drugs, the course of diabetes, and complications that can occur and motivate them to have the desire to be responsible for their care. A very important topic for people with diabetes mellitus is controlling their blood sugar so that it is always within normal limits by regulating nutrition and nutrition. Patients who are overweight or obese need to lose weight. Meanwhile, for patients who already have complications such as cardiovascular disease or dyslipidemia, it is recommended to combine the principles of a diabetes mellitus diet with a diet used in patients who suffer from cardiovascular disease or dyslipidemia (Amir, 2023: 43).

Based on the researcher's assumption that, controlling blood sugar levels is an effort to maintain blood sugar levels to remain stable. If blood sugar levels increase, it will cause narrowing of all blood vessels, as a result the organs of the body become weak and their functions decline and ultimately the organs in the body will be damaged. Therefore, it is very necessary for a sufferer to be invited to exchange ideas, increase physical activity, consume nutritious food, do useful things with a sense of comfort, and maintain emotions so that Diabetes Mellitus patients do not experience stress and do not think about what they are suffering from now.

2. Bivariate Analysis

Relationship of Diet Compliance to Blood Sugar Level Control in Diabetes Mellitus Patients

From the results of the bivariate analysis of Diabetes Mellitus patients, it is known that the variable of compliance with blood sugar level control with the indicator of compliance in respondents has controlled blood sugar level control, namely 14 (45.2%) and the variable of compliance with blood sugar level control with the indicator of non-compliance, most of them have uncontrolled blood sugar level control, as many as 17 people (54.8%). Overall, compliance with blood sugar level control in Diabetes Mellitus patients is mostly compliant with blood sugar level control, namely 14 people (45.2%). If dietary compliance is carried out correctly, the patient's body can minimize changes in blood sugar levels. However, on the other hand, if the patient does not comply with their diet, they will experience changes in blood sugar levels above normal (Purba, 2017).

This study is in line with the study conducted by Indah (2022) with the title of the study, namely "The Relationship between Diet Compliance and Blood Sugar Level Control in Type II Diabetes Mellitus Patients in the Padang Matinggi Health Center UPTD Work Area in 2022"

with the results obtained showing that people who have good dietary compliance have a 4 times greater risk of success in managing Diabetes Mellitus compared to those who do not. The suitability of respondents' dietary compliance can be measured by the accuracy of the diet pattern that respondents must follow.

Meanwhile, research conducted by Mulyati, et al. (2023) showed that the incidence of type 2 DM tends to occur in female respondents who are more affected by type 2 DM compared to men. This is because women in society have a higher life expectancy compared to men, so the increasing number of elderly women causes the number of women suffering from type 2 DM to increase.

Dietary compliance is the level of patient willingness to carry out a diet by following the dietary patterns recommended by doctors and health workers according to the rules that have been set (Sugiyono, 2015). If a patient follows their dietary compliance well, the patient will feel the benefits such as successful treatment and the rate of recovery will increase because if someone adheres to their diet it will give a greater chance of recovery (Widodo, 2019).

The principles of diet for people with DM are almost the same as the recommended diet for the general public, namely balanced food according to the calorie and nutrient needs of each individual. People with DM need to be given emphasis on the importance of regular meal schedules, types, and amounts of calorie content, especially for those who use drugs that increase insulin secretion or insulin therapy itself (Nursihhah, et al. 2021).

According to the researcher's assumption efforts to treat diabetes mellitus patients as well as prevent complications are to make efforts to control DM, one of which is the regularity of DM patients in complying with the DM diet. Diet compliance greatly affects the healing process of diabetes mellitus, factors that affect diet compliance include knowledge, attitude, and family support. DM sufferers need to be emphasized on the importance of regular eating patterns such as meal schedules, amount of food, and types of food.

CONCLUSION

Based on the results of the research and discussion that has been carried out, it can be concluded that there is a Relationship between Diet Compliance and Changes in Blood Sugar Levels in Diabetes Mellitus Patients in the Hiang Health Center Work Area, Kerinci Regency in 2024, with a p-value of 0.007 ($p \leq 0.05$).

BIBLIOGRAPHY

1. Almatsier, S. 2010. *Penuntun Diet, Edisi Baru*. Jakarta : PT Gramedia Pustaka Utama
2. Amir, elfizon. 2023. Ada Apa Dengan Diabetes Melitus Tipe 2.Yogyakarta : CV BUDI UTAMA
3. Amruddin. 2022. *Metodologi Penelitian Kuantitatif*. Sukoharjo: Pradina Pustaka
4. Apriyanti, Maya. 2023. *Meracik Sendiri Obat Dan Menu Sehat Bagi Penderita Diabetes Melitus*. Yogyakarta : Pustaka Baru Press
5. Dinas Kesehatan Kabupaten Kerinci. 2023. *Data Pasien Diabetes Melitus*. Kabupaten Kerinci: DINKES
6. Dharma, Kusuma Kelana. 2017. *Metode Penelitian Kepeawatan : Paduan Melaksanakan Dan Menerapkan Hasil Penelitian*. Jakarta : Trans Info Media.
7. Fahmi, NF, Dkk. 2020. *Pengaruh Waktu Penundaan Terhadap Kadar Glukosa Darah Sewaktu Dengan Metode Poct Pada Mahasiswa*. Madura : STIKES Ngudi Husada

