

## Research Paper

# Diabetes Patients' Preferences and Expectations for Health Services to Prevent Diabetes Complications: A Qualitative Study



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## ABSTRACT

**Background:** Health professionals have been making efforts to avoid heart and kidney complications among diabetes patients. However, these efforts were not effective due to not directly addressing the personal needs of each patient. The purpose of this study was to explore the preferences of diabetes patients regarding health services to prevent heart and kidney complications.

**Methods:** A qualitative method with a phenomenological approach was used in this study. The samples were diabetes mellitus patients living in the Kedungmundu Community Health Center's working area who were not experiencing heart or kidney complications, totaling about 25 participants. After obtaining consent, in-depth interviews were conducted using five questions prepared as a semi-structured interview guide. The duration of the interviews ranged from 30 to 60 minutes. The data analysis utilized the seven steps of the Colaizzi phenomenological analytic method.

**Results:** The identified themes were diet pattern adjustment, expectations for health information, information on choosing the right medication, need for information on the right type of exercise, biochemical and hemodynamic control, and expectations for health care services.

**Conclusion:** The themes found provide valuable information for health professionals and the government to develop a national health improvement program to prevent complications in a more optimal and targeted manner, according to the needs of patients in Indonesia and other countries in Asia with the same culture. The development of a personalized care program to reduce the risk of heart and kidney disease complications needs to be pursued in the future.

**Keywords:** Patient satisfaction, Personal health services, Diabetes

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## Introduction

**D**iabetes mellitus is a group of metabolic disorders characterized by elevated blood glucose levels (hyperglycemia) due to defects in insulin secretion, insulin action, or both [1]. A total of 537 million people suffer from diabetes, and this number is projected to reach 643 million in 2030, and 783 million in 2045. The number of diabetes sufferers (aged 20-79) in Indonesia experienced a significant increase from 5.65 million in 2000 to 19.47 million by 2021. It is estimated that this number will increase to 23.33 million by 2030 [2]. The increase in the number of diabetes patients is also accompanied by an increase in the incidence of diabetes-related complications. Complications that often occur due to diabetes include heart and kidney diseases [3]. According to data from the National Health Insurance of Indonesia, there was an increase in total claim costs for national health insurance related to diabetes and its complications, rising from IDR 4.9 trillion in 2018 to IDR 6.4 trillion in 2022 [2]. Appropriate efforts are needed to overcome the increasing number of diabetes sufferers and their complications in the future.

The self-management practice was effective in reducing the risk of complications, especially heart and kidney complications due to diabetes [4, 5]. Self-management includes managing diet, exercise, medication, education, and independent glucose monitoring. If self-management practice can be implemented consistently, blood glucose levels can be stable, thereby reducing the risk of complications in the future [3].

The complications resulting from diabetes are currently dangerous and life-threatening. Ordinary people often believe that the management of diabetes simply involves reducing sugar consumption [6]. However, many additional measures must be taken in the management of this disease. So far, the government, through health agencies, has implemented programs to control diabetes complications [7, 8]. The programs implemented by the government have not been optimal in achieving their desired goals. The lack of optimal implementation is primarily due to a failure to understand the expectations of diabetes sufferers regarding health services [9].

Health professionals have made efforts to improve self-management by providing health education [10, 11]. However, the educational approach still relies on a population-based strategy. Health professionals generally provide health education using leaflets or posters, which are the same for all diabetes patients, even though each diabetes patient has different problems and clinical

conditions [12, 13]. The population-based approach was ineffective because it does not directly address the personal issues faced by each diabetes patient [14].

A personalized approach means that medical and nursing interventions are tailored to each patient's clinical problems and preferences precisely [15]. When patient preferences are respected, patients feel more involved in medical and nursing intervention programs, and they feel more appreciated and cared for. As a result, they pay more attention to health workers' instructions and feel a greater sense of responsibility in self-management [16, 17].

