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Factors Associated With The Health Behaviors Of Type 2 Diabetes Mellitus Patients In Medan City

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Abstract

Type 2 Diabetes Mellitus is one of the major public health problems in Indonesia, including in Medan City, and its prevalence continues to rise. This disease not only affects the quality of life of those who suffer from it but also imposes a significant burden on the healthcare system. Type 2 Diabetes Mellitus is a chronic condition that requires long-term management, where the health behaviors of patients play a crucial role in preventing complications. This study aimed to analyze the factors associated with the health behaviors of Type 2 Diabetes Mellitus patients in Medan City. The research employed an analytic correlation design with a cross-sectional approach. The study population consisted of all individuals diagnosed with Type 2 Diabetes Mellitus in seven selected healthcare center service areas in Medan City, totaling 6,493 people. The sample was obtained using accidental sampling, resulting in a total sample size of 109 participants. Data were collected using a questionnaire administered through interviews. The data were then analyzed using univariate analysis with frequency distribution and bivariate analysis using the chi-square test. The study findings revealed no significant relationship between age and gender with the health behaviors of Type 2 Diabetes Mellitus patients in Medan City. However, there was a significant relationship between education level and family support with the health behaviors of Type 2 Diabetes Mellitus patients in Medan City.

***Keywords**: Diabetes, Type 2, health behavior*

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Introduction

Morbidity and mortality rates caused by non-communicable diseases (NCDs) remain high, underscoring the need to reduce these numbers in line with the health objectives of the Sustainable Development Goals (SDGs) agenda. By 2030, the SDGs aim to achieve better health and well-being for people of all ages. However, addressing NCDs, which account for a significant proportion of global deaths, is a challenging task.

Globally, NCDs contribute to 74% of all deaths, claiming 41 million lives annually (WHO, 2023). The leading causes within this category are cardiovascular diseases (17.9 million cases), cancer (9.3 million cases), respiratory diseases (4.1 million cases), and diabetes mellitus (1.5 million cases) (WHO, 2023). Diabetes mellitus (DM) ranks fourth among NCDs and is one of the major causes of death worldwide. According to the International Diabetes Federation (IDF), the number of people living with diabetes globally reached 537 million in 2021 and is projected to rise to 643 million by 2030.

In Indonesia, the prevalence of diabetes mellitus is also increasing. With 19.5 million cases in the 20–79 age group, Indonesia ranks among the top 10 countries with the highest number of diabetes cases, and the numbers are expected to grow annually (IDF, 2021). Data from the 2023 Indonesian Health Survey (SKI) reveals that the prevalence of diabetes mellitus among individuals aged ≥15 years, based on doctor diagnoses, has increased to 2.2% from 2.0% in 2018. Similarly, blood sugar testing shows a prevalence rise from 10.9% in 2018 to 11.7% in 2023.

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From a pathophysiological perspective, diabetes mellitus is classified into four types: Type 1 diabetes (DM Type 1), Type 2 diabetes (DM Type 2), gestational diabetes, and other specific types (ADA, 2022). Over 90% of diabetes cases worldwide are Type 2 DM, making it the most common form (IDF, 2021). While diabetes cannot be completely cured, patients can manage their blood sugar levels to improve their quality of life and prevent severe complications (Ministry of Health, 2023).

Complications arising from uncontrolled blood sugar levels include vision impairment (blindness), gangrene, stroke, heart disease, obesity, impotence, and kidney disorders. In severe cases, some patients may require limb amputation due to worsening conditions. Diabetes mellitus is often referred to as the "Silent Killer" because it affects multiple organs and can cause a range of debilitating symptoms (Ministry of Health, 2023). SKI data (2023) indicates that diseases like DM account for 59.1% of disabilities (e.g., vision, hearing, and mobility impairments) among individuals aged ≥15 years. Of these, 53.5% are attributed to NCDs, with DM contributing 10.5%.

The complications of Type 2 diabetes mellitus can be prevented if patients adopt proper health behaviors. Health behaviors are categorized into three main groups: health maintenance

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behaviors, utilization of healthcare services, and environmental health behaviors (Ajzen & Fishbein, 2000). For Type 2 DM patients, these behaviors include dietary regulation, physical activity, blood sugar monitoring, and adherence to prescribed medications (Ministry of Health, 2022).

