Keteraturan Kunjungan DM

by Titik Kuntari

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Factors Associated to Type 2 Diabetes Mellitus Patients' Irregular Visits to Puskesmas

Titik Kuntari[1]*, Alfreda Amelia Khotijah[2], Hana Nuraisa Basya[3], Rama Cakranegara[4], Zinedine Yusuf Ariant[5], Nina Tiwi Handayani[6]

[1,2,3,4,5] *Faculty of Medicine, Islamic University of Indonesia. Jalan Kaliurang KM*

[6]*Grabag II Health Center, Magelang District, Central Java*

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ABSTRACT

Background: Type 2 diabetes mellitus (DM) is a non-communicable disease with an increasing incidence. DM is associated with deaths caused by several complications. One of the efforts to manage DM is to control blood glucose by maintaining regular check-ups and treatment compliance. Unfortunately, many people with DM still need to visit health facilities regularly.
Purpose: This study aimed to explain the factors associated with the irregularity of type 2 DM patients in having check-ups at the public health center (*puskesmas*).
Methods: This cross-sectional study used the medical record data from Grabag II Public Health Center. The subjects were 135 outpatients with type 2 DM and complete medical records.
Results: The results showed that visit irregularity was significantly associated with sex (OR = 3.8; 95% CI = 1.12-12.79), distance from home (OR = 0.2; 95% CI = 0.06-0.52), and duration of diagnosis (OR = 0.3; 95% CI= 0.12-0.85), but not with age, insurance, comorbidities, and types of therapy.
Conclusion: Factors associated with type 2 diabetes mellitus patients' irregular visits to Puskesmas are sex, distance from home, and duration of diagnosis. Educational interventions at all levels of society should be carried out to increase knowledge about DM and the importance of regular check-ups and medication.

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INTRODUCTION

Changes in the environment, technology, and lifestyle have led to changes in disease patterns in the world, including in Indonesia. Non-communicable diseases (NCDs) have increased, such as DM, heart disease, dyslipidemia, obesity, kidney disease, hypertension, joint disease, and malignancies.[1] The 2018 Basic Health Research (Riskesdas) showed an escalation of these diseases compared to the 2013 Riskesdas.[2] A sedentary lifestyle, obesity, high-calorie diet, smoking, and genetic factors also intensify NCDs. Meanwhile, type 2 DM is a complex NCD that is currently a challenge for the public health sector since it is associated with high incidence and mortality rates at a young age.[3]

Diabetes mellitus (DM) is a common chronic disease in society. DM is caused by reduced insulin secretion by the pancreas gland or impaired cell sensitivity to insulin, making the hormone work ineffectively. Both conditions cause an increase in blood sugar levels (hyperglycemia). Uncontrolled and prolonged hyperglycemia can lead to severe damage to various body systems, such as the nervous system and blood vessels. DM that occurs due to low insulin production is called type 1 DM. Meanwhile, DM caused by the body's inability to utilize insulin effectively is called type 2 DM, which is the most common type of DM (90%).[4]

The International Diabetes Federation (IDF) in 2011 stated that about 336 million people worldwide had type 2 DM. The disease is associated with 4.6 million deaths annually or about one every seven seconds. The World Health Organization (WHO) estimates an increase in the number of people with DM in Indonesia to approximately 21.3 million people in 2030. This figure has increased from 8.4 million people in 2000. The IDF data shows that, in 2014, there were 9.1 million people with DM in Indonesia. It is estimated that the number will continue to grow every year. In 2014, Indonesia ranked 5th in the world, going up two places compared to the previous year.[5]

One of the pillars of DM treatment that needs to be emphasized is pharmacological intervention. The success of DM treatment is indicated by the control of blood sugar levels and the absence of complications. Patient adherence to treatment influences this success. Treatment adherence is defined as the suitability of the treatment actions taken by a patient to the recommendations for medications prescribed by the doctor related to the time, dose, and frequency. Some people with DM experience complications and uncontrolled blood sugar levels because they are not compliant with taking medication or changing their lifestyle as recommended by health workers. Treatment adherence, among others, is also indicated by the regularity of visiting health facilities. *Puskesmas* (public health center) is one of the primary health facilities essential in managing type 2 DM in Indonesia. Unfortunately, there are still many people with type 2 DM who do not regularly make periodic visits to the public health center. The factors associated with irregular visits should be identified to determine appropriate interventions. This study aims to identify the determinants that influence irregular visits to the public health center among people with type 2 DM.

METHOD

The study used a cross-sectional design. The data were taken from the electronic medical records of Grabag II Public Health Center, Magelang, Indonesia. The research subjects were all people with Type 2 DM who underwent outpatient care at Grabag II Public Health Center, Magelang, over the period of January-June 2022 and had complete medical record data. The sample size of this study was 135 people.

