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Sociodemographic Factors Affecting Diabetic Dietary Behavior in People with Type 2 Diabetes Mellitus

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Abstract

Dietary behavior is one of the components of self-care that is difficult for people with type 2 diabetes mellitus (T2DM) to perform. The study aimed to determine the sociodemographic factors that influence the dietary behavior of people with T2DM. The study method is an analytic observational study with a cross-sectional design. The subjects of this study were people with T2DM in the Jember Regency, with a sample size of 130 respondents using a multistage random sampling technique. This study had two variables: dietary behavior as a dependent variable, measured using Self-Management Dietary Behavior Questionnaire (SMDBQ, and sociodemographic factors (age, gender, marital status, income level, education level, ethnicity, and family type) as an independent variable measured using a sociodemographic questionnaire. Data were analyzed using a multiple logistic regression test (α = 0.05). The results of the study showed that most of the respondents were 55 – 65 years old (51.5%), female (71.5%), married (85.4%), a primary education level (50.8%), low-income level (73.1%), Madurese (54.6%), and nuclear family type (37.7%). Most of the respondents had dietary behavior in the medium category (66.9%), and the sociodemographic factors that influenced diabetes diet behavior were education level (p = 0.001) and family type (p = 0.001) with R2 = 0.241. Efforts to improve self-care regarding adherence to diabetes diet behavior must pay attention to sociodemographic factors to prevent complications and improve the quality of life of people with T2DM.

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disease, one of the four non-communicable diseases that are a priority for handling by world leaders. Globally, the prevalence of T2DM in 2021 is 537 million people. This figure is expected to reach 643 million in 2030 and 783 million by 2045 (International Diabetes Federation, 2021). Nationally, the prevalence of T2DM is 8.4%, or around 21,3 million people, especially in East Java, with as many as 2.6 million cases. In Jember Regency, the prevalence of T2DM cases in 2018 was 1.5 million, indicating an increase in cases from 2013 (Kementerian Kesehatan RI, 2019). T2DM management consists of four pillars: education, diet, physical exercise, and pharmacological management. Changes in lifestyle patterns, such as dietary arrangements, have an essential role in the success of T2DM management. Regulating diet diabetes is the most challenging thing for people with diabetes mellitus (American Diabetes Association, 2021a)general treatment goals and guidelines, and tools to evaluate quality of care. Members of the ADA Professional Practice Committee, a multidisciplinary expert committee (https://doi.org/10.2337/dc21-SPPC. The results of previous studies in several countries showed that most people with T2DM do not adequately manage their diet. Only 8.6% - 24.1% of people with T2DM adhere to a diabetes diet program (Ouyang *et al.*, 2015; Mogre *et al.*, 2017; Bonger *et al.*, 2018; Mirahmadizadeh *et al.*, 2020) self-efficacy, and the absence of psychological problems.

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Dietary regulation is one of the essential components of T2DM management (American Diabetes Association, 2021a) general treatment goals and guidelines, and tools to evaluate quality of care. Members of the ADA Professional Practice Committee, a multidisciplinary expert committee (https://doi.org/10.2337/dc21-SPPC. Good dietary regulation impacts weight loss, increasing glycemic control and triglycerides, reducing the need for treatment regimens, preventing complications, and improving the quality of life (American Diabetes Association, 2021b; International Diabetes Federation, 2021) general treatment goals and guide-lines, and tools to evaluate quality of care. Members of the ADA Professional Practice Committee, a multidisciplinary expert committee (https://doi.org/10.2337/dc21-SPPC. Control measures for type 2 diabetes mellitus with the control of dietary behavior compliance often experience obstacles. One factor that affects non-compliance to the diabetic diet is that many people with T2DM feel bored. In addition, sociodemographic, psychosocial, and other conditions also influence the regulation of diabetes diet in people with T2DM (Gonzalez-Zacarias *et al.*, 2016; American Diabetes Association, 2021a)Type 2 DM (T2DM.