A study shows that important points regarding general patient preferences in diabetes care include the need for information about the types of complications caused by diabetes, the location of endocrinology specialist doctors near their homes, and clarity on what treatments they need and do not need. It is also important to pay attention to the distress patients experience due to diabetes. Health workers also need to carry out health training and education for families, and for the patients themselves. Additionally, information related to kidney disease and heart failure needs to be provided in detail, as it is not yet clearly understood, including guidance on safe physical activity or exercise [17]. Previous studies have been limited in exploring the preferences of diabetes patients in general across various countries. Therefore, it is necessary to investigate the preferences of diabetes patients in Indonesia due to the cultural diversity of each country.

With the findings from research regarding diabetes patients' preferences for diabetes care, it is also necessary to explore more deeply the preferences of diabetes patients for health services aimed at preventing heart and kidney complications [17, 18]. The information obtained from this study will highlight the unique preferences of diabetes patients in preventing heart and kidney complications, which are influenced by their distinct cultural backgrounds. With this information, health workers in Indonesia or other countries in Asia with similar cultures can better understand patients' wishes and accommodate them in programs that align with their preferences.

## Methods

### Study design

This qualitative study used a phenomenological approach. The research was conducted using in-depth interviews with each respondent to explore more deeply the meaning of patients' diabetes preferences for health services aimed at preventing heart and kidney complications.

**Table 1.** Semi-structured interview guide

Question	Content of Questions
1	How do you maintain stable levels of blood glucose, cholesterol, triglycerides, creatinine, and HbA1C while at home?
2	What information do you get from health professionals to keep your laboratory values within the normal range?
3	When is the best time for you to exercise at home? Please also provide information on which types of exercise you are most likely to do
4	Do you do independent laboratory tests at home?
5	Have you had a check-up outside of the health facility where you receive your routine health check-ups, for example, at another clinic, to learn more about your condition?



### Time and place of study

Data collection was conducted from July to August 2024 in the working area of the Kedungmundu Health facility in Semarang, Central Java, Indonesia.

### Sample

The population of this study was all diabetes patients living in the working area of the Kedungmundu Health Center, Semarang City, Central Java, Indonesia. The sample was recruited by purposive sampling technique with the following criteria: Diabetes mellitus patients residing in the Kedungmundu Health Facility's working area who are not suffering from heart or kidney complications. The number of participants was 25 adults aged between 30 and 50 years.

### Data collection procedure

The researcher introduced himself and asked for the patient's willingness to participate in the interview. During the interview process, the researcher built a comfortable situation and asked questions according to the interview guidelines presented in [Table 1](#).

The researcher collected data on diabetes patients at community health centers and then selected respondents who met the inclusion criteria. Respondents were asked for their willingness to be interviewed at a location of their choice. Respondents were willing to interview at their homes due to privacy reasons.

### Data validity

The determination of data validity in this study followed four criteria: Credibility, which refers to trust in the accuracy of the data and its interpretation. In this study, the researcher rechecked the verbatim transcripts to data conformity between the recordings and the tran-

scripts. The researcher then presented the interview transcripts to each respondent and sought their approval. Afterward, the researcher asked the respondents if any data needed to be added or if they agreed with the content. During the process of data collection, writing transcripts, data analysis, and theme determination, the researcher consulted with other members of the research team [\[19\]](#).

### Data analysis

The researcher analyzed the interview results according to the Colaizzi phenomenological analytic method [\[19\]](#). This method consists of seven steps, as follows: 1) Read all protocols to gain an understanding of them; 2) Review each protocol and extract significant statements; 3) Clarify the meaning of each significant statement; 4) Organize the formulated meanings into clusters of themes; 5) Integrate the results into a comprehensive description of the phenomenon under study; 6) Formulate an exhaustive description of the phenomenon in as clear a statement of identification as possible; 7) Ask participants about the findings thus far as a final validating step. This study validates the data from interviews by triangulation following ways: 1) Comparing observation data with interview data; 2) Comparing what people say about the research situation with what was done throughout the study; 3) Comparing interview results with the contents of an existing document; 4) Comparing interview results with relevant sources.

