❒   265

The health beliefs of patient with type 2 diabetes mellitus who use herbs as a complement to self-care

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Article Info

ABSTRACT

Diabetes mellitus type 2 patients who have a tendency to use herbs, are based on the patient's health belief that herbal medicine is a natural ingredient that has efficacy and is safe. This study aimed to explore health beliefs as predictors of herbal use as a complement to diabetes self-care. A cross-sectional study was conducted on 230 patients with type 2 diabetes mellitus who had been clinically diagnosed, received medical treatment and used herbs. The data was collected using a questionnaire at seven community health centers (*Puskesmas*) in Surabaya City. Data analysis using Partial Least Square. The indicator of health belief variables has a loading factor value>0.5: perceived vulnerability and severity (0.820), perceived benefits (0.739), perceived barriers (0.822), sense of self-efficacy (0.695). Health beliefs have a significant effect on the use of herbs as a complement to diabetes self-care, the value of T>1.97 (T>10.07). Health beliefs consisting of perceived vulnerability and severity, perceived benefits, perceived inhibition, and perceived self-efficacy were strong predictors associated with the use of herbs as a complement to diabetes self-care. Nurses as part of health workers must pay attention to patient health beliefs in providing education to patients.

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1. INTRODUCTION

Diabetes mellitus (DM) is a complex chronic disease that requires ongoing medical care with a multifactorial risk reduction strategy beyond glycemic control. This disease requires ongoing patient self-management to prevent acute complications and reduce the risk of long-term complications [1]. The number of people with DM at the age of 20-79 in Indonesia in 2017 is sixth in the world, and is expected to decline to be ranked seventh in 2045 [2]. The prevalence of DM diagnosed by doctors at the age of more than 15 years in 2013-2018 in East Java is 2.6% and is ranked fifth in Indonesia [3], while the prevalence of DM in the city of Surabaya is 4.3% and is ranked sixth in East Java [4] The response of type 2 diabetes mellitus (T2DM) patients when suffering from illness was seeking treatment such as medical treatment or complementary and alternative medicine [5]. The prevalence of DM patients using herbal alternative medicine in Indonesia is 35.7%, while in East Java it is 28.4%. 9% DM patients do not take anti-diabetes medication regularly, because 50.4% feel healthy, 25.3% take traditional medicine, and 12.6% cannot stand the side effects of medical drugs [3]. This condition can lead to an increase in blood glucose levels which can trigger complications.

Complementary and alternative medicine (CAM) that are widely used by T2DM patients are herbs [6], [7]. Many people with diabetes use complementary medicine (together with) or alternative medicine (as a substitute) with conventional treatments for diabetes. The use of herbs needs to consider aspects of the efficacy and safety of treatment. There is insufficient evidence to make recommendations regarding the efficacy and safety of complementary or alternative medicine for individuals with diabetes [8]. In certain Eastern and ethnic cultures, CAM treatment plays an integral part in an individual's health belief system, where religious teachings, rituals, and family influences play a major role in an individual's health behavior [9]. Diabetics tend to use herbal remedies to minimize dissatisfaction with conventional therapies, their concerns about possible side effects caused by conventional therapies, and believe that herbal remedies from natural sources are safer and more effective [7]. Complementary medicine has been applied to health services in the city of Surabaya which already have a traditional medicine clinic, namely in 20 community health centers (*Puskesmas*) and at the Dr. Soetomo General Hospital, Surabaya. The health services provided are socialization on the use of herbs, acupuncture and acupressure [10].

Individual health beliefs that include: perceived susceptibility and severity, benefits, barriers of behavior, and self-efficacy, here in after referred to as the health beliefs model (HBM) construct [11]. In relation to the use of CAM, constructs of perceptions of benefits and barriers show a statistically significant relationship with use of CAM [12]. Diabetes self-care is a form of self-care behavior that must be undertaken by T2DM patients to regulate their blood sugar levels [1], [13]. The problem often experienced by T2DM patients is that they cannot carry out routine diabetes self-care. The majority of diabetic patients had a poor score of self- care and there were perceptions that diabetes self-care is difficult [14], [15]. People with T2DM as a chronic disease also have a tendency to seek other treatments besides medical treatment, such as using herbs. T2DM patients believed that using a combination of conventional and traditional medicines was more effective than using either type of medicine alone [16]. Qualitative research conducted at Dr. Sutomo General Hospital Surabaya showed the results that T2DM patients had not been able to do diabetes self-care regularly and in the aspect of treatment, participants used herbs to manage their disease as a companion to medical treatment [17].

