

## **The Relationship of Environmental Factors (Family Support, Health Worker Support and Friend Support) to the Improvement of Life Style Behavior in Diabetes Mellitus Patients in the Pekanbaru City Health Center Area.**

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### **ABSTRACT**

Diabetes mellitus is a chronic metabolic disease that can lead to serious complications, including damage to the eyes, kidneys, blood vessels, nerves and heart. A healthy lifestyle is important in the management of diabetes, but behavior change is often difficult to achieve without appropriate interventions. Although environmental factors (family support, friend support and health worker support) are one of the social cognitive theory, other factors must also be considered. Objectives This study aims to determine the relationship between family support, health worker support and friend support on improving the life style behavior of patients with diabetes mellitus. This research method uses descriptive and explanatory research approaches. The study population consisted of 326 patients with diabetes mellitus registered at five health centers in Pekanbaru City. The sampling technique used was probability sampling with random sampling method. The instrument used was a questionnaire to measure the variables of family support, health worker support and friend support on improving the life style behavior of diabetes mellitus patients. Data analysis was performed using descriptive analysis techniques and Partial Least Squares. The results showed a significant relationship between environmental factors and improving life style behavior (path coefficient = -0.314; t-statistic = 5.761). Environmental factors have a significant effect on improving lifestyle behavior. can be integrated in diabetes management programs at the Puskesmas level. Promotive policies that encourage active social support are needed for sustainable healthy lifestyle changes.

**Keywords: Diabetes mellitus, family support, health worker support, friend support, lifestyle behaviour.**

## Introduction

Diabetes mellitus (DM) is one of the most serious public health problems in Indonesia. Diabetes mellitus is a chronic disease that cannot be totally cured. The disease not only affects individual health but also has a significant social and economic impact on the country. Indonesia itself ranks 5th in the world for the number of diabetes mellitus patients. (Norma Lalla & Rumatiga, 2022)

According to the Indonesian Ministry of Health, Diabetes is an increasing global health problem worldwide. In the 21st century, the increase in diabetes cases is faster, as confirmed by the International Diabetes Federation (IDF) in its 10th edition Atlas by the end of 2021. By 2021, there will be 537 million cases of diabetes worldwide, equivalent to more than half a billion cases. Everyone estimates that the number will reach 643 million by 2030 and 783 million by 2045. In addition to the high number of diabetes patients, it is estimated that the number of patients with blood sugar problems will also begin to increase. By 2021, more than 541 million people will have reduced glucose tolerance, also known as prediabetes. Another impact of diabetes is the high diabetes mortality rate in this population, estimated to be more than 6.7 million people between the ages of 20 and 79 (Indonesian Ministry of Health, 2021). Based on data from the Riau Health Office, there are 90,797 cases of diabetes in the province, with the largest number of cases in Pekanbaru City (18,044). The results of research conducted at DKK (City Health Office) Pekanbaru revealed, there were 10,094 cases of DM visits from 21 Puskesmas, with 5 Puskesmas (Garuda 1148 cases, RI Tenayan Raya 964 cases, RI. Simpang Tiga 940 cases).

One of these increases is caused by changes in social structure due to changes in lifestyle that can lead to an increase in non-communicable diseases, one of the most common diseases is diabetes mellitus (Burhan, 2019). Lifestyle greatly affects a person's physical and psychological condition, lifestyle changes and lack of healthy living behavior can lead to various health problems, unhealthy habits affect the emergence of diabetes mellitus such as an unbalanced diet (Violline, 2021).

Changes in lifestyle have led to an increase in non-communicable diseases, one of the most common diseases is diabetes mellitus (Burhan, 2019). Lifestyle greatly influences a person's physical and psychological condition. Local cultural factors, such as the social habit of eating together and the value of respect in serving foods high in carbohydrates and sugar, also pose a challenge in managing a healthy lifestyle, especially in Pekanbaru. In addition, the role of family and social environment often reinforces unhealthy behaviors, such as giving food restrictions to people with DM or limiting physical activity because of the desire to care excessively.

The nurse is a factor that has an important role in changing the patient's behavior so that there is an equilibrium in the patient. The behavioral system model developed by Dorety E. Johnson is one method that can be used. Individuals, according to the Behavioral Systems Model are action systems that strive for balance and stability, both in the internal and external environment. They also have the ability to adapt and respond to changing circumstances. (Glasgow, 2024).

