



The Environment of Patients with Type 2 Diabetes Melitus: A Qualitative Study

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ABSTRACT: People with T2DM play an important role in providing optimal results for the treatment of this disease, though supporting environments can also help to control blood sugar levels. The supportive environment with the correct facilities enables T2DM sufferers to maintain a healthy diet and regular exercise. The study is therefore aimed to analyze the influence of environment on T2DM patients. The research method used phenomenological qualitative research by semi-structured interviews. The study was conducted between October-December 2018, and the sample was ten participants with interviews conducted in the Yogyakarta. The interviews are recorded, identified and transcribed, then the script was analyzed based on *Thematic Analysis* by NVIVO 10® software. The results of the study found four themes i.e: the importance of T2DM knowledge, activities in controlling T2DM, perceptions of the non-physical and the physical environment. The importance of knowledge for participants to control T2DM correctly is conducted by regulating diet, adequate and routine exercises, support by the environment that provides facilities with access to health services, healthy food vendors and social support.

KEYWORDS: type 2 DM, perception, qualitative study

I. INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is often referred to as *diabetes life style* because it is caused by the habits of unhealthy patients who, despite

heredity, age and insulin resistance, still manage to develop the disease. The formation of the disease is slow to begin with, and has imperceptible symptoms. Based on data obtained from the International Diabetes Federation (IDF) in 2016, the prevalence of DM amounted to over 425 million people worldwide, with Indonesia experiencing 10.2 million sufferers (1). The data of Basic Health Research conducted in 2013 deduced that DM in Indonesia had increased to 6.9% and DIY with the highest prevalence after the provinces of DKI and East Kalimantan had a percentage of 2.6% (2). The prevalence of T2DM is caused by fixed risk factors including gender, age, and genetics, as well as the more changeable elements such as smoking habits, education level, occupation, physical activity, alcohol consumption, body mass index and waist circumference (3).

Perception is a means of interpreting information obtained through the human sensory system. It is influenced by internal factors, such as personality, learning processes and physical condition, while external factors include information obtained, knowledge, intensity, and things that are new or familiar (4).

Previous research conducted by Ganivieve et al. identified individuals with diabetes as the most vulnerable group to be at risk of depression. Recommendations for diet and exercise in diabetic individuals might be difficult to achieve in environments with limited access to healthy restaurants and sport venues. Furthermore, expansive green and natural physical environments are a contributing factor in reducing the risk of depression (5). This study aims to determine the perceptions of T2DM patients on their physical and non-physical environments.



II. Methods

The design of this study is a qualitative method with a phenomenological approach, a procedure that intends to understand an experience created via the subject of the researcher (6). Participants were selected through a *purposive sampling* technique, where the sample used is determined under specific considerations; participants are chosen if they have T2DM and receive treatment at Jogja Hospital. The total sample number of this study is ten participants.

This study employs semi-structured interviews, meaning they are open but limited to the theme and have a flow of conversation. The speed of interviews can be predicted, flexible but still controlled, interview guidelines are used as a benchmark, the order and use of words, and the

purpose of the interview is to understand the phenomenon in question (7). The researcher used NVIVO 10® data analysis with thematic content. The study was conducted between October-December 2018 with ethical approval number 011808112 issued by the UAD Research Ethics Committee.

III. Result

The total sample is ten participants, consisting of 3 (30%) civil servants, 2 (20%) self-employed, and 5 (50%) unemployed/retirees. Participant demographic data is presented in table 1.

Table 1. Participant demographic data

Variabel	N=10	%
Age		
<50th	3	30%
50-60th	3	30%
>60th	4	40%
Gender		
Male	7	70%
Famale	3	30%
Work		
Civil Servans	3	30%
Entrpreuner	2	20%
Does not work/housewife/retirees	5	50%
DMT2 Duration		
<5 years	3	30%
>5 years	7	70%
Education level		
Not School	3	30%
Primary/Secondary School	4	40%
Bachelor	3	30%

Theme 1: The importance of knowledge on T2DM through finding information. Participants with good knowledge of T2DM are able to control their blood sugar better. Participant were asked how they found out about T2DM, options including; "read a book about T2DM"; "find out on the internet and youtube"; "ask your doctor" and "ask your neighbors or relatives who have T2DM". "... I found out from a book I bought from the book store".

What is the cause of diabetes mellitus?

"The book stated that most of DM cases are hereditary. After that I looked to Pekalongan to make sure, it turned out that it was true, my family had DM too"-P4

"After I knew that I suffered from DM, I find information on the internet and downloaded videos, then I adjusted it to fit the symptoms that I experience" -P8



Suffering from T2DM provides lessons for different participants according to their experiences. The following is the participants' statements:

"I have been diagnosed with DM since 2004 because I was often tired if I worked, it had been a long time ago. Now I consider it normal, the hypoglycemia means I take a sweet test often" -P3

Theme 2. Activity in controlling blood sugar. Generally, participants maintain health to control blood sugar, "regulating their diet specifically by cooking themselves", "taking medication regularly" and "routinely going to the hospital". In addition, exercise assists the maintenance of health, participant take part in exercises such as "cycling", "walking", "cleaning the house", "treadmill" and "routine sunnah prayer". Here's the participants' statements in maintaining a diet to control blood sugar:

"I have taken care of my food, I haven't been eating sweets for a long time, I eat what my wife is cooking. Previously, the rice was 2-3 paddles. Now I eat only half of that and have more for side dishes. Allhamdulillah, I remember to take the medicine regularly"-P6

This was supported by a statement from the participant's wife:

"since he got DM, he maintained his dietary habits. He only ate my food" -K6

A retired mother with daily activities at home stated that:

