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RESEARCH ARTICLE

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Self-Efficacy of Patients with Type 2 Diabetes Mellitus Who Consume Herbs

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ABSTRACT

Diabetes mellitus (DM) is a chronic disease with metabolic disorders characterized by hyperglycemia that can cause it. Self-efficacy is a factor that contributes to preventing complications. This study aims to explore self-efficacy in managing blood sugar levels in patients with DM. This study was a cross sectional study, with a sample size of 125 T2DM patients who used herbs and carried out controls to the public health center in Surabaya. The instrument used for data collection was a questionnaire. The data analysis used was descriptive analysis and Spearman analysis. The self-efficacy value obtained was 52% having low self-efficacy. Patients with DM, had a low self-efficacy regarding dietary management (59.2%) and the use of herbs as a complement to treatment was high (80%). There was a relationship between self-efficacy of eating management, physical activity, and herbal use with random blood sugar levels, with p-values of 0.017, 0.023, and 0.040, respectively. Self-efficacy is an important part that can support the success of T2DM patients in managing blood sugar levels. T2DM patients who use herbs have low self-efficacy, which has the potential to reduce self-care behavior. Nurses must support patients in self-care by paying attention to patient self-efficacy.

Keywords: self-efficacy; diabetes mellitus; use of herbs

INTRODUCTION

Background

Diabetes mellitus (DM) is a serious, long-term (or 'chronic') condition that occurs when there is an increase in glucose levels in the blood because the body cannot produce enough of the hormone insulin, or cannot effectively use the insulin it produces. The number of cases and the prevalence of diabetes have continued to increase over the last few decades. The number of DM sufferers aged 20-79 years in Indonesia in 2019 and 2030 ranks seventh in the world, and is expected to decline to rank eighth in 2045⁽¹⁾. This condition requires patients with DM to carry out self-care behaviors throughout their lives^(2,3).

Diabetes self-care includes a healthy diet, physical activity, sugar monitoring, appropriate medication, excellent problem-solving attitude, good adaptability, and risk reduction. These seven self-care practices are associated with good glycemic control, reduction of problems, and improved quality of life. Uncontrolled blood sugar levels can cause macro and microvascular complications⁽⁴⁾. Hyperglycemia associated with diabetes causes macro and microvascular complications. Macrovascular complications include coronary artery disease causing angina and / or myocardial infarction and peripheral artery disease which can lead to stroke, diabetic encephalopathy, and diabetic foot. Microvascular complications include nephropathy, neuropathy and retinopathy. Therefore, it is very important to make all efforts to prevent this complication^(5,6).

Inadequate self-care in patients with diabetes is a major problem for health care providers⁽²⁾. Many factors influence self-care behavior, namely: social demographics, social support, health beliefs, barriers, and self-efficacy⁽⁷⁻⁹⁾. Self-efficacy is one of the factors that influence T2DM patients in doing self-care in controlling blood sugar levels^(10,11). Self-efficacy can increase motivation both directly and indirectly which can change the behavior of T2DM patients in improving self-care⁽¹²⁾. Self-care has an important role in controlling the disease of T2DM patients. According to Bandura, self-efficacy is the strongest construct in predicting changes in a person's behavior and usually those showing the highest behavior change have a higher self-efficacy to perform certain behaviors. Self-efficacy is defined as a person's belief in his ability to explore a behavior. In other words,

self-efficacy is a person's belief in oneself in taking special actions. Perceived self-efficacy is a prerequisite for behavior change⁽¹³⁾.

This study explores the self-efficacy of patients with T2DM who use herbs in self-care, which has never been done in a similar study. Patients with T2DM who use herbs tend to leave self-care, because of their belief in the efficacy of herbs that can lower their blood sugar levels. Existing research shows that taking herbs can have a feeling better effect on his physical condition and lower blood sugar levels^(14, 15). Patients with T2DM must have high self-efficacy in order to carry out self-care appropriately and regularly to achieve optimal blood sugar levels and quality of life. There was a significant difference between the use of Complementary and Alternative Medicine (CAM) and the level of self-efficacy and that individuals using CAM had higher levels of self-efficacy compared to those who did not use CAM⁽¹⁶⁾.

Purpose

This study aims to explore the self-efficacy of T2DM patients who consume herbs in carrying out self-care to control blood sugar levels. Self-efficacy explored in this study includes: self-efficacy in regulating diet, physical activity, controlling blood sugar levels, and using herbs as a complement to medication.

METHODS

This research was an analytic observational study with a cross sectional approach, which was conducted from May to October 2018. The population was T2DM patients who underwent examinations at the health center of Pucangsewu, Tambak Rejo, and Tanah Kali Kedinding, Surabaya, Indonesia. The health centers provides BATTRA services consisting of acupuncture, acupressure, baby massage, and herbal consultation. The sample size was 125 DM patients who met the inclusion criteria as research subjects. Inclusion criteria were patients who have experience or are currently using herbal medicine as a complement to treatment at least 2 months, aged 30-70 years, long suffering from DM more than 1 year, and stable conditions (vital signs within normal limits, no history of disease, heart failure, failure. kidney, and liver disorders).

