

Medication Adherence, Glycemic Control, and Quality of Life Among Patients with Type 2 Diabetes Mellitus at a Primary Health Center in Makassar, Indonesia

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ABSTRACT

Background: Diabetes Mellitus is a chronic disease characterized by high blood sugar levels which can affect quality of life, instability of blood sugar levels and compliance with taking medication.

Objective: The aim of this study was to determine the relationship between medication adherence and blood sugar levels with quality of life in type II diabetes mellitus patients at the Kassi-Kassi Community Health Center.

Methods: This study uses a quantitative research method with a cross-sectional approach. The research location is at the Kassi-Kassi Community Health Center in Makassar City. Sampling used purposive sampling with a population of 190 and a sample of this study amounted to 65 respondents, data collection using the Morisky Medication Adherence Scale-8 questionnaire for medication adherence, the Quality of life-brief clinical inventory questionnaire for quality of life and observation sheets for Random Blood Glucose (RBG) examination. observation sheets and analyzed using the parametric Pearson/non-parametric Spearman rho test.

Results: The results of the study showed that there was a relationship between the level of compliance in taking medication and quality of life with a p value of 0.001, there was no relationship between Random Blood Glucose (RBG) and quality of life with a p value of 0.010.

Conclusion: The conclusion of this study is that there is a relationship between medication adherence and quality of life, but no relationship between blood sugar levels and quality of life. To lower blood sugar levels in diabetic patients, adherence to medication and maintaining a healthy lifestyle can help maintain a high quality of life.

Keywords: Type 2 Diabetes Mellitus, Random Blood Glucose (RBG), Medication Adherence, Quality of Life

INTRODUCTION

Non-communicable diseases (NCDs) are a health problem that causes high mortality rates in Indonesia. The main NCDs in Indonesia include hypertension, cancer, chronic obstructive pulmonary disease (COD), and diabetes mellitus. Diabetes mellitus is a chronic disease characterized by high blood sugar levels, which can affect blood sugar instability, quality of life, and medication adherence.

According to WHO in 2024, the number of diabetes mellitus sufferers experienced between the ages of 30 and 70 years increased globally, in 2022 the number of sufferers was 200 million sufferers increasing to 830 million (WHO, Diabetes, 2024). Meanwhile, data from the Ministry of Health of the Republic of Indonesia in 2023 was found through the Healthy Indonesiaku (ASIK) application at 14.05% (13,470,556 of 95,900,441) especially in South Sulawesi as much as 12.99% (Kemenkes, 2023). Based on data from the Makassar City Health Office in 2024, the Kassi-Kassi Community Health Center was ranked first out of 47 Community Health Centers spread across the Makassar City area, with 2,290 sufferers (152.11%), including 945 male sufferers and 1,345 female respondents (DINKES Kota Makassar, 2024).

Uncontrolled blood sugar levels can be influenced by, among other things, non-compliance with medication. Based on research conducted by (Mpila

et al., 2023)., forgetting to take medication, stopping taking medication when feeling better or worse, drug side effects, lower education levels, low income, and not having a glucometer at home. According to Suaka Insan & Banjarmasin Kalimantan Selatan (2020), medication compliance is taking prescribed medications at the right dosage. Treatment compliance will also directly affect the quality of life and can reduce morbidity and mortality in DM patients. The quality of life of DM patients is influenced by age, gender, education level, occupation, medication compliance, and duration of diabetes mellitus (Mpila et al., 2023).

Based on preliminary data obtained from the Kassi-Kassi Community Health Center in 2024, 2,283 (151.7%) cases were found, with a total of 29,664 people of productive age. Researchers also conducted site observations and interviews with DM officers at the Community Health Center. The study location was characterized by a dense population, central urban location, numerous fast food vendors, and a habit of rarely taking medication and uncontrolled diabetes.

Based on interviews and observations during the treatment of type II diabetes, it was discovered that some patients were non-compliant with their medication, as evidenced by their failure to take their medications. Based on the above description, the researchers were interested in conducting a study to

examine the relationship between medication non-compliance and blood sugar levels and the quality of life of patients with type II diabetes mellitus.

