

# Treatment adherence in patients with diabetes mellitus type 2

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## Treatment adherence in patients with diabetes mellitus type 2

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### Abstract

**Background:** Diabetes Mellitus (DM) is a chronic disease often referred to as a lifelong disease with chronic complications. The risk of complications of diabetes mellitus can be reduced by effective management of medication therapy by implementing medication adherence. Medication compliance in diabetes mellitus is influenced by various determinants that describe the extent to which the patient's behavior is to comply with taking medication, following a diet, and implementing lifestyle changes per the recommendations recommended by health care providers.

**Purpose:** to analyze the determinants of medication adherence in patients with type 2.

**Method:** The design of this research is quantitative with a cross-sectional study approach. The sample amounted to 97 patients with diabetes mellitus. The statistical analysis used is logistic regression.

**Results:** Showed that the determinants related to medication adherence were age p-value (0.019), education p-value (0.039), Income p-value (0.006), Health Examination p-value (0.034), Blood Sugar Check p-value (0.005), DM knowledge p-value (0.000), and Social Support p-value (0.003), while work value (0.136), Length of Suffering from DM p-value (0.399), Use of insulin p-value (0.504), Number of Diseases p-value (0.409), Comorbid p-value (0.583), emotional p-value (0.561) there is no relationship. The most dominant determinant related to medication adherence was the knowledge variable p-value (0.000) with an odds ratio of 0.150 (95% CI: 0.057-391).

**Conclusion:** The most significant determinant of medication adherence is knowledge, so it is recommended to provide continuous and comprehensive updated information about the management of DM, one of which is the diabetes self-management education (DSME) method. The provision of the DSME method can be carried out through a home visit approach to the homes of type 2 DM sufferers.

**Keywords:** Diabetes Mellitus; Education; Self Management

### INTRODUCTION

Non-communicable diseases (NCDs) are a problem of global concern because these diseases cause an increase in mortality worldwide. Diabetes Mellitus (DM) is one of the PTMs that is increasing and serious. Diabetes mellitus is a chronic disease so medication adherence is important in the treatment of diabetes mellitus (Bestari, 2020).

In 2019 it is estimated that the number of deaths related to diabetes and its complications will reach 4.2

million. Most of these deaths occurred in those under 60 years of age and located in Africa (73.1%), the Middle East and North Africa region (53.3%), and the Southeast Asia region (51.5%). Meanwhile, according to The International Diabetes Federation (IDF) in 2019 estimates that deaths from diabetes mellitus will continue to increase to 578 million people in 2030 and 700 million people in 2045 (International Diabetes Federation, 2019).

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Diabetes Mellitus ranks 2nd out of the 10 most non-communicable diseases after hypertension in the Aceh region with a total of 121,160 sufferers while those who receive standard services are 75,518 or 62%. The prevalence of diabetes mellitus in Aceh has also increased. The profile of the Aceh Health Office in 2021 shows that the prevalence of diabetes mellitus in Aceh in 2013 was 1.8%, whereas this figure increased in 2018 to 2.5%. The increase in prevalence in Aceh Province is very significant when compared to the increase nationally. It is necessary to review the problem of handling diabetes mellitus in the province of Aceh (Aceh Health Office, 2021).

Diabetes Mellitus is a chronic disease that can cause very dangerous complications and can lead to death, such as destructive macrovascular complications (cardiovascular disease) and microvascular complications (such as diabetic kidney disease, diabetic retinopathy, and neuropathy). These complications can cause increased mortality, decreased quality of life, and decreased adherence to medication due to the long course of the disease (Hintze, 2020). The success of therapy is not only in the accuracy of choosing the right treatment and therapy program, but the problem with patient treatment adherence is a determinant of success. However, medication adherence of Diabetes Mellitus patients can be influenced by many determinants, such as; (length of suffering from DM, number of chronic illnesses suffered, comorbid diseases, frequency of taking medication, therapy performed, repeat treatment visits, regular check-ups, taking medication according to prescription or not, and emotional characteristics and social support) (Fatmawati & Karuniawati, 2017).