The data collection instrument in this study was a questionnaire about characteristics of patients, blood sugar levels, blood sugar monitoring skills and foot care. Prior to use, first the validity and reliability of the questionnaire were tested from 20 T2DM patients. Instruments regarding patient characteristics included age, gender, ethnicity, education, religion, length of suffering, hereditary history, complications, complaints. The instrument on self-efficacy consisted of 13 items with Likert scale with choices: strongly agree (4), agree (3), disagree (2), and strongly disagree (1). The total self-efficacy score related to diet regulation: 4-16, physical activity: 3-12, controlling blood sugar levels: 3-12, and the use of herbal medicine as a complement to treatment: 2-8, with higher scores indicating a higher level of self-efficacy. higher which is categorized as high and low. Blood sugar levels were randomly categorized into normal and abnormal.

Descriptive analysis (frequency, percentage, mean, and standard deviation) was used to describe characteristics of patients, self-efficacy and blood sugar levels. Spearman's rho test was used to determine the correlation between characteristics and self-efficacy.

This research had received ethical approval from the Ethical Commission of Poltekkes Kemenkes Surabaya, No. 228/S/KEPK/VI/2018.

RESULTS

Patients with T2DM in this study mostly used herbs after being diagnosed with DM and they used more than 1 herbal to treat their disease. The response shown by patients with T2DM when using herbs was that 56% of patients felt healthier, did not feel weak, decreased blood sugar levels, and there was no tingling sensation in the legs. The data about self-efficacy obtained are self-efficacy regarding diet management, physical activity, controlling blood sugar levels, and the use of herbs as a complement to medical treatment.

Table 1 shows the results that most of the patients' ages were in the range of 51-60 years, almost all of them were female, Javanese, and moslem. Most of the patient's education level was basic education. Indicators of self-efficacy measured in this study were dietary regulation, physical activity, controlling blood sugar levels, and the use of herbs as a complement to treatment, which are components of self-care in T2DM patients. The category of self-efficacy was based on the mean score of each self-efficacy indicator, namely the mean of dietary regulation, physical activity, controlling blood sugar levels, and the use of herbs as a complement to treatment, respectively 11.56 ± 1.56 , 9 ± 1.63 , 8.79 ± 1.72 , and 6.04 ± 0.85 (table 3). The value of self-efficacy with a score of \geq the mean was referred to as high self-efficacy and $<$ mean is referred to as low self-efficacy. Most of the T2DM patients had low self-efficacy in diet settings and had high self-efficacy on the use of herbs as a complement to treatment. Most of the random blood sugar levels of patients with T2DM were abnormal.

Table 2 shows data on the mean of each indicator of self-efficacy and random blood sugar levels of patients with T2DM. The relationship between self-efficacy indicators can also be seen in table 3, where there was a significant relationship between dietary settings ($p = 0.017$), physical activity ($p = 0.023$) and the use of herbs as a complement to treatment ($p = 0.040$) with blood sugar levels.

Table 1. Characteristics of patients with T2DM (n = 125)

Characteristics	Frequency	Percentage
Age		
36 – 45	3	2.4
46 – 55	18	14.4
56 – 65	98	80.8
> 65	3	2.4
Gender		
Male	8	6.4
Female	117	93.6
Level of education		
Never went to school	32	25.6
Primary school	60	48.0
Secondary school	28	22.4
College / university	5	4.0
Blood sugar level		
Abnormal	80	64
Normal	45	36
Self-efficacy		
Diet settings		
Low	74	59.2
High	51	40.8
Physical activity		
Low	47	37.6
High	78	62.4
Control of blood sugar levels		
Low	53	42.4
High	72	57.6
The use of hebal as a complement		
Low	25	20
High	100	80

Table 2. The relationship between self-efficacy and blood sugar levels

Indicator	Mean	SD	95%CI	r	p
Diet settings	11.57	1.56	11.29 - 11.84	0.212*	0.017
Physical activity	9.00	1.63	8.71 - 9.28	0.204*	0.023
Controlling blood sugar levels	8.79	1.72	8.48 - 9.09	0.160	0.075
Use of herbs as a complement	6.06	0.85	5.91 - 6.21	0.184*	0.040
Blood sugar level	230.50	86.68	215.15 - 245.85	1.000	1.000

SD: Standard deviation, r: Correlation coefficient

Table 3 shows the score of the question items for each self-efficacy indicator. In the diet setting, it was found that most patients with T2DM gave an opinion that they did not agree if they felt confident in their ability to maintain a healthy diet (n = 65, 52%). Most of the patients with T2DM agreed that using appropriate herbs as a complementary medicine could keep diabetes under control (n = 94, 75.2%). Complete data about self-efficacy can be seen in table 3.