METHODS

This study uses a quantitative method with a correlation study design using a cross-sectional approach. The purpose of this study was to determine the relationship between the level of medication adherence and Random Blood Glucose (RBG) with the quality of life of type II diabetes mellitus patients at the Kassi-Kassi Community Health Center, Makassar City. This study was conducted in February 2025 at the Kassi-Kassi Community Health Center. The population in this study were 190 Type II DM patients and a sample of 65 respondents was

obtained using a purposive sampling technique. The instruments in this study were the Morisky Medication Adherence Scale-8 questionnaire for medication adherence, the Quality of Life-Brief Clinical Inventory questionnaire for quality of life and an observation sheet for Random Blood Glucose (RBG) examination. Data processing techniques in this study were carried out through the stages of editing, coding, data entry and tabulation. Data analysis techniques were carried out using Univariate and Bivariate analysis used was the Pearson Test. This research has passed the ethical test with number 070/STIKES-NH/KEPK/II/2025 issued on February 15, 2025, Nani Hasanuddin College.

RESULT

Respondent Characteristics

Table 1. Respondent Characteristics (N:65), Age, Gender, Last Education, Occupation, Duration of DM Suffering, Medication Consumption and Medication Dosage

Characteristics	Frequency (n)	Presentase (%)
Age		
19-59 Year (Dewasa)	57	87,7
>60 Year (Seniors)	8	12,3
Gender		
Man	15	23,1
Woman	50	76,9
Last Education		
No School	1	1,5
Elementary School	23	35,4
Junior High School	9	13,8
Senior High School	17	26,2
S1	15	23,1
Work		
Housewife	54	83,1
daily laborer	5	7,7
self-employed	6	9,2
Long Suffering DM		
≤ 5 Year	38	58,5
>5 Year	27	41,5
Consuming medication DM (Metformin)		
Yes	49	75,4
No	16	24,6
drug dosage		
3x1	49	75,4
not taking medication	16	24,6
Total	65	100,0

Based on table 1, it shows that the adult age of respondents aged 19-59 years was 57 respondents (87.7%) and the elderly age of >60 years was 8 respondents (12.4%), gender was 15 respondents (23.1%), women were 50 respondents (76.9%), the last education of respondents was less than half was elementary school as many as 23 respondents (35.4%), no school as many as 1 respondent (1.5%), junior high school as many as 9 respondents (13.8%), high school as many as 17 respondents (26.2%), bachelor's degree (S1) as many as 15 respondents (23.1%), occupation was housewife as many as 54

respondents (83.1%), daily laborers as many as 5 respondents (7.7%) and self-employed as many as 6 respondents (9.2%), the duration of DM sufferers was predominantly <5 years as many as 38 respondents (58.5%), >5 years as many as 27 respondents (41.5%), those who consumed DM medication (metformin) as many as 49 respondents (75.4%), did not consume DM medication (metformin) as many as 16 respondents (24.6%), respondents took medication mostly 3x/day as many as 49 (75.4%) and did not take medication as many as 16 respondents (24.6%).

Table 2. Univariate Analysis of Blood Sugar Level Questionnaire (GDS), Medication Compliance Level and Quality of Life Level.

Characteristics	Frequency (n)	Presentase (%)
Blood Sugar Levels (GDS)		
Controlled \leq 140 mg/dl	9	13,8
Uncontrolled $>$ 141 mg/dl	56	86,2
Level of Adherence to Taking Medication		
Tall	9	13,8
Currently	5	7,7
Low	51	78,5
Quality of Life Level		
Low	25	38,5
Tall	40	61,5
Total	65	100,0

Based on table 2, it shows that the criteria for the level of compliance with taking medication in type II DM sufferers, the low level of compliance is dominantly high as many as 51 respondents (78.5%), while the moderate level of compliance is as many as 5 respondents (7.7%) and the high level of

compliance is as many as 9 respondents (13.8%). The level of quality of life in DM sufferers is more dominant at high quality of life as many as 40 respondents (61.5%), while low quality of life is as many as 25 respondents (38.5%).

Table 3. Bivariate Analysis of the Relationship Between the Level of Medication Compliance and the Quality of Life of Type II Diabetes Mellitus Patients.

medication adherence	Quality of Life				Amount		p Value	α
	Low		High		n	%		
	n	%	n	%	n	%		
Tall	0	0	9	13,84	9	13,84	0.001	0.05
Currently	0	0	5	7,70	5	7,70		
Low	25	38,46	26	40	51	78,46		
Total	25	38,46	40	61,54	65	100		

Table 3 shows that the relationship between the level of medication adherence and quality of life from the analysis using the Pearson statistical test has a p value of 0.001 because the p value $<$ α (0.05) then the alternative hypothesis is accepted. The

interpretation is that there is a relationship between the level of medication adherence and quality of life. The strength of the correlation is below 1, which means that medication adherence and quality of life have a weak relationship.

