

## Overview Of Patient Treatment Compliance Type 2 Diabetes Mellitus At Seyegan Health Center Sleman District In 2023

Giovanno Sebastian Yogie<sup>1</sup>, Ridwan Muttaqin<sup>2</sup>

Tarumanagara University, Indonesia<sup>1</sup>

Seyegan Health Center, Indonesia<sup>2</sup>

Correspondence: [giovannousa@gmail.com](mailto:giovannousa@gmail.com)<sup>1</sup>

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**ABSTRACT:** Diabetes mellitus is a chronic metabolic disorder characterized by increased blood sugar levels caused by impaired insulin secretion and function or both. If left untreated, diabetes mellitus can cause various macro and microvascular complications and has high morbidity and mortality. DaIn Seyegan Health Center patient visits from January to October 2023 there were 11,583 visits for type 2 diabetes mellitus, of which 1,281 visits were for type 2 diabetes mellitus with complications. Research objectives: This study aims to assess the description of medication adherence in type 2 diabetes mellitus patients at the Seyegan Community Health Center. The design of this research is descriptive to see the picture of compliance with the use of oral anti-diabetic drugs in patients with type 2 diabetes mellitus at the Seyegan Community Health Center, Sleman Regency for the period November 2023. The sample for this study is outpatients at general polyclinics who suffer from type 2 diabetes mellitus who included in the inclusion criteria. The measuring instrument used in this research is the MMAS-8 questionnaire. Based on an assessment using the MMAS-8 questionnaire, it was concluded that 26 (43.3%) respondents were considered to have low compliance in taking anti-diabetic drugs. Meanwhile, 14 (23.3%) respondents were considered to have moderate compliance and 20 (33.3%) respondents had high compliance in taking anti-diabetic drugs. Of the 60 respondents involved in the sample, 26 (43.3%) respondents were considered to still have low compliance in taking anti-diabetic drugs. Future researchers are advised to carry out an analysis of various factors that influence a person's taking medication and other factors such as family support and comorbid diseases.

**Keywords:** Compliance, Type 2 Diabetes Mellitus, Anti-Diabetic Drugs



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## INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by increased blood sugar levels caused by impaired insulin secretion and function or both. If left untreated, diabetes mellitus can cause various macro and microvascular complications and has high morbidity and mortality. (Galicia-Garcia et al., 2020).

Based on data from *International Diabetes Federation* In 2021, it is estimated that 537 million people will suffer from diabetes worldwide. Indonesia is ranked 5th in the world with the most diabetes sufferers with 19.5 million people. Yogyakarta Special Region Province is ranked 3rd nationally in

the province with the most diabetes sufferers in Indonesia. (International Diabetes Federation, 2021; Indonesian Ministry of Health, 2018)

Based on patient visit data at the Seyegan Community Health Center from January to October 2023, there were 11,583 visits for type 2 diabetes mellitus, of which 1,281 visits were for type 2 diabetes mellitus with complications. This is what makes type 2 diabetes mellitus the 3rd of the 10 most diseases diagnosed at the Seyegan Community Health Center after hypertension and dyspepsia.

Various factors increase the risk of developing diabetes complications, including lack of knowledge in maintaining optimal blood glucose levels, physical activity, and compliance with therapy. In research by Alshehri, et al. It was found that treatment compliance plays a role in maintaining glucose levels. In addition, lack of medication adherence is associated with various outcomes and poor quality of life. This study aims to assess the picture of treatment compliance in type 2 diabetes mellitus patients at the Seyegan Community Health Center (Alshehri et al., 2020; Haghighatpanah et al., 2018).