Sociodemographic factors are one of the predisposing factors that shape behavior. Sociodemographic factors that influence the dietary behavior of diabetes include age (Bonger, Shiferaw and Tariku, 2018; Aga *et al.*, 2020; Xie *et al.*, 2020)which adversely affects their disease control. Therefore, identification of the factors related to patient adherence is warranted. In this study, we aimed to examine (i, gender (Gonzalez-Zacarias *et al.*, 2016; Boakye *et al.*, 2018; McKinnon *et al.*, 2019; Mirahmadizadeh *et al.*, 2020; Xie *et al.*, 2020)those who are older, male, of low socioeconomic status, and uninsured, and marital status (Gonzalez-Zacarias *et al.*, 2016; Kim and Lee, 2019; Lasari *et al.*, 2021)Type 2 DM (T2DM. Other sociodemographic factors are income level (Gonzalez-Zacarias *et al.*, 2016; Assari *et al.*, 2017; Mogre *et al.*, 2017; Bonger, Shiferaw and Tariku, 2018; McKinnon *et al.*, 2019; Orr *et al.*, 2019)participants were 112 patients with type 2 DM who were prescribed insulin (ns = 38 Black women, 34 Black men, 14 White women, and 26 White men, respectively, education level (Mogre *et al.*, 2017; Boakye *et al.*, 2018; McKinnon *et al.*, 2019; Orr *et al.*, 2019; Adam *et al.*, 2021)and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES, ethnicity (Anders and Schroeter, 2015; Gonzalez-Zacarias *et al.*, 2016; McKinnon *et al.*, 2019) and thus contribute to lifestyle improvement. However, previous research suggests that dietary adherence is arguably among the most difficult cornerstones of diabetes management. The objectives of this study are (1, and family support (Anders & Schroeter, 2015; Gonzalez-Zacarias et al., 2016)and thus contribute to lifestyle improvement. However, previous research suggests that dietary adherence is arguably among the most difficult cornerstones of diabetes management. The objectives of this study are (1.

Older people with T2DM have poor care management skills (Xie *et al.*, 2020). The elderly tend to have poor diabetes diet management (Aga *et al.*, 2020). Women have difficulty carrying out diabetes diet management (Assari *et al.*, 2017; Mogre *et al.*, 2017; Aga *et al.*, 2020) participants were 112 patients with type 2 DM who were prescribed insulin (ns = 38 Black women, 34 Black men, 14 White women, and 26 White men, respectively. The low income level makes it difficult for people with T2DM to access health services and determine the type of food suitable for diet management (Assari *et al.*, 2017; Mogre *et al.*, 2017; Boakye *et al.*, 2018)participants were 112 patients with type 2 DM who were prescribed insulin (ns = 38 Black women, 34 Black men, 14 White women, and 26 White men, respectively. The marital status of people with T2DM affects the management of diets related to support from spouses (Gonzalez-Zacarias *et al.*, 2016; Kim and Lee, 2019; Lasari *et al.*, 2021)fat and protein metabolism associated with absolute or relative deficiency of insulin action and/or secretion. It is estimated that between 2010 and 2030, developed and developing countries will experience a 20% and 69% increase in the number of adults with diabetes, respectively. This research is a quantitative analytic study with a cross sectional design. Utilizing secondary data at the Health Office

of Banjarbaru City as of January-March 2020, in particular the five health centers, namely the South Banjarbaru Health Center, the Sei Besar Health Center, the Sei Ulin Health Center, the Liang Anggang Health Center and the Guntung Manggis Health Center. The sampling method is quota sampling and data analysis using chi square. The result is that there is no relationship between gender (p-value=0.742. Ethnic groups influence diabetic diets linked to beliefs in selecting healthy foods based on cultural habits (Anders and Schroeter, 2015; Gonzalez-Zacarias *et al.*, 2016; McKinnon *et al.*, 2019) and thus contribute to lifestyle improvement. However, previous research suggests that dietary adherence is arguably among the most difficult cornerstones of diabetes management. The objectives of this study are (1. Highly educated people with T2DM have extensive knowledge and better diet management behavior (McKinnon *et al.*, 2019; Orr *et al.*, 2019)and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES. Based on the description above and the data from previous studies, researchers want to analyze related sociodemographic factors that affect diabetic dietary behavior in people with T2DM in the Jember Regency.