Table 4. Bivariate Analysis of the Relationship Between Blood Sugar Levels (BGS) and Quality of Life of Type II Diabetes Mellitus Patients.

Kadar Gula Darah (GDS)	Kualitas Hidup				Amount		p Value	α
	Low		High		n	%		
	n	%	n	%	n	%		
Controlled \leq 140 mg/dl	0	0	9	13,48	9	13,84	0.010	0.05
Uncontrolled $>$ 141 mg/dl	25	38,46	31	48,69	56	78,46		
Total	25	38,46	40	62,17	100	100		

Table 4 shows that the relationship between Random Blood Glucose (RBG) and quality of life from the analysis using the Pearson test shows a p value $>$ α , namely $0.010 > 0.05$, which means H_a is rejected and H_0 is accepted, which means there is no relationship between Random Blood Glucose (RBG) and quality of life.

Based on the results of statistical tests in table 5.10, it can be seen from 57 respondents in the Kabaena Health Center Working Area, showing the results of eating patterns (amount of food) in accordance with prehypertension blood pressure as many as 9 respondents (15.8%) and eating patterns

(amount of food) not in accordance with prehypertension blood pressure as many as 1 respondent (1.8%) while eating patterns (amount of food) in accordance with stage 1 blood pressure as many as 12 respondents (12.1%) and eating patterns (amount of food) not in accordance with stage 1 blood pressure as many as 1 respondent (1.8%) while eating patterns (types of food) in accordance with stage 2 blood pressure as many as 32 respondents (31.6%) and eating patterns (amount of food) not in accordance as many as 2 respondents (3.5%).

These data show that H_a in this study was accepted with a p value = 0.899, which is greater than

0.05 (indicating no significant relationship), between dietary patterns (amount of food) and the incidence of hypertension in the Kabaena Health Center Work Area.

DISCUSSION

Based on this research conducted at Kassi-Kassi Health Center, Makassar City in February 2025, the population in this study were 190 type II diabetes mellitus sufferers with a sample of 65 respondents. Data collection using a questionnaire, then univariate and bivariate analysis was carried out. Univariate analysis to describe the distribution of general characteristics of variables including age, gender, last education, occupation, duration of DM, drug consumption (metformin) and drug dosage, while bivariate analysis was carried out to see the relationship between variables in proving the hypothesis, the basis for decision making with a significance level of 95% ($\alpha = 0.05$).

Univariate Analysis

Description of Medication Compliance in Type II Diabetes Mellitus Patients.

Low medication adherence among respondents is based on several factors such as age, gender, education level, and occupation. Those aged <40 years and having productive activities have other priorities in their daily lives, are unable to take medication or attend routine check-ups (Jasmine et al. al. , 2020). The majority of adult patients aged 25-64 years old, with 47 respondents, adhered to medication, compared to 17 respondents aged over 65 years old, because the aging process will continue after the age of 30, and anatomical, physiological, and biochemical changes will occur (Antoro et al., 2023). From the results of Bidulang's research, et al. , (2021) with medication adherence using the MMA-8 questionnaire , the dominant level of compliance was low at 30 respondents, high compliance at 23 respondents, and moderate compliance at 11 respondents.

According to researchers by Mpila et al. , (2023) some reasons for non-compliance with medication are not being careful with the treatment regimen , forgetting to take medication, stopping taking medication when feeling better or worse, side effects of medication, lower education level, low income, not having a glucometer . At home . Factors related to adherence to diabetes mellitus treatment significantly influence adherence, including motivation to achieve treatment targets, social factors, education on self-monitoring of high blood sugar levels, access to health services, and psychological factors such as laziness and anxiety (Syahid, 2021).

Gender is a sexual difference that does not rule out the possibility of occurring in both men and women. There were 59 female respondents compared to 59 male respondents.

As many as 41 respondents because women have a greater chance of increasing their body mass index due to cyclical syndrome (Priambodo et al., 2022).

The relationship between age and medication adherence is related to those under 40 years of age who have productive activities and have other priorities in their daily lives (Jasmine et al., 2020).

Educational status is one of the predictors that can influence medication adherence. The highest level of education for patients was elementary school, with 29 respondents. The higher the level of education, the more likely they are to pay attention to health awareness, diet, and lifestyle (Bidulang) . et al. , (2021). Higher education can influence a person's intellectual abilities regarding basic knowledge, logic, and general knowledge (Jasmine et al. , 2021). al. , 2020). Higher levels of education are more likely to have broader knowledge than those with lower levels of education, and they will behave in accordance with their experience undergoing the treatment process (Kusumaningrum & Azinar , 2021).