## **METHOD**

This study used a descriptive research design to look at the description of compliance with the use of oral anti-diabetic drugs in patients with type 2 diabetes mellitus at the Seyegan Community Health Center, Sleman Regency for the period November 2023. The sample for this study was outpatients at the general polyclinic who suffered from type 2 diabetes mellitus. included in the inclusion criteria. The sampling technique in this research is total sampling. The inclusion criteria in this study were patients who had been diagnosed with diabetes mellitus who were seeking treatment at the Seyegan Community Health Center at the time of sampling, subjects were willing to fill out a questionnaire *Morisky Medication Adherence Scale 8-items* (MMAS-8) and treatment data, and received oral antidiabetic medication.

The measuring instrument used in this research is the MMAS-8 questionnaire. MMAS-8 is a questionnaire used to assess medication adherence which has the advantage of being quite cheap, simple, and subjects self-reporting medication adherence. Score measurement for questions 1 to 7, Morisky scale 8-items if the answer is yes is worth 0, except for question number 5 the answer is yes is worth 1, while for question number 8 if the answer is no. never/rarely (not once a week) is worth 1 and if the respondent answers once/twice a week), sometimes (three/four times a week), usually (five/six times a week) and all the time has a value of 0. Patients with a total score of less than 6 are said to have low compliance, if the score is more than 6 - <8 the respondent is said to have moderate compliance, and a score of 8 has high compliance in taking medication (Okello et al., 2016).

The procedure in this research went through several stages, namely the preparation stage, data collection stage, collection and research stage, and report preparation stage. The preparation stage is the stage of preparing a research proposal, a preliminary survey to obtain the necessary data and studying documentation and literature related to the research problem. The data collection stage

is distributing it to respondents and distributing *informed consent* questionnaire to respondents. After being briefed on the objectives of the research and procedures for filling out the questionnaire, respondents were given time to fill it out. The collection and research stage is that after the questionnaires have been collected, data analysis and statistical tests are then carried out. The stage of preparing the report and presenting the research results is that after the research implementation activities have been completed, then a research report is prepared which must be accounted for through the presentation of the research results.

## RESULTS AND DISCUSSION

Based on the results of sampling and data processing, data was obtained from 60 respondents who met the inclusion criteria with an average age of 54.15 years. Judging from the characteristics of the respondents, there were 34 female respondents (56.7%). Based on their education level, 18 respondents (30%) completed elementary school/equivalent. In terms of work, 27 respondents (45%) earn their living as farmers. Judging from the consumption of oral antidiabetic drugs, 25 respondents (41.7%) consumed metformin alone. (table 1)

**Table 1. Characteristics of Respondents**

| Variable                                | Amount (%) | Mean $\pm$ SD    | Median (Min $\pm$ Max) |
|-----------------------------------------|------------|------------------|------------------------|
| <b>Age</b>                              |            | 54.15 $\pm$ 8,41 | 54 (38 $\pm$ 72)       |
| <b>Gender</b>                           |            |                  |                        |
| Man                                     | 26 (43,3%) |                  |                        |
| Woman                                   | 34 (56,7%) |                  |                        |
| <b>Last education</b>                   |            |                  |                        |
| No school                               | 10 (16,7%) |                  |                        |
| Completed elementary school/equivalent  | 18 (30%)   |                  |                        |
| Completed junior high school/equivalent | 17 (28,3%) |                  |                        |
| Completed high school/equivalent        | 15 (25%)   |                  |                        |
| <b>Work</b>                             |            |                  |                        |
| Doesn't work                            | 11 (18,3%) |                  |                        |
| Farmer                                  | 27 (45%)   |                  |                        |
| Housewife                               | 14 (23,3%) |                  |                        |
| Private sector employee                 | 8 (13,3%)  |                  |                        |
| <b>Anti-Diabetic Drugs</b>              |            |                  |                        |
| Metformin                               | 25 (41,7%) |                  |                        |
| Metformin with other OADs               | 18 (30%)   |                  |                        |
| Other OADs (1 type)                     | 17 (28,3%) |                  |                        |

