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ASSOCIATED FACTORS FOR SELF MANAGEMENT IN TYPE 2 DIABETES MELLITUS PATIENTS

Hema Malini[1], Fitra Yeni[1], Cindy Ayu Pratiwi[2],Devia Putri Lenggogeni[1]

1. Faculty of Nursing, Universitas Andalas, Kampus Unand Limau Manis, West Sumatera, 25163
2. Undergraduate Student, Faculty of Nursing, Universitas Andalas, Kampus Unand Limau Manis, West Sumatera, 25163

ABSTRACT

Patients with diabetes mellitus can have difficulties in managing their disease. Most of the patients with uncontrolled diabetes have a HbA1c > 9%. This study aimed to determine the factors associated with self-management of type 2 diabetes mellitus patients with a HbA1c> 9% in Public Health Center, Padang 2019. This study used a cross-sectional design. The sampling technique used a total sampling technique, with a total sample of 79 respondents. This study used a questionnaire that consisted of questionnaires; DKQ, DMSES, S4-MAD, and SDSCA-revised. Data were analyzed using the Pearson Product Moment Correlation test. This study found the following factors - knowledge (mean= 10.89), self-efficacy (mean= 50.01), social support (mean= 52.27) and self-management (mean= 48.38). The factors associated with self-management of type 2 diabetes mellitus patients with HbA1c> 9%, are knowledge (p = 0.016), self-efficacy (p = 0.000) and social support (p = 0.001). The most dominant factor in self-management of diabetes patients is self-efficacy (p-value = 0.000), (r = 0.607) and (r2 = 0.3684). Based on the study, it is recommended for health professionals to be able to increase their attention towards type 2 patients diabetes mellitus patients who have a HbA1c> 9% to improve their efficacy in self-management so that they can better control their blood sugar level. Furthermore, health professionals need to motivate patients and families to improve self-management skills.

Keywords: HbA1c; Knowledge; Self-Efficacy; Self-Management; Social Support

ABSTRAK

Banyak pasien dengan diabetes melitus (DM) memiliki kendala dalam mengelola penyakitnya. Sebagian besar penderita DM yang tidak terkontrol memiliki kadar HbA1c >9%. Penelitian ini bertujuan untuk mengetahui faktor yang berhubungan dengan manajemen diri penderita DM tipe 2 yang memiliki HbA1c >9% di Puskesmas Kota Padang tahun 2019. Rancangan penelitian survei dengan pendekatan cross sectional. Teknik pengambilan sampel secara total dengan jumlah sampel sebanyak 79 responden. Instrumen penelitian menggunakan kuesioner DKQ, DMSES, S4-MAD, dan SDSCA-*revised*. Analisa data menggunakan uji korelasi *Pearson Product Moment*. Hasil penelitian yang didapatkan meliputi pengetahuan (rata-rata=10,89), efikasi diri (rata-rata=50,01), dukungan sosial (rata-rata=52,27) dan manajemen diri (rata-rata=48,38). Faktor yang berhubungan dengan manajemen diri DM tipe 2 yang memiliki HbA1c >9% yakni pengetahuan (p=0,016), efikasi diri (p=0,000) dan dukungan sosial (p=0,001). Faktor yang paling dominan berhubungan dengan manajemen diri yakni efikasi diri DM (p=0,000), (r=0,607), dan (r^2=0,3684). Disarankan kepada tenaga kesehatan meningkatkan perhatiannya kepada penderita DM yang memiliki HbA1c >9% dalam meningkatkan efikasi dirinya dalam manajemen diri yang baik yang berdampak pada kontrol gula darah serta lebih memberikan motivasi kepada pasien dan keluarga untuk meningkatkan manajemen diri.

Kata kunci: HbA1c; Dukungan Sosial; Efikasi diri; Manajemen Diri; Pengetahuan

Corresponding Author : Hema Malini
Email : hemamalini@nrs.unand.ac.id

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BACKGROUND

Diabetes mellitus (DM) is a chronic condition characterized by elevated blood glucose levels because the body cannot produce insulin or use insulin effectively (Smeltzer, Bare, Hinkle, & Cheveer, 2010). According to the World Health Organization (2016), the incidence and prevalence of diabetes is increasing every year and is becoming a global health problem. Globally, an estimated 422 million adults have diabetes. Based on The International Diabetes Federation (2017), an estimated 425 million cases is expected to increase by 48% to 629 million cases by 2045. Indonesia is the sixth country with the most significant number of diabetes patients, with a prevalence of 8.9 to 11.1% after China, India, the USA, Brazil, and Mexico (IDF, 2017). Data Basic Health Research (2018) reported that diabetes mellitus is the fourth chronic disease in Indonesia, with a prevalence of 0.5% (Ministry of Health, 2018).