Work is a daily activity and has an important role in fulfilling human life needs. The majority of patients' occupations were housewives, with 47 respondents. Housewives' occupations are classified as jobs with light physical activity, because after doing household chores for a short time (Bidulang et et al. , 2021).

The researcher assumed that the majority of respondents were in the low compliance category (51 respondents), moderate compliance (5 respondents), and high compliance (9 respondents). 49 respondents complied with taking medication according to the dosage given by the community health center and following the doctor's prescription, while 16 respondents did not take the medication.

Respondents stated several reasons for not complying with medication, such as forgetting to take medication, difficulty remembering to take medication, stopping taking medication when feeling better, lack of self-awareness, high medical costs, fear of complications such as kidney disease due to continuous medication consumption and busy work.

Respondents were 15 male and 50 female. This was found in research data that the age group of 15-59 years was the highest compared to the elderly, with 57 respondents. Researchers assume that type II DM patients have low medication adherence because they are still in their productive age and have other priorities in their daily lives.

Educational status can influence medication adherence. Primary school education is more prevalent among type II DM patients, with 23 respondents reporting low medication adherence. Researchers assume a lack of general knowledge in managing type II DM, supported by data on work as a housewife (54 respondents) as the highest daily activity . Respondents are housewives but often neglect taking medication because they feel they are not sick and are in good health.

Description of Random Blood Glucose (RBG)in Type II Diabetes Mellitus Patients.

Blood cavern levels are the amount of glucose contained in the blood and also a source of energy in

body cells. Normal blood sugar levels are less than 100mg/dl (Antoro et al. , 2023). Diabetes Mellitus (DM) is a chronic disease characterized by high blood sugar levels as a result of decreased insulin or when the body cannot effectively use insulin (Bulu et al., 2013). al. , 2019). Diabetes mellitus is a chronic metabolic disease with multiple etiologies characterized by increased blood glucose levels (Haskas et al. , 2023). Diabetes mellitus has two main categories, namely type I DM (insulin dependent) caused by a lack of insulin production and type II DM (also called insulin independent) caused by less effective use of insulin in the body (Kusumaningrum & Azinar , 2021).

Respondents had GDS 140-200 mg /dl totaling 51 respondents and had blood sugar levels >200 mg/dl totaling 49 respondents. Factors that influence abnormal blood sugar levels include not exercising regularly, food intake, and irregular consumption of medication (Priambodo et al. al. , 2022). The initial symptoms of DM are characterized by polyuria , polydipsia , polyphagia, weight loss, fatigue and muscle weakness , protein catabolism in the muscles, and the inability of most cells to use blood sugar for energy. Other symptoms include tingling and numbness, impaired immune function , decreased energy, slow-healing wounds, and blurred vision due to cataracts (Emde , 2021).

Efforts made by DM sufferers include reducing consumption of sweet foods, foods that contain a lot of fat, fried foods, high-fat dairy products, processed foods made from wheat and vegetables cooked with the addition of salt, cheese and butter in large quantities (Kristelina). et al. , 2023). DM sufferers, in addition to being compliant in taking medication, should also do 30 minutes of physical activity every day or exercise 5 days a week , such as jogging, and follow a healthy diet by reducing sugar and fatty foods (Bulu et al. , 2023). et al. , 2019).

Patients can also carry out diet management, physical exercise, monitoring of blood sugar levels at the nearest health service, and patient education (Emde , 2021).

From the results of the research, researchers found that Random Blood Glucose (RBG) are said to be controlled if ≤ 140 mg / gl and abnormal category if blood sugar levels > 141 mg / dl. Respondents' blood sugar levels were more dominantly uncontrolled as many as 56 compared to controlled blood sugar levels as many as 9 respondents. Data from patient characteristics from consuming metformin type DM medication and duration of suffering, drug consumption as many as 49 respondents, not consuming metformin medication as many as 16, respondents mostly 3x / day in taking medication and the duration of DM sufferers ≤ 5 years as many as 38 respondents compared to the duration of DM sufferers > 5 years as many as 27.

Based on the research, the researcher assumed that respondents said they felt signs and symptoms of high blood sugar levels, including feeling an increase in the amount of urine with a frequency of more than 5 times a day until they often wake up at night, feeling tingling or itching on the body, feeling excessive hunger, age >60 feeling blurred vision,

wounds taking a long time to heal, and muscle weakness. How to deal with increased blood sugar levels, Respondents said they took medication if they felt better, stopped taking it, had regular check-ups at the health center, did exercise every afternoon, were enthusiastic about activities and reduced fat levels.

