

Personal characteristics, families, and community support associated with self-care behavior among Indonesian diabetic patients

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Abstract

Self-care management is the way to prevent the complication in diabetes. However, adherence to self-care management is low. This study aims to assess the association of personal characteristics, supports the system, including families and community, with the self-care behavior among diabetes patients. A cross-sectional study was used in this research. 158 participants were randomly selected based on the primary health care database in Malang City, Indonesia. There are eight parts of the questionnaire as the instruments in this study. Multivariate logistic regression was used to analyze the association of all independent variables with self-care behavior as a dependent variable. This study showed that 60.80% of respondents had complications while the less practicing self-care behavior was 46.84%. Furthermore, the ordinal regression logistic showed that duration of DM (OR:4.347, 95%CI 1.671-11.310), illness perception (OR: 0.028, 95%CI 6.090-51.346), family supports (OR: 3.295, 95%CI 1.325-8.192), and community supports (2.802, 95%CI 1.209-6.493) were associated with self-care behavior among diabetes Mellitus. This finding can support the primary health care to involved family and community around diabetes patients to success the self-care management.

Introduction

Type 2 diabetes mellitus is caused by insulin resistance, which occurs when the

body cannot release insulin. Insulin levels and insulin production increase because they cannot work. Conditions like this can deplete the pancreas, increasing insulin and hyperglycemia. Type 2 diabetes can live several years before being diagnosed because symptoms progress slowly, even absent for some people. Type 2 diabetes is common in older people. Still, it does not rule out the possibility that it often occurs in children and adolescents due to obesity, physical activity and poor diet.^{1,2}

In middle and low-income developing countries, the prevalence of diabetes is increasing more rapidly.³ In 2013, 382 million people were living with diabetes, which increased in 2019 to 463 millions adults aged 20-79 years. It is predicted that by 2045 it will increase to 700 million.^{4,3} In 2017, 1 in 5 adults in Southeast Asia lived with diabetes.⁴ Indonesia is one of the countries with the highest diabetes cases, ranking seven after Mexico, with 10.7 million.⁴ Based on data Indonesia Health Survey in 2013, the prevalence of diabetes in people aged > 15 years was 6.9% and increased rapidly to 10.9% in 2018. The number of people who had a risk of Type 2 Diabetes Mellitus increased year by year.⁵

The Centers for Disease Control and Prevention (CDC) has a program to prevent diabetes and improve quality of life, namely Diabetes Self-Management Education and Support (DSMES).⁶ In connection with the CDC program, the Indonesian government established a Prolanis program or Chronic Disease Management Program to support diabetic patients in reducing the impact of diabetes.⁷ Prolanis is an integrated program with a chronic disease management model for participants who use a proactive approach.⁸ Prolanis involves BPJS (agent of universal health coverage), Primary Health Care (PHC), and participants.⁷ All UHC participants who suffer from chronic diseases (type 2 diabetes and hypertension) are targets for Prolanis.⁸ Self-care in diabetes can improve patients' quality of life and control diabetes, namely by treatment and prevention or suppressing the occurrence of complications.^{9,10} Some factors influence the success of self-management, such as adherence to attitudes, beliefs, knowledge about diabetes, culture and language skills, health literacy, income, complications, and social support.^{11,12} One of the essential factors is that supporting a system around patients has an essential role in ensuring this successful program and helping diabetes patients prevent complications.¹³ However, focusing on that support, our research focused on families and community support related to diabetes self-care behaviour among type 2 diabetes patients.

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Materials and Methods

A cross-sectional online survey was conducted in this study. Two areas of primary health care were selected for data collection as primary health care, which has many type 2 diabetes patients in Malang City, Indonesia. Random selection was used to select the 175 respondents invited to participate from the primary health care registra-

tion database. The inclusion criteria included diabetes patients who registered <6 months, lived in a primary health area (+500 km) and could communicate in Bahasa (or Indonesian dialect). Patients who had cognitive problems were excluded from the study.

There are four components involved in the questionnaire. Three experts in public health have approved the instruments used as content validity index (CVI). The CVI average for tests used ranges from 0.80 to 0.85, which means a good validity level. The four components are listed as follows:

Sociodemographic: age, sex, education level, occupation, income, living arrangement, family member, and assurance participation.

Health conditions: disease duration, a complication occurred, type of treatment, diet program, and BMI (it is calculated from weight and height data).

Health worker perspective. Patients' perception of health workers (doctor, nurse, nutritionist, administrative staff and pharmacies) in outpatients clinic. There was 10 item question such as kindness, performance, pro-

viding information, suggestion and ability to answer the questions.¹⁴

Diabetes knowledge. There were ten-item questions that built the knowledge of diabetes. This questionnaire was validated and did a reliability test in Tangerang, Indonesia.¹⁵

Diabetes perception: This questionnaire has 16-items that measure patients' cognitive and emotional regard to their perceptions of symptoms, personal control, illness consequences, duration, treatment control, concern, emotional response, and causes.¹⁵ A

Table 1. Characteristics of participants.

