Research Article

Factors Related to Diet Adherence in Diabetes Mellitus Patients: A Scoping Review

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Abstract.
Diabetes Mellitus (DM) is a disease that causes increased blood glucose levels or hyperglycemia. High blood glucose levels can be controlled by following a diet program. Adherence to diet is one of the keys to stabilizing blood glucose and preventing complications. Therefore, this study aimed to determine the factors associated with dietary adherence in patients with diabetes mellitus based on a literature study of 12 journals. Journal searches were carried out on Google Scholar, PubMed, ScienceDirect, and ProQuest using the keywords Factors AND Associated AND Diet OR Dietary AND Adherence OR Compliance AND Diabetes Mellitus. The journals were then assessed for quality using the Joanna Briggs Institute and analyzed using qualitative descriptive analysis. Based on the analysis, there is a relationship between intrinsic factors (age, gender, marital status, occupation, place of residence, education level, income/economic, family type, level of knowledge, BMI, duration of illness, perception, self-motivation, smoking, and family history of DM) of 71% and extrinsic factors (social support, family support, caregiver category, diet monitoring, and selection of food types) of 29%. Based on the results, it can be concluded that these factors are related to dietary compliance, so it is hoped that various nursing strategies can be designed to help people with diabetes mellitus improve their adherence to diets.

Keywords: Dietary Compliance, Factors Associated, Diabetes Mellitus

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1. INTRODUCTION

Diabetes mellitus is a disease caused by metabolic disorders that result in hyperglycemia or increased blood glucose in the body caused by disturbances in insulin production or insulin secretion disorders or can occur due to both (1). According to the American Diabetes Association (ADA), diabetes mellitus is a disease caused by a metabolic disorder that causes the body to be unable to convert glucose into energy due to impaired insulin secretion, which causes an increase in blood glucose levels (hyperglycemia) (2). Classification of diabetes mellitus includes 4 types, namely diabetes mellitus types 1, 2, other types, and gestational diabetes mellitus (3).

Diabetes mellitus is a non-communicable disease, but every year cases of death due to diabetes mellitus always increase. According to the World Health Organization (WHO) explaining data for 2013 the prevalence of diabetes mellitus in the world is approximately 172 million people and is expected to increase in 2030 to more or less reach 366 million people (2). Meanwhile, the International Diabetes Federation (IDF) explains that there are 463 million people aged 20-79 years who are susceptible to diabetes mellitus in 2019 and it is predicted to increase rapidly in 2045 to reach 700 million people (4).

The phenomenon of diabetes mellitus is the result of a lifestyle that is very unhealthy, lack of activity and eating patterns can cause health problems. Diabetes mellitus is a disease that cannot be cured but can be controlled through various means such as diet management, education, medication and regular exercise (5). Meanwhile, according to research from (Suciana & Arifianto, 2019) there are five pillars of proper management of diabetes mellitus, namely education, diet, physical activity, pharmacological intervention and controlling blood sugar regularly (6). According to the results of Basic Health Research (RISKESDAS) in 2018 explaining the management of diabetes mellitus in the previous study, namely with a percentage of diet as much as 80.2%, exercise as much as 48.1% and alternative medicine as much as 35.7%, by looking at these percentages management The highest diabetes mellitus is diet (7). Diet can help control blood glucose levels in the body by paying attention to the type, schedule and amount of food consumed, considering that increased blood glucose levels are the cause of insulin imbalance in the patient's body and are always within normal limits (8). Diet management is one of the diabetes treatments that can reduce glycosylated hemoglobin (hbA1c) by 1% to 2% absolutely in the early stages of diabetes. Diet can also reduce fat intake, increase fiber, reduce sodium and further increase intake of healthier foods. such as consuming fish, soybeans, fruits and vegetables (9). According to the Indonesian Ministry of Health in 2018 explained that diet is one of the appropriate management to reduce development or complications in people with diabetes mellitus (10).

The prevalence of non-compliance with diabetes mellitus in several countries in the world is quite high. In India, as many as 43% of patients are not compliant in carrying out the diet program and control their glucose, in the United States, as many as 48% of patients are non-compliant in participating in physical activity programs and in Northern California, as many as 25% of patients are non-compliant in taking medication and 85% do not buy medication regarding with a recipe ((11). Several studies have explained that dietary adherence of people with diabetes mellitus was obtained by around 10 respondents (11.1%) who were disobedient in carrying out the diet nor did they pay

attention to the type, schedule and amount of food consumed according to orders or directions from health workers and 88.9% of sufferers adhered to when blood glucose is high (12). In this study as many as (75%) of respondents did not carry out the diet according to orders or directions and 77% of respondents were wrong when controlling blood glucose levels (13). Sufferers feel bored in doing the diet program, this is an obstacle in carrying out the diet. Because of this, the implementation of the diet program is not good enough and becomes a challenge in carrying out the diet program (14).