Overview of Quality of Life in Type II Diabetes Mellitus Patients.

The quality of life of DM patients is influenced by factors such as age, gender, education level, occupation, medication adherence, and duration of medication use. Ninety-six respondents had a high quality of life, 20 had a low quality of life, and 46 had a moderate quality of life, with 160 patients suffering from type II DM (Naufanesa et al., 2021).

Research results from Antoro et al. , (2023) Respondents were more dominant with a high quality of life as many as 26 respondents because the family is the closest person who can play an active role in compliance and success of treatment to improve the quality of life in DMII sufferers, sufferers are required to be able to adapt to their disease so that they can regulate and handle changes in lifestyle that will occur in themselves from maladaptive behavior to adaptive behavior.

Based on data found by researchers, the level of quality of life in DM sufferers is more dominant in high quality of life as many as 40 respondents, while the number of low scores is 25 respondents. This researcher assumes that respondents have a high level of compliance due to close social relationships, psychological, family support and the environment that provides support for fellow type II DM sufferers . In addition, it can also be seen in terms of age, respondents are still in productive age with a high enthusiasm for life so they can maintain physical health, and there is family support.

Bivariate Analysis

The Relationship between Medication Compliance and Quality of Life.

Compliance is an individual's response attitude which is contained in disciplined compliance with regulations that must be implemented. Compliance with taking medication (indication Compliance) is taking medication prescribed by a doctor at the right time and dose (Suaka Insan & Banjarmasin, South Kalimantan, 2020). Based on the results of Mpila's research et al. , (2023) reasons for non-compliance include patients forgetting to take medication regularly, stopping taking medication when feeling better or worse, drug side effects, low education level, low income and not having a glucometer . At home .

Based on the research results, researchers found that type II DM patients were classified as having a low level of compliance, and most respondents tended to stop or not comply with taking their medication according to the dosage prescribed by their doctor during treatment. The results showed that 51 respondents had low levels of medication compliance, 25 respondents had a low quality of life, and 26 respondents had a high quality of life. Five respondents had moderate levels of compliance, only with a high quality of life. Nine respondents had high levels of compliance, only with a high quality of life.

So from the analysis using statistical tests Pearson obtained a value ($p < \alpha$), namely a value of 0.001 from <0.05 , which means that H_a is accepted and H_0 is rejected, which means that there is a relationship between the level of compliance in taking medication and the level of quality of life.

Naufanesa's research results et al. , (2021) the relationship between the level of medication adherence with a p value (0.001) means there is a relationship between medication adherence and the quality of life of type II DM patients. Research conducted by Mpila et al. , (2023) conducted a Spearman statistical test. ρ shows a significant relationship between medication adherence and patient quality of life ($p=0.05$) with a positive correlation coefficient and a sufficient correlation level ($r=0.294$).

Researchers assume that respondents with medication adherence have a high quality of life because the respondents' lives in general have a dominant very satisfied at this time, including being able to maintain social relationships so that they are still able to interact with other people, very satisfied in psychological conditions , already feeling good about themselves, stopping taking medication when they feel better, knowing the complications caused by diabetes, having suffered from diabetes for a long time, have been able to adapt and are able to maintain quality of life, maintaining family life, providing support to each other and being responsible for each other in the family.

After the implementation of medication adherence and blood sugar level checks with the quality of life of DM sufferers at the Kassi-Kassi Community Health Center in Makassar City, from 65 respondents, a significance value of $p = 0.001$ ($p < 0.05$) was obtained, which means H_a was accepted and H_0 was rejected, while Random Blood Glucose (RBG) with quality of life, a significance value of $p = 0.010$ ($p > 0.05$) which means H_a was rejected and H_0 was accepted. This is in line with research from Naufanesa et al. , (2021) the relationship between the level of compliance with taking medication with a p value of 0.001 where the test results have a significant value between compliance with taking medication and the quality of life of type II DM patients, the same as research conducted by Mpila et al. , (2023) conducted a Spearman statistical test ρ shows a significant relationship between medication adherence and patient quality of life ($p=0.05$) with a positive correlation coefficient and a sufficient correlation level ($r=0.294$).

