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Family Support and Dietary Adherence in Individuals with Type 2 Diabetes Mellitus in Banten, Indonesia

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ABSTRACT

The aim of this study was to determine the correlation between family support and dietary compliance in diabetes patients. This observational, crossectional study was conducted among 92 Type 2 Diabetes Mellitus (T2DM) patients age 20–70 years in Citangkil Public Health Center, Cilegon, Banten, Indonesia. Data were collected using self administered questionnaire to measure the dietary adherence and family support. Data was analyzed using Fisher Exact Test. Among 92 respondents that participated in the study, 84 (91.30%) reported having good family support, while 8 (8.70%) reported having inadequate family support. Family support associated with dietary adherence in individuals with T2DM ($p<0.05$) in the Citangkil I Public Health Center area, Cilegon I, Banten, Indonesia. Good family support is expected to increase dietary adherence in T2DM patients.

Keywords: diabetes, dietary adherence, family support

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is a group of metabolic diseases defined by hyperglycemia signs and symptoms caused by abnormalities in the production or action of insulin or both (PERKENI 2021). Diabetes Mellitus is a non-communicable disease with a high prevalence worldwide, and the prevalence rate will continue to rise globally. According to the International Diabetes Federation (IDF), the global prevalence of Diabetes Mellitus in the 20–79 age range was 8.3% in 2019. Meanwhile, Bangun *et al.* (2020) state that the prevalence of Diabetes Mellitus in Indonesia has increased by 6.9% (MoH RI 2013) to 8.5% (MoH RI 2018) and results (Dinkes Provinsi Banten 2020) Banten province in 2018 the prevalence of individuals with Diabetes Mellitus in the City of Cilegon in residents aged 15 and over the target 2021 prevalence of T2DM is 2.6%, or 8,726 people.

T2DM must be closely monitored for blood sugar levels to remain stable (Ilmah & Rochmah 2015). The implementation of a specific dietary regimen is an integral component of diabetes management strategies, aimed at mitigating the risk of complications. Effective adherence to the prescribed dietary plan is contingent upon factors such as familial support, healthcare provider involvement, and pertinent knowledge factors (Anggi & Rahayu 2020). Dietary adherence entails minimizing fatty foods, soft drinks, sweets, and carbohydrates and increasing fiber, fruit, and vegetable consumption.

Individuals with Diabetes Mellitus recognize the significance of dieting, but many are inevitably disobedient to their diet, intentionally or accidentally. Several factors, including internal and external factors, can influence dietary adherence in individuals with Diabetes Mellitus. Internal factors of dietary adherence can be affected by education, knowledge, beliefs, and personal traits. In contrast, external aspects of a person's dietary adherence are influenced by the environment, family support, and interactions between health professionals and patients with Diabetes Mellitus (Bangun *et al.* 2020). Individuals with T2DM can receive support from their families through assistance with nursing issues, adherence to dietary recommendations, and encouragement to continue following a healthy diet to maintain and enhance their quality of life. Family intervention may improve patients' perceptions of social support, self-efficacy, diabetes knowledge, and self-care (Mphasha *et al.* 2022; Baig *et al.* 2016). Family support had a

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correlation with dietary adherence in individuals with Diabetes Mellitus (Azmiardi *et al.* 2021; Aklima *et al.* 2012).

The incidence of T2DM at the Citangkil I Health Center was the highest in the city of Cilegon, Banten, Indonesia, and family support correlated with dietary adherence in individuals with T2DM. Given these problems, this study aims to determine the correlation of family support to diet adherence in patients with T2DM in the Citangkil I Public Health Center area, Cilegon City, Banten, Indonesia.

METHODS

Design, location, and time

This is an observational study with a cross-sectional study design, which aims to determine the correlation between family support and dietary adherence in individuals with T2DM. Cross-sectional design was used because it enables measurement of prevalence for all aspects under examination and allows researchers to acquire information about multiple age groups in a short amount of time and at a low cost. This study was conducted from June 2021 to September 2022 at Citangkil I Health Center, Cilegon City, Banten, Indonesia.

