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RESEARCH ARTICLE

Oral Antidiabetic Drug Consumption Adherence in Primary Health Care through PRECEDE Method

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ABSTRACT:
Diabetes mellitus is a chronic disease that is complex and can be suffered for entire life. Patients with this disease are often desperate with a long therapy program, so that patient compliance can affect the success of the treatment. Factors that influence the treatment adherence can be analyzed using the PRECEDE model. To study the behavioral factors that affect patient adherence to oral antidiabetic drug consumption through the PRECEDE model. This study is an analysis and cross sectional research. Data retrieval is done by non random sampling with accidental sampling technique. The number of respondents obtained in this study were 58 patients who met the inclusion criteria. The research instrument used in this study was a questionnaire to be proposed using the *Spearman test*. The results of the *Spearman* correlation test showed that the coefficient correlation values for patient knowledge, patient attitudes, health facilities, and health worker behavior were 0.069 (*p-value*: 0.604), 0.226(*p-value*: 0.087), 0.171 (*p-value*: 0.199), and 0.287 (*p-value*: 0.029). The behavior of health workers has an influence on patient adherence to taking oral antidiabetic drugs.

KEYWORDS: Diabetes mellitus, PRECEDE, Oral Antidiabetic drug, Compliance.

INTRODUCTION:

Diabetes Mellitus (DM) belongs to a group of diseases with metabolic disorders and noncommunicable disease (NCD) which is generally characterized by hyperglycemia. Type 2 diabetes is the most common type in the world[1–3]. Diabetes Mellitus (DM) is a disease that is found in many countries with low to middle income rates including Indonesia. This disease is caused by many factors, but the incidence increases in people who are overweight and obese and individuals with low activity. The number of diabetic patients in 2012 in the world was 422 million and 1.5 million patient was passed away because of this disease[4].

Indonesia has 10 million people with diabetes and 17.9 million people who are predicted to suffer from diabetes. The World Health Organization (WHO) predicts an increase in the number of patients with diabetes mellitus (DM) in Indonesia, from 8.4 million in 2000 to 21.2 million in 2030. Many people with DM are unaware if they are affected by this disease and less than 1% receive treatment. Report from the *Riset Kesehatan*

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Dasar (Riskesdas) in 2013, the proportion of diabetes mellitus patients has doubled compared to 2007. The number of people with DM in Surabaya has increased from 2009 to 2011, from 15,961 to 26,613 people[4–6].

Treatment in diabetic patients are intended to control blood sugar levels and do it for a long time. The success of the treatment is a combination of lifestyle changes and pharmacological therapy. Treatment in diabetics is a combination of 2 oral therapies and 1 injection. This combination of therapies are intended to reduce complications that occur[7,8]. The oral antidiabetic drugs needed by diabetic patients currently available are sulfonilurea, glinid, biguanid, thiazolidinedion, alpha glucosidase inhibitors, DPP-IV inhibitors. This classification of oral drugs is based on the mechanism of action[8].

Treatment for DM patients is applied for a lifetime so it requires a high level of compliance. Compliance can be affected by Drug Therapy Problems (DTPs). The cause of DTPs is that patients do not accept the correct rules for using the drugs, do not comply with the treatment rules, forget to take drugs, do not take drugs that are not understood and cannot use drugs correctly[9]. The division of human behavior based on the PRECEDE model is influenced by three factors, namely predisposing factors related to knowledge, patient attitudes, beliefs and values. Enabling factors related to the availability of health facilities, physical environment, resources. Reinforcing factors related to the behavior of health workers and other officers[10]. This study aims to determine the behavioral factors that affect patient adherence to oral antidiabetic drugs consumption through the PRECEDE model.

MATERIAL AND METHODS:

This study is an analytical cross sectional study. Data retrieval is done by non random sampling with accidental sampling technique. The number of research subjects that met the inclusion criteria were as many as 58 people. The inclusion criteria in question are patients with type 2 diabetes mellitus who come for treatment and take oral antidiabetic drugs at least 2x at Simomulyo Health Center (Puskesmas Simomulyo) Surabaya, get a combination of oral or single antidiabetic drugs in the prescription and are willing to be the subject of this study. Patients who have limitations such as speech, hearing impairment and psychological disorders are not included in this study. The subject of research was retrieved by using non random sampling (accidental sampling) technique. The research subjects were given questionnaires related to knowledge, attitudes (predisposing factors), health facilities (enabling factors), health worker behavior (reinforcing factors) and also regarding adherence to taking oral antidiabetic drugs. The results obtained will be analyzed statistically using the *Spearman* correlation test.