This study integrated the behavior of using herbs in self-care for T2DM patients. This integration is carried out because T2DM patients who have a habit of using herbal medicine have not routinely performed diabetes self-care behaviors and tend to abandon conventional medicine when consuming herbal medicine, so this research needs to be carried out, to increase the compliance of T2DM patients in carrying out diabetes self-care. Many factors affect the self-care behavior of T2DM patients using herbs, including individual health beliefs. Herbal remedies are believed to be a better choice than synthetic drugs because of their fewer side effects and toxic effects. Herbal formulations are easy to obtain without a doctor's prescription [18].

This study aimed to explore health beliefs as a predictor of the behavior of using herbal medicine as a complement to self-care in T2DM patients, especially in the aspect of treatment, so as to optimize the regulation of blood glucose levels. Health beliefs that will be explored are perceived susceptibility and severity, perceived benefits, perceived barriers, and perceived self-efficacy which are components of the Health Beliefs Model.

2.   RESEARCH METHOD

This research was an observational analytic study with a cross sectional approach which was conducted between May and October 2016 on 230 respondents. The research locations were seven community health centers (*Puskesmas)* Surabaya, East Java, Indonesia, which was randomly selected, including: Jemursari, Keputih, Medokan Ayu, Pucang Sewu, Tambak Rejo, Tanah Kali Kedinding, and Tenggilis. The community health centers (*Puskesmas*) provides traditional medical services. The sample in this study were T2DM sufferers who had been clinically diagnosed with T2DM, received conventional treatment and used herbs as a complementary treatment who visited the *Puskesmas.* The inclusion criteria established were patients who had T2DM for more than one year, were in stable condition, aged between 30 and 70 years, and used herbs for at least two months or more.

The data was collected using a questionnaire consisting of demographic characteristics (8 indicators: age, sex, ethnicity, monthly family income, education, occupation, religion), disease characteristics (5 indicators: complication, complaint, duration of illness, hereditary of DM, drug), health beliefs (4 indicator: perceived susceptibility and severity, perceived benefit, perceived barrier, perceived self-efficacy), and using herbs as a complement diabetes self-care (5 indicator: diet regulation, activities and exercise, monitoring blood sugar level, Medication adherence and using herbs, behavior to reduced complications risk). The validity and reliability of the indicators were measured by convergent validity (loading factor >0.5), discriminant validity using a square root of average extracted (AVE) value >0.50 and composite reliability with a value of ≥0.7. Indicators that do not meet this value are excluded from the construct or variable.

The relationship between variable health beliefs and using herbs as a complement diabetes self-care was analyzed using partial least square (PLS). PLS is also used to analyze the indicators that compose each variable and analyze the relationship between other variables.

3. RESULTS AND DISCUSSION

There are around 35 types of herbs that have been used by T2DM patients in Surabaya as complementary medical treatments in this study. They consume at least one type of concentrate or more herbs and consume it for at least two months with the highest frequency of two times per week. There are 10 types of herbs used mostly which are Indonesian bay leaves (16.5%), mangosteen peel (9.4%), tinospora cordifolia and andrographis paniculata (10.5%), cinnamon (6.3%), morinda citrifolia (5.4%), black cumin (5%), soursop leaves (4.3%), turmeric (4.3%), betel leaves (4.3%), and other herbs (34%).

3.1. Characteristics

Complete distribution of T2DM patients who were the subjects in this study can be seen in Table 1. These data indicate that most of the T2DM patients in this study were female (73%), Javanese (87.2%), Muslim (92.6%), married (94.3%), have a history of descent (64%), and use oral treatment (80%).

Table 1. Characteristics of T2DM patients who used herbs as a complementary treatment (n=230)

Characteristics		n	%
Demographic characteristics			
	30-40	2	0.9
Age	41-50	40	17.4
	51-60	102	44.3
	61-70	86	37.4
Gender	Male	62	27
	Female	168	73
Ethnicity	Javanese	202	87.8
	Others	21	9.2
Monthly family income (IDR)	<1 million	16	7
	1-3 million	170	74
	3-5 million	36	15.6
	>5 million	8	3.4
Education	No formal education	11	4.8
	Elementary education	107	46.5
	Secondary education	78	34
	Higher education	34	14.7
Occupation	Civil servant	18	7.8
	Private employees	34	14.8
	Entrepreneur	14	6
	Retired	40	17.4
	Jobless	124	54
Religion	Islam	213	92.6
	Others	17	7.4
Marital status	Married	217	94.3
	Widowed/Divorced	13	5.7
Disease characteristics			
Complications	None	114	49.6
	Exist	116	50.4
Complaint	None	73	31.7
	1-3 complaints	77	33.5
	>3 complaints	80	34.8
Duration of illness	1-5 years	100	43.5
	6-10 years	86	37.4
	>10 years	44	19.1
Heredity of DM	None	83	36
	Exist	147	64
Drugs	Oral	184	80
	Injection	28	12.2
	Oral and injection	18	7.8