Table 3. Scores of self-efficacy items in patients with T2DM

Item	Strongly agree	Agree	Disagree	Strongly disagree	Mean	SD
Diet Settings						
I can avoid unhealthy foods when I am outside the house	7	68	48	2	2.64	0.614
I can keep my weight under control	12	88	25	0	2.89	0.536
I feel confident in my ability to maintain my healthy diet	13	45	65	2	2.71	0.669
If I set the right diet, I can minimize the complications of diabetes	40	83	2	0	3.30	0.495
Physical activity						
I am able to choose the right physical activity to control my diabetes	26	77	22	0	3.03	0.621
I feel confident in my ability to maintain regular physical activity	24	64	37	0	2.89	0.693
If I am doing the right physical activity, I can minimize the complications of diabetes	23	88	14	0	3.07	0.541
Controlling blood sugar levels						
I am able to control or monitor my blood sugar levels	24	78	21	2	2.99	0.653
I feel confident in my ability to keep my blood sugar level up	26	63	36	0	2.92	0.702
Use of herbs as a complement						
I feel confident in my ability to manage my diabetes	25	60	40	0	2.88	0.713
If I use proper herbs as complementary medicine then I can keep my diabetes under control	17	94	14	0	3.02	0.499
I was able to choose the right herbs as a complementary medicine to control my diabetes	18	92	15	0	3.02	0.515

SD: Standard deviation

DISCUSSION

The use of CAM for chronic diseases including diabetes mellitus is gaining popularity day by day. Health professionals (doctors and nurses) should have healthy discussions with patients to understand their views on CAM. It is necessary to conduct research on safety and efficacy tests on herbal products commonly used for diabetes. The existence of concrete evidence in the form of trial results in research will help patients and health professionals regarding the use of certain complementary medicinal products⁽¹⁷⁾. Patients with DM who use CAM must be accompanied by good self-care behavior in order to achieve optimal blood sugar levels. Self-efficacy is one of the factors associated with CAM use and self-care behavior.

Self-efficacy has a positive effect on self-care for many chronic health conditions. High self-efficacy was found to be associated with high self-care behavior among diabetic patients, and both have a direct effect on glycosylated hemoglobin (HbA1c)⁽¹⁸⁾. This study has explored the self-efficacy of patients with T2DM who use herbs in self-care, which includes dietary arrangements, physical activity, controlling blood sugar levels, and the use of herbs as a complement to medical treatment.

Self-care is an activity in which people use their own knowledge, skills and strengths as resources, to build and maintain health, and prevent and treat disease. It is an important factor in reducing disease prevalence, improving health, and ultimately improving quality of life⁽²⁾. Self-efficacy, home blood glucose test, weekly exercise, meal planning, dietary restriction, diabetes duration, type of medication and appetite description were significant variables associated with adherence to self-care behavior. High self-efficacy was the strongest variable associated with adherence to self-care behavior among diabetes patients⁽¹⁹⁾. A significant correlation was found between self-efficacy and HbA1c, indicating that a higher self-efficacy score correlates with better glycemic control in patients with T2DM in primary care Malaysia⁽²⁰⁾.

The data of this study indicate that adherence to the self-efficacy of using herbs as a complement to medical treatment is the highest self-efficacy (80%). This shows that patients with DM have more confidence in drug

consumption in managing their disease. T2DM patients in Sudan who had high self-efficacy were found to be more adherent in regulating general diet, exercise activities, and drug consumption, compared to patients with low efficacy. Adherence to medication showed higher outcomes compared to other self-care activities (diet and exercise)⁽¹⁸⁾.

As people with chronic diseases, patients with DM have a tendency to use herbs as a complement to treatment. The reasons patients use herbs are as an adjunct to medication, controlling blood sugar levels, affordable costs, and preventing complications⁽²¹⁾. The use of herbs by patients with T2DM has a tendency to randomly lower blood sugar levels when used as a complement to medical treatment. Pare fruit showed the effect of decreasing blood sugar levels randomly greater than that of bay leaves and cinnamon⁽²²⁾. Patients with DM who have high self-efficacy may use CAM inappropriately and this can affect their glycemic value. High levels of self-efficacy, essential for positive health behavior change⁽¹⁶⁾.

Improving self-care behavior in patients with T2DM in long-term conditions is very important to build coping skills and to delay disease progression. Self-efficacy and self-care behavior are associated with glycemic control. There is a need to improve glycemic control by increasing self-efficacy for maintaining a healthy diet, recognizing the importance of medication, and monitoring disease monitoring and progress⁽²³⁾. Self-efficacy can significantly be used to predict self-management of behavior; where patients who had stronger perceptions / beliefs about self-efficacy in following a diet, doing exercise, blood sugar testing, and foot care were found to be more likely to exhibit self-management behaviors in them⁽²⁴⁾. Self-efficacy is a "social cognitive" concept that has a basis of behavior; among these is the motivation for the individual to be active and persist in certain behaviors, even in the face of adversity, depending on the extent to which efficacy is expected. Self-efficacy is driven by individual expectations that certain behaviors will produce benefits and avoid future difficulties⁽²⁵⁾.

CONCLUSION

Self-efficacy is an important part that can support the success of patients with T2DM in managing their disease. Patients with T2DM who use herbs have low self-efficacy, this has the potential to reduce the behavior of managing T2DM disease. Health workers must play an active role to support patients in managing their disease by paying attention to patient self-efficacy.

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