Variables	Total participants n (%)	Self-care behavior		p-value
		Frequent practicing (n=84, %)	Less practicing (n=74, %)	
Age (years)				0.636
Adults	6 (3.8)	2 (2.4)	4 (5.4)	
Pre elderly	37 (23.4)	20 (23.8)	17 (23.0)	
Middle elderly	58 (36.7)	29 (34.5)	29 (39.2)	
Elderly	57 (36.1)	33 (39.3)	24 (32.4)	
Sex				0.593
Male	35 (22.2)	20 (23.8)	15 (20.3)	
Female	123 (77.8)	64 (76.2)	59 (79.7)	
Education level				0.167
High	43 (27.2)	19 (22.6)	24 (32.4)	
Low	115 (72.8)	65 (77.4)	50 (67.6)	
Occupation				0.566
Employee	54 (34.2)	27 (32.1)	27 (36.5)	
Unemployed	104 (65.8)	57 (67.9)	47 (63.5)	
Income				0.013*
<2.3 jt	117 (74.1)	69 (82.1)	48 (64.9)	
≥2.3 jt	41 (25.9)	15 (17.9)	26 (35.1)	
Living arrangement				0.321
Family	152 (96.2)	82 (97.6)	70 (94.6)	
Alone	6 (3.8)	2 (2.4)	4 (5.4)	
Family's member				0.041
1 – 4 people	116 (73.4)	56 (66.7)	60 (81.1)	
5 – 9 people	42 (26.6)	28 (33.3)	14 (18.9)	
Assurance participations				0.314
Have assurance	135 (85.4)	74 (88.1)	61 (82.4)	
Don't have assurance	23 (14.6)	10 (11.9)	13 (17.6)	
Disease duration				0.205
<5 years	100 (63.3)	57 (67.9)	43 (58.1)	
≥5 years	58 (36.7)	27 (32.1)	31 (41.9)	
Complication occurred				0.105
No complication	62 (39.2)	28 (33.3)	34 (45.9)	
There are complications	96 (60.8)	56 (66.7)	40 (54.1)	
Type of treatment				0.342
Don't take medicine	9 (5.7)	3 (3.6)	6 (8.1)	
Medicine	103 (65.2)	59 (70.2)	44 (59.5)	
Insulin injection	13 (8.2)	7 (8.3)	6 (8.1)	
Traditional	4 (2.5)	3 (3.6)	1 (1.4)	
Combination	29 (18.4)	12 (14.3)	17 (23.0)	
Diet program				0.006*
Not on a diet	53 (33.5)	20 (23.8)	33 (44.6)	
On a diet	105 (66.5)	64 (76.2)	41 (55.4)	
BMI				0.610
Underweight	7 (4.4)	5 (6.0)	2 (2.7)	
Normal	77 (48.7)	40 (47.6)	37 (50.0)	
Overnutrition	74 (46.8)	39 (46.4)	35 (47.3)	

Significant based on Chi-square test ($p \leq 0.05$).

Linkert scale was used in this questionnaire. There was an option to disagree until strongly agreed on each question item. In addition, scoring 1 was given to participants' less positive answers while scoring 4, the maximum score, for strongly positive responses.

Families support: the questionnaire was validated and reliable in Surabaya, Indonesia.¹⁶ Three parts of this support such as informative support (the family provided information for the patients), instrumental support (the family supported the health facilities and budget for medication), and emotional and self-efficacy support (the family helped the patient to accept their disease and adherence the treatment).

Community support and participation in social group. Six items consisted of informative support and motivation.¹⁶

Self-care behaviour: 18 questionnaires consisted of dietary consumption, physical activities and treatment adherence. A survey in Taiwan depicted 0.85 in Cronbach's alpha, 0.79 in reliability ($p < 0.001$) and 0.86 for validity.¹⁷

After cleaning the data, descriptive statistics were used to provide the frequency and mean dan Standard Deviation (SD) of sociodemographic and all variables. Chi-

square analyses were undertaken to know the association for each variable. Finally, step-wise binary regression examined all independent variables' association with self-care behaviours. This study was approved by Bhakti Wiyata Health Institute ethic committee, Indonesia (400/PP2M-KE/II/2021). Detailed information and informed consent were collected from all participants before data collection started. The participants were allowed to withdraw during the project without any penalty.

Results

Description of sociodemographic factors as explained in Table 1. These results depicted most respondents in the middle elderly category as much as 36.7%, and most respondents are women (77.8%). In addition, more than half of the respondents have low levels of education (72.8%), do not work (65.8%), and have an income <2.3 million (74.1%). Most respondents live with their families (96.2%) with 1-4 family members (73.4%), and 85.4% of respondents have insurance. More than half of respondents had disease duration <5 years

(63.3%), and there were complications (60.8%). Most respondents chose the type of treatment by taking medication (65.2%) and a diet program (66.5%). Furthermore, most respondents (48.7%) had a BMI in the normal category.

The description of family and community support factors is explained in Table 2. These results depicted the majority of health worker perspective as $\geq$ mean (59.5%). The majority of respondents know about diabetes $\geq$ mean (56.3%), and perception of diabetes $\geq$ mean (58.9%). More than half of the respondents received family support $\geq$ mean (64.6%). Community support and participation in social groups, most respondents have groups (64.4%).