Sampling

The sampling technique used in this research was consecutive sampling. The population of this study was T2DM patients who lived in the Citangkil I Public Health Center area, Cilegon City, totaling 727 individuals with T2DM, and the sample size of this study was 92 respondents (determined using the Lemeshow formula, which was added 10% to avoid sample dropping out). The inclusion criteria of the subjects were patients diagnosed with Type 2 Diabetes Mellitus, have family members, age more than 18 years old, and are literate. The exclusion criteria of subjects are T2DM patients who is mute and deaf.

Data collection

Data were collected using self administered questionnaires to measure the dietary adherence and family support. The questionnaire used in this study refers to questionnaires that have been used in previous study (Sulanjari 2018). The questionnaires have been tested for validity and reliability with the results of the validity test of the family support questionnaire (r=0.704–0.914) and the diet adherence questionnaire (r=0.949–0.983) for the reliability value of the family support questionnaire (α=0.957) and on the diet adherence questionnaire (α=0.957).

The instruments used for data collection in this study were the dietary adherence and family support questionnaires. Questionnaire I contains the level of family support for individuals with T2DM and consists of 16 questions with a Likert scale category of favorable questions. Positive questions scored Always=4, Often=3, Rarely=2, Never=1 and one negative/unfavorable questions scored Always=1, Often=2, Rarely=3, Never=4. Questionnaire II contains dietary adherence in individuals with Diabetes Mellitus, including 19 questions with a Likert scale category of positive questions. Positive questions scored Always=4, Often=3, Rarely=2, Never=1 and on negative questions scored Always=1, Often=2, Rarely=3, Never=4.

Data analysis

Subject characteristics such as age, gender, occupation, level of education, and length of suffering from T2DM were described in percentage (proportion). Bivariate analysis uses Fisher's exact statistical test because it does not meet the requirements of using the chi-square test. This research has received approval from the Research Ethics Commission of 'Aisyiyah Yogyakarta University and has fulfilled ethical principles with No: 2252/KEP-UNISA/VII/2022.

RESULTS AND DISCUSSION

Based on Table 1, of the 92 respondents, it was found that the average age of respondents in the middle adult category (40–60 years) was 59.78% of respondents. More than half of the respondents got good family support (91.30%) and good adherence to their diet (91.30%) (Table 1).

Based on Table 2, it was found that 17 respondents (88%) of 82 respondents had good family support and adhered to their diet. Meanwhile, some respondents had poor family support and dietary adherence (5%) (Table 2). The statistical test showed a correlation between family support and dietary adherence in individuals with T2DM in the Citangkil I Public Health Center Area, Banten, Indonesia ($p<0.05$, $p=0.0001$).

Table 1. Characteristics of respondents

Variable	f	%
Age		
Adult (20–40 years old)	6	6.52%
Middle age (40–60 years old)	55	59.78%
Late adult (>60 years old)	31	33.70%
Education level		
Elementary	11	11.96%
Junior High School	13	14.13%
Senior High School	43	46.74%
Academy/College	23	25%
No school	2	2.17%
Sex		
Male	48	52.17%
Female	44	47.83%
Work		
Private area	11	18.48%
Entrepreneur	13	30.43%
Civil servant	43	11.96%
Unemployment	23	39.13%
Length of time with diabetes		
1–3 Years	28	30.43%
4–6 Years	25	27.17%
>6 Years	39	42.39%
Family support		
Good	84	91,30%
Poor	8	8.70%
Dietary adherence		
Good	84	91.30%
Poor	8	8.70%

Table 2. The Correlation between family support and dietary adherence

Family support	Dietary adherence				Total		*p*
	Good		Poor				
	n	%	n	%	n	%	
Good	81	88	3	3	84	91	0.001*
Poor	3	3	5	5	8	9	
Total	84	91	8	9	92	100	