3.2. Loading factor and t-value

Table 2 shows the loading factors for each indicator of the variables: patient characteristics, disease characteristics, health beliefs, and use of herbs as complementary diabetes self-care. The loading indicator value of gender, ethnicity, occupation, religion, marital status and medicines are invalid indicators because they have a loading factor value of <0.5 and t value <1.96. Other indicators are valid indicators with loading

factor >0.5 and t-value >1.96, which have the opportunity to influence health beliefs. The loading factor for all indicators of health beliefs: perceived susceptibility and perceived severity, perceived benefit, perceived barrier, and perceived self-efficacy are >0.5 and t value >1.96 which means that all indicators are good and can affect the use of herbal medicine as a complement to diabetes self-care.

All indicators of using herbs as a complement to diabetes self-care have a factor loading value of >0.5, which means that this indicator is a good construct for this variable. The behavior of using herbs by T2DM patients in this study is a complement or a companion to conventional medicine, not as an alternative medicine or as a substitute for conventional medicine. The results obtained are the behavior of integrating the use of herbs into diabetes self-care which consists of diet regulation, activity and exercise, monitoring of blood glucose levels, adherence to medication and herbal use, behavior to reduce the risk of complications, as in Table 2.

Table 2. Loading factor value of indicator

Indicator	Loading factor	t-value	Indicator	Loading factor	t-value
Demographic characteristics			Health beliefs		
Age	0.501	6.982	Perceived susceptibility and severity	0.820	15.400
Sex	0.278	2.883			
Ethnicity	0.260	1.367	Perceived benefit	0.739	14.013
Monthly family income	0.667	10.014	Perceived barrier	0.822	15.834
Education	0.813	14.716	Perceived self-efficacy	0.695	12.307
Occupation	0.185	0.239	Using herbs as complement		
Religion	0.029	0.938	Diabetes self-care		
Marital Status	0.311	5.556	Diet regulation	0.789	21.780
Disease characteristics			Activities and exercise	0.740	20.384
Complications	0.796	13.194	Monitoring blood sugar level	0.806	22.490
Complaints	0.782	16.167	Medication adherence and using herbs	0.787	21.202
Durations of illness	0.778	15.558			
Heredity of DM	0.672	10.531	Behaviour to reduced complications risk	0.774	22.926
Drugs	0.108	0.681			

3.3. Analysis of the relationship between variables

Figure 1 shows the results of the analysis of the relationship between variables. The figure shows that health beliefs are significantly associated with the use of herbs as a complement to diabetes self-care with a value of t>1.96 (t=10.066). The figure also shows that patient characteristics and disease characteristics are also associated with the patient's health beliefs, with a value of t>1.97, which are t=6,021 and 8,656, respectively. Blood sugar levels of people with T2DM are mostly abnormal (52%, n=120). The use of herbs as a complement to diabetes self-care was associated with blood glucose levels with a t value of 37.489.
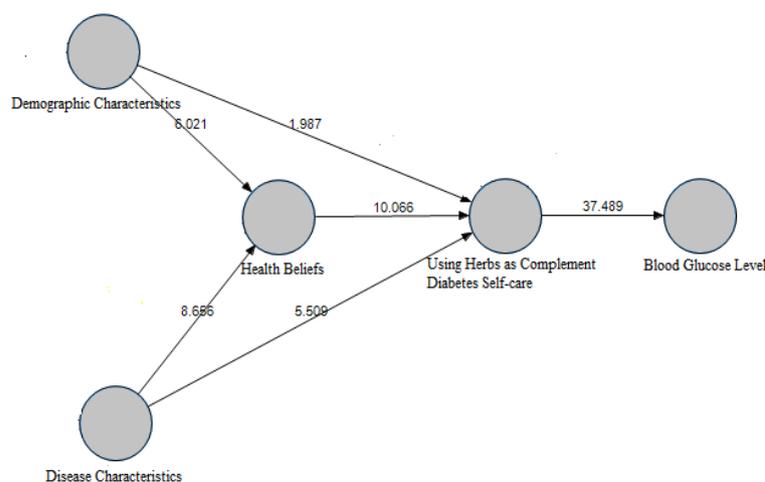

Figure 1. The path coefficients (t-value) relationship of health beliefs with the use of herbs as a complement of diabetes self-care