Method

This study is an analytic observational design with a cross-sectional approach on March 28-April 22, 2022, in Jember Regency, East Java, Indonesia. The study population was people with T2DM with a sample size of 130 calculated using G power (f^2= 0.15; α = 0.05 and power 0.9) using multistage random sampling. Researchers divided the Jember Regency public health based on the regional map, then randomly chose two public health in each region. Then, randomly select five villages in each public health and choose 2-3 people with T2DM in each village randomly. The inclusion criteria were 40 - 65 years old and who had diabetes for more than a year. The study's independent variables were sociodemographic factors, and the dependent variable was dietary behavior. The instrument used is a questionnaire.

Sociodemographic questionnaires were used to identify the characteristics of the people with T2DM, consisting of 7 items (age, gender, marital status, education level, income level, ethnicity, and family type). Diabetic dietary behavior variables were measured by the SMDBQ (Self-Management Dietary Behaviors Questionnaire) developed by Primanda, Kripracha, and Thaniwattanon (2011) and modified by Putri Mei Sundari (2018). Researchers conducted validity and re-reliability tests on questionnaires. The SMDBQ consists of 16 items with four determinants of statements, namely the attitude of recognizing the needs of the number of calories (1 item), food selection (7 items), schedule settings (6 items), and setting dietary behavior challenges (3 items). The results of the questionnaire assessment consisted of 3 classifications, namely low < 32, medium 32-48, and high > 49. Data collection in previous respondents provided information (informed) where the researcher explained the objectives, benefits of management procedures, and study risks. Then, the respondent will provide a signature on the consent sheet. Data were analyzed using descriptive and inferential analysis with an ordinal multiple logistic regression test (α= 0.05). This study had approval by the Health Study Ethics Commission of the Faculty of Nursing with the number 035 / UN25.1.14 / KEPK / 2022.

Result and Discussion

Based on Table 1, most respondents were 56 - 65 years old (51.5%), female (71.5%), married (85.4%), with a primary education level (50.8%), income level less than UMK (73.1%), Madurese (54.6%) and family type were nuclear families (37.7%). Most dietary behaviors were in the category of moderate behavior (66.9%) (Table 1).

Table 1. Characteristics of Type 2 Diabetes Mellitus Respondents (n= 130)

Characteristics of respondents	N	%
Age (year)		
36 – 45	12	9.23
46 – 55	51	39.23
56 – 65	67	51.54

Characteristics of respondents	N	%
Gender		
Male	37	28.46
Female	93	71.54
Marital Status		
Married	111	85.38
Widow/widower	19	14.62
Education Level		
No School	23	17.69
Primary education	66	50.77
Secondary education	33	25.38
Higher education	8	6.16
Income Level		
≥ UMK	35	26.92
< UMK	95	73.08
Ethnic		
Madurese	71	54.62
Java	59	45.38
Family Type		
Nuclear family	49	37.69
Extended family	48	36.92
Single parent	11	8.47
Middle age	22	16.92
Dietary Behavior		
Good	25	19.23
Medium	87	66.92
Bad	18	13.85
Total	130	100

Table 2 shows that sociodemographic factors influence diabetic dietary behavior (chi-square p-value= 0.004 < α = 0.05). This study's results align with a study conducted by (Xie *et al*., 2020), which said that the sociodemographic characteristics of people with diabetes mellitus affect the adherence to self-care of people with T2DM. Based on the partial test, sociodemographic factors that influence the behavior of diets are education level and the type of family (p-value < < α=0.05). The regression equation obtained is:

$$\text{Logit P1} = 0.824 - 0.605_{(36-45)} + 0.674_{(46-55)} + 0.172_{(male)} - 0.126_{(married)} + 3.473_{(no\ school)} + 1.868_{(primary\ school)} + 1.558_{(secondary\ school)} + 0.181_{(\geq UMK)} - 0.042_{(Madurese)} + 0.467_{(nuclear\ family)} + 0.054_{(extended\ family)} + 2.803_{(single\ parent\ family)}$$