The key to controlling the blood glucose level is self-management, which controls and improves the quality of life for diabetes patients (Vaccaro, Exebio, Zarini, & Huffman, 2014). It consists of the management of diet, physical activity, medication management, blood sugar monitoring and foot care (Coyle, Francis, & Chapman, 2013). Compliance, according to the World Health Organization (2016), is a person's behavior towards getting treatment, such as diet or lifestyle changes, which are recommended by health care professionals. Factors affecting a person's compliance in diabetes self-management consists of knowledge, self-efficacy, emotional, self-regulation and social support (Horvat et al., 2018; Ravi, Kumar, & Gopichandran, 2018; Wlodarchak & Xing, 2016).

According to Mumu, Saleh, Ara, Afnan, & Ali (2014), non-compliance in performing diabetes self-management due to problems in implementing routine management of diabetes is because of a lack of information regarding the benefits of this. Furthermore, due to personal factors such as busy schedules and dismissal of procedures diabetes self-management. Saleh, Mumu, Ara, Hafez, & Ali (2014) also explain non-compliance in diabetes self-management is caused by difficulties in lifestyle changes, perception of the disease, and lack of knowledge of the effects of self-care.

A strategic program by the Indonesian government in providing care for people with diabetes is through a particular program such as *PROLANIS* (Indonesian program for Chronic Disease Management Program). *PROLANIS* is a health care program involving participants, health facilities, and health care providers to improve health care. *PROLANIS* aims to increase the quality of life for patients with chronic diseases (hypertension and diabetes) to prevent complications (BPJS Health, 2014). *PROLANIS* activities are conducted in the public health center with a routine health examination, a HbA1c examination for patients with diabetes conducted every once or twice a year, physical activities, and health education.

HbA1c describes the status of the average daily blood glucose within three months. HbA1c provides information related to disease progression and the development of diabetes complications. HbA1c is an indicator of diabetes management; the higher the levels of HbA1c are the greater the risk of getting complications. HbA1c for uncontrolled diabetes patients is a HbA1c of over 9%, whereas patients with well-controlled diabetes have a HbA1c of less than 7% (Bikramjit, Raveender, & Sudipta, 2017). A high level of HbA1c reflects the poor diabetes self-management among patients (Amelia, Damanik, Lindarto, & Mutiara, 2017).

In 2018, West Sumatra had a total prevalence of diabetes of 1.6 and ranked 21st out of 34 provinces in Indonesia (Ministry of Health, 2018). According to West Sumatra Provincial Health Office in 2018, the number of diabetes cases in West Sumatra in 2018 *amounted to* 44.280 cases, with the highest number of cases in the city of Padang that increased to become 12.231 cases (Data Dinas Kesehatan Kota Padang, 2018).

Based on data from the Padang Health Office, of the 207 diabetes patients that attended PROLANIS regularly, 123

patients were measured for their HbA1c at the end of 2018, around 65% had > 9% for their HbA1c. There are still only limited studies investigating why some of the patients had a high level of HbA1c, which related to poor self-management among diabetes patients. Thus, this study aimed to investigate the factors relating to the self-management of diabetes for patients who have HbA1c> 9% in Public Health Center, Padang.

METHOD

This study is a survey research with a cross-sectional approach to investigate the correlation between each variable at one time (Donsu, 2016). The data collection was conducted from February to March 2019. The population were diabetes patients who had a HbA1c> 9% in the last six months, which amounted to 79 people with total sampling. We used the last HbA1c results from the latest measurement conducted by a private clinical laboratory in Padang city.

There were four questionnaires used:

1. Diabetic knowledge questionnaire (DKQ) consists of 24 questions with alternative answers 1: true, 0: wrong, and do not know.
2. Diabetes Management Self-Efficacy Scale (DMSES) consists of 20 item questions using a Likert scale of 1-5.
3. Social Support Scale For Self-care in Middle-aged Patients With Type 2 Diabetes (S4-MAD), which consists of 30 questions, using a Likert scale of 1-4.
4. Summary of Diabetes Self-Care Activities (SDSCA)-Revised, which consists of 9 item questions about self-care activities.