### Results

The majority of respondents were women (76%), predominantly from the Javanese ethnicity (96%), had suffered from diabetes for more than three years, and 92% regularly consumed oral medication ([Table 2](#)).

Six emergent themes were identified in this study: Diet pattern adjustment, expectations for health information, information on choosing the right medication, need for information on the right type of exercise, biochemical and hemodynamic control, and expectations for health-care services.

### Dietary pattern adjustment

Several health professionals in Indonesia stated that they have educated patients about how to regulate food portions. However, due to minimal levels of knowledge, motivation, and family support, many patients struggle to be consistent in limiting their food portions.

### Limiting food portions

Participant 1 (P1) stated to keep food portions small, eat little rice, and include lots of vegetables while continuing to eat fruit and maintaining regular meals for breakfast, lunch, and dinner, along with a mindful diet. P2 mentioned that I still eat one and a half ladles of rice, twice a day, in the morning at 10 and in the afternoon at 5. P3 indicated that I reduce rice portions and sometimes eat two times and sometimes three times a day. P4 stated that I usually eat three times a day, in the morning, afternoon, and evening. P9 noted that I reduce food portions and avoided eating if I want to sleep.

### Increasing protein consumption

P13 stated that I include side dishes of tempeh, tofu, and sea fish, and only a little chicken. P12 mentioned that I am looking for alternative sources of carbohydrates, such as eating potatoes and more meat.

### Looking for alternative carbohydrate sources

P21 indicated that I reduce my rice consumption and replace it with sweet potatoes. P17 stated that sometimes I feel like eating rice, but I replace it with brown rice, even though it is not tasty; I do this because I want to stay healthy. P23 noted that sometimes I do not eat enough rice but consume more boiled corn to maintain my energy levels.

### Limiting sugar consumption

P4 stated that I am reducing sweet drinks but use Tropicana Slim (a sugar product with less glucose) for sweetness and often drink mineral water. P7 mentioned that I cook without sugar and do not consume sweet products. P15 indicated that I never drink sweet products or water with high glucose.

### Expectations for health information

Diabetes patients must be provided with information to recognize the signs and symptoms of diabetes emergencies. Therefore, if an emergency or complications occur, patients and their families immediately go to the nearest health service.

### Need for information regarding paresthesia of the extremities

Doctors recommend attending prolanis (health program from primary healthcare) events so that patients can have regular check-ups. If there is counseling, they will inform patients that if they feel numbness, they can perform exercises such as squeezing paper; it is not necessary to do it for long, but the important thing is to exercise regularly, according to P9.

**Table 2.** Respondents' characteristics (n=25)

Parameters		No. (%) / Mean $\pm$ SD
Sex	Male	6(24)
	Female	19(76)
Ethnic	Javanese	24(96)
	Non-Javanese	1(4)
Duration of diabetes suffering in years		25(100)/3.76 $\pm$ 1.422
Medication	Oral	23(92)
	None	2(8)



### Need for information in case of an emergency

P9 stated that I have never had a health check other than at a health center, but if it is urgent, I check at the laboratory clinic. P24 mentioned that I have never had a health check outside the health center; if I am dropped off, I go directly to the hospital.

### Need for information on doctors practicing near patient residence

"If there are new complaints, I go to the nearest clinic/doctor, noted P8.

### Information on choosing the right medication

Alternative treatments for lowering blood glucose are obtained by patients based on information from the cultural practices they adopt. If the management goals have not been achieved with this first step, the patient's therapy can be combined with pharmacological measures in the form of oral hypoglycemic drug therapy, insulin therapy, or a combination of both, as recommended by health professionals.

### Pharmacological drug management

P6 stated that I take diabetes medicine in the morning before eating and blood pressure medicine in the evening. P11 indicated that I take medicine in the morning before eating and at mealtime. P12 mentioned that I take medicine regularly after dawn and after eating. P13 stated that I keep taking my medicine. P16 mentioned that I take medicine every day. P18 stated that I take my medicine. P24 noted that I take my medicine until it runs out.

