

Perception of illness and disease, an overview of a diet of people with type 2 diabetes in the COVID-19 era

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Abstract

Purpose: One of the management of diabetes mellitus is diet needs special attention, mainly when the pandemic occurred in 2020, which more or less affected people with diabetes in accessing health services. This study aimed to provide an overview of the understanding of type 2 diabetes mellitus and dietary patterns in people with type 2 diabetes (T2DM) with COVID-19.

Methods: This is qualitative research with a case study approach. Researchers collected data through in-depth interviews and observations. The case study was conducted in 2 areas of *Kampung Tangguh* in Malang, a populated village with a lower-middle economic level. Selection of research participants using a purposive sampling method. In this study, a total of 14 participants were diagnosed with diabetes with an age limit of 45-71 years.

Results: People with T2DM view diabetes as a disease that must be managed well in terms of medication and diet. The significant role of others, such as family, cadres, and health workers, is needed to support successful diabetes management. *Kampung Tangguh*, with its health dimension, has not been able to play a role in health resilience in the community. The diet applied is still not adequate. Socio-economic is one of the influencing factors.

Conclusions: People with T2DM must anticipate themselves to manage DM and improve their quality of life successfully. The dimension of health resilience in *Kampung Tangguh* needs to be maximized with the role of cadres as a preventive effort against degenerative diseases in the community.

Keywords: COVID-19; diabetes; management; perception; T2DM

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INTRODUCTION

Diabetes Mellitus (DM) is projected to be one of the causes of death worldwide by 2030 (WHO, 2005). Nationally, the data from Basic Health Research (Riskesmas) in 2018 showed an increase in the prevalence of DM from 6.9% to 8.5% [1]. East Java Province was ranked ninth, with a prevalence of 6.8%. Based on data from the Malang City Health Office (2018), there were 9,214 cases of diabetes, an increase from 7,534 cases in 2013 [2].

More worryingly, the world, including Indonesia, is facing the *coronavirus disease* 2019 (COVID-19) disaster. Data shows an increase from early March 2020 until January 2021; it continues to increase [3]. Several studies have stated that the elderly group (elderly) and someone with a history of chronic disease or comorbidity have a higher risk of contracting this virus [4]. Comorbidities in this case are hypertension, diabetes mellitus, cardiovascular disease, and chronic lung disease [4,5]. Diabetes is the second most common comorbidity after hypertension, at 8%, with a mortality rate three times higher than that of sufferers in general, 7.3% compared to 2.3% [6].

Based on the description related to the COVID-19 condition, the researcher conducted a study by exploring in depth how people with diabetes perceive illness and disease and the description of the diet of people with diabetes in Kampung Tangguh during the COVID-19 pandemic.

METHODS

This qualitative descriptive study uses an exploratory case study design. It was conducted in two "Kampung Tangguh" areas in Malang Raya: Kampung Cempluk (Malang Regency) and Kampung Narubuk (Malang City). Data was collected over six months, from July to December 2020. A total of 14 informants were involved, including 11 women and three men aged 45–71. The researchers selected informants using homogeneous sampling, considering the characteristics of the location and socio-economic conditions.

RESULTS

Based on the analysis results in Table 1, three themes answered the research questions regarding the perception of pain and illness and the diet description in people with DM (hereinafter referred to as diabetics). These themes are the perception of pain and disease (internal factors), external factors, lifestyle,

behavior, and the description of the diet of people with diabetes.

Perceptions of illness and disease (internal factors)

This theme refers to the extent to which informants understand type 2 DM, including how informants are aware of their disease condition, experiences about efforts made to undergo treatment, habits or behaviors that have been formed to support treatment, and what motivations build themselves to the treatment.

The beginning people with diabetes know about their DM condition

Some informants realized that their disease condition was already at a high severity level. These symptoms include hypoglycemia/hyperglycemia, hypertension, diabetic ulcers, and diabetic retinopathy. These chronic symptoms then became part of the form of complications felt by the informant.