"The right time to exercise is after the morning prayer. I travel around the square for a quarter of an hour. I am already used to it, if I don't exercise, it feels weird on the body. While waiting for sunset I sometimes take a walk around the field in the afternoon if there is no activity" -P1

From the participants' statements, it was explained that exercise was not only carried out through heavy physical activity, as prayer could also be considered exercise as well as worship. As stated by the following participant:

"I rarely do sports like walking, running or something else because I get tired quickly. What I do routinely is night prayers, as many as 20 rakaat, the prayers are twice of two rakaat so it is like sports, then I pray dhuha too. Allhamdulillah I have routinely done this, and my body is healthier"-P5

This statement is supported by the participant's wife:

"my husband is regularly doing tahajud prayer, thus Allah gives him health now" -K5

Theme 3. Perception on the non-physical environment. Perception of humans in social support refers to entertaining, caring for, appreciating, or helping someone from another person or group. Overall, participants received support from "families living together", "neighbors around the house" and "health workers". This was conveyed by a 46-year-old private employee who had been diagnosed with T2DM 6 years ago:

"I received great support when people around me suggested treatment. Besides that, my relatives always reminded me to maintain a diet. In this case, I do not consider it a prohibition, but a concern of the people around me, so I keep thinking positively" -P8

This is supported by the participant's wife who works as a teacher:

"Yes, bro, my husband used to be desperate, especially since the second year he had dropped so much" -K8

The same was said by a woman who lived at home with a household assistant:

"Because my child is far away, he usually likes to call me to take care of my health, if I go to the hospital my child will order an online taxi" -P2

Although he was far away, he always provided support for his parent.

Theme 4. Perception on the physical environment. In general participants have proper, comfortable, and small shady tree environments. Access to the destination is to be reached via "walking", "cycling", or "motorcycle riding". The following is the expression of participants who take advantage of the distance to health services on foot.

"the distance to Jogja hospital is quite near, I usually register on early morning to get a queue number in spite of walking" -P9

Participants who live in an environment with easy access to healthy food can help them in managing their diet. Participant expressions can be seen below:

"If I am looking for a vegetable or selling a lot of food, I just have to go ahead, it is already there, the vegetables are fresh, too, but if you go to the pharmacy you have to use a motorbike" -P7

A clean environment provides comfort for those who occupy it, so good waste management is needed. Overall the participants manage waste properly, but there are participants who have



different waste-systems in their environment, this is stated in the following statement

"Each house has a garbage bin like that (pointing to the garbage bin in front of the house), then the garbage will be collected to the house of Mrs. RT. From every house, it must be easy to sell and burn. The proceeds of the sale are made for RT cash. The garbage bin gets funds from the village head, every

IV. DISCUSS

In this study, it is suggested that participants' perceptions of T2DM could be influenced by the level of knowledge, and the length of time they had it for. Seeking awareness and information increases the knowledge of participants; this can be influenced by one's level of education. People with a higher level of education tend to be more informed about issues regarding health (8). Through this knowledge, participants are aware of how to maintain their health, as well as explain their symptoms of DMT2 clearly. Participants who routinely perform sunnah prayers show a calmer attitude in overcoming the disease, this is supported by Nurul et al's research using a qualitative method with a phenomenological approach. They stated that someone who is obedient in carrying out religious practices will be more active in self-care. Believing that God has a major role in healing someone is supported by the individual's own consciousness (9).

Research using a Cross-Sectional approach for 114 respondents found a distribution frequency of 57.9% having excellent family support and 83.3% having good dietary compliance. The analysis used is the *Pearson Product Moment Correlation Coefficient*, which suggests there is a positive association of dietary compliance with family support for T2DM respondents (10). Diet can reduce complications in T2DM because the disease continues to effect the participant when left uncontrolled or treated, one must therefore get support from family and health personnel in controlling the disease, reducing symptoms and preventing complications (11).

Family support is related to well-being and health, it has been defined as an important factor in adherence to disease management for adolescents and adults with chronic diseases (12). Descriptive analytic studies conducted by Shofiyah participants who received motivation and attention from the family found that it was easier to follow the advice of medical personnel than participants who lacked support from their families. Social support has a positive impact on the health of participants. It assists patients in countering the

month the garbage goes up to 400-500 thousand" - P8

Participants stated that waste management activities like this were only carried out in 2 neighborhoods (RT). Hygiene in the environment provides comfort for participants around the neighborhood, the benefits for the community itself include the use of vacant land for planting vegetables.

negative effects of high stress that leads to illness. In addition, the presence of the environment around the supporting participants will make it easier for them to accept their conditions (13).

Participants who live in an environment with dense food stores will be disadvantaged because T2DM patients are more likely to buy unhealthy food, smoke, drink alcohol and gain weight. However if the shop only supplies healthy food, it can definitely reduce T2DM. Patients need healthy food to regulate their diet and maintain their BMI to reduce the risk of obesity (14). The cohort study on T2DM participants from the *Diabetes Health Study* (2008-2013) conducted in Canada included 1,298 participants over 5 periods. The results of the study found that depression factors that effect T2DM participants include access to facilities of physical activity, cultural services and the level of greenness in the environment (5).

V. CONCLUSION

In this study the environment surrounding T2DM patients is influenced by knowledge of the disease, comfort, having adequate access to health facilities and medical treatment. These factors can support participants in controlling blood sugar and lead healthier lifestyles. To achieve this, social support from family, surrounding communities or other people is needed.

It is recommended that further research should be conducted with a larger sample size to make the results more generalizable, the larger the sample, the easier it is to apply to the wider population.

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