Researchers assume that respondents found high social support, still able to interact with others, very satisfied in psychological condition already feel good about themselves, stop taking medication when they feel better, know the complications caused by diabetes, maintain dietary restrictions risk of diabetes, the length of time suffering from diabetes has been able to adapt so that they can maintain quality of life, maintain family life by providing support to each other. It can also be seen from the productive age aspect as many as 57 respondents

The Relationship Between Blood Sugar Levels and Quality of Life.

Blood sugar levels are the amount of glucose contained in the blood and also a source of energy in body cells. Normal blood sugar levels are less than 100mg/dl (Antoro et al. , 2023). Compliance with taking medication can affect the quality of life, research from Rahmatulloh et al. al. , (2023) the effect of controlled and uncontrolled treatment has a lower quality of life compared to high, showing the results of no significant relationship with a p value of 0.864 ($p > 0.05$) therefore in productive age it can affect the quality of life.

The quality of life of uncontrolled patients feels more limited in their daily activities or work. Statistically, there is a significant difference in value ($p=0.034$) where the energy of controlled and uncontrolled patients both feel tired, less enthusiastic and energetic in carrying out daily activities. In contrast to research (Naufanesa et al. , 2021) In addition to medication adherence, controlling blood sugar levels is a key factor in the management of diabetes mellitus (DM), which aims to improve quality of life and minimize both long-term and short-term complications of DM. A high quality of life was reported in 37 respondents (45.1%) and a low quality of life in 45 respondents (54.8%) (Haskas et al. , 2023). Complications in DM sufferers can trigger an increase in complications such as heart disease, stroke, and neuropathy in the feet, which can lead to amputations (Syahid, 2021). have a high spirit of life so they can maintain physical health, and there is family support.

CONCLUSION

There is a relationship between the level of medication adherence and the quality of life of type II Diabetes Mellitus patients. There is no relationship between Random Blood Glucose (RBG) and the quality of life in type II Diabetes Mellitus patients. The description of the level of medication adherence in type II Diabetes Mellitus patients at the Kassi-Kassi Community Health Center is more dominant at the low level of compliance, the level of compliance is 51 respondents, the high level of compliance is 9 respondents and the moderate level of compliance is 5 respondents. The description of Random Blood Glucose (RBG) in type II Diabetes Mellitus patients at the Kassi-Kassi Community Health Center is that respondents are more dominant at uncontrolled blood sugar levels > 141 mg/dl as many as 56 respondents while controlled as many as 9 respondents. The description of the quality of life in type II Diabetes Mellitus patients at the Kassi-Kassi Community Health Center is more dominant at high quality of life, as many as 40 respondents, while low quality of life as many as 25 respondents.

REFERENCES

- Antoro, b., erwin nurdiansyah, t., & karmila sari, e. (2023). Dukungan Keluarga Dan Peran Perawat Terhadap Kepatuhan Kontrol Kadar Gula Darah. *Media Husada Journal Of Nursing Science*,