Based on the characteristics of the answers to the MMAS-8 questionnaire, 49 (81.7%) respondents admitted that they did not forget to take anti-diabetic medication. 52 (86.7%) respondents admitted that they did not forget to take anti-diabetic medication. 38 (63.3%) respondents did not stop or reduce medication without telling the doctor, 53 (88.3%) respondents did not forget to take

medication when traveling or leaving the house. 52 (86.7%) respondents took medication yesterday, 33 (55%) respondents did not stop treatment if the condition improved, 52 (86.7%) respondents admitted that they were not bothered if they had to routinely take medication every day, and 52 (86.7%) respondents have never experienced difficulties in taking medication. (table 2)

**Table 2. MMAS-8 Questionnaire Results**

| No. | Question                                                                                                             | Of         | No         |
|-----|----------------------------------------------------------------------------------------------------------------------|------------|------------|
| 1   | Patients who forget to take medication                                                                               | 11 (18,3%) | 49 (81,7%) |
| 2   | The patient forgot to take medication for the last 2 weeks                                                           | 8 (13,3%)  | 52 (86,7%) |
| 3   | Patients who have ever reduced or stopped taking medication without telling the doctor                               | 22 (36,7%) | 38 (63,3%) |
| 4   | When patients travel or leave the house, they sometimes forget to take their medication                              | 7 (11,7%)  | 53 (88,3%) |
| 5   | Yesterday the patient took all the medicine                                                                          | 52 (86,7%) | 8 (13,3%)  |
| 6   | When patients feel that their condition is improving, sometimes they choose to stop taking medication                | 27 (45%)   | 33 (55%)   |
| 7   | Some patients who feel uncomfortable if they take medication every day have felt disturbed because of this situation | 8 (13,3%)  | 52 (86,7%) |
| 8   | The patient has difficulty taking medication                                                                         |            |            |
|     | a. Never                                                                                                             | 52 (86,7%) |            |
|     | b. Once in a while                                                                                                   | 3 (5%)     |            |
|     | c. Sometimes                                                                                                         | 3 (5%)     |            |
|     | d. Usually                                                                                                           | 2 (3,3%)   |            |
|     | e. At any time                                                                                                       | 0 (0%)     |            |

From the results of the assessment carried out using the MMAS-8 questionnaire, it was concluded that 26 (43.3%) respondents were assessed as having low compliance in taking anti-diabetic drugs. Meanwhile, 14 (23.3%) respondents were considered to have moderate compliance and 20 (33.3%) respondents had high compliance in taking anti-diabetic drugs. (table 3)

**Table 3. Compliance Results Based on the MMAS-8 Questionnaire**

| Variable              | Amount (%) |
|-----------------------|------------|
| Low compliance        | 26 (43,3%) |
| Adherence is moderate | 14 (23,3%) |
| High compliance       | 20 (33,3%) |

Compliance with taking medication is an effort made to keep blood sugar levels within the normal range. Various complications of type 2 diabetes mellitus will arise if you do not take anti-diabetic medication obediently. Such as acute complications in the form of hyperosmolar hyperglycemia (HHS) or diabetic ketoacidosis, where there is a decrease in consciousness due to too high blood glucose levels. (Aldhaefi et al., 2021) Apart from that, chronic complications include macro and microangiopathy disorders, such as hypertension, stroke, coronary syndrome, retinopathy, nephropathy and diabetic foot (Farmaki et al., 2020).

In research by Husna, et al. shows that compliance with taking medication has an influence in keeping blood sugar levels under control. Low compliance in taking medication indicates uncontrolled blood sugar levels. On the other hand, high compliance in taking medication shows that blood sugar levels tend to be controlled (Husna et al., 2022).