$$\text{Logit P2} = 4.768 - 0.605_{(36-45)} + 0.674_{(46-55)} + 0.172_{(male)} - 0.126_{(married)} + 3.473_{(no\ school)} + 1.868_{(primary\ school)} + 1.558_{(secondary\ school)} + 0.181_{(\geq UMK)} - 0.042_{(Madurese)} + 0.467_{(nuclear\ family)} + 0.054_{(extended\ family)} + 2.803_{(single\ parent\ family)}$$

P1 is the probability of good dietary behavior, and P2 is the probability of moderate dietary behavior. Then, the formed model is the predictive model:

a) $Log\ \frac{\pi 1}{1-\pi 1} = 0.824 + 3.473_{(education\ level)} + 2.803_{(family\ type)}$

b) $Log\ \frac{\pi 2}{1-\pi 2} = 4.768 + 3.473_{(education\ level)} + 2.803_{(family\ type)}$

The model of the equation:

a) $\Pi 1 = \frac{\exp(0{,}824 + 3{,}473(\text{education level}) + 2{,}803(\text{family type}))}{1+\exp(0{,}824 + 3{,}473(\text{education level}) + 2{,}803(\text{family type})}$

b) $\Pi 2 = \frac{\exp(4{,}768 + 3{,}473(\text{education level}) + 2{,}803(\text{family type}))}{1+\exp 4{,}768 + 3{,}473(\text{education level}) + 2{,}803(\text{family type})}$

Interpretation: On the variables of education level and family type simultaneously, both positively affect diabetic dietary behavior. If the people with T2DM are in no school, it will provide an opportunity to reduce their diabetic dietary behavior by 3,473. If the family type of people with T2DM is a single-parent family, eating will offer the chance to reduce diabetic dietary behavior by 2.803.

Table 2 also explains the value of R^2 = 0.241, which shows that sociodemographic factors can explain variations in diabetic dietary behavior by as much as 24.1%. In contrast, other factors explain 75.9%. This study analyzed seven sociodemographic characteristics of people with T2DM.

Age did not significantly affect the dietary behavior of people with T2DM (Table 2). This study's results align with previous studies that state there was no significant association between age and adherence to diabetic dietary behavior in people with T2DM (Bonger, Shiferaw and Tariku, 2018; Aga *et al.*, 2020; Xie *et al.*, 2020)which adversely affects their disease control. Therefore, identification of the factors related to patient adherence is warranted. In this study, we aimed to examine (i. However, the results of this study are not in line with previous studies, which stated that there was a relationship between age and diabetic dietary behavior (Kim & Lee, 2019). Age is one of the factors that affect personal knowledge.

Table 2. Multiple Logistic Regression Test Results Ordinal

Variable	Multiple Logistic Regression Test Results Ordinal						
		Estimate	Wald	P	X^2	R^2	95% CI
Dependent	Dietary behavior: good	0.824	0.456	0.499			-1.589 – 3.218
	Dietary behavior: medium	4.768	13.162	0.000			2.192 – 7.345
Independent	36 – 45	-0.605	0.773	0.379			-1.953 – 0.743
	46 – 55	0.674	2.215	0.137			-0.214 – 1.561
	56 - 65	0					
	Male	0.172	0.143	0.705			-0.719 – 1.064
	Female	0					
	Married	-0.126	0.029	0.865			-1.583 – 1.331
	Widow/widower	0					
	No school	3.473	11.180	0.001			1.437 – 5.509
	Primary education	1.868	4.450	0.085			0.132 – 3.604
	Secondary education	1.558	3.110	0.078			-0.174 – 3.290
	Higher education	0					
	≥ UMK	0.181	0.155	0.694	0.004	0.241	-0.722 – 1.085
	< UMK	0					
	Madurese	-0.042	0.008	0.927			-0.945 – 0.980
	Java	0					
	Nuclear family	0.467	0.563	0.453			-0.756 – 1.685
	Extended family	0.054	0.008	0.930			-1.156 – 1.264
	Single parent family	2.803	6.741	0.001			0.687 – 4.919
	Middle age	0					

