Analysis Of The Relationship Of Blood Sugar Control In Patients With Diabetes Mellitus With Compliance To Take Medicine In Balimbingan Hospital In 2019

Erni Karmila[1*], Sri Lestari Ramadhani Nasution[2], Ermi Girsang[3], Ali Napiah Nasution[4]

[1] Magister Student of Magister Public Health, Faculty of Medicine, University of Prima Indonesia
[2,3,4] Magister Public Health, Faculty of Medicine, University of Prima Indonesia
[*] Corresponding author:
Email: ernikarmilaunpri@gmail.com

Abstract.
Diabetes mellitus is a major public health problem because of its short-term and long-term complications. Diabetes Mellitus (DM) is a disease that involves pancreatic endocrine hormones, including insulin and glucagon. The main manifestations include disturbances of lipid, carbohydrate, and protein metabolism, which in turn stimulates hyperglycemia. This hyperglycemic condition will develop into diabetes mellitus with various forms of complications. Adherence is very important, especially in long-term treatment. In general, the level of compliance in each patient is described by the percentage of the number of drugs taken and the time of taking the drug within a certain period of time. This study aims to determine the relationship between controlled blood sugar in patients with diabetes mellitus with medication adherence at Balimbingan Hospital. The design of this study was cross sectional, with a quantitative approach with a sample of 56 patients. The data collection method in this study used a questionnaire and data on visits to patients with diabetes mellitus at Balimbingan Hospital.

Keywords: *Diabetes mellitus, medication adherence, blood sugar levels*

I. INTRODUCTION

Non-Communicable Diseases (NCD) is currently a serious public health problem, because the pattern of occurrence is increasing every year and is a cause of death and disability. The World Health Organization (WHO) estimates that around 70% of deaths in the world's population in 2005 were caused by non-communicable diseases, namely: 30% due to heart and blood vessel disease, 13% due to cancer, 9% due to chronic disease, 7% due to respiratory disease. chronic, 7% due to accidents and 2% Diabetes Mellitus (DM) (Hasbi, 2014).Diabetes Mellitus (DM) is a disease that interferes with chronic metabolism with multiple etiologies, such as damage to pancreatic beta cells, decreased insulin secretion and excessive sugar consumption. Usually this disease is characterized by high blood sugar levels accompanied by impaired carbohydrate, lipid and protein metabolism as a result of insulin function insufficiency (Fatmawati, 2017). There are several complications that occur in diabetes mellitus, namely:

1. Acute complications (complications that occur immediately in a short time), hypoglycemia (lack of glucose / sugar). Symptoms: hunger, shaking, cold sweats, dizziness, and others.
2. Diabetic coma (too high glucose). Symptoms: decreased appetite, frequent thirst, drinking a lot, urinating a lot, nausea, vomiting, fast breathing.
3. Chronic complications (complications that appear for a long time, if sugar levels are not controlled), causing inflammation and acute infection.

Diabetes mellitus is a major public health problem because of its short-term and long-term complications. Complications of diabetes can be in the form of macrovascular diseases, such as cardiovascular or microvascular plaque formation, such as diabetic retinopathy, neuropathy, nephropathy (Greenberg, 2012). According to Fatmawati (2017), diabetes mellitus is a chronic chronic disease so that adherence to medication is important in the treatment of diabetes mellitus. Compliance can describe the extent to which a person's behavior is to take medication, follow a diet, and or implement lifestyle changes in accordance with agreed recommendations from health care providers.The hormone insulin functions to regulate the balance of glucose levels in the blood. Impaired insulin production and function results in an increase in blood sugar levels above normal (hyperglycemia) which will eventually increase blood pressure (hypertension) (Handayani, 2016).A previous study using the MMAS-8 instrument showed that patients with diabetes mellitus had a high adherence rate of 20 patients (18.2%), a moderate level of adherence was 43

patients (39.1%) and a low level of adherence was 47 patients (42.7%) (Alfian, 2015). Another study also showed that using the same method, namely MMAS-8, it was found that the level of patient compliance was mostly still low (Ramadhan, et al, 2015).

Adherence is very important, especially in long-term treatment. It is very important for pharmacists to pay attention to patients in terms of adherence to taking drugs in order to achieve the target of therapy. Pharmacists as health workers who are responsible for the treatment of patients can actively participate in helping to improve compliance with drug consumption such as holding health promotions, for example by providing brochures, pamphlets so that patients understand disease and treatment so that they play a role in maintaining health, providing tools such as drinking reminder cards. drugs that can be marked when the patient has taken the drug, provide additional information or large and clear writing on the drug label for patients who are difficult to hear or see, and provide support, motivation,In general, the level of compliance in each patient is described by the percentage of the number of drugs taken and the time of taking the drug within a certain period of time. The causes of low adherence that often arise are mostly patients forgetting, not complying with treatment according to doctor's instructions, and misreading etiquette. In addition, the low non-adherence in treatment can be caused because the drug regimen given is too much so that the patient will find it increasingly difficult to follow the regimen.Based on the results of a preliminary survey conducted at the Balimbingan Hospital, it was found that the data on diabetes mellitus patients at the Balimbingan Hospital was still high and the majority who had diabetes mellitus were women. Based on the background of the problem above, the researcher is interested in raising the issue of "Analysis of the relationship between controlled blood sugar in patients with diabetes mellitus and adherence to taking medication at Balimbingan Hospital".