### Alternative non-pharmacological drug management

One participant stated that I drink juice and papaya leaf decoction mixed with bitter melon (P14). Another participant mentioned that I often drink papaya root (P15). A different participant indicated that I drink boiled water from kenikir (the leaf of a traditional medicine plant) (P20).

### Need for information on the right type of exercise

Nurses, as educators, play an important role in providing appropriate information to diabetes patients about the management of this disease, including increasing the patient's ability to assess that he or she has the power to achieve desired outcomes. However, sometimes the physical exercise information provided by health workers does not take into account the patient's health condi-

tion, leading to non-compliance with physical exercise due to feelings of fatigue.

### Light exercise options

One participant stated that most people walk to the mosque and then return home (P2). Another participant mentioned that I exercise by walking up and down stairs (P6). A different participant noted that I walk in front of the house, routinely every morning during COVID (P10). One participant stated that they performed stretching exercises for hands and feet for 5 minutes (P12). Another participant indicated that I do tiptoe exercises in the yard (P21). One participant mentioned that I walk for 5 to 10 minutes (P23). Lastly, a participant stated that they engage in morning walks around the house (P25).

### Moderate exercise options

One participant stated that the easiest exercise is walking for 30 minutes (P1). Another participant mentioned that I walk for 30 minutes in the morning (P3). A different participant indicated that I walk from 5:30 AM to 6:00 AM routinely every day and sometimes cycle. One participant stated that I engage in morning walking exercises for approximately 10 to 20 minutes (P17). Another participant noted that I perform morning walking exercises until their body feels sweaty (P19).

### Biochemical and hemodynamic control

Many diabetes sufferers only check their blood sugar when they refer to a clinic or health center for treatment. Complete blood checks and routine health checks at health services are activities that diabetes patients cannot avoid. Currently, health agencies have created a routine examination program for diabetes sufferers.

### Self-monitoring biochemical and hemodynamic

One participant stated that I never checked my health independently, including sugar and high blood pressure, and did so routinely once a month; cholesterol checks are rare (P2). Another participant mentioned that I never check independently (P3). A different participant indicated that they check their sugar at home every day (P4). One participant stated that I never do an independent check (P5). Another participant noted that they never check at home (P6). One participant mentioned that I bought a glucometer to check their blood glucose level (P7). Another participant stated that they never check independently (P9, P10, and P11). One participant indicated that I check their blood sugar independently at



home once a month and often check blood sugar at the pharmacy clinic (P20). Lastly, one participant stated that I often check their blood sugar at home (P21).

### Laboratory monitoring in health facilities

One participant stated that there are sugar checks at health centers and complete laboratory checks every 6 months (P1). Another participant mentioned that I once had a complete laboratory check for sugar and high blood pressure, which I do routinely once a month; cholesterol checks are rare (P2). A different participant indicated that I had a check when my leg hurt, after which I was given a referral to the hospital; however, I check my sugar diligently every month and my blood pressure at the health center (P3). One participant stated that I never check their health condition outside the health center, but at the health center, I had complete checks for blood sugar, blood pressure, cholesterol, intestines, urine, HbA1C, and uric acid (P4).

### Expectations for healthcare services

Apart from the role and support of health professionals, most diabetes patients currently expect services that are easy to reach and that provide support group facilitation among diabetes patients to share their experience in diabetes care and management.

### Need support group facilitation

One participant stated that regular medical check-ups and monitoring in healthcare are sufficient (P1, P2, and P3). Another participant mentioned that check-ups and monitoring activities are conducted to check blood pressure and sugar (P11). A different participant indicated that there is no need for socialization and that it is better to go to the health center once a month (P15). One participant expressed a desire to go to the health center because there is a community health post near their house in the village hall to check cholesterol and conduct blood glucose tests (P16). Lastly, one participant stated that during regular medical check-ups and monitoring of healthcare events, they can meet friends with the same problem (P20).