Increasing age positively impacts understanding and correlates to certain attitudes and behaviors. However, younger people with T2DM tend to have better diabetes diet behavior, including the type, amount, and schedule of the diabetes diet (Ouyang *et al*., 2015). There is no significant relationship between age and diabetes diet behavior, which might be because young and elderly respondents can perform diabetes diet behavior. Younger people with T2DM use many sources, both directly and digitally. In contrast, older people get information from health workers and families.

Gender did not significantly affect diabetic dietary behavior in people with T2DM (Table 2). The results of this study are inconsistent with previous studies that state females have better dietary behavior than males (Gonzalez-Zacarias *et al.*, 2016; Boakye *et al.*, 2018; McKinnon *et al.*, 2019; Mirahmadizadeh *et al.*, 2020; Xie *et al.*, 2020)those who are older, male, of low socioeconomic status, and uninsured. However, the results of this study follow previous studies that stated a relationship between gender and adherence to a diabetic diet (Orr *et al.*, 2019; Matsunaga *et al.*, 2021)and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES. There is no significant effect because gender is not the main factor in forming healthy behavior. The main predictors of the formation of chronic disease behavior are experience, habits, motivation, cognitive and functional impairment, social support, and access to health services (Riegel *et al*., 2019).

The study showed no significant effects of marital status on diabetic dietary behavior in people with T2DM (Table 2). Marital status can affect the treatment of type 2 diabetes mellitus. The existence of support from a spouse can improve adherence to the treatment regimen to promote optimal glycemic control. (Gonzalez-Zacarias *et al*., 2016)Type 2 DM (T2DM. Previous studies showed that people with T2DM who have partners have better diabetic dietary behavior (Gonzalez-Zacarias *et al.*, 2016; Kim and Lee, 2019; Lasari *et al.*, 2021) fat and protein metabolism associated with absolute or relative deficiency of insulin action and/or secretion. It is estimated that between 2010 and 2030, developed and developing countries will experience a 20% and 69%

increase in the number of adults with diabetes, respectively. This research is a quantitative analytic study with a cross sectional design. Utilizing secondary data at the Health Office of Banjarbaru City as of January-March 2020, in particular the five health centers, namely the South Banjarbaru Health Center, the Sei Besar Health Center, the Sei Ulin Health Center, the Liang Anggang Health Center and the Guntung Manggis Health Center. The sampling method is quota sampling and data analysis using chi square. The result is that there is no relationship between gender (p-value=0.742, so they have better glycemic control. People with T2DM have a social support system as well as a safe place for individuals to help promote a healthy lifestyle (Liu *et al*., 2016). Marital status is also not one factor influencing type 2 diabetes mellitus (Gonzalez-Zacarias *et al.*, 2016; Kim and Lee, 2019; Lasari *et al.*, 2021)fat and protein metabolism associated with absolute or relative deficiency of insulin action and/or secretion. It is estimated that between 2010 and 2030, developed and developing countries will experience a 20% and 69% increase in the number of adults with diabetes, respectively. This research is a quantitative analytic study with a cross sectional design. Utilizing secondary data at the Health Office of Banjarbaru City as of January-March 2020, in particular the five health centers, namely the South Banjarbaru Health Center, the Sei Besar Health Center, the Sei Ulin Health Center, the Liang Anggang Health Center and the Guntung Manggis Health Center. The sampling method is quota sampling and data analysis using chi square. The result is that there is no relationship between gender (p-value=0.742. The study's results showed no significant relationship between marital status and diet because respondents who did not have a partner were also likely to get social support from other family members.