All of the instruments were standard questionnaires that most researchers use in diabetes studies.

The data analysis used distribution frequency for univariate, and the correlation analysis used Kolmogorov Smirnov based on normality data with CI 95% with α = 0,05.

RESULT

Characteristics of Respondents (N = 79)

Table 1 showed that the research respondents were middle-aged adults (64,6%), female (81%), working as housewives (70.9%), Middle-level educational background (60.7%), had a longevity period of disease of 6-10 years (36.7%), drug combination (62.1%), drug consumption frequency three times a day (50.6%) and no medication adverse effects (79.7%)

Table 1 Distribution Frequency Characteristics of Type 2 Diabetes Mellitus Patients with HbA1c >9% (n-79)

Variable	f	%
Ages		
- Middle Age (41-60 years)	51	64,6
- Elderly Age (> 60 years)	28	35,4
Gender		
- Male	15	19
- Female	64	81
Level of Education		
- Primary	18	22,8
- Medium	48	60,7
- Tertiary	13	16,5
Occupation		
- Private employee	13	16,5
- Housewife	56	70,9
- Government employee	1	1,3
- Pensionary	8	10,1
- Fisherman	1	1,3
Duration of Diabetes		
- 1-5 years	27	34,2
- 6-10 years	29	36,7
- > 10 years	23	29,1
Medication Regimen		
a. Drugs Consumption		
- Single	26	32,9
- Combination	53	62,1
b. Frequency		
- 1x a day	5	6,3
- 2x a day	34	43
- 3x a day	40	50,6
c. Drugs Effect		
- Yes	16	20,3
- No	63	79,7

Table 2 showed that knowledge amongst patients with type 2 diabetes who have HbA1c levels> 9% was 10.89, with a range of 0-24 (middle category). Components that were explored in the knowledge questionnaire were diet, physical activities; medication; blood glucose control; and foot care.

A self-efficacy mean score was

50.01, with a range of scores 20-100 (*full of certainty)*. The aspects of self-efficacy consisted of diet, physical activities, medication, blood glucose control, and foot care.

The mean score of social support was 52.27, with range 30-120 *unfavorable*—some aspects of social support included emotional, instrumental, informational, and appreciation.

The self-management mean score was 48.38, with scores of 0-112 (middle category), consisting of diet, physical activities, medication, blood glucose control, and foot care.

Table 2 The Mean of Knowledge, Self-Efficacy, Social Support, and Self-Management for Type 2 Diabetes Mellitus patients with HbA1c> 9% (n=79)

Variable	Mean	SD
Knowledge	10,89	2,572
Self-efficacy	50,01	8,301
Social Support	52,27	6,230
Self-management	48,38	11,196

Table 3 The Correlation between Knowledge, Self-Efficacy, Social Support and Self-Management for Type 2 Diabetes Mellitus patients with HbA1c> 9% (n=79)

	Self-Management		
	r	r^2	p-(value)
Knowledge	0,27	0,0729	0,016
Self-Efficacy	0,607	0,3684	0,000
Social Support	0,374	0,14	0,001

Table 3 showed a correlation between knowledge, self-efficacy and social support, and self-management. The results of statistical tests showed a significant relationship between knowledge and self-management of type 2 diabetes patients with HbA1c> 9% with p-value = 0.016. The correlation value was 0,270 with a positive correlation which means that there was a weak correlation value between variables; the more positive the knowledge, the higher the self-management of type 2 diabetes by the patients.

Furthermore, there was a significant relationship between self-efficacy and self-management of type 2 diabetes patients with HbA1c> 9% with p-value 0.000. Then, the correlation value was 0.607 with a positive correlation, which means there was a strong correlation between both variables; the more positive the self-efficacy value, the higher the patient's self-management of type 2 diabetes is.

It also showed the correlation between self-efficacy and self-management of type 2 diabetes patients with a HbA1c> 9% with a p-value of 0.001. The correlation value was 0.14 with a positive correlation and a weak correlation, which means the more positive the value, the higher the social support and the better the patient's self-management of type 2 diabetes is.

DISCUSSION

The results revealed that diabetes patients with poor self-management have a low level of knowledge, self-efficacy, and social support. This study also scrutinized several aspects of knowledge, self-efficacy, and social support that contributed to the self-management. The details of each aspect were discussed in the following section.