### Need for empathy and attention from health professionals

One participant stated that there is a doctor who comes to their house once a month (P1). Another participant mentioned that I would like a health worker to visit my house (P4). A different participant indicated that a doctor has come to my house, and when an officer visits, I feel

happy because I feel cared for (P8). One participant stated that it would be better if a health worker visited my house once a month (P9). Another participant expressed that I also want a visit from a health worker to my house (P9). One participant mentioned that I wanted a health worker to come to my house (P14). Another participant expressed hope that there would be a visit from a health worker to my house (P17). One participant stated that I do not refuse a visit to my house (P23). Lastly, one participant mentioned that I feel happier when there is a visit to my house (P25).

### Need for affordable health facilities

One participant stated that I hope there will be communication, for example, about how to maintain a diet so that blood sugar remains stable (P7). Another participant mentioned that I would be happy if the prolanis event could provide information about blood pressure and blood sugar; sometimes, there are people from Panti Wiroso Hospital who visit the village (P12). A different participant indicated that if there is a health event, it is enjoyable as long as it is not far from home; sometimes, there are integrated health posts that come (P13). One participant stated that I have never wanted to check at the hospital but is constrained by costs (P17). Another participant expressed hope that someone would come to my house to avoid the hassle of going to the health center, which would eliminate transportation costs and long queues (P18). One participant mentioned that I hoped cholesterol checks at the health center would be conducted like those at the hospital every 6 months, and I also hoped that health workers would come to my house (P21). Lastly, one participant stated that I hoped there would be routine checks from health workers (P22).

## Discussion

Dietary pattern adjustment is the best way to keep blood glucose levels under control and prevent complications for diabetes patients [20, 21]. The results showed that the majority of patients who maintained a healthy diet experienced better metabolic control [22, 23]. Culture and food availability in Indonesia determine the diet pattern of diabetes patients, which can be seen from the meals chosen. In this study, the average patient adjusted their diet by reducing portions of rice and increasing their consumption of vegetables, fruits, and protein (meat, fish, and tempeh). In Indonesia, there is a cultural belief that “you have not eaten if you have not eaten rice,” even though it is known that rice contains high levels of glucose [24]. Diabetic patients can seek alternatives to rice for carbohydrate intake by consuming other

carbohydrate sources, such as sweet potatoes, potatoes, and corn, as was done by the patients in this study. This research shows that patients reported consuming protein from chicken, tofu, tempeh, and seafood. The Indonesian diet is characterized by a culture that is abundant in spices and has a sweet taste, which can increase the risk of complications for diabetes sufferers. Therefore, reducing the consumption of sweet foods and drinks is an effort that patients must make [25, 26].

The second theme was the expectations of diabetes patients regarding the health information they need. Some diabetes mellitus patients have physical limitations that limit their ability to search for or use information related to their disease [27, 28]. Based on information in developing countries, the search for health information and the culture of individual and community use of health information is still limited. Health professionals in the health sector had limited or no access to primary health information sources, especially formal information sources, such as the Internet. The greatest hope for patients suffering from diabetes is information that is easy to access and understand to prevent complications [29, 30].

The third theme is information on choosing the right medication. To achieve the goal of preventing complications in diabetes patients, treatment compliance is essential. Low treatment compliance can result in increased risk of treatment costs, increased disease complications, and an increased likelihood of hospitalization [31]. A lack of information causes patients not to know the dangers of stopping their medication [32, 33]. Additionally, insufficient information about medications, especially if the drugs used do not have an immediate effect or take a long time to show results, can lead patients to feel that the medications are ineffective and to prefer alternative treatments. In general, people in Indonesia now tend to use natural ingredients to treat health problems [34, 35]. The Indonesian Ministry of Health recognizes the importance of integrating pharmacological and non-pharmacological therapies as part of the national health system, particularly in primary health services, such as promotional and preventive efforts [36].