Other research conducted by Bulu, et al. shows a significant relationship between adherence to taking medication and blood sugar levels in people with type 2 diabetes mellitus. Furthermore, compliance with taking medication can lead to blood sugar levels that were previously controlled becoming uncontrolled. Meanwhile, high compliance in taking medication can keep blood sugar levels under control (Bulu et al., 2019)

Based on the age characteristics of the respondents, the average age of the respondents was 54.15 years. This is similar to research conducted by Fajriansyah, et al. where the age of type 2 diabetes mellitus sufferers was >40 years old, amounting to 91.67% of respondents (Fajriansyah, 2022). These results are also similar to research conducted by Santhanakrishnan, et al. where the majority of respondents were >50 years old, amounting to 74.8% of respondents (Santhanakrishnan et al., 2014).

In terms of gender, women were the largest gender in this study, namely 56.7% of respondents. This is supported by data from the Central Statistics Agency of Sleman Regency, where the population of both genders is greater than the population of male gender, namely 572,096 residents of the female gender and 564,378 residents of the male gender. Meanwhile, in Seyegan District, 26,179 residents are female and 25,788 residents are male (Sleman, 2022).

In research by Sahoo, et al. shows that there is no relationship between age and gender factors on adherence to taking diabetes medication. (Sahoo et al., 2022) This is reinforced by research conducted by Wakui, et al. that there is no relationship between gender and medication adherence. (Wakui et al., 2021). However, this is different from research conducted by Afaya, et al. that there is a relationship between age and compliance with taking medication, where younger people tend to be non-compliant due to lack of attention in paying attention to their illness due to busyness in daily activities (Afaya et al., 2020).

In this study, 30% of respondents had an education level of completing elementary school/equivalent. This is in accordance with research conducted by Ningrum, that 40% of respondents had completed elementary school/equivalent. Apart from that, the level of education has a significant relationship with medication adherence, where higher education is 29.6 times more compliant than low education. (S. P. Ningrum, 2018) In the research of Sidroturollah, et al. stated that 47.9% had elementary school/equivalent education. Education plays an important role in helping someone receive information, so that knowledge and compliance can be improved (Sidrotullah & M, 2022).

In terms of work, 45% of respondents work as farmers. Occupation plays a role in determining whether a person adheres to taking medication or not. A person who is not working has plenty of time to get checked out and take medication. Meanwhile, people who work have less time to check and take medication, and the possibility of forgetting or missing their medication schedule is higher than those who don't work (Diantari & Sutarga, 2019; Sailan, 2017).

The amount of medication consumed influences a person's compliance in taking medication. The greater the amount of medication consumed, the less a person's compliance with taking medication. (Wabe et al., n.d.) This is due to the emergence of side effects from the medication

consumed and the possibility of errors in taking medication due to complex treatment. (Dobrică et al., 2019)

Several other factors can influence a person's compliance with taking medication, such as family support and comorbid diseases. Family support is related to a person's compliance in taking medication, good support creates good compliance in taking medication. (Olagbemide et al., 2021) Comorbid diseases cause a person to have to take more medication to treat the disorder they are experiencing. This causes reduced compliance in taking medication due to complex treatment, fear of side effects that will arise, and expensive costs (Sendekie et al., 2022)

A person's knowledge regarding diabetes mellitus is another factor in determining a person's compliance with taking medication, where knowledge makes a person better understand the disease, the importance of taking medication to keep blood sugar levels under control, and prevent complications from arising in the future (Jasmine et al., 2020).

In addition, attitude and motivation play a role in medication adherence. Motivation is an energy in behavior in pursuit of a goal, it is a fundamental element of our interactions with the world and with each other. (Simpson & Balsam, 2016) Motivation in treatment is needed so that a person has the desire and feels not burdened by treatment in order to avoid complications that occur. Attitude is an important part in forming behavior. A positive attitude creates good behavior in taking medication (Lestarina, 2017).

The role of the family has an influence in increasing compliance with taking medication. This was proven in research conducted by Salensehe, et al where there was a relationship between the role of the family and adherence to taking medication. This is because the family can help remind them to take medication, sympathize, care and provide support, so that the patient does not feel lonely (Salensehe et al., 2020). Another research was conducted by Ningrum where the role of the family not only influences compliance, but also non-compliance with patient treatment caused by activities carried out such as work (D. K. Ningrum, 2020).