The result showed there is a weak and positive correlation for the knowledge and self-management of patients. It indicates that by improving knowledge, the ability and the adherence of patients to perform self-management would also increase. Moreover, this study also revealed some of the knowledge aspects that were inadequate among respondents, which were physical activity and controlling blood glucose. Additionally, most respondents lacked knowledge of the relationship between physical activity and blood sugar control (HbA1c). The level of knowledge and awareness of physical activity determined whether patients performed physical activity. Insufficient physical activity has an impact on the level of HbA1c. There is a correlation between knowledge and self-management of type 2 diabetes mellitus patients (Kugbey, Oppong Asante, & Adulai, 2017).

Type 2 diabetes patients with adequate knowledge are expected to have certainty in self-care behaviors (Muhammad, Nazar, Bojerenu, Safdar, & Marwat, 2016). Knowledge will affect self-

management, which is considered as a behavior that requires considerable knowledge, including the understanding of the impact caused by diabetes, treatment goals, the impact of glucose regulation (Wlodarchak & Xing, 2016).

Thus, in improving patient knowledge, some modifications to delivering health information in an educational program such as PROLANIS need to be made to focus on the implementation of self-management (Mikhael, Hassali, Hussain, & Shawky, 2019).

The results also showed that there is significant correlation between self-efficacy and self-management. In terms of self-efficacy aspects, the respondents have low efficacy in regards to physical activities, because most of the respondents assumed that physical activities only related to daily activities without consideration of the endurance of the activities that would impact the level of blood glucose. Diabetes patients need to believe that managing diabetes well includes conducting physical activities as recommended. The study is consistent with Suandi's (2016) study that there is a strong relationship between self-efficacy and the self-management of type 2 diabetes by patients. This study is consistent with Sari's (2018) study, which found that there is a relationship between self-care, self-efficacy and type 2 diabetes mellitus.

Type 2 diabetes mellitus patients who have low self-efficacy tend to have poor glycemic control, which accelerates the risk of complications. Meanwhile, individuals with good self-efficacy tend to improve their self-management of the disease and their ability to control their blood sugar also improves (Dehghan et al., 2017).

Type 2 diabetes mellitus patients who have a HbA1c > 9% tend to have doubts about implementing adequate self-management, especially in terms of diet and physical activity. The level of self-efficacy determines the patient's enthusiasm for carrying out physical activity. Type 2 diabetes mellitus patients who fail to perform physical activity will have reduced self-management, which then directly affects their HbA1c levels. Self-efficacy will increase by providing a structured health education approach, facilitating social support, and preventing stress (Ariani, Sitorus, Gayatri, 2012).

On the other hand, the study also revealed that there is positive correlation between social-support and self-management, which indicates the better the social support, the better the self-management that will be performed. This study is congruent with the study by (Koetsenruijter et al., 2016), which describes the relationship between social support and self-management of patients with diabetes mellitus.

This study showed the lowest social support is emotional support and information, especially from the family, in which patients with diabetes had less support in treatment, such as finding relevant information about diabetes and less motivating to them. It will have an impact by creating doubts in patients to perform self-management.

Social support is a psychosocial aspect that impacts on self-management, glycemic control, and the quality of life of diabetes patients. If they have good social support and reasonable blood sugar control; it is reflected in their HbA1c levels (Sharifirad, Azadbakht, Feizi, Kargar, & Mohebi, 2013).

Diabetes patients, in terms of managing themselves, are in need of social support. The social support that patients need the most is emotional support as it relates to improved self-esteem, self-motivation, and confidence to improve diet and physical activity. Type 2 diabetes mellitus patients who have inadequate emotional support will fail regarding their diet and physical activity management. Therefore, the lower the social support of diabetes patients, the increased chances of failing in self-management. It affects an increase in HbA1c levels (Schiøtz, Bøgelund, Almdal, Jensen, & Willaing, 2012).

There are some limitations to the present study, significantly how the lack of social support would also impact on the stress levels among respondents. As it is known that people with diabetes need to have adequate social support since they

experience stress in managing their condition.

CONCLUSION

Based on this research, there was a significant relationship between knowledge, self-efficacy, social support, and self-management.

It is recommended to the health professionals in public health centers to modify the media and mode of delivering health information. People with diabetes need to be given a chance to share their feelings and experience in dealing with their disease. It is expected that the changes in the way health information is provided would decrease feelings of loneliness and increase self-efficacy in controlling blood sugar. Health centers are expected to create a program and provide information for families with diabetes patients with a HbA1c> 9% to support them in self-management.

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