The independent variables consisted of age, sex, health insurance ownership, distance from home to the public health center, comorbidities, length of diagnosis, and types of therapy. The dependent variable was the regularity of visits to the public health center. The categories of the visit regularity were divided into two, namely "regular" and "irregular". An individual was categorized as "regular" if he/she had consecutive check-ups for at least three months within the last six months. The distance traveled by the patient from the hamlet of residence to *puskesmas* was divided into two groups: long distance of ≥3 km and short distance of <3 km. The comorbidity variable was defined as the presence or absence of comorbidities other than Type 2 DM and listed in the electronic medical record. The type of therapy variable was based on the number of drugs received by people with DM, categorized into monotherapy (one type of drug) and multitherapy (more than one drug).

The results of univariate analysis were presented in a frequency distribution table. The bivariate analysis used the chi-square analysis, whereas the multivariate analysis used the logistic regression analysis. The significance level of the correlation was expressed with a p-value <0.05. The study passed the ethical review by the Faculty of Medicine Ethics Committee, Islamic University of Indonesia, with the certificate number 3/Ka.Kom.Et/70/KE/II/ 2023.

RESULT DAN DISCUSSION

The results of the univariate analysis showed that the people with type 2 DM at Grabag II Public Health Center were mainly in the age group of 51-60 years (28.1%), were female (70.4%), had health insurance (51.1%), had a residence of more than 3 km away from the Public Health Center and did not have comorbidities (54.1%). Most of the subjects (71 patients or 52.6%) received one type of drug therapy (monotherapy). Based on the regularity of visits, the majority of the subjects (78.5%) did not regularly visit the public health center (Figure 1). The characteristics of the people with type 2 DM at Grabag II Public Health Center are presented in Table 1.

Table 1. Characteristics of the research subject

Variables	Irregular	Regular	Total	Percentage
Age (y.o.)				
≤30	4	0	4	3.0
31-40	14	4	18	13.3
41-50	26	9	35	25.9
51-60	31	7	38	28.1
61-70	29	9	35	25.9
≥71	2	0	5	3.7
Sex				
Male	36	4	40	29.6
Female	70	25	95	70.4
Financing				
Out of Pocket	56	10	66	48.9
BPJS Insurance	50	19	69	51.1
Distance				
Near (≤ 3 km)	55	6	61	45.2
Far (>3 km)	51	23	74	54.8
Comorbidity				
Yes	46	16	62	45.9
No	60	13	73	54.1
Therapy				
Monotherapy	58	13	71	52.6
Multitherapy	48	16	64	47.4
Duration				
≥6 months	33	17	50	37.0
<6 months	73	12	85	63.0

Source : Primary Data, 2022

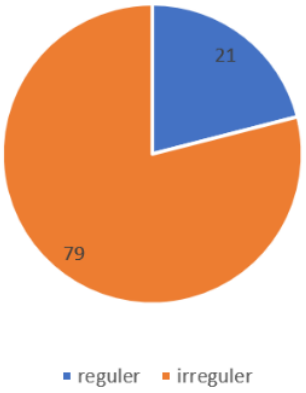

Figure 1. Regularity of check-ups of patients with type 2 diabetes at the public health center

The bivariate and multivariate analysis results showed that sex, distance from home to the public health center, and duration of diagnosis were the factors associated with irregular visits to the public health center (p < 3 km). In other words, people with DM who live close to health facilities (3 km or less) were five times more likely to make irregular visits.

Meanwhile, people with DM having been diagnosed for six months or more had 0.3 times the risk of irregular visits compared to those with a diagnosis of less than six months. New patients (less than six months) had 3.3 times risk of irregular visits to the public health center compared to old patients. Meanwhile, age, source of financing, comorbidities, and types of therapy were not significantly associated with the irregularity of DM patients visiting health facilities. The results of the bivariate and multivariate analysis are presented in Table 2.

Table 2. Results of bivariate and multivariate analyses

Variables	Bivariate		Multivariate	
	OR (CI 95%)	***p-value***	**aOR (CI 95%)**	***p-value***
Age	0.8 (0.34-1.96)	0.658	1.3 (0.46-3.50)	0.648
≥60 y.o.				
< 60 y.o.				
Sex	**3.2 (1.04-9.95)**	**0.035***	**3.8 (1.12-12.79)**	**0.033***
Male				
Female				
Financing	2.1 (0.90-5.01)	0.08	2.0 (0.77-5.37)	0.15
Out of Pocket				
BPJS Insurance				
Financing	**0.2 (0.09-0.64)**	**0.003***	**0.2 (0.06-0.52)**	**0.002***
Far (> 3 km)				
Near (≤3 km)				
Comorbidiy	0.6 (0.27-1.42)	0.259	0.5 (0.17-1.34)	0.159
Yes				
No				