"After that, my body felt feverish and sweaty, then I was taken to the health center, at the health center it turned out I was checked and suddenly it was 600... at the hospital after that I was hospitalized for 3 days." (SN10, female, 18 years old DM, hypertension)

Other symptoms often felt are frequent urination, weight loss, quick tiredness, and weakness. Informants do not yet understand these mild symptoms as symptoms of diabetes.

"sleepy, sometimes lethargic, when walking it's like you've just walked a long way, tired, your legs are tired. Then sleepy every day. Then urinate often, urinate often. One night it's almost 6 times 7 times..." (MC3, female, 13 years old DM, diabetic ulcer)

Opinions regarding DM disease and its causes

Most informants understand diabetes as a disease condition with high and low sugar. Some informants define the type of diabetes based on the condition of the wound, such as wet or dry diabetes. Wet diabetes is DM with a moist wound with pus that is difficult to heal due to the risk of amputation. Dry diabetes is a DM condition with characteristics of a dry wound that does not ooze pus or an itchy or scaly condition.

"Why is guatel itchy now? I've never been to church because I'm embarrassed. Maybe people say the sugar is dry... guatel is sugar, but I don't know what's going on inside me." (LN11, female, 26 years old DM, hypertension)

"If diabetes is wet, if God forbid, sis (showing feet), for example, if there is an ulcer, the wound can spread everywhere. If it is dry, it will go to the eyes, it will get into the eyes. This is what you get from dry diabetes. Especially if the sugar is high, the eyes will be even less visible." (family)

According to informants, the causes of DM are hereditary factors, excessive sugar consumption, and genetic factors. This understanding emerged based on the informant's own experience or observation.

"Hereditary, it's said to be hereditary, high blood sugar. "Drinking a glass of tea like that and then finally getting sugar" (SN7, female, DM 4 years)

"This is because of genes, miss... I think people in the past ate foods that contained a lot of sugar. My father didn't have any complaints; he and my mother were healthy. "Suddenly, one, two, three of their children were affected, so it means it's in their genes; it doesn't rule out the possibility of it being in their genes." (LC1, female, 9-year-old DM)

In an interview with a Nutritionist at the health center, most of the uncontrolled diabetes conditions in the community are also caused by stress factors. The triggers for these stress factors mostly come from the patient's closest environment, the family.

"... Having problems with their children, or with their wives and husbands. That also happens, quite a lot of them. So for those factors, if they come to us, because we don't just dig into food consumption, we usually also dig into psychological factors. If we look at healthy eating patterns, then we try to dig into other factors, usually it comes out and eventually tells its own story, it could also be from stress factors.. if from theory, it also exists, it can affect metabolism, blood sugar too." (Nutritionist)

Feeling

Through interviews and observations, researchers captured each informant's feelings, such as fear, disappointment, sincerity, and optimism. For example, people are afraid and disappointed when limited activities decrease work productivity.

"So I'm scared. If I don't have sugar, I'm not scared, but because I have sugar, I'm scared. I'm scared that later, they say, the wound will get worse and then I'll have to cut it, I'm scared" (SN8, female, DM 2 years, diabetic ulcer)

"I didn't think about you at all for a whole month, I didn't work so I was totally sick at home for a whole month. My body was exhausted at that time... Well, when I wanted to work, I wasn't allowed to for a month, but I forced myself to try not to work. If I couldn't take it, I wouldn't work, just say that." (SN14, male, 6 months DM, hypertension)

Some informants chose not to think about the pain, surrender, and continue living their lives while trying to manage DM.

"If it's sugar, it's up to me, I'm careful myself. I eat corn every day, until I'm miserable. I used to eat white rice and vegetables, but now I eat it with foreskin, and one tempeh, in a portion. After eating corn rice, I feel miserable indeed. After eating delicious food, tewel vegetables, bamboo shoots like tofu and tempeh cooked in spicy coconut milk... now I'm used to it, sis..." (SC5, female, 9-year-old DM, uric acid hypertension)

The informant's statement also revealed feelings of gratitude. He was very grateful that he had been given the blessing of health even though he would continue living with DM.