The results of previous studies showed that there was a statistically significant relationship between the

level of knowledge ( $p=0.046$ ; OR=6.435 95% CI; 1.037-39.93) and compliance with type 2 DM treatment. There was a statistically significant relationship between locus of control in Internal Health ( $p=0.004$ ), frequency of treatment ( $p=0.007$ ), and comorbidities ( $p=0.016$ ) with adherence to treatment for type 2 DM (Ansyar & Abdullah, 2020). The purpose of this study was to analyze the determinants of medication adherence in Diabetes Mellitus patients at the Banda Aceh City Health Center. Therefore, the determinants of medication adherence need to be observed thoroughly so that patients have a high level of adherence in carrying out treatment management programs and the sustainability of improving the health status of Diabetes Mellitus patients

### RESEARCH METHOD

This type of research is quantitative research, with descriptive observational survey research design with a cross-sectional study approach. The population in this study were diabetes mellitus patients at the Health Center in Banda Aceh City in 2022 with a total of 97 patients. Sampling technique with a simple random sampling of as many as 97 patients.

The validity and reliability test was not carried out because the instruments used were standard. The instruments used in this study were the Knowledge of Diabetic Diet Questionnaire (KDDQ), SSQ Social Support (social support questionnaire), emotional characteristics, and medication adherence using the MMAS-8 questionnaire. All variables were analyzed using univariate analysis, then bivariate to see the relationship between the determinants, and in the end, multiple logistic regression analysis was performed to see the related determinants.

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1 **RESEARCH RESULTS**

**Table 1 Demographic Characteristic of Respondents (N=97)**

Variable	Results
<b>Age (n/%)</b>	
Early Adult	10/10,3
Late Adult	23/23,7
Early Seniors	25/25,8
Late Seniors	39/40,2
<b>Gender (n/%)</b>	
Male	34,0
Female	66,0
<b>Profession (n/%)</b>	
Work	51,5
Doesn't work	48,5
<b>Education (n/%)</b>	
Intermediate	51,5
High	48,5
<b>Income (n/%)</b>	
> 3.165.031	34,0
< 3.165.031	66,0

4 Based on table 1 it can be seen that the majority of respondents in the late elderly category were 40.2%, the sex of the majority of female respondents was 66.0%, the job of more respondents working was 51.5%, secondary education was 51.5%, and income respondents below < 3,165,031 of 66.0%.

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**Table 2. Univariate Analysis (N=97)**

Variable	Results
<b>Long Suffering DM (n/%)</b>	
> 5 Years	26/26.8
< 5 Years	71/73.2
<b>Number of Diseases (n/%)</b>	
> 2	28/28.9
< 2	69/71.1
<b>Comorbid Disease (n/%)</b>	
Yes	25/25.8
No	72/74.2
<b>Insulin Use (n/%)</b>	
Yes	27/27.8
No	70/72.2
<b>Medical Chekup (n/%)</b>	
> 3 Times	12/12.4
< 3 Times	85/87.6
<b>Check Blood Sugar (n/%)</b>	
Once a Month	56/57.7
> 1 Month	41/42.3
<b>Knowledge (n/%)</b>	
Good	63/64.9
Not Good	34/35.1
<b>Social Support (n/%)</b>	
Positive	45/46.4
Negative	52/53.6
<b>Emotional (n/%)</b>	
Positive	45/46.4
Negative	52/53.6
<b>Medication Compliance (n/%)</b>	
Obey	45/46.4
Not Obey	52/53.6

Based on table 2, shows that of the 97 patients with type II DM, the majority of respondents had suffered from diabetes for < 2 years 73.2%, had some diseases < 2 by 71.2%, did not have comorbid diseases 74.2%, carried out

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health checks < 3 times by 87.6%, checking blood sugar only once a month by 57.7%, The majority of respondents had good knowledge of 64.9%, received negative social support by 53.6%, had negative emotions by 53, 6%, and has a moderate level of adaptive mal medication adherence or disobedience of 53.6%.

