

RESEARCH ARTICLE

THE HEALTH-SEEKING BEHAVIOR OF DIABETES MELLITUS PATIENTS DURING THE COVID-19 PANDEMIC IN BREBES REGENCY

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ABSTRACT

Background: The COVID-19 pandemic in Indonesia has impacted patients with non-communicable diseases such as Diabetes Mellitus (DM). The impacts include health services, treatment management, and patients' health-seeking behavior. This study aims to determine the DM patients' health-seeking behavior in the Salem sub-district, Brebes district, Central Java.

Methods: This research was a quantitative descriptive study conducted cross-sectionally using a survey. The purposive sampling technique was employed to obtain the data with a total sample of 106 respondents.

Results: Most DM patients still visited health facilities during the pandemic (73%). Some efforts to control DM were regularly taking medication (27.7%) and maintaining a healthy diet (34%). However, most respondents stated that

they have uncontrolled blood glucose levels (54.7%). During the pandemic, respondents communicated with health workers (75.5%), via telephone (64.2%), and through messaging applications (45.3%). In addition, they search information, especially when they felt symptoms (90.6%), and tried to find information about complications due to the coronavirus (68.9%) with the source from health workers (94.3%). Most respondents had good access to information about DM (99.1%).

Conclusion: This study shows that the pattern of health-seeking behavior among the respondents during the COVID-19 pandemic are the combination of using online communications and visiting the clinic or hospital. However, screening behavior using self-measuring blood glucose and non-pharmacological therapy such as physical activities was still concerning and needs further evaluation.

Keywords: diabetes mellitus, COVID-19, Indonesia, health-seeking behavior, information-seeking behavior.

INTRODUCTION

At the beginning of 2020, the world faced a COVID-19 pandemic that started with the discovery of cases in Wuhan, China.¹ Indonesia announced its first patient in March 2020; COVID-19 cases have continued to rise since then.² At the end of 2020, the Indonesian government announced 581,550 confirmed cases with 17,867 deaths.³ This COVID-19 pandemic has affected patients with non-communicable diseases such as Diabetes Mellitus (DM), especially in health services and treatment management.⁴

Indonesia recorded DM patients aged 20-79 years amounted to about 10.7 million people and is ranked 7th in the world.⁵ Riset Kesehatan Dasar (Riskesdas) results show that the prevalence of DM in Indonesia in 2018 increased by 0.5% compared to 2013.⁶ Meanwhile, in Central Java, the

proportion of new cases of DM is 20.57% and ranks second among all cases of Non-Communicable Diseases (NCDs) after hypertension.⁷

DM is one of the comorbidities in patients infected with COVID-19. Research conducted by Wulandari et al. from March to August 2020 in Jakarta found that the mortality of COVID-19 patients with comorbid DM was 3.9 times higher than that of COVID-19 without comorbid DM.⁸ A meta-analysis study showed that comorbid DM increased the risk of death by 2.17 times compared to COVID-19 patients without DM.⁹

Patients' health-seeking behavior is a step taken by an individual who feels the need for help when trying to solve their health problem.¹⁰ Management of DM can be done with diet, physical exercise, blood glucose monitoring, and drug therapy. In addition, the success of the treatment depends on

the behavior of people with diabetes. The determinants of seeking treatment include culture, age, gender, socioeconomic and economic factors, physical access to health facilities, perceived quality, and availability of health facilities.¹¹

The Indonesian government has implemented Large-Scale Social Restrictions (LSSR) in various cities to prevent the spread of COVID-19.¹² This policy dramatically impacts health service facilities, both primary (clinics, doctor's independent practice) and secondary (hospitals), by limiting services and the number of patients.¹³ Due to these circumstances, the Indonesian Society of Endocrinology (ISE/Perkeni) recommends that people with DM stay at home, adopt a healthy lifestyle, take blood sugar measurements at home and consult online by telephone if needed.¹⁴

However, this policy can disrupt the DM patients' health-seeking behavior DM patients in controlling their disease. Based on a survey conducted by WHO, the COVID-19 pandemic has disrupted the management and prevention of patients with non-communicable diseases.⁴ As a result, patients with NCDs, especially DM patients, find it difficult to go to the hospital.¹⁵ In addition, the policy can affect physical activity, interfere with blood sugar checks, and it is difficult to provide education to DM patients.¹⁶

Not much has been known about the health-seeking behavior of people with DM in Indonesia during the COVID-19 pandemic. According to the Riskesdas 2018 data from Central Java province, we conducted this study to provide an overview of the health-seeking behavior of DM patients during the COVID-19 pandemic in Brebes Regency in 2020 from the patients or their caretakers.