"Now I don't have to do the washing myself. Now, thank God, I can also cook. Before, I didn't, my daughter-in-law did the washing, now she doesn't, thank God, thank God)" (SN10, female, DM 18 years old, hypertension)

Most informants admitted that they did not understand COVID-19. Some argue that it is a disease accompanied by cough and lungs.

"No, what is often heard is the lungs, coughing is what is caused by Covid. I have never heard of diabetes..." (MC3, female, 13-year-old DM, diabetic ulcer)

One informant stated that people with diabetes are susceptible to COVID-19, so maintaining body immunity is essential.

"We are worried, but I try to anticipate myself because people with diabetes are vulnerable... so I consume it, sis, and my children buy guava juice, make their own juice, drink it themselves, don't use sugar. Then if I feel a little unwell, I drink something like paracetamol, drink paracetamol." (LC1, female, 9-year-old DM)

Self-motivation

Several reasons encourage people with diabetes to manage their disease. This study found several motivations, including wanting to be able to socialize soon, wanting to live longer, and enjoying time with family and grandchildren.

"Yes, healthy, back to being healthy, that's all I ask for..." (SFC2, female, 15 years of DM, hypertension)

"That is so that you don't get sick, so that the diabetes doesn't get worse, so that the diabetes doesn't go anywhere, right, miss. Anticipate yourself..." (LC1, female, 9-year-old DM)

"Maintained, so that it lasts until old age, taking care of grandchildren so that it lasts forever. Continue to be healthy, what I ask for is a day and a night after worship, yes, that's it, miss. That's it, miss" (SC5, female, 9 years of DM, uric acid hypertension)

In addition, another form of motivation is related to limited economic conditions so as not to become a burden on the family.

"I try, I don't complain, I can walk and work, that's all, that's the spirit, if I just let it be, I'll continue to be lazy, that's it. (Not) Not trying medicine, not going to the health center, not getting checked. That's how you have to try, be enthusiastic." (HN12, male, DM 5 months, diabetic ulcer)

External factors

Significant others

In this study, the role of *significant others* came from family, relatives/friends, and health workers. The support from the family was in the form of assistance in buying medicine, accompanying them to the place of treatment, and reminding the informant of diet if it was known to be less than recommended. Support from relatives was obtained regarding treatment information, such as alternative medicine.

"Yes, when it's time to work, I go home. If it's Saturday afternoon, I go home at 1 o'clock after the check-up again. Even though the work is far away, when it's time for the check-up, I go home, take the check-up. Even if it's raining, whatever, I still go..." (MC3, female, 13-year-old DM, diabetic ulcer)

Health workers' informants support motivation and provide sound advice on medication or dietary recommendations to help manage the disease.

"Yes, the doctor said this, drink this... you can't drink this... just follow the doctor..." (NC4, female, DM 3 years, tooth infection)

"... "Don't limit yourself too much, Grandma," the doctor said, "I want to have it once or twice. Don't have too much, Grandma; if you keep limiting it, you won't have the strength." Yes, I do feel weak. Sometimes, I can't stand being sleepy and dizzy, like I'm spinning. "Yes, grandma, don't just sleep in the morning, grandma." I just sit like that and then suddenly fall asleep, doc." (SN8, female, 2-year DM, diabetic ulcer)

In addition to health service workers, cadres also play an important role in supporting people with diabetes. This study found that cadres are conducting door-to-door visits and have the potential to strongly influence the early detection of disease and the success of DM management in the community. One of the roles carried out is to conduct *door-to-door visits*.

Access to health services

Most informants in this study used BPJS for health services. They were looking for cheap services to get treatment even in limited conditions. However, some did not utilize these facilities because they were less exposed to information. In addition, most informants utilized health services that were relatively close to their homes. Choosing a closer service location was more beneficial for most informants.

Health services during COVID-19 and resilient villages

Based on the informant's experience with the pandemic conditions, services, especially for diabetics, continue to run normally. Most informants still carry out the routine control process by implementing health protocols.