The fourth theme is the need for information on the right type of exercise. Diabetes mellitus is generally directly related to self-management, which includes individual lifestyle management patterns, such as eating patterns and activities [37, 38]. Patients need complex treatment, one of which is physical exercise. The Indonesian Endocrinology Association formulated four pillars of treatment in preventing complications of diabetes mellitus, namely education, meal planning, pharmaco-

logical intervention, and physical exercise [36, 39]. A study shows that diabetes mellitus patients who engage in walking can offset decreases in glycemia; even just walking can positively impact optimal energy expenditure. Research proves that respondents with diabetes who exercise regularly have a diabetes management success rate of 50.9% [36].

The fifth theme is biochemical and hemodynamic control. Early detection of diabetes and monitoring of blood glucose levels are important. This is because serious complications do not occur in various organs of the body. Currently, there are blood glucose testing tools available that are easy for people to use, namely glucometers. However, it seems that there are still many people, especially people in Indonesia, who are not skilled at using them [40]. In addition, there are still many people who do not understand diabetes mellitus holistically, making it necessary to provide education about the disease and how to use a glucometer. The phenomenon that occurs is the patient's lack of compliance in controlling their blood glucose levels [40, 41]. Only 21.4% of sufferers monitored their blood sugar properly. Indonesian people have expressed several reasons why some do not comply with blood sugar control. Factors influencing this include level of education, level of knowledge, time or distance traveled, as well as family support and support from health workers. Not infrequently, diabetes mellitus patients only check their blood sugar when they go for treatment [42, 43].

The final theme of this research is expectations for healthcare services. In the last few decades, diabetes mellitus patients' expectations of professional health services have increased rapidly. Improving the quality of services in Indonesia must also be accompanied by an increase in the attention of health workers [17]. The public stated that the increased attention of health workers is related to the quality of education. The information or material provided during education does not meet patients' expectations and needs. Patients feel that the information provided by health workers is too biomedical and is repeated over and over again at each education, making it too time-consuming and monotonous. Also, the information provided by health workers has not yet been synchronized with patients' daily lives and culture [14, 44]. In a survey in Indonesia, 56% of diabetes sufferers felt dissatisfied with the intervention they received and felt that nurses had not provided counseling material about diabetes management as expected [45].

## Conclusion

The research themes in this study consisted of diet pattern adjustment, expectations for health information, information on choosing the right medication, the need for information on the right type of exercise, biochemical and hemodynamic control, and expectations for healthcare services. The themes identified from exploring patient preferences to reduce the risk of heart and kidney disease complications in diabetic patients provide valuable information for health professionals and the government. This information can help in preparing a national health improvement program that is more optimal and targeted according to the preferences and needs of patients based on the culture in Indonesia.

## Limitations and suggestions

This study has some limitations. Patient preferences cannot be generalized to all patients in various countries due to cultural differences in each country. Information from existing research still needs to be adjusted to the culture in Indonesia; therefore, this study is essential for further exploration in the future. The development of a personalized care program to reduce the risk of heart and kidney disease complications needs to be done in the future.

## Ethical Considerations

### Compliance with ethical guidelines

The researcher explained the purpose of the interview. After receiving an explanation, respondents were willing to fill out the consent form provided by the researcher. Before the interview process, the researcher asked the respondents for permission during the interview process to be recorded using the voice recorder. This study was approved by the ethical review board of [Universitas Muhammadiyah Semarang](#), Semarang, India (430/KE/06/2024).

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### Authors' contributions

Conceptualization and supervision: Satriya Pranata, Yunie Armiyati, and Khoiriyah Khoiriyah; Methodology: Satriya Pranata and Yunie Armiyati; Data collection: Novita Andaresta Putri and Maya Rosmayanti; Data analysis: Satriya Pranata, Yunie Armiyati, Khoiriyah Khoiriyah, and Dwin Seprian; Investigation and writing: Satriya Pranata, Novita Andaresta Putri, Maya Rosmayanti and Dwin Seprian.

## Conflict of interest

The authors declared no conflict of interest.

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