Although environmental factors (family support, health workers and friend support) part of Social cognitive theory has been widely applied to diabetic patients in various countries, most of the studies were conducted outside Indonesia, so the integration of SCT in the context of local Indonesian culture, especially in managing healthy lifestyles in areas such as Pekanbaru, is still

very limited. This study offers a new approach by applying parts of SCT in the context of local Indonesian culture, specifically to improve healthy lifestyle behavior in diabetic patients in Pekanbaru City. By considering local cultural factors, this study has the potential to contribute significantly to the development of intervention models that are more effective and easily accepted by the community, increasing the chances of success in changing healthy lifestyles in diabetes mellitus patients. This study aims to determine the relationship of environmental factors (family support, health worker support and friend support) to improving life style behavior in DM sandn in the Pekanbaru City Puskesmas area. This study integrates an environmental factor approach to improve the management of healthy lifestyles in diabetic patients, taking into account the local cultural values that exist in Pekanbaru.

## Methods

This research uses non-experimental quantitative methods with a descriptive analysis approach and explanatory research type. Explanatory research aims to explain the relationship between the independent variable and the dependent variable. This research was conducted in the Puskesmas area of Pekanbaru City, focusing on five Puskesmas that have the highest number of diabetes mellitus cases among 21 Puskesmas in Pekanbaru City, namely Garuda Puskesmas, Ri Tenayan Raya Puskesmas, RI Simpang Tiga Puskesmas, Karya Wanita Puskesmas, and Payung Sekaki Puskesmas. The selection of these Puskesmas was carried out to obtain a representative sample, with the hope of providing a comprehensive picture of the factors that influence the lifestyle behavior of diabetes mellitus patients in Pekanbaru City. This study was conducted from August to September 2024. The population in this study were diabetes mellitus (DM) patients registered at five Puskesmas with the most DM cases in Pekanbaru City, namely Puskesmas Garuda, RI Tenayan Raya, RI Simpang Tiga, Karya Wanita, and Payung Sekaki, with a total population of 4,282 patients from January to December 2023. The research sample was calculated using the Lemeshow formula (1997) due to the unknown or unlimited population size, with a confidence level of 95%, an estimated maximum proportion of 0.9, and a 5% margin of error (sampling error). The sampling technique used was probability sampling with the random sampling method, where the sample was randomly selected from patients registered at the five health centers. The proportion of the sample was divided based on the population size in each health center to ensure balanced representation in the study. The sample criteria in this study were divided into inclusion and exclusion criteria. Inclusion criteria included patients who were willing to become respondents, aged between 19 to 65 years, had a blood sugar level of more than 200 mg/dL, were patients with diabetes mellitus who sought treatment at the Puskesmas, and had at least elementary school education. Exclusion criteria were patients who were being hospitalized at the health center, patients with cognitive impairment that could affect the ability to understand instructions or answer the questionnaire, as well as patients who were not present when the study was conducted.

## Results

Data analysis was conducted using Partial Least Squares (PLS), an effective statistical method to overcome problems in the data, such as non-normal distribution, missing values, and multicollinearity. PLS does not require the assumption of normal distribution and can be used with small samples. The first step is to evaluate the outer model by measuring the validity of indicators through loading factors (more than 0.5 is considered valid) and Average Variance Extracted (AVE) for discriminant validity. Reliability tests were conducted using composite reliability and Cronbach's alpha (values  $> 0.6$  and  $0.7$  indicate high reliability). Furthermore, the inner model was tested by looking at the R-square value to assess the quality of the model, with criteria of 0.75 (strong), 0.50 (medium), and 0.25 (weak). Q-square evaluation is used to assess the predictive relevance of the model. For hypothesis testing, the path coefficient was used to test the direct effect between variables, with a p value  $< 0.05$  indicating a significant relationship.

Table 1. Frequency Distribution of Improved Life Style Behavior of DM Patients in 5 Puskesmas of Pekanbaru City, Riau Province, 2024 (n=326)

No	Life Style Improvement Behavior	Frequency	Percentage (%)
1	No Improvent	183	56,1
2	There is an increase	143	43,9
	<b>Total</b>	<b>326</b>	<b>100</b>

Based on Table 4.1, it can be seen that the results of the increase in lifestyle behavior values from 326 respondents in the Pekanbaru City Health Center area showed that most of them did not experience an increase in lifestyle behavior of 56.1%, while those whose lifestyle behavior increased were 43.9%.