The results of this study showed that education level had a significant effect on diabetic dietary behavior in people with T2DM (Table 2). This study's results align with several previous studies that stated education level affected diet behavior (Mogre *et al.*, 2017; Boakye *et al.*, 2018; McKinnon *et al.*, 2019; Orr *et al.*, 2019; Adam *et al.*, 2021) and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES. Highly educated individuals can behave in better health than those with low education. Individuals with higher education will have broader and more knowledge because education becomes the primary basis of success in medication regimens (McKinnon *et al.*, 2019; Orr *et al.*, 2019; Adam *et al.*, 2021)and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES. This study's results showed that respondents with a non-school education level had diabetic diet behaviors that tended to be poor and moderate. In contrast, people with T2DM who had a primary school education level had diabetic diet behaviors with moderate and good categories. The higher the education of respondents, the better their dietary behavior. It means there is a significant relationship between the education level and the behavior of the diabetic diet in people with T2DM in the Jember Regency. This statement aligns with previous studies that stated that people with T2DM with a higher education level have enough knowledge and behavior to receive health information from health workers (McKinnon *et al.*, 2019; Orr *et al.*, 2019; Adam *et al.*, 2021)and to examine trends in socioeconomic disparities in diet quality. Methods: Repeated cross-sectional analysis of eight National Health and Nutrition Examination Survey (NHANES. The ability to receive information about diet, especially the ability to understand the directives of health workers, can influence dietary behavior.

The results showed that the level of income affected the behavior of the diabetic diet in people with T2DM, but the value was not significant (Table 2). The results of the study are in line with the previous studies that state the income level of each individual is different, causing economic inequality that causes stress in individuals with low incomes (Assari *et al.*, 2017; Mogre *et al.*, 2017; Boakye *et al.*, 2018) those who are older, male, of low socioeconomic status, and uninsured. Low income makes people with type 2 diabetes mellitus experience poor diet behavior that causes poor glycemic

control (Gonzalez-Zacarias *et al.*, 2016; Matsunaga *et al.*, 2021)Type 2 DM (T2DM. In addition, people with T2DM with low income have limitations in accessing health services that lead to increased problems in self-care independently (Gonzalez-Zacarias *et al.*, 2016; Assari *et al.*, 2017; Mogre *et al.*, 2017; Boakye *et al.*, 2018)exercise, self-monitoring of blood glucose (SMBG. People with T2DM with enough income can provide foodstuffs that follow more varied diabetic dietary standards compared to low-income people with T2DM. People with T2DM with low incomes can also manage the diabetic diet by modifying the diet food menu so as not to feel bored and still meet the needs of calories and nutrients. There was no relationship between income levels and diabetic dietary behavior because most people with T2DM could adjust the selection of healthy foods according to respondents' financial capabilities.

Ethnicity affects diabetic dietary behavior in people with T2DM, but it is insignificant (Table 2). The results of this study are not in line with the previous studies that stated ethnicity influenced the management of the diabetic diet of people with T2DM (Boakye *et al.*, 2018; Matsunaga *et al.*, 2021)those who are older, male, of low socioeconomic status, and uninsured. Race is one of the causes of inhibition in the formation of diabetic dietary behavior due to the habit of each culture in serving food and communication that is difficult to do due to language differences (Anders dan Schroeter, 2015; Gonzalez-Zacarias *et al.*, 2016; Park *et al.*, 2016)it is not known whether EAIs' perspectives are addressed in diabetes self-management interventions developed for EAIs. Therefore, a mixed-study review was conducted to identify EAIs' perspective from qualitative research (n = 9 studies. Based on the study, the two ethnic groups (Madurese and Javanese) had diabetic diet behavior in the moderate category. Madurese and Javanese ethnic groups have habits that are not too different, so the people's diet is also relatively the same; besides that, Jember Regency has a Pandalungan culture that combines two ethnic groups. Currently, health services originating from Jember Regency have the same mother tongue as people with T2DM so that two-way communication can remain well established, and people with T2DM can receive health information properly.