METHODS

This quantitative descriptive study was conducted cross-sectionally using a survey distributed electronically

with Google Form. The research was conducted in the Salem District, Brebes Regency, Central Java, from August to November 2020. The purposive sampling technique was used with a total sample of 106 respondents consisting of 82 patients and 24 caretakers.

The data were taken from DM patients and caretakers registered in community health centre and several clinics in Salem District and willing to participate in this study.

The variables assessed included the respondents' characteristics (age, gender, education, occupation, and length of time they have had diabetes) and their behavior during the pandemic. The behavioral variables of these patients were divided into visits to health facilities during the pandemic, their efforts to control DM, statements about blood sugar control, frequency of blood sugar measurements and medication adherence, communication with health workers, and seeking health information during the pandemic.

ETHICAL APPROVAL

This research has been approved by the Ethics Committee of the Faculty of Medicine, UIN Syarif Hidayatullah Jakarta with an ethical clearance number: B-007/F12/KEPK/TL.00/03/2021.

RESULTS

The Respondents' Characteristics

This study involved 106 respondents consisting of patients and their caretakers in Salem sub-district, Brebes district, Central Java province. The characteristics of the research subjects can be seen in Table 1. The proportion of women was 62% in the patient group and 41.7% in the caretakers group. In addition, 60% of the patients were of productive age, 42.7% went to junior high school, and 56.1% were housewives. Most respondents had had diabetes for 1-5 years; 81.7% from the patient group and 75% from the caretakers.

Table 1. Description of the characteristics of respondents and DM patient caretakers

Characteristics	Group of Respondents	
	Patients (n=82)	Caretakers (n=24)
Age	17-25 years	-
	26-35 years	2 (2.4)
	36-45 years	12 (14.6)
	46-55 years	38 (46.3)
	56-65 years	20 (24.4)
	>65 years	10 (12.2)
Sex	Male	20 (24.4)
	Female	62 (75.6)
		22 (91.7)
		1 (4.2)
		-
		1 (4.2)
		-
		-
		14 (58.3)
		10 (41.7)

Education	Elementary School	16 (19.5)	2 (8.3)
	Junior High	35 (42.7)	2 (8.3)
	Senior High	20 (24.4)	18 (75)
	Diploma	1 (1.2)	0 (0)
	Undergraduate	8 (9.8)	2 (8.3)
	Graduate	2 (2.4)	-
Occupation	Students	-	16 (66.7)
	Private sector	6 (7.3)	2 (8.3)
	Government sector	6 (7.3)	3 (12.5)
	Entrepreneur	8 (9.8)	1 (4.2)
	Housewife	46 (56.1)	1 (4.2)
	Retired	4 (4.9)	-
	Others	12 (14.6)	1 (4.2)
Diabetes duration	<1 year	5 (6.1)	2 (8.3)
	1-5 years	67 (81.7)	18 (75.0)
	6-10 years	10 (12.2)	2 (8.3)
	11-20 years	-	2 (8.3)

The Respondents' Behavior during the Pandemic

The behavior of visiting hospitals can be seen in Table 2. Respondents, both patients and their caretakers, still visited health facilities during the pandemic as many as 73%, with the most visited health facilities being clinics with 57.5%.

37.7% of respondents who visited health facilities were to control DM disease, and the majority (89.7%) who did not visit health facilities reasoned that they feared being infected with COVID-19.