8. *International Diabetes Federasional*. 2022. *Internasional Diabetes Federasional* : *Diabetes Atlas Ninth Edition*.
9. Jayanti, Desi Pratama. 2020. *Hubungan Kepatuhan Diet Terhadap Kadar Gula Darah Penderita Diabetes Melitus Di Posbindu Wilayah Kerja Puskesmas Suka Merindu Kota Bengkulu*
10. Kementerian Kesehatan Republik Indonesia. 2020. *Hari Diabetes Nasional*. KEMENKES RI. Perpustakaan Kemenkes RI
11. Laquatra, Ida Marie. 2014. Nutrition For Weight Management: dalam Mahan LK, Stumpes. Krause's Food Nutrition and Diet Therapy 11 th edition. Pensylvania : Saunders
12. Lingga, Lanny. 2012. *Bebas Diabetes Tipe 2 Tanpa Obat*. Jakarta : PT Agromedia Pustaka.
13. Magfiroh, dkk. 2023. *Hubungan Kepatuhan Diet Dengan Perubahan Kadar Gula Darah Pada Pasien Diabetes Melitus Di Puskesmas Jambon Kabupaten Ponorogo*. Ponorogo : STIKES Buana Husada Ponorogo
14. Maria, Insana. 2021. *Asuhan Keperawatan Diabetes Melitus Dan Asuhan Keperawatan Stroke*. Yogyakarta : CV Budi Utama
15. Martin, Akbar. 2022. *Hubungan Kepatuhan Diet Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus*. Cirebon : STIKES Ahmad Dahlan
16. Medical Record. 2023. *Jumlah Diagnosa Diabetes Melitus Di Puskesmas Hiang Kabupaten Kerinci*. Hiang : Puskesmas Hiang.
17. Mulyati, Sri. 2023. *Pengaruh Senam Diabetes Melitus Terhadap Kadar Gula Darah Pada Penderita Diabetes Melitus Tipe 2 Di Wilayah Kerja Puskesma Kecil Jambi*. Jambi :Jurnal Keperawatan Kesehatan
18. Nursihhah, Meliana & Dwi Septian Wijaya. 2021. *Hubungan Kepatuhan Diet Terhadap Pengendalian Kadar Gula Darah Pada Pasien Diabetes Melitus Tipe 2*. Bekasi : STIKES Khas Kempek
19. Notoadmojo. 2018. *Metodologi Penelitian Kesehatan*. Jakarta : Renika Cipta.
20. Parliani, dkk. 2021. *Buku Saku Mengenal Diabetes Melitus*. Jawa Barat: CV Jejak, Anggota IKAPI
21. Ramadhina, Aura, dkk. 2022. *Kepatuhan Diet Diabetes Melitus (DM) Dengan Kadar Glukosa Darah Pada Pasien DM Di Rs Islam Sultan Agung Semarang*. Semarang :Universitas Islam Sultan Agung.
22. Rahmatiah, dkk. 2022. *Literature Review: Hubungan Kepatuhan Diet Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus*. Poltekkes kemenkes makassar, Indonesia
23. Saraswati,Made Ratna. 2022. *Diabetes Melitus Adalah Masalah Kita. Jumat,5 agustus 2022 13.48 wib. RSUP Prof, Dr, I.G.N.G.Ngoerah*
24. Setiana, Anang & Rinanuraeni. 2018. *Riset Keperawatan*. Cirebon: LovRinz Publishing
25. Suhartatik, Siti. 2022. *Faktor-Faktor Yang Mempengaruhi Tingkat Kepatuhan Diet Penderita Diabetes Melitus*. Surabaya : Jurnal Kesehatan Tadulako.
26. Sugiyono. 2015. Epidemiologi Penyakit Tidak Menular. Trans Info Media. Jakarta. 2015:25-33
27. Sugiyono. 2017. *Diabetes Bukan Untuk Di Takuti* . Jakarta : F Media. 2018
28. Tandra, Hans. 2017. *Segala Sesuatu Yang Harus Anda Ketahui Tentang Diabetes*. Jakarta : PT Gramedia Pustaka Utama.
29. Tjahjadi, Vicynthia. 2017. *Mengenal, Mencegah & Mengatasi Silent Killer*. Yogyakarta : Romawi Press.
30. Ovan &Andika Saputra. 2020. *CAMII: Aplikasi Uji Validitas Dan Reliabilitas Instrumens Penelitian Berbasis Web*.Sulawesi Selatan : Yayasan Ahmar
31. Cendekia Indonesia Vione, Dkk. 2022. *Edukasi Diabetes Melitus Dan Pemeriksaan Kadar Glukosa Darah Umat Paroki St. Antonius Padua Tataran*: STIKES Gunung Maria Tomohon.
32. WHO. 2023. *World Health Organization*