The binary logistic using forward step-wise methods showed that Nagelkerke R square was 0.50 while the Pearson chi-square in Hosmer and Lemeshow test showed $p = 0.295$ ($p\text{-value} > \alpha$). Those results presented that this model was fit and can explain 50% of consuming high sugar drinks. Furthermore, the probability determines factors described in Table 3.

Table 3 showed there were five variables significantly associated with self-care behaviour among diabetic patients such as

Table 2. Chi-square results of families and community support variables.

Variables	Total participants n (%)	Self-care behavior		p-value
		$\geq$ mean (n=84, %)	< mean (n=74, %)	
Health worker perspective				0.106
$\geq$ mean	94 (59.5)	45 (53.6)	49 (66.2)	
< mean	64 (40.5)	39 (46.4)	25 (33.8)	
Diabetes knowledge				0.002
$\geq$ mean	89 (56.3)	57 (67.9)	32 (43.2)	
< mean	69 (43.7)	27 (32.1)	42 (56.8)	
Diabetes perception				0.000
$\geq$ mean	93 (58.9)	69 (82.1)	24 (32.4)	
< mean	65 (41.1)	15 (17.9)	50 (67.6)	
Families support				0.000
$\geq$ mean	102 (64.6)	65 (77.4)	37 (50.0)	
< mean	56 (35.4)	19 (22.6)	37 (50.0)	
Community support and participation in social group				0.003
No group	56 (35.4)	21 (25.0)	35 (47.3)	
Have group	102 (64.6)	63 (75.0)	39 (52.7)	

Significant based on Chi-square test ($p \leq 0.05$).

Table 3. Binary logistic model results using SSBs consumption as a response.

Variable	B	Odds ratio (95%CI)	p-value
Community support	1.030	2.802 (1.209, 6.493)	0.016*
Duration of DM	1.469	4.347 (1.671, 11.310)	0.003*
Illness perception	2.873	0.028 (6.090, 51.346)	0.000*
Families support	1.192	3.295 (1.325, 8.192)	0.010*
Community support	1.030	2.802 (1.209, 6.493)	0.016*

*Significant based on Binary logistic regression ($p \leq 0.05$).

community support (OR: 2.802, CI: 1.209, 6.493), families support (OR: 3.295, CI: 1.325, 8.192), duration of DM (OR: 4.347, CI: 1.671, 11.310), health worker perception (OR: 0.186, CI: 0.068, 0.507) and attitude (OR: 0.028, CI: 6.090, 51.346).

Discussion

Self-care management is the most crucial contribution to preventing complications in diabetes patients.^{18,19} Diabetes patients who frequently practice self-care behaviour proved to significant impact on quality of life reduce the possibility of complications.^{11,20} Some complications that can occur in diabetes are chronic: diabetic nephropathy, diabetic retinopathy, macrovascular complications such as coronary artery disease, cerebrovascular and peripheral vascular disease, and acute complications: hypoglycemia and acute hyperglycemic decompensation.^{21,22}

Many factors influence the success of self-care diabetes management. This study presented some variables that have an association with those practising. The sociodemographic showed that income and family members had a significant association with practising self-care diabetes programs. These results were supported by a study in Ethiopia that low income can affect the success of self-care in diabetic patients.²³ In addition, family members also play an important role in the self-care of people with diabetes.²⁴ Family members must provide support in self-care that requires family members to live with people with diabetes. There are positive values obtained by family members, namely gaining knowledge and changing bad habits that can cause diabetes.²⁵ Other results showed that people who practice diet programs are associated with practising self-care behaviour. This study is similar to the study in Ethiopia that the practice of a diet program has an important role in implementing self-care for diabetics.²⁶

Multivariate analysis showed that the longer duration of the disease, the odds to do practising self-care were 4.3 times. It is similar to a study in India that diabetic patients with a disease duration of 10 years or more will be better at self-care, considering ongoing educational steps.²⁷ In addition, the more people had a positive attitude to their disease, the odds to do they practising self-care was 2.8 times. It was supported by a study in Iran that a positive attitude will improve the results of better self-care.²⁸

Furthermore, support was an essential part of successful self-care.²⁹ This study showed that patients who had family and

community full support had the possibility of practising self-care management 1.19 and 1.03 times compared to those who didn't have full support. This finding was supported by a study in Dander Health Center that patients who get full family support will benefit from their healthy development. Diabetes could cause a psychological impact such as anxiety, shame, sadness, and discomfort. Family supports plays a role in preventing stress, it buffers stress factors experienced by the patient and it enhances quality of life. Family supports can be a behavioral support, facilitating, providing information, accommodating, reminding, motivating and hoping to improve the patient's health status.³⁰

Conclusions

This study concludes that support for primary health care services involves families and communities around diabetes patients to support successful self-care management. This study proves that 60.80% of respondents experience complications, while self-care behaviour that is less practical is 46.84%. Furthermore, ordinal logistic regression showed that DM duration, perception of disease, family support, and community support were associated with self-care behaviours among diabetes mellitus. This finding can support the primary health care to involved family and community around diabetes patients to success the self-care management.

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