Table 2. Visits to health facilities during the pandemic

Behavior	Respondents (n, %)			
	Patients	Caretakers	Total	
Visit health facilities during the pandemic				
Yes	64 (78)	13 (54.2)	77 (73)	
No	18 (22)	11 (45.8)	29 (27)	
Facilities visited during the pandemic (multiple response)				
General practitioner	24 (29.3)	6 (25)	30 (28.3)	
Clinic	56 (68.3)	5 (20.8)	61 (57.5)	
Primary health care	48 (58.5)	10 (41.7)	58 (54.7)	
Hospital	21 (25.6)	10 (41.7)	31 (29.2)	
Reason				
Visiting health facilities	Control	24 (37.5)	5 (38.5)	29 (37.7)
	Feel complaints/pain	4 (6.3)	3 (23.1)	7 (9.1)
	To get well	20 (31.3)	3 (23.1)	23 (29.9)
	Fear of worsening/complications	9 (14.1)	2 (15.4)	11 (14.3)
	Runs out of medicine	5 (7.8)	-	5 (6.5)
	More confidence when treated by health workers	1 (1.6)	-	1 (1.3)
	The doctor is friendly	1 (1.6)	-	1 (1.3)
Not visiting health facilities	Fear of being infected with coronavirus	17 (94.4)	9 (81.8)	26 (89.7)
	No complaints/feeling well	1 (5.6)	1 (9.1)	2 (6.9)
	Buy medicine from pharmacy	-	1 (9.1)	1 (3.4)

The respondents' behavior to control the disease can be seen in Table 3. Thirty four percents of the respondents maintained their diet if they did not visit health facilities

during the pandemic, and 46.2% maintained a healthy lifestyle if they did not communicate with health workers during the pandemic.

Table 3. Respondent's behavior to control DM

Behavior	Respondents (n, %)		
	Patients	Caretakers	Total
Attempt to control DM if not visit health facilities during the pandemic			
Take medicine regularly	22 (26.8)	6 (25)	28 (27.7)
Maintain diet	28 (34.1)	8 (33.3)	36 (34.0)
Physical activity	3 (3.7)	2 (8.3)	5 (4.7)
Take herbal medicine	8 (9.8)	2 (8.3)	10 (9.4)
Call for health workers	13 (15.9)	5 (20.8)	18 (17.0)
Substitute sugar with corn sugar	3 (3.7)	-	3 (2.8)
Self-monitoring of blood glucose	-	1 (4.2)	1 (0.9)
Attempt to control DM if not communicate health workers during the pandemic			
Take medicine regularly	6 (33.3)	2 (25.0)	8 (30.8)
Self-monitoring of blood glucose	-	1 (12.5)	1 (3.8)
Go to health workers	-	1 (12.5)	1 (3.8)
Maintain healthy lifestyle	9 (50.0)	3 (37.5)	12 (46.2)
Take herbal medicine	3 (16.7)	-	3 (11.5)
Find informations through social media	-	1 (12.5)	1 (3.8)

The majority of respondents (54.7%) stated that they have uncontrolled blood glucose levels. Patient respondents (46.3%) measured their blood sugar level once a week, while caretaker respondents (54.2%) did it once a month.

Meanwhile, 53.8% of the respondents took measurements after eating. For the adherence, 95.3% of the respondents regularly took medicine, and 85.8% immediately bought medicine when they ran out of it (Table 4).

Table 4 Distribution of respondents based on statements of controlled blood sugar, frequency of blood sugar measurements, and adherence to taking medication

Blood Glucose Monitor		Responden (n, %)		
		Patients	Caretakers	Total
Blood glucose level based on statements	Controlled	38 (46.3)	10 (41.7)	48 (45.3)
	Uncontrolled	44 (53.7)	14 (58.3)	58 (54.7)
Frequency	Uncertain	-	1 (4.2)	1 (0.9)
	Once in a month	17 (20.7)	13 (54.2)	30 (28.3)
	Once in a week	38 (46.3)	6 (25)	44 (41.5)
	Once in 3 days	19 (23.2)	1 (4.2)	20 (18.9)
	Everyday	1 (1.2)	1 (4.2)	2 (1.9)
	When have complaints	7 (9.8)	2 (8.3)	9 (8.5)
Time (multiple response)	Uncertain	5 (6.1)	-	5 (4.7)
	Before meal	35 (42.7)	12 (50)	47 (44.3)
	After meal	44 (53.7)	13 (54.2)	57 (53.8)
Adherence				
Take medicine regularly	Yes	79 (96.3)	22 (91.7)	101 (95.3)
	No	3 (3.7)	2 (8.3)	5 (4.7)
Immediately buy medicine when it runs out	Yes	70 (85.4)	21 (87.5)	91 (85.8)
	No	12 (14.6)	3 (12.5)	15 (14.2)

Communication with Health Workers
75.5% of the patients communicated with health workers during the pandemic. 64.2% used phone calls, and 45.4% did

it via messaging applications such as Whatsapp or Line. 76.4% of the respondents made this communication, especially when they felt a complaint (Table 5).