Other factors such as belief and economic level play a role in a person's medication adherence. As is meant by trust, namely health trust is a person's perception regarding the efficacy of treatment which can influence a person's decisions regarding healthy behavior. Research by Nurhidayati, et al. stated that there was a positive correlation between health beliefs and adherence to taking diabetes mellitus medication. (Nurhidayati et al., 2019) A person's economic level is seen from the quality of the family including aspects of education, economic and cultural health, family independence, and religious values. Apart from that, economic factors influence a person's compliance in taking medication, for example the need for adequate transportation support to health facilities can support a person's compliance in taking medication (Sanusi & Karso, 2017).

Various interventions can be carried out to increase compliance in taking medication, such as through education about the risk of complications if you do not take medication regularly, carrying out follow-up therapy using the telephone, maximizing 1 type of treatment before combining it with other drugs, conveying therapy targets, if accompanied by psychiatric symptoms can carry out joint therapy with a psychiatrist or psychologist, make warnings and instructions for taking



medication (can be through telephone warnings, alarms, notes, etc.), and choose treatment that is low cost but still effective (Kini & Ho, 2018).

Other efforts to control blood sugar levels so that they remain controlled, apart from maintaining compliance in taking anti-diabetic drugs, are by adjusting your diet, exercising and losing weight. Dietary patterns that are of concern to diabetics include replacing simple carbohydrates with complex carbohydrates, increasing fiber consumption, sweeteners without additional calories, replacing fat. *unsaturated* becomes *saturated* such as omega-3, 15-20% protein, avoid excessive alcohol and sodium consumption, and increase vitamin consumption (Marín-Peñalver et al., 2016).

Exercise provides various benefits for diabetes mellitus sufferers in preventing weight gain, improving insulin resistance and blood sugar levels, and lipoprotein metabolism. The recommended type of exercise is aerobic, where aerobic exercise has the advantage of lowering blood sugar levels more effectively than resistance exercise and a lower risk of hypoglycemia than resistance exercise (Zahalka et al., n.d.).

Reducing body weight by 5-10% is recommended in the initial stages of diabetes mellitus therapy, where this weight loss can reduce 0.6-1.0% A1C. Besides that, *American Diabetes Association* (ADA) recommends a 7% weight loss in pre-diabetic patients to prevent the development of diabetes. (Bramante et al., 2017) Through efforts to implement a good diet, regular exercise, and increasing mobility can help in losing weight. It can further help control blood sugar levels (Bramante et al., 2017; Hamilton et al., 2014)

Furthermore, adherence to lifestyle, diet, and medication has an important role in controlling diabetes mellitus. (Saleh, 2022) Research conducted by Liu, et al. shows that compliance with adopting a healthy lifestyle can influence the emergence of various microvascular complications and neuropathy due to type 2 diabetes mellitus. (Liu et al., 2023) In addition, research conducted by Mohhamed, et al. assessing dietary compliance with recommendations can lead to better glycemic control compared to non-compliance (Mohammed et al., 2020).

## **CONCLUSION**

Of the 60 respondents involved in the sample, 26 (43.3%) respondents were considered to still have low compliance in taking anti-diabetic drugs. However, 14 (23.3%) respondents were considered to have moderate compliance and 20 (33.3%) respondents had high compliance in taking anti-diabetic drugs. Future researchers are advised to carry out an analysis of various factors that influence a person's taking medication and other factors such as family support and comorbid diseases.

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## Overview Of Patient Treatment Compliance Type 2 Diabetes Mellitus At Seyegan Health Center Sleman District In 2023

Yogie, Muttaqin

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## Overview Of Patient Treatment Compliance Type 2 Diabetes Mellitus At Seyegan Health Center Sleman District In 2023

Yogie, Muttaqin

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