- 4(2), 63–70.
<https://doi.org/10.33475/mhjns.v4i2.128>
- Aulya Fitriani, S., Noormartany, & Mauludin, A. (2022). Hubungan Kepatuhan Konsumsi Obat Antidiabetik dengan Kualitas Hidup Pasien Diabetes Melitus Tipe 2 di Kabupaten Garut. *Bandung Conference Series: Medical Science*, 2(1), 312–318.
<https://doi.org/10.29313/bcsms.v2i1.754>
- Bidulang, C. B., Wiyono, W. I., & Mpila, D. A. (2021). Evaluasi Tingkat Kepatuhan Penggunaan Obat Antidiabetik Pada Pasien Diabetes Melitus Tipe 2 Di Puskesmas Enemawira. *Pharmacon*, 10, 1066–1071.
- Bulu, A., Wahyuni, T. D., & Sutriningsih, A. (2019). Hubungan Antara Tingkat Kepatuhan Minum Obat Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus Tipe II. *Ilmiah Keperawatan*, 4(1), 181–189.
- Cristancho, S. M., Goldszmidt, M., Lingard, L., & Watling, C. (2018). Qualitative research essentials for medical education. *Singapore Medical Journal*, 59(12), 622–627.
<https://doi.org/10.11622/smedj.2018093>
- DINKES Kota Makassar. (2024). Profil Kesehatan Kota Makassar Penderita Diabetes Militus . Kota Makassar: Dinas Kesehatan Kota Makassar .
- Emde, Q. T. (2021, June 28). Laporan Pendahuluan Diabetes Melitus.
<https://id.scribd.com/document/513319387/LP-DM>. Retrieved June 28, 2021, from <https://id.scribd.com/document/513319387/LP-DM>
- Ekasari, E., & Dhanny, D. R. (2022). Faktor Yang Mempengaruhi Kadar Glukosa Darah Penderita Diabetes Melitus Tipe Ii Usia 46-65 Tahun Di Kabupaten Wakatobi. *Journal of Nutrition College*, 11(2), 154–162.
<https://doi.org/10.14710/jnc.v11i2.32881>
- Gama B, d. (2019). Buku Ajar Anatomi Fisiologi ((L.F.Ed) ed.). Jakarta: Pantera Publishing.
- Haskas, Y., Suarnianti, S., & Kadrianti, E. (2023). Relationship Between Diabetes Elivia, Distress and Quality of Life Among Patients with Type II Diabetes Mellitus. *Poltekita : Jurnal Ilmu Kesehatan*, 17(1), 37–44.
<https://doi.org/10.33860/jik.v17i1.1662>
- Janna, N. M., & Herianto. (2021). Artikel Statistik yang Benar. *Jurnal Darul Dakwah Wal-Irsyad (DDI)*, 18210047, 1–12.
- Jasmine, N. S., Wahyuningsih, S., & Thadeus, M. S. (2020). Analisis faktor tingkat kepatuhan minum obat pasien diabetes melitus di Puskesmas Pancoran Mas periode Maret-April 2019. *Jurnal Manajemen Kesehatan Indonesia*, 8(1), 61–66.
- Katadi, S., Andayani, T. M., & Endarti, D. (2019). Hubungan Kepatuhan Pengobatan dengan Outcome Klinik dan Kualitas Hidup Pasien Diabetes Melitus Tipe 2. *Jurnal Manajemen Dan Pelayanan Farmasi (Journal of Management and Pharmacy Practice)*, 9(1), 19–26.
- Kristelina, J., Zainal, S., & Fajriansi, A. (2023). Pengaruh Self Care Activity Dalam Mengontrol Gula Darah Pada Penderita Diabetes Melitus Tipe 2. *JIMPK: Jurnal Ilmiah Mahasiswa & Penelitian Keperawatan*, 3(3), 136–142.
- Kusumaningrum, A., & Azinar, M. (2021). Higeia Journal of Public Health. *Higeia Journal of Public Health Research and Development*, 5(3), 227–238.
- Kemendes 2019, K. K. (n.d.). Siklus Hidup Kelompok Usia Dewasa dan Lansia. Retrieved from <https://ayosehat.kemkes.go.id/kategori-usia/dewasa#:~:text=Dewasa%2019%2D59%20Tahun&text=Kesehatan%20fisik%20yang%20baik%20juga,mendukung%20produktivitas%20dan%20kualitas%20hidup>.
- Kemendes. (2023, Juli 28). Direktorat jenderal pencegahan dan pengendalian penyakit, laporan kinerja semester I tahun 2023. Kementerian Kesehatan Republik Indonesia, 99-100.
- Lestari, Zulkarnain, Sijid, & Aisyah, S. (2021). Diabetes Melitus: Review Etiologi, Patofisiologi, Gejala, Penyebab, Cara Pemeriksaan, Cara Pengobatan dan Cara Pencegahan. *UIN Alauddin Makassar*, 1(2), 237–241.<http://journal.uin-alauddin.ac.id/index.php/psb>
- Ludwigshafen, K. D. S. (2001). *Ct Et Ra Ct*. 5(5), 194–199.
- Majdina, N. I., Pratikno, B., & Tripena, A. (2024). Penentuan Ukuran Sampel Menggunakan Rumus Bernoulli Dan Slovin: Konsep Dan Aplikasinya. *Jurnal Ilmiah Matematika Dan Pendidikan Matematika*, 16(1), 73.
https://doi.org/10.20884/1.jmp.2024.16.1.1123_0
- Mpila, D. A., Wiyono, W. I., & Lolo, W. A. (2023). Hubungan Tingkat Kepatuhan Minum Obat dengan Kadar Gula Darah dan Kualitas Hidup Pasien Diabetes Melitus Tipe 2 di Klinik Imanuel Manado. *Medical Scope Journal*, 6(1), 116–123.
<https://doi.org/10.35790/msj.v6i1.51696>
- Mariana Insana. (2021). Asuhan Keperawatan Diabetes Militus dan Asuhan Keperawatan Stroke (1st ed.). Yogyakarta, Yogyakarta: Yogyakarta Deepublish. Retrieved 2021
- Mutmainna, a., & abrar, e. A. (2024). Analisis faktor risiko kejadian diabetes melitus tipe ii pada pasien yang terdiagnosa diabetes puskesmas pampang. 4, 60–64
- Naufanesa, Q., Nurhasnah, N., Nurfadila, S., & Ekaputri, N. W. (2021). Kepatuhan Penggunaan Obat Dan Kualitas Hidup Pasien Diabetes Melitus Di Rumah Sakit Islam Jakarta. *Media Farmasi: Jurnal Ilmu Farmasi*, 17(2), 60.
<https://doi.org/10.12928/mf.v17i2.15341>
- Norhasanah, & Dewi, A. P. (2021). Jurnal Kesehatan Indonesia (The Indonesian Journal of Health). *Jurnal Kesehatan Indonesia (The Indonesian Journal of Health)*, XI(3), 111–115.
- Priambodo, N., Kriswiastiny, R., & Fitriani, D. (2022). Hubungan lama menderita Diabetes