II. METHODS

The study design of this research is cross sectional, with a quantitative approach method. Quantitative research to obtain data on age, sex, income, knowledge of DM, duration of suffering from DM and history of disease. The place of this research was carried out at Balimbingan Hospital, and the time of this research will be carried out in August 2019. The population of this study was all patients suffering from diabetes mellitus as many as 65 patients. Based on the formula according to Notoatmodjo (2015), the sample size of this study was 56 patients. Research inclusion criteria: patients suffering from DM, patients aged >40 years and families of patients with DM. Exclusion criteria of the study: doctors, nurses and pharmacists.

The data collection method used to obtain data/information in this study is by using primary data obtained directly from respondents and collected through filling out questionnaires, as well as observation and secondary data collected and documented by the Balimbingan Hospital which is a hospital profile and data. visits of patients with diabetes mellitus at Balimbingan Hospital.

III. RESULT AND DISCUSSION

The majority of the age characteristics of respondents who suffer from diabetes mellitus in Balimbingan Hospital with the age of 51-60 years are 22 people (39.3%), and the minority aged 31-40 years are 1 person (1.8%). Of the 56 respondents with diabetes mellitus at Balimbingan Hospital, patients with diabetes mellitus can be grouped based on gender and carried out to determine the ratio of the number of male and female patients. The results of the study showed that the comparison with the most diabetes mellitus was female as many as 31 people (55.4%) and the least was male sex as many as 25 people (44.6%). Based on the characteristics of education, the majority of respondents who suffer from diabetes mellitus are high school graduates (44.6%) and a minority of DIII graduates are 5 people (8.9%).

Table 1. The relationship between sex and medication adherence in DM patients

Gender	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
Woman	12	38.7	2	6.5	17	54.8	31	55.4	0.304

Man	9	36.0	5	20.0	11	44.0	25	44.6	

Based on table 1, it can be seen that there is no relationship between gender and medication adherence in DM patients, as evidenced by p-value <0.05. A total of 31 respondents were female, there were 12 people with low compliance, 2 people with moderate adherence and 17 people with high compliance. Of the 25 male respondents, there were 9 people with low compliance, 5 people with moderate compliance and 11 people with high compliance. This may be due to the desire to heal male and female patients equally.

Table 2. The relationship between length of illness and adherence to medication in DM patients

Long Suffering Disease	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
1-3 years	2	3.6	3	5.4	6	10.7	11	19.6	0.354
> 3-5 years	10	17.9	3	5.4	13	23.2	26	46.4	
>5 years	9	16.1	1	1.8	9	16.1	19	33.9	

Based on table 2, it can be seen that as many as 11 respondents who suffered from the disease 1-3 years, there were 2 people with low compliance, 3 people with moderate compliance and 6 people with high compliance. In 26 respondents who suffered from disease >3-5 years, there were 10 people with low adherence, 3 people with moderate adherence and 13 people with high compliance. In 19 respondents who suffered from disease >5 years, there were 9 people with low adherence, 1 person with moderate adherence and 9 people with high adherence. In this result, it was found that there was no relationship between duration of illness and medication adherence in DM patients, as evidenced by p-value <0.05. This may be due to the need for medication remains the same as long as the patient has not been declared cured.

Table 3. Relationship of disease history with medication adherence in DM patients

Illness History	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
Yes	20	35.7	6	10.7	28	50.0	54	96.4	0.178
Not	1	1.8	1	1.8	0	0	2	3.6	

Based on table 3, it can be seen that as many as 54 respondents who have a history of disease, there are 20 people with low compliance, 6 people with moderate compliance and 28 people with high compliance. In 2 respondents who did not have a history of disease, there was 1 person with low adherence, 1 person with moderate adherence and none with high compliance. These results indicate that there is no relationship between medical history and medication adherence in DM patients, as evidenced by p-value <0.05.

Table 4. The relationship between types of drugs and medication adherence in DM patients

Drug Type	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
Acarbose	0	0	1	1.8	1	1.8	2	3.6	0.301
Glimeperide	19	33.9	6	10.7	22	39.3	47	83.9	
Metformin	2	4.6	0	0	5	8.9	7	12.5	

Based on table 4, it can be seen that there is no relationship between the type of drug and medication adherence in DM patients, as evidenced by the p-value <0.05. This may be due to the absence of significant differences between the three drugs.