Table 5. Distribution of respondents based on communication with health workers

Behavior	Respondents (n, %)		
	Patients	Caretakers	Total
Communication with health workers			
Yes	64 (78)	16 (66.7)	80 (75.5)
No	18 (22)	8 (33.3)	26 (24.5)
Media used to communicate with health workers during the pandemic (multiple responses)			
Phone	55 (67.1)	13 (54.2)	68 (64.2)
SMS	15 (18.3)	3 (12.5)	18 (17.0)
WhatsApp/LINE	42 (51.2)	6 (25)	48 (45.3)
Video call	-	1 (4.2)	1 (0.9)
Conditions when communicating with health workers during the pandemic (multiple responses)			
Have complaints	71 (86.6)	10 (41.7)	81 (76.4)
To monitor blood glucose	38 (46.3)	8 (33.3)	46 (43.4)

The respondents' behavior in seeking health information during a pandemic can be seen in Table 6. Almost all of respondents (99.1%) had access to information about their illness. In addition, 90.6% of the respondents sought information when they felt symptoms. 68.9% of respondents

sought information about diseases caused by the Coronavirus and its relationship with DM. Most of the respondents (94.3%) relied on health workers as a source of health information.

Table 6. The behavior of seeking health information during the pandemic

Behavior		Respondents (n, %)		
		Patients	Caretakers	Total
Access to information about DM	Yes	81 (98.8)	24 (100)	105 (99.1)
	No	1 (1.2)	0 (0)	1 (0.9)
Frequency	Everyday	1 (1.2)	3 (12.5)	4 (3.8)
	When have complaints	75 (91.5)	21 (87.5)	96 (90.6)
	Never	6 (7.3)	0 (0)	6 (5.7)
Looking for information about the disease caused by the coronavirus and its relationship with diabetes	Yes	58 (70.7)	15 (62.5)	73 (68.9)
	No	24 (29.3)	9 (37.5)	33 (31.1)
Source of health information (multiple responses)	Health workers	77 (93.9)	23 (95.8)	100 (94.3)
	Communication media	23 (28.0)	9 (37.5)	32 (30.2)
	Friend/family	32 (39.0)	6 (25.0)	38 (35.8)

DISCUSSION

This study found that most of the respondents still visited health care facilities (73%) with the aim of routine control of diabetes (37.7%). In addition, the desire to recover (29.9%) and the patient's concern about complications from his illness (14.3%) were the reasons for patients to continue to visit health facilities. The large number of respondents who visited health facilities is not in accordance with the findings of several studies that show a decrease in visits to hospitals and primary health centers.¹⁷ However, these results

align with a study conducted in the city of Yogyakarta, where the Health Office and Public Health Center (*Puskesmas*) have attempted to utilize information technology to facilitate access to health services via telephone, SMS, or WhatsApp. However, people still choose to come directly to the health center.¹⁸ Research by Mahmuda et al. found a significant relationship between the length of time suffering from DM and the patient's level of anxiety.¹⁹ This is in accordance with the length of time the respondents suffered from DM (81.7%) and why they visited health facilities. In addition, in the study by Harahap et al., orthopedic patients who visited

the hospital polyclinic were old patients and wished to meet directly with doctors.²⁰

There are several things to consider regarding the respondents' behavior who visited health facilities. First, visiting a health facility during the COVID-19 pandemic carries a high risk of Coronavirus exposure. Second, DM is a comorbid disease of COVID-19, so DM patients need to get more protection.²¹ Health facilities can take several steps in dealing with patient visits, including limiting patient visits, changing the registration flow, and improving health protocols.^{13,17} In addition, health workers must make DM patients understand that they can come to the hospital only when acute conditions or emergencies occur.