Table 2. Frequency Distribution of Environmental Factors on the Lifestyle Behavior of DM Patients in 5 Health Centers in Pekanbaru City, Riau Province in 2024 (n=326)

Variable	Category	Frequency	Percentage (%)
Family Support	Tall	214	65,6
	Low	112	34,4
	<b>Total</b>	<b>326</b>	<b>100</b>
Friend support	Tall	201	61,7
	Low	125	38,3
	<b>Total</b>	<b>326</b>	<b>100</b>
Support from health workers	Tall	156	47,9
	Low	170	52,1
	<b>Total</b>	<b>326</b>	<b>100</b>

Based on the table above, it is known that 214 respondents (65.6%) received high family support. The majority of respondents received strong support from their family environment. This shows the important role of the family in encouraging or facilitating positive behavior, especially in the context of health. More than half of respondents or 61.7% felt supported by their friends. Support from peers can contribute to the formation of motivation, a sense of togetherness in healthy activities, and social reinforcement to maintain behavioral changes. Interestingly, more than half of respondents (52.1%) felt that they received less support from health workers. This shows the potential for weaknesses in health services or communication between medical personnel and patients.

Table 3. Results of the Inner Model Test for Improving Lifestyle Behavior in Diabetes Mellitus Patients

Connection	<i>Original sample</i>	<i>Sample mean</i>	<i>Standard deviation</i>	<i>T statistik</i>	<b>Ket</b>
Environmental Factors > Behavior <i>Life Style</i>	-0,314	-0,311	0,055	5,761	sig

Table 3. The results of the PLS analysis of environmental factors and lifestyle behavior have a path coefficient value of -0.314 and a t statistic value of 5.761 ( $t > 1.96$ ). This shows that there is a significant relationship between environmental factor variables and lifestyle behavior in patients with diabetes mellitus. A positive sign on the Path Coefficient value indicates a unidirectional relationship and can be interpreted that the higher the environmental factor, the stronger the increase in the lifestyle of Dibaestes patients.

## Discussion

These results indicate that there is a significant relationship between environmental factors and increased lifestyle behavior. Valid environmental factors consist of peer support in increasing lifestyle behavior. According to Bandura (2007) that in carrying out health promotion in order to change behavior into healthy behavior, namely with health workers, in this case providing support in terms of providing health communication channels that can change health habits and using media such as informing, modeling and motivating and guiding individuals in the process of change, both creating social networks and community arrangements where these special places are arranged and guided intensively.

This very high level of friend support is reflected in the respondents who answered strongly that friends can help when sick, such as supporting clients to stay away from prohibited foods when at events, prohibiting smoking or not being invited to smoke when gathering, resulting in an increase in the patient's lifestyle behavior. This study is not in line with Khotimah's (2018) research, which states that friend support is still lacking. Support from health workers is reflected by health workers not optimally providing information about health, especially regarding a healthy lifestyle.

Furthermore, the relationship between environmental factors and lifestyle behavior showed significant results. Peer support plays an important role in supporting a healthy lifestyle, especially in encouraging patients to avoid unhealthy eating habits and smoking, support from health workers plays an important role in increasing compliance in lifestyle behavior. This finding is in accordance with the results of a study by Kusumayanti & Rahayu (2019) patients need the support of health workers to increase their compliance. Health workers act as educators who provide accurate information about DM,

provide health education so that complications do not get worse, teach how to properly treat diabetes mellitus so that they can motivate patients with DM. This finding is in accordance with the results of a study in the United States which linked peer support to increased physical activity after a diabetes diagnosis (W.Qin.2022).

Unfortunately, support from health workers is considered less than optimal, in contrast to studies in other countries which show that support from health workers can encourage significant lifestyle changes (S.Suhl.J.B.Rost.K.C (2020)

This study demonstrates that in the context of local culture and reinforces the importance of a community-based approach in diabetes management. This study also provides practical contributions to the development of health education and promotion programs that consider peer support and local cultural values such as mutual cooperation. Policy implications of this study suggest the need for active involvement of health workers in ongoing support programs, self-regulation skills training for patients, and community-based health promotion campaigns that strengthen local social and cultural networks.

### conclusion

Environmental factors, especially peer support, have a strong influence on behavioral change, while the role of health workers and families is still not optimal. These results indicate that psychosocial dimensions have a greater influence than demographic factors on the success of diabetes management. Health workers need to improve their consistent and empathy-based educational role, while policy makers are advised to design promotive policies that encourage the formation of active social support at the primary level. Interventions targeting improving patient self-regulation and motivation should be integrated into diabetes management programs so that lifestyle changes can be sustainable.

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