RESULTS:

Table 1 Variable analysis results

Variabel	Interval	Round Value	n (%)	Category
Predisposition Factors				
Patient Knowledge	4.7-7	5-7	19 (32.6)	Good
	2.4-4.6	3-4	33 (56.9)	Moderate
	0-2.3	0-2	6 (10.5)	Poor
Patient attitude	11-16		30 (51.7)	Positive
	4-10		28 (48.3)	Negative
Enabling Factors				
Health Facility	11-16		30 (51.7)	Good
	4-10		28 (48.3)	Poor
Reinforcing Factors				
Health worker behavior	11-16		14 (24.1)	Good
	4-10		44 (75.9)	Poor
Other Variable				
Patient Adherence	25-32		26 (44.8)	High
	17-24		35 (55.2)	Medium
	8-16		0 (0)	Low

Table 1 shows that the patient's knowledge is dominated by moderate categories, while the patient's attitude in taking the drug has shown a positive attitude which means that the patient is willing to take medicine according to the given instructions. Assessment regarding health facilities showed good results. Assessment related to health facilities, namely regarding the availability of drugs, the provision of a comfortable waiting room during service, information on DM and ease of access of patients to health services. The pharmacy officer behaves in a friendly and polite manner, provides information on drug use, information on the effects of drugs and how to fix side effects is an indicator of health behavior assessment but most of the behavior of health workers is predominantly poor so improvement is needed to provide better services. The level of patient adherence shows that results are still moderate so that evaluation and control are needed regarding the level of adherence.

Table 2. Results of *Spearman correlation test*

Variable	Adherence	
	Coefficient Correlation	**Sig (2-tailed)**
Patient knowledge	0.069	0.604
Patient attitude	0.226	0.087
Health facility	0.171	0.199
Health workers behavior	**0.287**	**0.029***

*sig <0.05 shows significance

Based on the table above shows that only the behavior of health workers has a significant influence on the level of patient adherence to taking oral antidiabetic drugs.

DISCUSSION:

Adherence is one of the success factors in diabetes mellitus treatment. Possible factors that can affect adherence are trust/beliefs and values (predisposing factors) and behavior of community leaders (reinforcing factors)[10]. The use of oral antidiabetic drugs can be affected by the surrounding environment and habits in the family. Determination of a complete attitude is influenced by the knowledge, thoughts, beliefs, and emotion state of a person, besides the factors that can influence attitudes are socio-cultural conditions[10].

The patient's adherence to taking the drug is influenced by the duration of illness, duration of taking the medication and the number of drug combinations. Patients who suffer from this disease for 1-5 years still adjusting their habits from those who do not use drugs to those who consume drugs. Patients are required to follow instructions in the management of DM therapy to avoid complications[11]. Treatment for this disease is only to control blood sugar levels so it must be given for a lifetime. Pharmacological therapy consist of a combination in the form of oral and injection. Combination therapy is done to minimize the side effects. Long drug consumption causes patients to experience boredom if it is not accompanied by strong knowledge and motivation from each patient and family[7].

In patients who receive several combinations of drugs will potentially cause DTPs, so the role of pharmacists is needed to do Pharmaceutical Care. Pharmaceutical Care is a pharmacist responsible for assessing, monitoring, planning, and modifying the treatment done by patients so that the quality of life of patients can be improved and achieved the desired therapeutic results. One of the roles that can be performed by pharmacists is to identify, prevent, overcome the possibility of the occurrence of DTPs so that the therapy received by patients will be safe and effective[12,13].

The quality of health services is directly affected by health workers in the service. Health workers in the first level of service are the most important component and as a symbol for health worker in higher level[14,15]. This is consistent with the results of research that show that the behavior of health workers can influence the level of adherence to taking oral antidiabetic drugs. In other study with other age group, gender, education level, degree, qualifications and working experience of health worker had a significant influence on the quality of service provided to patients[14]. Management of drug therapy requires collaboration between pharmacists, patients and other health worker to improve effectiveness and safety in drug use[16].

Type 2 diabetes mellitus is influenced by lifestyle and genetics. Lifestyle that affects the risk of diabetes mellitus are the physical activity and diet of food. Lack of physical activity in elderly is one factor in the occurrence of DM[17,18]. Excessive estrogen in women has an negative influence and increases the risk of developing type 2 diabetes. This is one reason why many women suffer from type 2 diabetes[19,20]. In addition, the level of education has an influence on individual health attitudes and behaviors. Adequate education and knowledge can provide protection against harmful health behaviors[21]. The level of education and information obtained affects the attitudes and behavior of individuals in dealing with diabetes, including the level of adherence to medication[22]. Factors that can affect knowledge are experience, education, beliefs, facilities, income, and social culture. Knowledge that can influence adherence is an active knowledge, for example patients read books at their own initiative. To achieve an active knowledge, adequate facilities are needed, such as the availability of magazines, newspapers, brochures related to the diseases that being experienced by patients[10,23].

The method used for evaluation in this study is the PRECEDE model. PRECEDE is a model that can be used to design and evaluate health promotion plans[24–26]. The PRECEDE method is used to evaluate the factors that influence the level of patient adherence to taking oral antidiabetic drugs, so that this study can improve the quality of health care, especially regarding the therapy of this disease.

CONCLUSION:

The behavior of health workers has an influence on patient adherence to taking oral antidiabetic drugs.

CONFLICT OF INTEREST:

The author reports no conflict of interest of this work.

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