**Table 3. Multiple Regression Analysis**

5 Variable	B	OR	95 % CI Lower	95 % CI Upper	p-value
Age	-0.561	0.571	0.300	1.087	0.088
Education	0.431	1.539	0.461	5.134	0.483
Income	-1.195	0.303	0.079	1.153	0.080
Medical Chekup	2.330	10.279	1.873	56.410	0.007
Check Blood Sugar	0.269	1.309	0.413	4.145	0.647
Knowledge DM	-1.632	0.196	0.065	0.588	0.004
Social Support	0.188	1.207	0.434	3.354	0.718

At this stage 7 (seven) independent variables passed the bivariate selection stage with a p-value <0.25 and the next step was carried out with the first stage of elimination/selection of variables whose p-value was > 0.05 and the largest value was excluded from the regression model, until in the third stage or final selection.

**DISCUSSION**

Determinants that affect medication adherence were analyzed by multivariate logistic regression. Variables that met the requirements of multivariate analysis (p<0.25) were then analyzed multivariate. Variables that meet the requirements of multivariate analysis in this study are age, education, health examination, income, blood sugar examination, DM knowledge, & social support. Management of diabetes mellitus is an effort with an important goal of controlling complications. Self-management in cases of diabetes includes medication, diet, blood sugar control, and exercise (Fatimah, 2015). Optimal DM management is needed to change the behavior of DM sufferers so that they have a healthy lifestyle, namely exercising, regular eating patterns, controlled blood pressure, regular drug use, and foot care using health services (Perkumpulan Endokrinologi Indonesia, 2015). Treatment of diabetes mellitus is carried out routinely for life because DM is a disease that cannot be cured permanently so that most patients feel bored and tend to be disobedient in treatment (Upadhyay et al., 2020).

Compliance with treatment plays an important role in targeting the success of therapy, especially for

chronic diseases including diabetes mellitus. The low adherence of patients to diabetes mellitus therapy is one cause of the lack of control over blood sugar levels (Katadi et al., 2019). High adherence to treatment is one indicator that determines the success of the DM disease control process. Various studies have found that people's adherence to chronic disease treatment is generally still low. This low adherence can be caused by accident (for example forgetting because of activities), lack of knowledge, social support, duration of suffering from diabetes, or not taking medication on purpose. Lack of patient understanding of the risks in the event of an increase in blood sugar levels with a lack of knowledge, and consistency is also a cause of non-compliance (Riani, 2017).

The results of this research are in line with the preliminary study that the DM knowledge variable has a value of 0.150 (95% CI: 0.057 – 0.391), meaning that respondents who have good knowledge have odds of adherence to the medication of 0.150 higher than respondents who do not have good knowledge of DM. So it can be concluded that the most dominant

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variable has the most influential determinant of medication adherence in patients.

The success of a treatment, both primary and secondary, is greatly influenced by DM sufferers to maintain their health. With a good level of knowledge, primary and secondary treatment can be carried out optimally and the quality of health can still be felt. The reason is if DM sufferers do not have the self-awareness to be obedient then this can cause failure in treatment which results in decreased health (Isnaeni et al., 2018).

Knowledge is needed to control the impact of risks and complications caused by DM. Patient knowledge about DM is an important tool to help the patient himself in managing his disease condition, so the more and the better the knowledge about diabetes education, the better it is in handling the DM diet (Nurhaliza et al., 2021). Patient medication compliance can be controlled directly by the patient if the patient gets an understanding and knowledge about the condition of his disease. Therefore, one of the first attempts to determine the effect of medication adherence with the determinants of knowledge at the Banda Aceh City Health Center is to improve education. Better education given to patients will be an important outcome in diabetes mellitus management strategies (Ulfa et al., 2019).

Understanding education about how to know the right diet recommended activities, prevention of diabetic foot ulcers the utilization of these health services will help predict the patient's life better. The researcher also recommends increasing education with the Diabetes Self Management Education (DSME) method, which is a method with better application of education to manage DM (Hailu et al., 2019). with the family approach (PIS-PK). One of the indicators to achieve a healthy family is that people with diabetes mellitus must also comply with and carry out regular medication programs (Astuti & Soewondo, 2019).

## CONCLUSION

The determinant that has the closest relationship with medication adherence in type 2 diabetes mellitus patients with a p-value: (0.000). Increasing

knowledge can be done by providing education through the Diabetes Self Management Education (DSME) method. The provision of the DSME method can be carried out through a home visit approach to the homes of type 2 DM sufferers.