This study showed that family type significantly influenced diabetic dietary behavior in people with T2DM (Table 2). Respondents from single-parent families have diet behavior tends to be a moderate and poor category. In contrast, the other type of family tends to have diabetic diet behaviors that tend to be a moderate and good category. Families have an essential role in the health status of people with T2DM. Family members will provide support that will positively impact the compliance of care management of people with T2DM. People with complete family members tend to change health behaviors towards healthier ones more quickly than those without family members and who do not get family support (Pierce and Lutz, 2013). The previous study states that people with T2DM with good family support tend to have diabetic diet adherence behaviors (Anders & Schroeter, 2015; Gonzalez-Zacarias *et al.*, 2016)and thus contribute to lifestyle improvement. However, previous research suggests that dietary adherence is arguably among the most difficult cornerstones of diabetes management. The objectives of this study are (1. Family support is essential for people with T2DM to improve adherence to chronic disease management. The authors assumed that respondents with a single-parent family type had poor diabetic dietary behavior due to a lack of family support.

Conclusion

Sociodemographic factors (age, gender, marital status, level of income and education, ethnicity, and family type) simultaneously influence the diabetic diet in people with T2DM. Partially, sociodemographic factors that influence the dietary behavior of diabetes in T2DM patients are education level and family type. Efforts to improve diabetic dietary behavior as part of diabetes self-management must be carried out correctly. This effort must pay attention to sociodemographic factors, especially the level of education and type of family with T2DM. Using simple language that is easy to understand by patients is essential in diabetes education. In addition, efforts to increase social support from family and others

considered necessary by people with T2DM are crucial to improving dietary behavior. It can enhance diabetes self-management and metabolic control, reduce complications, and improve the quality of life of people with T2DM.

References

Adam, H.M.I., Elmosaad, Y.M., Ahmed, A.E.E., Khan, A., & Mahmud, I., 2021. Dietary Knowledge, Attitude and Practice Among Type 2 Diabetes Mellitus Patients in Sudan: A Hospital-Based Cross-Sectional Study. *African Health Sciences*, 21(1), pp.32–40.

Aga, F., Dunbar, S.B., Kebede, T., Higgins, M.K., & Gary, R., 2020. Relationships of Diabetes Self-Care Behaviours to Glycaemic Control in Adults with Type 2 Diabetes and Comorbid Heart Failure. *Nursing Open*, 7(5), pp.1453–1467.

American Diabetes Association., 2021a. Facilitating Behavior Change and Well-Being to Improve Health Outcomes: Standards of Medical Care in Diabetes—2021. *Diabetes Care*, 44(Supp. 1), pp.S53–S72.

American Diabetes Association., 2021b. Obesity Management for the Treatment of Type 2 Diabetes: Standards of Medical Care in Diabetes-2021. *Diabetes Care*, 43(Suppl. 1), pp.S89–S97.

Anders, S., & Schroeter, C., 2015. Diabetes, Diet-Health Behavior, and Obesity. *Frontiers in Endocrinology*, 6(33), pp.1–8.

Assari, S., Lankarani, M.M., Piette, J.D., & Aikens, J.E., 2017. Socioeconomic Status and Glycemic Control in Type 2 Diabetes; Race by Gender Differences. *Healthcare (Switzerland)*, 5(4), pp.1–10.

Boakye, E.A., Varble, A., Rojek, R., Peavler, O., Trainer, A.K., Osazuwa-Peters, N., & Hinyard, L., 2018. Sociodemographic Factors Associated with Engagement in Diabetes Self-Management Education among People with Diabetes in the United States. *Public Health Reports*, 133(6), pp.685–691.

Bonger, Z., Shiferaw, S., & Tariku, E.Z., 2018. Adherence to Diabetic Self-Care Practices and Its Associated Factors Among Patients with Type 2 Diabetes in Addis Ababa, Ethiopia. *Patient Preference and Adherence*, 12, pp.963–970.

Gonzalez-Zacarias, A.A., Mavarez-Martinez, A., Arias-Morales, C.E., Stoicea, N., & Rogers, B., 2016. Impact of Demographic, Socioeconomic, and Psychological Factors on Glycemic Self-Management in Adults with Type 2 Diabetes Mellitus. *Frontiers in Public Health*, pp.195.

International Diabetes Federation., 2021. *IDF Diabetes Atlas*. 10th ed. Brussels, Belgium: International Diabetes Federation.