Melitus dan kadar gula darah dengan kualitas hidup pada pasien Diabetes Melitus tipe 2. *Medula*, 13(2), 38–44.

<http://journalofmedula.com/index.php/medula/article/view/386>

Puskesmas Kassi-Kassi, P. K.-K. (2024, 12 13). Profil Kesehatan Puskesmas Kassi-Kassi Kota Makassar Tahun 2024. Kota Makassar, Sulawesi Selatan. Retrieved Desember 13, 2024

Rahmatulloh, W., Menit Ardhiani, Imaniar Noor Faridah, Haafizah Dania, Lalu Muhammad Irham, & Dyah Aryani Perwitasari. (2023). Luaran Terapi Dan Kualitas Hidup Pasien Dmt2 Yang Menggunakan Insulin Di Apotek X Kota Yogyakarta. *Medical Sains: Jurnal Ilmiah Kefarmasian*, 8(2), 395–404.

<https://doi.org/10.37874/ms.v8i2.742>

Ratnasari, P. M. D., Andayani, T. M., & Endarti, D. (2020). Analisis Outcome Klinis Berdasarkan Kualitas Hidup dan Biaya Medik Langsung Pasien Diabetes Melitus Tipe 2. *Jurnal Sains Farmasi & Klinis*, 7(1), 15.

<https://doi.org/10.25077/jsfk.7.1.15-22.2020>

Roslina, G. (2022). Asuhan Keperawatan Pada Pasien Dengan Diabetes Melitus . Yogyakarta: Cv Budi Utama S.

Restika BN, I., Haskas, Y., & Dewi, I. (2019). Manajemen Pengendalian Diabetes Mellitus melalui Peningkatan Health Literacy Diabetes. *Indonesian Journal of Community Dedication*, 1(1), 1–5.

<https://doi.org/10.35892/community.v1i1.12>

Syahid, Z. M. (2021). Faktor yang Berhubungan dengan Kepatuhan Pengobatan Diabetes Mellitus. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(1), 147–155.

<https://doi.org/10.35816/jiskh.v10i1.546>

Siska Y H, D. (2022). Penatalaksanaan Diabetes Self Management Education. *Jurnal Keperawatan*, 129.

Syaipuddin, s., haskas, y., nurbaya, s., tawil, s., & suhartatik, s. (2023). Management of diabetes self management education (dsme) as an effort to prevent complications in people with diabetes mellitus in kassi kassi village, makassar city. *Jurnal kreativitas pengabdian kepada masyarakat(pkms)*, 6(9),3554–3563

WHO. (14 November 2024). DIABETES. World Health Organization. Retrieved from <https://www.who.int/news-room/factsheets/detail/diabetes>

Yuni Mulyani, A., & Patimah, S. (2023). Analisis Faktor Yang Mempengaruhi Kualitas Hidup Pasien Diabetes Melitus Tipe II di Rumah Sakit Umum Daerah Lasinrang Kabupaten Pinrang Tahun 2022. *Journal of Muslim Community Health (JMCH) 2023*, 4(4), 345–357.

<https://pasca-umi.ac.id/index.php/jmch>

Z, K., & Akbar, T. I. S. (2022). Pemeriksaan Kadar Gula Darah Sewaktu (Kgds) Dan Konseling Diabetes Melitus Kepada Lansia Di Kampung Jawa Baru Kecamatan

Banda Sakti Lhoksumawe. *Jurnal Vokasi*, 6(2), 133. <https://doi.org/10.30811/vokasi.v6i2.3054>