# Analysis of Factors Affecting Compliance With Drug Use in Type-2 Diabetes Mellitus Patients

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| Article | Abstract |
|---|---|
| | Diabetes Mellitus is a disease that is a world health problem. In 2013 to 2018 Indonesia was the largest sufferer of diabetes mellitus. This increase in diabetes mellitus cases is caused because patients have not been obedient in treatment therapy. The purpose of this study was to determine the factors associated with compliance to medication use in patients with type-2 diabetes mellitus. This research is an observational analytic study with a cross sectional approach. The sample in the study was 41 respondents with a total sampling technique. Primary data collection using the MMAS-8 questionnaire (Morisky Medication Compliance Scale 8 items), the data analysis performed was the Chi-square test with a significant level of <0.05. The independent variables are socio-demographic and clinical characteristics with the dependent variable being compliance to diabetes mellitus drug use. From the results of the Chi-square test, it shows that Age (p-value = 0.05), Gender (p-value = 0.01) and Education Level (p-value = 0.02), which have a relationship with drug use compliance. diabetes mellitus. In this study, the majority of respondents were female as much as 63.4%, while for the age of the respondents the majority of the early elderly were 61.0%, for the level of education with the formal category <9 years which was 63.4%, for the low income category it was 65.9%, and the majority of respondents do not work 65.9%. From this study it can be concluded that age, gender and education level have a significant effect on drug use compliance in patients with type-2 diabetes mellitus. |

## Introduction

Diabetes Mellitus (DM) is a disease that has become a world health problem. The World Health Organization (WHO) estimates that the number of people with Diabetes Mellitus (DM) in Indonesia will increase by two to three times in 2000, with 8.4 million people with diabetes mellitus, reaching 21.3 million in 2030 (Decroli, 2019). According to the International Diabetes Federation (IDF), the number of patients suffering from diabetes mellitus is estimated to increase in Indonesia from 9.1 million in 2014 to 14.1 million in 2035. The prevalence of diabetes mellitus has increased due to the prosperity rate in the country which causes the disease to occur. degenerative one of which is diabetes mellitus (Decroli, 2019).

The management of patients with Diabetes Mellitus (DM) has a short-term goal, in order to achieve the target of

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The 1st International Conference on Health, Faculty of Health
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controlling blood glucose at normal levels and the disappearance of the accompanying clinical symptoms. In the long term to prevent or reduce complications. The success of this therapy can be done by means of approaches without drugs, can be controlled with diet, lifestyle modifications, and approaches with drugs (pharmacotherapy) owever, there has not been found a way or treatment that can cure diabetes as a whole (Healthy Department, 2005).

In the treatment therapy of Diabetes Mellitus patients with compliance to medication use is very important in achieving treatment goals and effectiveness in preventing several complications in patients with Diabetes Mellitus. the disease suffered, by taking drugs, especially for patients who have to take drugs for a long time and even for life (Sasmito, 2007). The aims of this study were to obtain socio-demographic characteristics (gender, age, education level, income, and occupation) in Type-2 Diabetes Mellitus patients, to obtain clinical characteristics (number of drug items, drug side effects, comorbidities, duration of diabetes mellitus). ) in Diabetes Mellitus Type-2, Obtaining an overview of the level of compliance to drug use based on clinical characteristics and socio-demographic characteristics in Diabetes Mellitus Type-2 patients at Hospital in 2021.

**Methods**
This research is an analytic observational study using a cross sectional design. The subjects of this study were patients with type-2 diabetes mellitus who were treated as outpatients at the General Ahmad Yani Regional General Hospital Metro. Sampling in this study is Total Sampling by applying inclusion and exclusion criteria. This study involved 41 respondents. The dependent variable (dependent) in this study is the level of patient compliance. Independent variables (independent), gender, age, education level, occupation, income,

comorbidities, number of drugs, side effects of drugs, duration of diabetes.

The research instrument used a self-data questionnaire, the MMAS-8 compliance questionnaire (Morisky Medication 8-Item Compliance Scale). Analysis of the data used in this study is a univariate analysis test performed by calculating the frequency of each variable studied. Bivariate analysis was carried out to see the effect of the variables on medication compliance by using the Chi-Square test with a significance level ($\alpha$) of 0.05 or a 95% confidence level.

**Results**
In this study, the number of diabetes mellitus patients who were used as respondents was 41, consisting of 25 respondents with low compliance and 16 with high compliance. Table 1 shows the sociodemographic characteristics of type-2 diabetes mellitus patients in outpatient hospitals. The frequency distribution of the research sample based on sociodemographic characteristics includes age group, gender, education level, occupation, income.

Most of the outpatient type 2 Diabetes Mellitus patients with the highest age in the early elderly category with an age range of 46-55 years were 25 respondents (61.0%) in the late elderly category, namely 16 respondents (39.0%).