Table 5. Relationship between education and medication adherence in DM patients

Education	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
SD	9	16.1	2	3.6	2	3.6	13	23.2	0.086

Junior High School	4	7.1	2	3.6	7	12.5	13	23.2	
Senior High School	8	14.3	2	3.6	15	26.8	25	44.6	
DIII	0	0	1	1.8	4	7.1	5	8.9	

Based on table 5, it can be seen that low adherence was most commonly found in patients with elementary education level (16.1%), while high adherence was most commonly found in patients with DIII education level (26.8%). This may be because education affects a low level of education. From these results, it was found that there was no relationship between education and medication adherence in DM patients, as evidenced by p-value <0.05.

Table 6. Relationship of income with medication adherence in DM patients

Income	**Obedience**						**Total**		**P value**
	Low Compliance		Moderate Compliance		High Compliance				
	n	%	n	%	n	%	N	%	
<2,300,000	17	30.4	5	8.9	22	39.3	44	78.6	0.868
>2.300.000	4	7.1	2	3.6	6	10.7	12	21.4	

Based on table 6 above, it can be seen that 44 respondents with income < 2,300,000, there are 17 people with low compliance, 5 people with moderate compliance and 22 people with high compliance. In 12 respondents with income > 2,300,000, there are 4 people with low compliance, 2 people with moderate compliance and 6 people with high compliance. These results indicate that there is no relationship between the type of drug and income in DM patients, as evidenced by the p-value <0.05.

IV. CONCLUSION

Based on the research that has been done, the results of the analysis of the relationship between blood sugar control in patients with diabetes mellitus with medication adherence at Balimbingan Hospital are as follows: there is no relationship between sex, length of illness, history of disease, type of medication, education and income on medication adherence. Diabetes mellitus in Balimbingan Hospital is shown from all variables, the majority of patients have high adherence to the consumption of diabetes mellitus drugs at Balimbingan Hospital.

V. ACKNOWLEDGMENTS

Thank you to the supervisor who has guided to complete this research. And we don't forget to thank the family for the great support to the author.

VI. ETHICAL CONSIDERATIONS

The research will be conducted after the researcher has obtained ethical clearance from the Prima University Ethics Committee. Ethical considerations are standards of behavior that distinguish between acceptable behavior and unacceptable behavior (Tappen, 2016). To ensure accountability to participants, a study requires the protection of human rights which include autonomy, privacy, confidentiality, and justice (Wood and Ross-Kerr, 2011).

REFERENCES

[1] Bruhn, M. & Schnebelen, S., 2017. Integrated Marketing Communication from an Instrumental To ACustomer-Centric Perspective. ***European Journal of Marketing***, 51(3), pp. 464-489.https://doi.org/10.1108/EJM-08-2015-0591

[2] Chanarah, J. & Njuguna, RK, 2015. The Effect of Promotional Mix Tools on Brand Equity Among Hospitalsin Nairobi Country. ***International Journal of Sales,*** Retailing and Marketing, 4(6), pp. 45-51.https://api.semanticscholar.org/CorpusID:55927768

[3] Daryanto.(2010) “”” Communication Science. Bandung : PT. Prosperous Conscience Tutorial ToolGronroos, C. (2000). “”Service Management and Marketing, A Marketing Relationship Management Approach. Second Edition. West Sussex: Chicheste.

[4] Herfiza, A., 2018. Marketing Communication of Malahayati Islamic Hospital in Increasing VisitsPatients in Medan City. ***JOM FISIP,*** 5(1), pp. 1-11.https://jom.unri.ac.id/index.php/JOMFSIP/article/view/171533

[5] Kotler, P. & Keller, KL, 2015. Marketing Management, Global Edition. UK: Pearson Education.

[6] Nugraha, M., Anwar, A., Priadana, S. & Firdaus, M., 2017. Analysis of the Effect of Image and Service QualityAgainst Patient Satisfaction and Its Implications on Marketing Communications at the Fatimah Maternity Hospital in Bandung. ***Journal of Industrial Technology and Management,*** 3(1), pp. 14-19. https://doi.org/10.36040/jtmi.v3i1.172

[7] Oana, D., 2018. Integrated Marketing Communication and Its Impact on Consumer Behavior. Studies inBusiness and Economics, 2(13), pp. 92-102.https://doi.org/10.2478/sbe-2018-0022

[8] Patel, S., Ramesh, R., Mehra, S. & Rathod, S., 2017. IMC Preferences at Super Specialty Hospitals.***International Journal of Advanced Scientific Research and Management***, 2(5), pp. 1-9. http://ijasrm.com/wpcontent/uploads/2017/05/IJASRM_V2S5_232_1_9.1.pdf

[9] Santoso, Y., 2018. Integrated Marketing Communication Transformation in the Digital Era. ***Library JournalCommunication,*** 1(2), pp. 313-326.https://doi.org/10.32509/pustakom.v1i2.710

[10] Wahyuni, D., 2019. Marketing Communication Strategy of Pekanbaru Eye Center (PBEC) Eye Hospital inBuild Brand Awareness***. JOM FISIP***, 6(1), pp. 1-15.https://jom.unri.ac.id/index.php/JOMFSIP/article/view/24124