Kementerian Kesehatan RI., 2019. *Laporan Nasional RISKESDAS 2018*. Jakarta: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan.

Kim, M.Y., & Lee, E.J., 2019. Factors Affecting Self-Care Behavior Levels Among Elderly Patients with Type 2 Diabetes: A Quantile Regression Approach. *Medicina*, 55(340), pp.1–10.

Lasari, H.H., Musafaah., Afifah, N.L., Mutmainnah, Y., & Fitriyanti, J., 2021. Spatial Analysis and Risk Factors for Diabetes Mellitus Type II in Banjarbaru City. *KEMAS: Jurnal Kesehatan Masyarakat*, 17(2), pp.240–247.

Liu, H., Waite, L., & Shen, S., 2016. Diabetes Risk and Disease Management in Later Life: A National Longitudinal Study of the Role of Marital Quality. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 71(6), pp.1070–1080.

Matsunaga, M., Lim, E., Davis, J., & Chen, J.J., 2021. Dietary Quality Associated with Self-Reported Diabetes, Osteoarthritis, and Rheumatoid Arthritis Among Younger and Older us Adults: A Cross-Sectional Study Using Nhanes 2011–2016. *Nutrients*, 13(2), pp.1–18.

McKinnon, R.A., Oladipo, T., Ferguson, M.S., Jones, O.E., Maroto, M.E., & Wolpert, B., 2019. Reported Knowledge of Typical Daily Calorie Requirements: Relationship to Demographic Characteristics in US Adults. *Journal of the Academy of Nutrition and Dietetics*, 119(11), pp.1831-1841.

Mirahmadizadeh, A., Khorshidsavar, H., Seif, M., & Sharifi, M.H., 2020. Adherence to Medication, Diet and Physical Activity and the Associated Factors Amongst Patients with Type 2 Diabetes. *Diabetes Therapy*, 11(2), pp.479–494.

Mogre, V., Abanga, Z.O., Tzelepis, F., Johnson, N.A., & Paul, C., 2017. Adherence to and Factors Associated with Self-Care Behaviours in Type 2 Diabetes Patients in Ghana. *BMC Endocrine Disorders*, 17(1), pp.1–8.

Orr, C.J., Keyserling, T.C., Ammerman, A.S., & Berkowitz, S.A., 2019. Diet Quality Trends Among Adults with Diabetes by Socioeconomic Status in the U.S.: 1999-2014. *BMC Endocrine Disorders*, 19(1), pp.1–9.

Ouyang, C.-M., Dwyer, J.T., Jacques, P.F., Chuang, L.-M., Haas, C.F., & Weinger, K., 2015.

Determinants of Dietary Self-Care Behaviours Among Taiwanese Patients with Type 2 Diabetes. *Asia Pacific Journal of Clinical Nutrition*, 24(3), pp.430–437.

Park, C., Nam, S., & Whittemore, R., 2016. Incorporating Cultural Perspectives into Diabetes Self-Management Programs for East Asian Immigrants: A Mixed-Study Review. *Journal of Immigrant and Minority Health*, 18(2), pp.454–467.

Pierce, L.L., & Lutz, B.J., 2013. Family Caregiving,' in I.M. Lubkin and P.D. Larsen (eds) *Chronic Illness: Impact and Intervention*. 8th Ed. Burlington, MA: Jones & Bartlett Learning, LLC, an Ascend Learning Company, pp.245–288.

Riegel, B., Jaarsma, T., Lee, C.S., & Strömberg, A., 2019. Integrating Symptoms into the Middle-Range Theory of Self-Care of Chronic Illness. *Advances in Nursing Science*, 42(3), pp.206–215.

Xie, Z., Liu, K., Or, C., Chen, J., Yan, M., & Wang, H., 2020.'An Examination of the Sociodemographic Correlates of Patient Adherence to Self-Management Behaviors and the Mediating Roles of Health Attitudes and Self-Efficacy Among Patients with Coexisting Type 2 Diabetes and Hypertension. *BMC Public Health*, 20(1), pp.1–13.