Most outpatient type 2 DM patients are female 26 respondents (63.4%), for Male 15 respondents (36.6%). Patients with diabetes mellitus type 2 outpatients have a formal education level <9 years by 26 respondents (63.4%), for Formal Education> 9 years obtained as many as 15 respondents (36.6%).
Diabetes Mellitus type 2 outpatients who have workers are 14 respondents (34.1%), not working are 27 respondents (65.9%). Outpatient Diabetes Mellitus type 2 patients who have high income are 14 respondents (34.1%), for low income are 27 respondents (65.9%).

Table 1. Sociodemographic Characteristics of DM Patients in Hospitals

| Characteristic | N(%) |
|---|---|
| **Age** | |
| Late Elderly 56-65 Years | 39,0% |
| Early Elderly 46-55 Years | 61,0% |
| **Gender** | |
| Female | 63,4% |
| Male | 36,6% |
| **Level of education** | |
| Formal education <9 Years | 63,4% |
| Formal education >9 Years | 36,6% |
| **Occupation** | |
| Worker | 34,1 % |
| Jobless | 65,9% |
| **Salary** | |
| Low Income Rp 500.000-3.000.000 | 65,9% |
| High Income >3.000.000 | 34,1 % |

Table 2. Clinical Characteristics of DM Patients in Hospital

| Comorbidities | N(%) |
|---|---|
| Some | 58,5% |
| None | 41,5% |
| **Drugs** | |
| <4 drugs | 92,7 % |
| ≥4 drugs | 7,3% |
| **Side Effect** | |
| Some | 12,2% |
| None | 87,8% |
| **Long Suffering From Diabetes Mellitus** | |
| ≤ 3-4 Years | 53,7 % |
| >5 Years | 46,3% |

Based on research with clinical characteristics including comorbidities, number of drugs, side effects of drugs, duration of suffering from diabetes mellitus, the patients can be seen in table 2. Most of the outpatient type-2 Diabetes Mellitus patients have comorbidities with a total of 24 respondents (58.5%), for respondents who do not have as many as 17 respondents (41.5%).

Based on the number of drug use, namely the use of <4 with 38 respondents (92.7%), for respondents with the use of 4 types of drugs 3 respondents (7.3%). Based on the side effects of drugs by 5 respondents (12.2%), 36 respondents (87.8%) did not have side effects of drugs.

Based on the length of suffering from type-2 diabetes mellitus for a period of 3 - 4 years, namely 22 respondents (53.7 %), or respondents >5 years suffering from diabetes mellitus obtained as many as 19 respondents (46.3%).

Table 3. The relationship between age characteristics and compliance to medication use

| Variabel | Tingkat Kepatuhan | | | | | | Total | | P-value | OR (Odds Ratio) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Kepatuhan Tinggi | | Kepatuhan Sedang | | Kepatuhan Rendah | | | | | |
| | N | % | N | % | N | % | N | % | | |
| **Usia** | | | | | | | | | | |
| **Lansia Akhir 56-65** | 2 | 4,9% | 0 | 0% | 14 | 39,0% | 16 | 39,0% | 0,005 | 0,112 |
| **Lansia Awal 46-55** | 14 | 34,1% | 0 | 0% | 11 | 26,8% | 25 | 61,0% | | |
| **Jenis Kelamin** | | | | | | | | | | |
| **Perempuan** | 5 | 12,2% | 0 | 0% | 21 | 51,2% | 26 | 63,4% | 0,01 | 0,087 |
| **Laki-laki** | 11 | 26,8% | 0 | 0% | 4 | 9,8% | 15 | 36,6% | | |
| **Pendidikan** | | | | | | | | | | |
| **Pendidikan Formal <9 Tahun** | 5 | 12,2 % | 0 | 0% | 21 | 51,2% | 26 | 63,4% | 0,01 | 0,087 |
| **Pendidikan Formal >9Tahun** | 11 | 26,8% | 0 | 0% | 4 | 9,8% | 15 | 36,6% | | |
| **Pekerjaan** | | | | | | | | | | |
| **Bekerja** | 6 | 14,6 % | 0 | 0% | 8 | 19,5% | 14 | 34,1% | 0,717 | 1,275 |
| **Tidak Bekerja** | 10 | 24,4% | 0 | 0% | 17 | 41,5% | 27 | 65,9% | | |