Families can help patients with T2DM adhere to their diets by regularly monitoring their health and informing them of the objectives, advantages, and side effects of their diet. Families can also offer informational support by giving patients with T2DM information obtained from health professionals, most of which is provided by walking alongside them. Family and friends' social support offers patients useful assistance and can lessen the strains of dealing with illness (Miller & DiMatteo 2013). Family support increases the dietary adherence of patients with T2DM (Susanti & Sulistyarini 2013). When the families of adults with T2DM2 participated in culturally appropriate family-based interventions, it helped families better understand the needs of the individuals with T2DM2, and it encouraged family behaviors that made it possible for the adults with T2DM2 to live healthy lives (Busebaia *et al.* 2023). There may be a connection between the increased risk of diabetes and non-communicable illnesses in a partner and family due to comparable dietary habits, lifestyles, and micro- and macro-environments. Family and spouse support is crucial for overcoming unfavorable behaviors and optimizing behaviors in diabetes management, studies have repeatedly demonstrated (Gupta *et al.* 2019).

Family support is related to dietary adherence because the more substantial the family support for individuals with T2DM, the higher their dietary adherence. Family support is significant to motivate patients to create an environment that avoids the stress caused by the treatment (Anjani & Gayatri 2018; Kencana *et al.* 2022). Family social support protects against stress triggers and creates a comfortable environment to maintain blood sugar control (Miller & DiMatteo 2013). Emotional support can involve expression, empathy, and concern for someone to make them feel better, feel they have regained their confidence, and feel belonging and love in times of stress. Communication and interaction between family members are necessary to understand the situation of family members. This dimension is obtained by measuring the patient's perception of family support through understanding and affection from other family members.

Family support consists of 4 dimensions, namely emotional support, information support, instrumental support, and appreciation support. So, with the fulfillment of these 4 dimensions, respondents with good family support tend to be more obedient in carrying out the T2DM diet. The results of research on emotional support for most of the respondents always answered that the family encouraged them to maintain their health. The family also advised respondents regarding T2DM. Still, in some respondents, it was also found that there were families who allowed respondents to eat or drink even though they violated dietary rules, did not help meet the needs of respondents, and did not supervise the implementation of eating rules that must be followed by sufferers of T2DM as evidenced by the respondent's answers to the family support questionnaire at point 11 which is about freedom to choose food and drink, blood sugar levels.

Based on the results, most of the families served and assisted the respondents when needed, and most of the families escorted or accompanied the respondents for treatment at health facilities. Most of the respondents' families always bought or provided them with food according to the recommended dietary guidelines for people with Diabetes Mellitus. Nevertheless, other

respondents discovered that many families rarely made an effort to hear the stories and criticisms that people with Diabetes Mellitus wished to share. A recent study about Dietary adherence to T2DM patients at the Depok II Health Center in Sleman Yogyakarta shows that the majority of respondents adhere to their diet as evidenced by the last level of education in the elderly who have been exposed to the characteristics of the respondents showed that most of the elderly had high school education so that the elderly were easier to receive information (Go'o *et al.* 2020).

Dietary adherence is a behavior recommended by nurses, doctors, and other health workers that must be adhered to by individuals with Diabetes Mellitus. Dietary adherence in individuals with Diabetes Mellitus, namely in the form of eating patterns and the accuracy of eating T2DM patients. The diet T2DM patients must pay attention to the amount of food, type of food, and meal schedule to control their blood glucose levels. Food management is the key to managing Diabetes Mellitus, which at first glance seems easy, but it is difficult to control one's appetite. Complying with a series of diets is a big challenge for T2DM patients so that complications do not occur. T2DM patients frequently have poor diet adherence because they do not comprehend, put into practice, and retain the necessary antecedents, including motivation, comprehension, health beliefs, self-efficacy, practical goals, and social support (Al-Salmi *et al.* 2022). Rural residents with diabetes had a 3.75 times higher risk of dietary non-adherence than those who lived in urban regions (Tirfie *et al.* 2020).