"No, there is no limit if there is no control there, it's just that the seating is limited to 2 empty chairs, 2 empty chairs because the control can't be late..." (MC3, female, 13 years old DM, diabetic ulcer)

Nutrition counseling during the pandemic is still available only for patients with certain conditions. It is generally provided to diabetes patients who are members of the health center's PROLANIS group.

"Counseling is still available during the pandemic for difficult conditions, such as those who are difficult to tell or with severe cases, whose blood sugar levels fluctuate. That is for prolanis members." (Nutritionist)

The pandemic condition allows for an increase in the incidence of degenerative diseases. Cadre, as an extension of health workers in the community, plays a role in monitoring disease conditions in the community.

"Because the monthly report is still requested by the health center, I do it door to door to the residents' houses. I am with my colleague. In addition to door to door, I also help handle those who have strokes and cannot walk, then I handle things like blood pressure if there are complaints of diabetes, I also check it. So every month. Then like the elderly who are weak and cannot get up, I also visit them every month." (Cadre)

One of the resilient village activities that most informants know about is the training in corpse handling. In addition, there is a food barn movement as a place to collect and distribute donations for people affected by COVID-19 in the village area. During the research process, no activities were found in the resilient village related to diabetics.

"What is accompanying, how to handle Covid, how to bathe and bury)" (SN7, female, DM 7 years old)

Lifestyle, behavior, and diet patterns

The study's informants make three efforts to manage DM, depicting the lifestyle and behavior of people with diabetes daily. The first effort is maintaining a diet, which informants do to stabilize blood sugar. However, not all informants follow the recommended diet based on the average total intake.

"Yes, it's important, so I take care of it myself... If I really want it, just a little bit, not too much, I can eat it, I take care of it myself..." (MC3, female, 13 years old DM, diabetic ulcer)

"... Basically, people with diabetes have to be careful with their diet. I think it's the eating pattern that affects my blood sugar, my high and low blood sugar, I think it's from my eating pattern. Right? From my eating pattern. If you eat sweets, your blood sugar will be high, because your pancreas can no longer produce insulin hormone, right? Yes, it can but it's not enough to get there. That's why it's regulated..." (LC1, female, 9-year-old DM)

The second is efforts related to treatment. The types of drugs consumed by informants to maintain their blood sugar levels are metformin, glibenclamide, glimepiride, and latibet. Only one informant is known to use insulin. Several informants chose to use alternative medicine by consuming efficacious natural ingredients. These ingredients include bitter melon, believed to control blood sugar, sirih bumi to relieve body aches, undur-undur, gecko, bajing, nyamplung leaves, horsetail leaves, and groups of onions. This is done for economic reasons.

"I tried to take care of it myself, because there was no money, and I had to work, the bracelet and necklace were finished, I felt sorry for my wife, I had to save up again. I didn't go to another doctor either, so I just used this alternative, fighting food, what shouldn't be eaten, don't eat it, so that's what I fight." (HN12, male, 5 months DM, diabetic ulcer)

Some informants admitted to being worried that consuming too much medicine would impact their kidneys. One family member also expressed this concern, so he suggested consuming efficacious natural ingredients.

"If you keep treating your kidneys, if you keep treating your kidneys, it's a shame. Because the medicine is that much, miss, one small plastic bag." (family)

Next is the effort to engage in physical activity. Depending on their physical condition and ability, informants often walk around the house and do light gymnastics.

"Yes, I just go around this area, then sunbathe. I sunbathe regularly, starting from 7 am to 9 am, or maybe 10 am" (SN10, female, 18 years old DM, hypertension)

Diet overview

Based on the interview results, most informants said that the frequency of food consumption was around 2-3 times a day.

"Three times a day... " (LN9, female, DM 9 years, diabetic retinopathy)

"Still three times a day. Breakfast, at half past 12 for sure, and in the evening, after Maghrib, I eat." (HN12, male, DM 5 months, diabetic ulcer)

We also found informants who only ate once a day.

"Yes, if I want to eat, I eat; if I don't, I don't... I don't eat breakfast in the morning, I don't eat at noon, and if I want to eat at night, I eat." (NC4, female, DM 3 years, hypertensive tooth infection)

Food processing uses frying, steaming, boiling, and stir-frying techniques.