3.4. Health beliefs of T2DM patients

The results of this study are which shows that perceptions of benefits and perceptions of barriers are significantly related to the use of CAM. Perceived susceptibility and severity can pose a threat that can cause more severe disease. In addition there are also threats that the disease can cause more severe symptoms or complications [19]. The perceived threat (vulnerability and severity) can be used to predict self-care behavior, i.e. if the perceived threat increases then self-care also increases [20], [21]. Individual beliefs as one of the HBM constructs have influenced T2DM patients to use CAM in managing their disease. T2DM patients who have a strong and positive health belief in CAM, will use CAM and have good self-care activities [12]. Positive beliefs about the perception of benefits are an important factor in carrying out health behaviors for DM patients, who must strike a balance between external benefits and internal benefits [22]. Self-efficacy is a psychological construct that is studied consistently and is related to health behavior. In T2DM patients, health behavior in the form of self-management behavior plays a central role in controlling blood sugar levels. Factors that influence the success of self-management of DM are self-efficacy, or in other words self-efficacy is the strongest predictor of self-care behavior [23], [24].

The results of this study indicate that patient characteristics such as age, family income, education, complications, complaints, hereditary history, and duration of illness DM are factors that are associated with the health beliefs of the T2DM patient. The results of other studies showed that all predictors of age, sex, duration of illness, education level, number of family members with diabetes, type of diabetes, attending diabetes workshops, and number of complications were statistically significant in association with patient beliefs [25].

3.5. The use of herbs as complement diabetes self-care

The behavior of using herbs as a complement to diabetes self-care in the aspect of treatment affects the regulation of blood sugar levels. Patients' behavior in managing their diet, activities and training, self-monitoring sugar levels, medication adherence, were mostly quite good. While the behavior of reducing the risk of complications is still mostly good. Dietary regulation in DM patients is the main element in DM management, which includes regulation in terms of number of meals, meal schedules and types of food [26], [27]. The results of this study indicate that self-care behavior in T2DM patients using herbs is still low. Patients have not been able to carry out diet, activity, blood sugar monitoring, and medication adherence regularly. Patients consider that medical treatment can cause complications because they contain chemicals, while herbal medicine is considered to contain natural ingredients which are safer than medical treatment, so that patients leave medical treatment and do not carry out regular self-care. T2DM patients used herbal medicine combined with medication, some of them made changes to their treatment without reporting to the doctor who provides therapy [28], [29]. Most patients did not consult a doctor before using complementary and alternative medicine [30]. The behavior of T2DM patients in choosing complementary and alternative medicine was based on their belief that this treatment can improve their health status, experience treatment failure, family history of using CAM, and side effects of treatment [31].

Increasing the perception of the components of health beliefs must be comprehensive so that the self-care behavior of T2DM patients using herbs can be carried out regularly. Furthermore, it could be proposed that herbs could be used in conjunction with anti-diabetic drugs to have better therapeutic potential, minimize the dosage of oral hypoglycemic drugs, and as an effective supportive therapy in the prevention and management of long-term complications of diabetes [29], [32].

Complementary-alternative medicine is carried out as a continuous service effort starting from promotive, preventive, curative and rehabilitative efforts. Types of complementary-alternative medicine in Indonesia can be integrated in health care facilities as stipulated by a Ministerial Decree [33]. Nurses as part of health workers have the authority to carry out complementary and alternative nursing management in carrying out their duties as nursing care providers in the field of public health efforts [34]. This research can be used as a theory development of health behavior in improving health status through promotive and preventive efforts. Promotional efforts are increasing knowledge about the use of herbs as a complement to self-care behavior which is a pillar of T2DM management. Preventive efforts are the use of herbs as a complementary treatment carried out together with diabetes self-care behavior that is appropriate and regularly will prevent complications, reduce complaints and regulate blood sugar levels optimally. The limitation of this study is that it does not test the effectiveness of using herbs, but only knows the behavior of T2DM patients in using herbs as a complement or companion to conventional treatment.

4. CONCLUSION

T2DM sufferers as chronic disease sufferers have a tendency to use herbs to manage their disease. Health beliefs consisting of perceived susceptibility and severity, perceived benefits, perceived inhibition, and perceived self-efficacy are strong predictors associated with the use of herbs as a complement to diabetes

self-care in regulating blood glucose levels. Family support is needed to support the patient's health beliefs in order to adhere to diabetes self-care when using herbs as a complement to treatment. Health workers (doctors or nurses) must be aware of T2DM patients using herbs. This serves to immediately identify changes in the quality of life experienced by T2DM patients related to herbal use. Further research on the efficacy, safety, impact on the quality of life of patients, and herbal drug interactions need to be done.

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