The respondents' behavior to control DM during a pandemic was more on taking the medication regularly and maintaining a diet. Only a small number of respondents did other activities such as exercising and replacing sugar with corn sugar. This is in line with several studies which state that during the lockdown, there is a decrease in physical activity and an increase in sedentary activities.²² Dietary regulation is important to control blood glucose levels during the pandemic. A study of type 2 DM patients in Turkey showed increased body weight and triglyceride levels due to a prolonged lockdown.²³ In addition, according to a study in Italy, patients with type 1 DM during the pandemic showed changes in eating patterns due to increased food portions and frequency of snack consumption.²⁴

In this study, blood sugar level measurement was carried out once a week to once a month, and the majority of respondents took measurements after eating. However, one respondent from the caretakers group measured their blood sugar level themselves when not visiting a health facility. From direct interviews, it was found that respondents did not have a blood glucose measuring device. This is consistent with a study in India, where 191 out of 426 patients who did not measure blood sugar levels during the lockdown did not have a glucometer.²⁵ This is a serious problem because self-monitoring of blood glucose (SMBG) is essential. According to Perkeni, SMBG is useful in maintaining the safety of people with DM, assisting efforts to change lifestyle and decision making, and adjusting drug doses.²⁶ In addition, SMBG can help in preventing complications of DM.^{27,28,29}

Most respondents (54.7%) stated that their blood sugar levels were not controlled. Meanwhile, most respondents (95.3%) regularly took their medicine. These results are consistent with table 3 regarding non-pharmacological treatment during a pandemic that shows low physical activity. Although, the majority of respondents (85%) in this study were able to buy drugs immediately when they ran out. It is known that the management of DM therapy includes pharmacological therapy and non-pharmacological therapy,

such as maintaining a healthy diet and physical activity.³⁰ This phenomenon is similar to a study in Iran where a trend of the increasing prevalence of uncontrolled DM patients in elderly respondents was 52.7%, and the frequency of uncontrolled DM was 55.9% in patients who had received therapy.³¹

One of the efforts in managing DM disease that can be done during the pandemic is the use of technology, especially in the field of information and communication. In Indonesia, the Perkeni has recommended avoiding direct consultations and conducting remote consultations with DM patients whenever possible.¹⁴ In this study, 75% of the respondents communicated with health workers during the pandemic. Communication was done using telephone and messaging applications such as Whatsapp and Line. Based on the results of previous research, Whatsapp is a social network that is easily accessible using a smartphone because of its easy features and small data capacity compared to other applications, making it an effective communication medium.³² The use of telephones during the COVID-19 lockdown provides a high level of medication adherence and the practice of SMBG.³³ However, some respondents still visited health facilities which is in accordance with a study in Israel where type 1 DM patients prefer a hybrid method consisting of virtual communication and physical visits, especially in elderly patients.³⁴ The reason is by visiting health facilities, they can get better service and communication from health workers.

An increase must also follow the use of information technology in health literacy. Unfortunately, Indonesia's low health literacy level has been a problem even before the pandemic.³⁵ A study in Yogyakarta showed a low level of health literacy in DM patients.³⁶ This will significantly impact diabetes management in Indonesia, especially during the pandemic. Therefore, cooperation and the role of various parties are needed to overcome this problem.

Patients can play an active role in seeking information related to DM during the pandemic. Several studies have shown that Indonesians have used the internet to find information about their diseases and health.^{37,38} In this study, almost all respondents had access to find information related to DM during the pandemic. A total of 68.9% of respondents sought information regarding the disease caused by the Coronavirus and its relationship with DM. This is similar with Aini, 2022 study that most of the respondents in Sragen conducted health searches during the COVID-19 pandemic.³⁹ Moreover, health workers can provide education by providing videos through the Whatsapp messaging application.⁴⁰

Limitation

There were several limitations to this study. First, data collection could not be done online due to several obstacles, such as respondents in the late adult age group and the elderly having difficulty filling out online questionnaires, having network problems, and being less familiar with using the Whatsapp messaging application. Second, this study could not confirm the respondent's current condition (blood glucose levels, DM complications). Finally, this study only assessed the perception among DM patients' about their health-seeking behavior during the pandemic.

CONCLUSION

This study shows that the pattern of health-seeking behavior among the respondents during the COVID-19 pandemic are the combination of using online communications and visiting the clinic or hospital. However, screening behavior using self-measuring blood glucose and non-pharmacological therapy such as physical activities was still concerning and needs further evaluation.

Furthermore, it is necessary to increase health literacy for DM patients by involving various parties, including patients and health workers. Optimizing the use of information technology can help manage and provide education to DM patients during the pandemic.

CONFLICT OF INTEREST

None declared.

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