"If it's that, I usually fry tempeh, miss. Well, maybe if it's boiled, it's the one with high cholesterol, miss, because if it's high cholesterol, people don't eat fried things" (LC1, female, DM 9 years old)

"Sometimes it's steamed, not fried, sis... then crushed. Now I don't dare to eat fried food too much... just for now... basically, before it was free... now it's limited..." (LN11, female, 26 years old DM, hypertension)

"I peeled off the foreskin, stir-fried it, added salt and Masako, and I also stir-fried the white cabbage." (SN8, female, 2 years of DM, diabetic ulcer)

Regarding the quantity of food, most informants said they consumed food in moderate portions, not too much or excessively.

"You can eat but not too much. Sometimes it can drop if you restrict it too much. Sometimes it drops, so you eat a little bit. Basically, you can eat anything as long as it's not too much." (SN7, female, DM 4 years)

Most still consume white rice as the main carbohydrate (C). Some informants avoid consuming white rice in hot/warm conditions. Informants assume

cold rice's sugar content is lower than hot white rice's. Other C groups often consumed are corn rice, cassava, sweet potatoes, mbote, and corn. Some informants avoid cassava because it is believed to be high in sugar.

"If you don't have rice, sis, replace it. I tried brown rice before and it wasn't delicious, it was sepo (tasteless). Finally, let's eat a little rice, ae. Yes, just eat according to your diet, sis." (LC1, female, DM 9 years)

"The rice is spicy, I can't have warm rice, it has to be spicy rice" (SN8, female, DM 2 years, diabetic ulcer)

"Yes, I like cassava, I boil it, corn too, I'm not picky, basically anything, whatever I have." (KN6, female, DM 6 months, blurred vision)

Some informants avoid cassava because it is believed to be high in sugar. According to health workers' recommendations, its consumption must be reduced.

"Steaming cassava is also not allowed, because the sugar content increases. In fact, what is allowed is like mbote, corn, sweet corn is actually allowed, well cassava is not allowed, boiled cassava is not allowed, the sugar content increases according to the doctor." (family)

The most frequently consumed vegetable protein groups are tempeh and tofu. The most frequent animal protein groups are eggs, chicken, and fish. Crackers are another side dish almost all informants usually consume.

"...crackers, tofu, that's tempeh..." (LN9, female, 9 years of DM, diabetic retinopathy)

"Yes, I eat vegetables, no meat. Yes, I eat side dishes with tofu and tempeh, crackers. Yes, before I had this (diabetes), I dared to eat pindang, now I don't dare, I don't dare to eat chicken either. I don't eat milkfish either, once in a while but only a little" (SN8, female, DM 2 years, diabetic ulcer)

Some informants avoid consuming animal protein, especially fish, because they worry it will worsen their wounds and illnesses.

"This is not allowed, sis, fish that live in the water... from catfish to cursing iwak, it is not allowed. If you want to be sane, you can eat fish that live in the water..." (HN12, male, DM 5 months, diabetic ulcer)

Consumption of vegetables and fruits is highly dependent on the condition of each informant.

Primarily, the vegetables and fruits chosen are adjusted to the taste of the informant or the informant's family.

"Lettuce, kale, green mustard greens, I like mustard greens. I don't dare to eat cabbage, I don't dare to eat it. Basically, I eat vegetables to be healthy)" (SN8, female, DM 2 years diabetic ulcer)

"My favorite vegetables are tamarind vegetables and clear spinach vegetables, wes. Long beans and spinach... Bening-bening is wes or soup, yes, my mother often cooks soup, yes, the putu-putune (grandson) likes it when my child gives me lodeh and then eats lodeh, but I never eat lodeh myself..." (SN14, male, DM 6 months, hypertension)

Some informants avoid consuming certain vegetables because they are related to disease conditions, such as preventing spinach. After all, they are worried about gout and avoiding cassava leaves. After all, they are concerned about increasing blood sugar.