| | n | % | n | % | n | % | n | % | p | OR |
|---|---|---|---|---|---|---|---|---|---|---|
| **Pendapatan** | | | | | | | | | | |
| **Rendah** | 11 | 26,8% | 0 | 0% | 16 | 39,0% | 27 | 65,9% | 0,754 | 1,238 |
| **Tinggi** | 5 | 12,2% | 0 | 0% | 9 | 22,0% | 14 | 34,1% | | |
| **Penyakit Penyerta** | | | | | | | | | | |
| **Ada** | 9 | 22,0 % | 0 | 0% | 15 | 36.6% | 24 | 58.5% | 0,812 | 0,856 |
| **Tidak Ada** | 7 | 17,1% | 0 | 0% | 10 | 24,4% | 17 | 41,5% | | |
| **Jumlah Obat** | | | | | | | | | | |
| **<4** | 14 | 34,1% | 0 | 0% | 24 | 58,5% | 38 | 92,7% | 0,308 | 0,292, |
| **≥4** | 2 | 4,9% | 0 | 0% | 1 | 2,4% | 3 | 7,3% | | |
| **Efek Samping Obat** | | | | | | | | | | |
| **Ada** | 3 | 7,3% | 0 | 0% | 2 | 4,9% | 5 | 12,2% | 0,305 | 0,305 |
| **Tidak Ada** | 13 | 31,7% | 0 | 0% | 23 | 56.1% | 36 | 87,8% | | |
| **Lama Menderita DM** | | | | | | | | | | |
| **≤3-4 Tahun** | 6 | 14,6 % | 0 | 0% | 12 | 29,3% | 22 | 53,7% | 0,364 | 1,806 |
| **>5 Tahun** | 10 | 24,4% | 0 | 0% | 13 | 31,7% | 19 | 46,3% | | |

To find out the relationship between sociodemographic characteristics and clinical characteristics of patients with medication compliance in outpatient type-2 diabetes mellitus patients at the General Hospital General Ahmad Yani Metro, a bivariate analysis was carried out with the chi square test as shown in table 3. The results of the bivariate analysis in table 3 shows that there are three variables that have a relationship (p <0.05) with drug use compliance in type-2 diabetes mellitus patients in outpatient hospitals. The variables are age, gender, education.

The Relationship between Age and Compliance with Drug Use Analysis of the relationship between age and compliance to drug use using the chi-square test, it was found that there was an effect of the relationship between age and the level of compliance to taking medication (p-value = 0.005) with OR value = 0.112. The OR value shows that type-2 diabetes mellitus patients with late elderly age are at risk of 0.112 times compared to early elderly respondents. The results of this study are in line with research conducted by (Naila Almir, 2019), showing that there is a significant relationship between age and medication compliance with p-value = 0.004. Increasing age will form an attitude to defend themselves so as to improve the quality of life and compliance to drug use. With patients who are already elderly, some do not comply because they use medicine with the excuse of forgetting, often forget to travel without taking medicine because they feel healthy, but there are also patients who care about their health so they don't worsen their condition and in this condition need family support to increase their knowledge. in the treatment so that it will have a good influence on compliance.

The Relationship between Gender and Compliance with Drug Use In this study, it was found that the number of female patients was higher than that of male patients because on average the mothers who came to the internal medicine polyclinic for control were housewives. Analysis of the relationship between sex and medication compliance using the chi-square test found that there was a relationship between gender and the level of medication compliance (p-value = 0.001) with OR = 0.087. The OR value indicates that type-2 diabetes mellitus patients with female sex are at risk of 0.087 times compared to male respondents. The results of this study are in line with research conducted by (Valentina Meta Sri Kartika, et al (2016)

which showed that there was a significant relationship between gender and medication compliance with a p-value = 0.011.

The Relationship between Education and Drug Use  Analysis of the relationship between the level of education and compliance to drug use, the results of the chi-square test showed that there was an influence between education and the level of compliance to taking medication (p-value = 0.001) with an OR value of 0.087. The OR value indicates that patients with type 2 diabetes mellitus with <9 years of formal education covering elementary, junior high, have a 0.087 times risk compared to respondents with >9 years of education covering elementary, junior high, high school, and bachelor's degrees. From the interviews, it was found that patients stopped taking diabetes medication if they felt their health condition was better or worse. In addition, patients often forget to take their medicine and take their medicine with them when they travel. This shows the patient's lack of knowledge regarding the importance of using diabetes medication regularly based on the given therapeutic regimen.  Uncompliance to respondents with low education can be caused by the lack of knowledge they have, this is shown in respondents with low education 51.2% have low knowledge about their disease. Education is closely related to knowledge. With the knowledge obtained, patients with diabetes mellitus will know the benefits of advice or advice from health workers so that they will be motivated to be more obedient in undergoing treatment recommended by health workers. The lower a person's education, the more disobedient the patient is to treatment because the person's low education greatly affects the respondent's absorption of information, so that it can affect the understanding of diabetes mellitus, the dangers of taking irregular drugs and treatment methods. Lack of understanding about the importance of using diabetes medication will affect blood sugar control.

## Conclusion

Based on the characteristics of the respondents, the majority of respondents are female as much as 63.4%, while for the age category of the early elderly it is 61.0%, for education level <9 years that is 63.4%, for low income category it is 65.9% , and the majority of respondents do not work 65.9%.

Factors that influence the level of compliance to drug use in patients with type-2 diabetes mellitus are: Age (p-value = 0.005), Gender (p-value = 0.01) and Education Level (p-value = 0.01).

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