Low-income family support will result in the health of individuals with Diabetes Mellitus being disrupted and vice versa (Baghikar *et al.* 2019). If the family support is good, individuals with Diabetes Mellitus will feel motivated to adhere to the diet. There are four main pillars in the management of Diabetes Mellitus, namely education (health education), medical therapy, nutrition (diet), physical exercise, and pharmacological intervention. Therapeutic nutrition or diet is a significant component of successful diabetes management as a result of diet, controlling blood sugar levels within normal limits, body weight within the normal range, and preventing the severity of complications (Djamaluddin *et al.* 2020). Diabetes Mellitus therapy and care require quite a long time, so it usually causes boredom, especially in elderly patients. In addition to paying attention to physical problems, individuals with Diabetes Mellitus also need to pay attention to psychological factors in solving Diabetes Mellitus problems, the role and participation of family members in medication, diet, physical exercise, and positive lung time filling. Family support is a form of an active role in the successful management of Diabetes Mellitus. Enrolling in culturally relevant family-based interventions helped increase understanding of the requirements of adults with T2DM2 and encouraged family behaviors that made those needs possible (Busebaia *et al.* 2023).

The obstacle often encountered when handling the Diabetes Mellitus diet is the patient's boredom with going on a diet, which is very important to achieve successful treatment. Implementation of the Diabetes Mellitus diet has a close correlation with family support. Support can be interpreted as belonging or believing someone actively participates in daily activities. The feeling of being connected to other people in their environment creates strength and helps to reduce feelings of isolation. Most patients with Diabetes Mellitus had strong family support and maintained their diet (Hariyono *et al.* 2022).

Based on the findings of this study, respondents paid attention to the type of food they consumed, such as using sugar substitutes if they wanted to consume sweet foods and drinks. Some respondents preferred replacing rice with tubers, consuming fruit daily as recommended, and reducing salt intake and saturated fat. However, it was found that some respondents still needed to be more compliant with the types of diets and recommended foods, such as still consuming sweet foods and drinks without special sugar, often consuming foods high in sugar, high in salt, and high in fat. In the meal schedule, most individuals with T2DM have not paid attention to their meal schedule because they often skip meals. The feeding schedule is disciplined to help the pancreas secrete insulin regularly, and according to the amount of food the respondent eats. The amount of food consumed by individuals with T2DM has not been considered the amount consumed based on body weight, height, type of activity, and age, so the standard calories consumed by individuals with T2DM are not known with certainty.

In providing health services, it is better to increase the involvement of families of T2DM patients in realizing their dietary adherence to control their blood sugar levels. The goal of the program for supporting dietary self-management is to help T2DM patients make better food choices and to give them the self-assurance they need to make the adjustments. A self-management support program cannot be successful without a collaborative correlation with each patient and their family. Collaboration between patients, their families, and their medical experts can improve how T2DM patients manage their condition (Aklima *et al.* 2012). Individuals with T2DM are expected to follow a diet based on recommendations from doctors, nurses, and other health workers. For families and communities to provide more support and motivation to Diabetes Mellitus patients to always comply with their diet by providing direction and motivation to avoid complications through emotional, informational, appreciation, and instrumental support. Effectiveness of a type 2 diabetes patient intervention on food and medication adherence based on the Health Action Process Approach (HAPA) approach and support from family and friends (Ranjbaran *et al.* 2022). For future researchers, it is hoped that this research can add to the knowledge and insight of researchers in developing knowledge about the correlation of family support to dietary adherence in individuals with Diabetes Mellitus and as additional reference material and references, and further researchers can examine other confounding factors.

Family support and dietary compliance are related to the working environment of the Citangkil I Public Health Center in Cilegon City. The most significant way to provide healthcare is to involve type 2 Diabetes Mellitus patients' families more in attaining diet compliance to control their blood sugar levels.

CONCLUSION

The aim of this study was to determine the correlation between family support and dietary adherence in diabetes patients. Family support is associated to dietary compliance in diabetes patients. Subject who received good family support tend to have good deitary adherence. Qualitative research to study the influence of family support on dietary adherence is good to caary out for more in-depth and comprehensive scientific study.

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DECLARATION OF CONFLICT OF INTERESTS

The authors declared no potential conflicts of interest concerning this articles research, authorship, and publication.

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