To support Type 2 DM patients in achieving optimal quality of life, reducing complications, and ensuring regular visits to primary healthcare facilities, the government has introduced the Prolanis program (Chronic Disease Management Program). This program includes activities such as: (1) medical consultations or educational sessions, (2) home visits, (3) reminders, (4) group activities, and (5) health status monitoring. Prolanis activities are implemented in health centers with schedules agreed upon by program organizers and participants (Ministry of Health, 2019).

Despite government support through programs like Prolanis, health behaviors among diabetes patients are not widely adopted. Among productive-age individuals (18–59 years), there is a disparity between the percentage of respondents diagnosed with DM (1.6%), those receiving treatment (1.46%), and those making follow-up visits to healthcare facilities (0.9%). A similar gap exists among older adults (≥60 years), where 6.5% are diagnosed with DM, 6.06% receive treatment, and only 4.12% make follow-up visits. Additionally, SKI data (2023) indicates that younger DM patients (18–59 years) are 1.3 times more likely to engage in insufficient physical activity and three times more likely to have central obesity compared to those without central obesity. Among older patients (≥60 years), the likelihood of central obesity is 2.3 times higher in DM patients than in non-DM individuals.

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Methods

This research employs an analytic correlation design with a cross-sectional approach. The study population consists of all individuals diagnosed with Type 2 Diabetes Mellitus in the service areas of seven selected health centers in Medan City, totaling 6,493 people. The sampling technique used is accidental sampling, resulting in a sample size of 109 participants. Data were collected using a questionnaire administered through interviews. The data were then analyzed using univariate analysis with frequency distribution and bivariate analysis with the chi-square test.

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Results

Table 1. Overview of Factors Related to Health Behaviors of Type 2 Diabetes Mellitus Patients in Medan City

Respondents Characteristics	Amount (n)	Percentage (%)
Age		
20-45 years	12	11.0
46-60 years	97	89.0
Gender		
Woman	71	65.1
Man	38	34.9
Education		
High	15	13.8
Low	94	86.2
Work		
Work	63	57.8
Doesn't work	46	42.2
Support Family		
Good	53	51.4
Less	56	48.6
Health Behavior		
Good	46	42.2
Less	63	57.8

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Table 1 shows that the majority of respondents are aged 46-60, with 97 people (89%), while the rest are aged 20-45, comprising 12 people (11%). Most of the respondents in this study were female, with 71 people (65.1%), while the remaining 34.9% were male. Regarding occupation, more respondents were employed, with 63 people (57.8%), while 42.2% were not working. In terms of education, the majority of respondents had secondary education (high school), with 72 people (66.1%), followed by 22 people (20.2%) with basic education (elementary school), and 15 people (13.8%) with higher education (D3 and S1). Additionally, the results of the family support variable in relation to health behavior implementation showed that 56 respondents (48.6%) had low family support, while 53 respondents (51.4%) had good family support.

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Table 2. Description of Health Behavior of Type 2 Diabetes Mellitus Patients in Medan City

Respondents Characteristics	Amount (n)	Percentage (%)
Health Behavior		
Good	46	42.2
Not enough	63	57.8

Based on the results of measuring the health behavior variable, 63 respondents (57.8%) were categorized as having insufficient health behavior, while 46 respondents (42.2%) were categorized as having good health behavior.

Table 3. Relationship of Factors Related to Health Behaviors of Type 2 Diabetes Mellitus Patients in Medan City

Age	Health Behavior				Total		*p*	Exp(B)
	Good		Not enough					
	n	%	n	%	n	%		
20-45	3	25.0	9	75.9	12	100	0.201	2,389
46-60	43	44.3	54	55.7	97	100		

Gender	Health Behavior				Total		*p*	Exp(B)
	Good		Not enough					
	n	%	n	%	n	%		
Man	18	47.4	20	52.6	38	100	0.424	0.327
Woman	28	39.4	43	60.6	71	100		

Education	Health Behavior				Total		*p*	Exp(B)
	Good		Not enough					
	n	%	n	%	n	%		
Low	33	35.1	61	64.9	94	100	0.0001	12,015
High	13	86.7	2	13.3	15	100		

Support Social	Health Behavior				Total		*p*	Exp(B)
	Good		Not enough					
	n	%	n	%	n	%		
Good	43	81.1	10	18.9	53	100	0.0001	75,967
Less	3	5.4	53	94.6	56	100		

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Table 3 shows that there is no significant relationship between age (p = 0.201) and gender (p = 0.424). However, there is a significant relationship between education and health behavior of DM sufferers (p = 0.0001). There is also a significant relationship between family support and health behavior of DM sufferers (p = 0.0001).