Therapy	0.7 (0.29-1.54)	0.345	1.1 (0.40-3.24)	0.807
Multitherapy				
Monotherapy				
Duration	**0.3 (0.14-0.74)**	**0.007***	**0.3 (0.12-0.85)**	**0.022***
≥6 months				
<6 months				

* p-value<0.05

Patient compliance with visiting health facilities according to doctor's recommendations will have implications for the regularity of taking medication. Irregular diabetes patients have a higher risk of developing complications, such as cardiovascular disorders, uncontrolled blood sugar levels, stroke, and others. It also increases the patient's risk for deteriorating conditions that require hospitalization, drugs, and medical measures, thus incurring higher costs.[6], [7]

The results showed that the factors influencing the regularity of visits of the people with type 2 DM to the public health center were sex, distance from home, and length of diagnosis. Male patients tended to be more irregular in visiting the public health center than female (p-value = 0.033). Puskesmas services held during working hours may be the reason for this. During these hours, men usually choose to work rather than take a moment to leave their work to have check-ups at the public health center, especially if they do not experience clinical complaints that interfere with their activities. In addition, women tend to be more attentive to health and self-care issues. Other studies of treatment for several chronic diseases, such as tuberculosis and hypertension, have also shown similar findings, with men being more non-compliant than women.[8], [9]

This study also indicated that the distance of the house to *puskesmas* was related to the regularity of visits. Long distance is not a barrier for people with DM to have regular check-ups at *puskesmas*. This may be because, even though far away, *puskesmas* remains accessible for the residents in its working area. Community's access to health facilities affects the regularity of treatment. Another study in Kupang showed that long distance was associated with the regularity of treatment for people with mental disorders. This may also be related to the geographical conditions and transportation facilities of the corresponding region.[10] The results of this study showed that close distance (3 km or less) was a risk factor for periodic check-ups. This may be influenced by different occupations or activities of the people living around *puskesmas*, which is in the center of the sub-district, and those of the people residing far from *puskesmas*.

The length of diagnosis was also significantly associated with the irregularity of the people with type 2 DM to have check-ups at *puskesmas*. People with DM who have been diagnosed for a long time tend to have periodic check-ups at *puskesmas*. It may be because, over time, patients will have more information, better understand the disease experienced, and feel the benefits of the therapy they receive. Providing information through various media and counselling with health workers will increase the regularity of examination and treatment.[11], [12] Also, optimizing the use of social media for promotion and education to society should continue, so that DM sufferers, families, and society have accurate information and knowledge about DM. The language and manner of communication during education are an essential component and determine patient compliance. Health workers should also understand what kind of information is needed by patients. In addition, cultural communication can improve emotional closeness and therapeutic success, such as diet therapy in DM patients.[13]

Meanwhile, age, source of health financing, comorbidities, and types of therapy were not significantly associated with irregular visits to the public health center. However, patients at older age (60 years or more) tended to be more irregular than those at younger age (less than 60 years), with an OR of 1.3 (95% CI 0.46-3.5). Older people often perceive that treatment is unnecessary as long as blood sugar levels are normal, or they do not have any significant complaints.[14] Older people also often have limited mobility as they depend on their children or younger family members to take them to health facilities.

In addition, general patients who did not have BPJS insurance (Indonesia's Social Security Agency on Health program) were twice as likely to be non-adherent as BPJS patients although it was not statistically significant (p-value = 0.15). DM is among the chronic diseases of which the treatment is covered by BPJS.[15] This may be one factor that encourages people with DM who have insurance/BPJS to be more regular to visit *puskesmas* than those who do not have it. In addition, this study showed that comorbidities and types of therapy were not significantly related to the regularity of patients visiting the public health center ($p>0.05$). Previous research on the relationship between the number or types of drugs consumed and medication adherence showed different findings. Some studies indicated that the number of drugs consumed increase the non-adherence of people with type 2 DM. However, other studies found no relationships between the number of drugs and treatment adherence.[16]

The limitation of this study is that we should have analyzed several other variables that may be associated with irregular patient visits, such as occupation and education level, due to limited data in medical records.

CONCLUSION

Type 2 diabetes mellitus patients' irregular visits to *puskesmas* was significantly associated with sex, distance from home, and length of diagnosis ($p<0.05$), whereas age, BPJS financing/membership, existence of comorbidities, and types of the therapy received were not. Educational interventions at all levels of society should be carried out to increase knowledge about DM and awareness of regular check-ups and taking medication for DM management and preventing its complications.

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