## REFERENCES

- Ansary, D. I., & Abdullah, A. Z. (2020). Komparasi Hubungan Faktor Predisposisi dan Faktor Penguat dengan Kepatuhan Pengobatan Penderita Diabetes Melitus Tipe 2 di Wilayah Pulau dan Non Pulau Kota Makassar. *Kampurui Jurnal Kesehatan Masyarakat*, 2(2), 36-42.
- Astuti, T. S. R., & Soewondo, P. (2019). Analisis Kesiapan Pembiayaan Hipertensi, Diabetes Melitus dan Gangguan Jiwa dalam Mendukung Program Indonesia Sehat dengan Pendekatan Keluarga (PIS PK) Tahun 2018-2020. *Jurnal Ekonomi Kesehatan Indonesia*, 3(1).
- Bestari, I. L. (2020). Characteristics Of Patients With Type 2 Diabetes Mellitus At Surabaya Haji General Hospital. *The Indonesian Journal of Public Health*, 15(3), 286.
- Dinas Kesehatan Aceh. (2021). Profil Kesehatan Aceh 2021. <https://dinkes.acehprov.go.id/detailpost/profil-kesehatan-aceh-tahun-2021>
- Fatimah, R. N. (2015). *Diabetes Melitus Tipe 2. J Majority*, 4 (5), 93-101
- Fatmawati, S. A., & Karuniawati, H. (2017). *Faktor-Faktor Yang Berpengaruh Terhadap Kepatuhan Minum Obat Pasien Diabetes Mellitus Tipe 2 Di RSUD Dr. Moewardi Periode Oktober 2016-Maret 2017* (Doctoral dissertation, Universitas Muhammadiyah Surakarta).
- Hailu, F. B., Moen, A., & Hjortdahl, P. (2019). Diabetes self-management education (DSME)-Effect on knowledge, self-care behavior, and self-efficacy

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- among type 2 diabetes patients in Ethiopia: A controlled clinical trial. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 2489-2499.
- Hintze, G. (2020). Diabetes-Komplikationen. *DMW-Deutsche Medizinische Wochenschrift*, 145(22), 1585-1585. International Diabetes Federation. (2019). *IDF Diabetes Atlas Ninth*. <https://diabetesatlas.org/atlas/ninth-edition>.
- Isnaeni, F. N., Risti, K. N., Mayawati, H., & Arsy, M. K. (2018). Tingkat pendidikan, pengetahuan gizi dan kepatuhan diet pada pasien diabetes mellitus (DM) rawat jalan di RSUD Karanganyar. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 1(2), 40-45.
- Katadi, S., Andayani, T. M., & Endarti, D. (2019). The correlation of treatment adherence with clinical outcome and quality of life in patients with type 2 diabetes. *Jurnal Manajemen Dan Pelayanan Farmasi (Journal Of Management And Pharmacy Practice)*, 9(1), 19-26.
- Nurhaliza, S., Mulfianda, R., & Putra, Y. (2021). Hubungan Motivasi dan Dukungan Keluarga Terhadap Kepatuhan Diet pada Penderita Diabetes Melitus. *Idea Nursing Journal*, 12(2), 26-31.
- Perkumpulan Endokrinologi Indonesia (2015). *Pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia*. <https://pbperkeni.or.id/wp-content/uploads/2021/11/22-10-21-Website-Pedoman-Pengelolaan-dan-Pencegahan-DMT2-Ebook.pdf>.
- Riani, D. A. (2017). *Validasi 8-item Morisky Medication Adherence Scale versi Indonesia pada pasien hipertensi dewasa di puskesmas kabupaten Sleman dan kota Yogyakarta* (Doctoral dissertation, Universitas Gadjah Mada).
- Ulfa, K., Mulfianda, R., & Desreza, N. (2019, December). Efektivitas Senam Prolanis Terhadap Penurunan Tekanan Darah Dan Kadar Gula Darah Di Puskesmas. In *Prosiding SEMDI-UNAYA (Seminar Nasional Multi Disiplin Ilmu UNAYA)* (Vol. 3, No. 1, pp. 728-740).
- Upadhyay, J., Trivedi, N., & Lal, A. (2020). Risk of future type 2 diabetes mellitus in patients developing steroid-induced hyperglycemia during hospitalization for chronic obstructive pulmonary disease exacerbation. *Lung*, 198, 525-533.

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