"Yes, I like foreskin, but I don't dare to eat cassava leaves. Yes, I used to be able to eat spinach, but now, I don't dare because after eating it, I feel pain all over, aches and pains)" (SN8, female, DM 2 years, ulcer diabetic)

Most informants consume fruits with minimal sweetness to maintain blood sugar levels. Fruits are consumed as snacks for informants.

"For me, fruit is sometimes apple, pear, if it's pear, I look for one that's not too sweet, that's not much." (LC1, female, DM)

"You can't eat bananas, papaya is too sweet, it hurts if it's too sweet, if not, then no, for example, if the papaya is not sweet, fresh papaya is fine." (HN12, male, 5 months DM, diabetic ulcer)

Sugar and sweetener consumption varied for each informant. Some did not consume any added sugar, only natural sugar from food. Several other informants admitted to still consuming sugar, with a maximum limit of 1 tablespoon/day. Not many informants used substitute sugar, such as corn sugar or stevia.

"To be honest, my children don't have sugar, they don't drink sugar, yes, my husband doesn't drink sugar. But he doesn't replace it with classic, classic Tropicana. If he has diabetes, he uses sugar that is specifically for diabetes. I only use sugar if I want it. If not, I don't drink water." (LC1, female, 9-year-old DM)

The informant felt that the pandemic did not impact changes in eating patterns. This is because the informant is used to implementing this eating pattern.

"It's still the same. From the beginning of diabetes, when I was a virgin, I ate thiwul rice and cassava rice. Now, there is warm cassava rice and adang rice. I grate the cassava, put it on the steamer, then eat the cassava rice, the adang rice. The side dishes are vegetables, moringa, eggplant; I cook it in clear seasoning; I make clear eggplant)." (SC5, female, 9 years old DM, uric acid hypertension)

DISCUSSION

Perceptions of illness and disease (internal factors)

In this study, informants perceived that diabetes mellitus is a disease that needs to be managed independently as a form of self-preservation. A person's perception of the disease in several studies shows that one of the factors that can significantly influence the form of disease management is emotional management, which may be present when experiencing pain [7,8]. The knowledge that is understood is then applied by people with diabetes for self-management to be the key. In one meta-synthesis study on diabetes self-management, it was stated that several complex factors influence the success of diabetes management, including the relationship between interpersonal relationships, gender, and the influence of socio-cultural context [9].

External factors

In this study, significant others who play a role in forming perceptions and managing DM include family, relatives, and health workers. Researchers did not read any rejection from diabetics with the form of support given by the family. Another study found that informants in their study felt disturbed by the treatment of families who seemed to nag and threaten, thus reducing the level of self-efficacy of people with diabetes and affecting DM management [10].

The role of health workers, as perceived by informants in this study, is a motivator and source of health information.

Regarding access to health services, in this study, several things are considered by people with diabetes when choosing health services. The first consideration is health services that accept patients with BPJS. The second consideration is health services that are close to the place of residence. Informants feel that the location of the service that is close makes it easier for informants to get treatment.