Discussion

Relationship Between Age and Health Behavior of Type 2 DM Patients in Medan City

Based on the study results, it can be seen that respondents aged 46-60 have poor health behavior (55.7%). The chi-square statistical test results show a p-value of 0.201 > 0.05, meaning there is no significant relationship between age and health behavior among Type 2 DM sufferers in Medan City. This finding is consistent with Fatimah's research (2016), where data analysis using the chi-square test showed no connection between age and diabetes self-management (p-value = 0.266). Respondents with good health behavior had an average age of 56 years (20 people), while those with poor health behavior had an average age of 60 years (15 people).

Dasopang (2018) stated that older patients tend to experience a decline in physical and cognitive abilities, which can influence their capacity to engage in health behaviors. Additionally, the emergence of complications in older age will also affect the ability of patients to maintain self-care. Yusra (2010) suggests that as a person ages, there is a greater likelihood of declines or changes in physical, intellectual, and psychological aspects. This is supported by Toobert's study (2013), which concluded that age does not influence a person's ability to perform self-management. However, the differences across studies may be due to younger respondents having a better understanding of health behaviors, while older respondents may rely more on the experiences gained through self-management (Khasanah, 2016).

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In conclusion, respondents aged 20-45 and 46-60 were found to exhibit insufficient health behaviors to maintain normal blood sugar levels and prevent complications caused by DM.

Relationship Between Gender and Health Behavior of Type 2 DM Patients in Medan City

The research results show that the majority of respondents are women (65.1%), and most of them exhibit poor health behavior (60.6%). Based on the chi-square test, the p-value was 0.327 > 0.05, indicating no significant relationship between sex and health behavior among Type 2 DM sufferers in Medan City. This is in line with Ningrum and Siliapantur's research (2019), which found no connection between sex and health behavior. Sari's research (2017) also reported no connection between sex and self-management. In contrast, a study by Purwangsih (2018) showed a significant connection between sex and self-management (p = 0.000). This study found that women exhibited the highest levels of self-management.

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Differences across studies may be due to the fact that health behavior among DM sufferers can be influenced by both men and women. Men may not always pay sufficient attention to disease management, while women may be more attentive to their health conditions. Motivation and intrinsic drive to maintain health behaviors can lead to daily healthy habits (Dasopang, 2018).

Relationship Between Education Level and Health Behavior of Type 2 DM Patients in Medan City

The research results indicate that the majority of respondents (86.2%) with lower education levels have poor health behavior (64.9%). The statistical test results showed a p-value of 0.0001, meaning there is a significant relationship between education level and health behavior among Type 2 DM sufferers in Medan City. These findings align with Putri's research (2024), which indicated a very strong relationship between education level and self-care activity, with a Spearman rank correlation of r = 0.831 (p = 0.000). Higher education levels are associated with better knowledge and responses to health-related information. People with lower education levels often find it more difficult to accept and understand health messages.

Education is an essential part of the learning process, which helps individuals acquire health-related knowledge. Learning allows people to better understand their health conditions and improve their overall well-being (Simon, 2020).

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Relationship Between Family Support and Health Behavior of Type 2 DM Patients in Medan City

Bivariate analysis results show a significant relationship between family support and health behavior of Type 2 DM sufferers in Medan City (p = 0.000). This finding is consistent with studies by Anggi and Rahayu (2020), which found a connection between family support and diet compliance among diabetes mellitus patients (p = 0.025). Ningrum's research (2020) also showed that family support (p-value = 0.000; PR = 8.17) was linked to medication adherence in Type 2 DM patients. Family support includes attitudes, actions, and acceptance from family members, and it plays a crucial role in maintaining health.

Family support can positively impact both physical and mental health, while a lack of support is associated with higher levels of pain and mortality. Support from family and friends is an integral part of the social support system that influences health behavior. The family is a key system for diabetes mellitus sufferers, providing support and encouragement to adhere to treatment (Friedman et al., 2018).

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Conclusion

Based on the study on the related factors with health behavior among Type 2 DM sufferers in Medan City, the results showed that there is no significant relationship between age and gender with health behavior among Type 2 DM sufferers in Medan City. However, there is a significant relationship between education level and family support with health behavior among Type 2 DM sufferers in Medan City.

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