Table 1. Themes, categories, and coding

Theme	Category	Coding
Perceptions of illness and disease (Internal Factors)	In the beginning, people with diabetes become aware of their DM condition (the concept of pain)	Severity occurs Complications occur Frequent urination Weight loss Feeling tired easily Weak body
	Opinions regarding the causes and disease of DM (disease concept)	Diabetes sugar disease Dry diabetes Wet diabetes DM due to heredity DM due to excessive sugar consumption DM due to diet
	Feeling	Disappointed and afraid: activities become limited, and work productivity is limited. Resigned Optimistic and grateful
	DM and COVID-19 in the eyes of diabetics	Covid disease with cough and lungs DM is vulnerable to covid It is essential to maintain body immunity. Don't know
	Motivation to act: Self-motivation	Want to be healthy Want to socialize again? I want to live a long life and hold my grandchildren. Economic conditions So as not to be a burden on the family
External factors	<i>Significant others</i>	Family support: buying medicine, taking to service locations, reminding about eating patterns Support from relatives/friends: treatment information Health worker support: motivating, providing advice according to conditions
	Access to health services	BPJS is looking for cheap/no-payment Looking for something close
	Health services during COVID-19 and resilient villages	Health services are running normally with health protocols Cadres play a role in monitoring disease conditions in the community. Funeral activities Food barn
Lifestyle, behavior, and diet of diabetics	Efforts to manage illness and disease	Maintain a diet Seeking and implementing alternative medicine Doing physical activity
	Diet Overview	Frequency: 2-3x/day; eat when you want to eat Quantity: not excessive Food groups and types: KH: corn rice, mbote, cassava, red rice, breadfruit, sweet potato Animal protein: eggs, chicken, fish Vegetable protein: tofu, tempeh, tempeh beans, menjes Vegetables: spinach, long beans, carrots, green beans, mustard greens, cassava, eggplant, kale, white mustard greens, watercress, kenikir, bean sprouts, cucumber Fruits: Ambon banana, Kepok banana, mango, orange, papaya, pear, guava, watermelon, apple, melon, cantaloupe, jicama Others: crackers Sugar and sweeteners: Do not consume at all; use <1 tbsp/day; corn sugar or stevia Cooking method: fry; stir fry; steam; boil Beliefs about certain foods: Lowering blood sugar: bitter melon, African leaves, nyamplung leaves, and mahogany fruit Lowering blood pressure: onions, male onions, horsewhip, binahong Eliminate aches and pains: earth betel Worried about wounds not healing quickly: avoid fish, meat, and soupy foods Diet and COVID-19: No change in eating patterns

This pandemic puts people with diabetes in a vulnerable position to the possibility of serious complications due to the virus. Resilient villages are one of the policies implemented at the regional level to combat the COVID-19 pandemic by involving the community. One of the domains of resilience applied in these resilient villages is health resilience. In this study, village resilience to health did not target residents with certain diseases, especially diabetes mellitus. So, residents with DM have not felt resilience in the context of health in the two resilient villages in the research area.

Lifestyle, behavior, and diet patterns

In general, people with diabetes try to implement a diet by following the advice of doctors and nutritionists. Researchers found that most informants did not mind following the advice given. The most common dietary advice received by informants included limiting excessive food consumption, avoiding high sugar consumption, and increasing fruit and vegetable consumption. This dietary arrangement should improve the general health of people with diabetes. The diet should also be attractive, easy to accept, and easy to access for people with diabetes so that the management of this diet can run sustainably [11,12].

In this study, the level of awareness and compliance of informants regarding drug consumption varied. Most informants understood the rules for consuming these drugs, which increased their compliance with drug consumption. Research by Jazz et al. (2011) in Malaysia also showed the same results. Education can increase diabetics' awareness of the need to consume drugs [13].

In this study, several informants admitted to doing physical activities such as walking and gymnastics. They did activities according to their abilities and did not force themselves. Based on the informants' statements, the intensity of their physical activity was light. This finding also aligns with a 2015 study that showed informants did physical likes such as walking. However, Several informants felt that their increasingly weak condition made physical activity difficult [14].

CONCLUSION

Diabetics define the cause of the disease based on experience and observation of events in life. Diabetics in this study consider diabetes to be a disease condition that can be managed by maintaining a diet and self-preservation. The perception formed and understood by diabetics is in line with the

recommendations in the management of diabetes mellitus that diabetes must carry out. People with diabetes show a good attitude in managing DM, including regulating diet. Proven by trying to implement the 3J principle (amount, type, hour). However, it was still found that the fulfillment of dietary needs for each informant was still far from the recommendations. Most of the informants in this study felt the presence of support from the family, health workers, and cadres as *significant others*. This presence motivates people with diabetes to maintain their health condition.

Cadres still have the opportunity to play an essential role in the health socialization process, especially in the pandemic era, because their existence is proper in the middle of society. This is important because during a pandemic, there is a risk of an increase in cases of degenerative diseases in society, especially DM and hypertension. The role of Resilient villages in the community needs to be maximized, especially in terms of health resilience. This is done to increase public health awareness, especially in pandemic conditions. This effort is expected to help other vulnerable groups, such as the elderly, pregnant women, babies, and toddlers.

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