Several studies that have been conducted on the topic of dietary compliance in people with diabetes mellitus show that according to research from (Rohani & Ardenny, 2019) explains that there is a relationship between age, work, knowledge and family support adherence to diet adherence (15). According to research from (Ernawati et al., 2020) states that gender, level of education and level of knowledge are related to dietary adherence (16). Dietary compliance in people with diabetes mellitus is one of the most important things in management, because often sufferers do not pay attention to balanced food intake. Therefore, based on the research that has been described above, there are several sustainable factors regarding dietary adherence in people with diabetes mellitus. The research objective was to determine the factors associated with dietary adherence in patients with diabetes mellitus based on a study of literature

2. METHODS

The design used in this study is the design of a literature study or literature review. Literature studies focus on examining pre-existing sources such as books, journals, articles and other literary or published sources that have or have not been published. The next stage or step is data search, data search using websites or websites such as Google scholar, PubMed, Sciencedirect, and Proquest which are accessed free or freely. In searching for journals, you need keywords and Boolean operators (AND, OR, NOT or AND NOT) which are used as connecting words to help and make it easier for researchers to find journals. Based on the research title taken, namely ”factors related to dietary adherence of people with diabetes mellitus”.

Screening is the stage of sorting or filtering data which is used to select journals or data according to the topic under study. The topic studied in this study was ”factors related to dietary adherence of people with diabetes mellitus”, with the chosen topic the researchers chose journals with the following inclusion criteria: (1) Journals published in the last 5 years (2017-2022); (2) Journals can be accessed in full text; (3) national and international journals; (4) The types of journals analyzed were research articles with

cross-sectional studies as a research design; (5) Journal that discusses factors related to dietary adherence in people with diabetes mellitus.

The quality assessment stage in the literature study or literature review method is by screening material and then assessing journal data sources selected according to the criteria determined by researchers who are worthy of further analysis. Researchers used the JBI (Joanna Briggs Institute) analytical cross-sectional studies instrument (17). Thematic synthesis was used to analyze the outcomes from the articles.

3. RESULTS

Based on data that has been analyzed in 12 journals, the respondent's data is classified based on age, gender, and country of origin. The results are described as below:

Table 1: Journal Demographic Characteristics.

No.	Characteristics of Respondents	Classification	N	(%)
1.	Age (years old)	0-19 > 15 ≥ 18 > 18 ≥ 20 > 30 24-76 25-65 26-81	1 1 4 1 1 1 1 1 1	8,3 8,3 33,6 8,3 8,3 8,3 8,3 8,3 8,3
2.	Gender	Male Female	4 8	33,3 66,7
3.	Origin	Indonesia Yaman Ethiopia Uganda Iran India	5 1 3 1 1 1	41,8 8,3 25 8,3 8,3 8,3

Table 1 shows the age demographic characteristics of the journals analyzed. It is known that the age of the respondents is 0-19 years old and the average age of the respondents is from 18-81 years old. Then the demographic characteristics of gender, namely the majority are female with a percentage of 66.7% in 8 journals and 33.3% are male in 4 journals. Finally, the demographic characteristics of the country of origin are from the Asian continent (Indonesia, Yemen, Iran and India) and the African continent (Ethiopia and Uganda).

Table 2 shows the factors associated with dietary adherence in diabetes mellitus patients categorized into 2 factors, namely intrinsic factors and extrinsic factors.

Table 2: Study Analysis.

No	Articles	Factors Associated with Diet Compliance in Patients with Diabetes Mellitus	
		Intrinsic Factor	Extrinsic Factors
1.	Factors Associated with Diabetes Mellitus Diet Compliance in Diabetes Mellitus Patients at Kendari City Hospital in 2018 (8).	Knowledge level Perception	Family support
2.	Factors associated with adherence to diet and exercise among type 2 diabetes patients in Hodeidah city,Yemen (18).	Place of residence (urban) Occupation (housewife/employee) Duration of illness	-
3.	Adherence to dietary recommendation and associated factors among diabetic patients in Ethiopian teaching hospitals (9).	Duration of illness	Provision of education
4.	Factors Associated With Non Adherence to Diet and Physical Activity among Diabetes Patients: A Cross Sectional Study (19).	Level of education Occupation (housewife) Marital status (single/never married) Type of family (nuclear family) Duration of illness	-
5.	Factors Associated with Diet Compliance in Patients with Tioe 2 Diabetes Mellitus at the Pasar Minggu District Health Center in 2018.(20).	Gender Duration of illness	-
6.	Factors Affecting the Level of Diet Compliance in Patients with Type 2 Diabetes Mellitus in Sumbang District, Banyumas (16).	Gender Level of education Knowledge level	
7.	Family Support Increases Diet Compliance in Patients with Type 2 Diabetes Mellitus (21).		Family support
8.	The Relationship between Self-Motivation and Diet Compliance in Patients with Diabetes Mellitus at the Kotamobagu Wound Care Center Clinic (22).	Self-motivation	
9.	Adherence to Medication, Diet and Physical Activity and the Associated Factors Amongst Patients with Type 2 Diabetes (23).	Age BMI (overweight and obesity) Do not smoke	
10.	Factors associated with adherence to diabetes care recommendations among children and adolescents with type 1 diabetes: a facility based study in two urban diabetes clinics in Uganda(24)[24] [24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24][24]	Marital status (single/divorce)	Diet monitoring Caregiver category
11.	Level of Adherence to the Dietary Recommendation and Glycemic Control Among Patients with Type 2 Diabetes Mellitus in Eastern Ethiopia: A Cross-Sectional Study (25).	Place of residence (urban) Income/economy Duration of illness Families with a history of DM	Education level
12.	Dietary non-adherence and associated factors among individuals with diabetes who are on treatment follow up at Felege-Hiwot Referral Hospital, Northwest Ethiopia(26).	Place of residence (urban) Duration of illness	Education level Social support Selection of types of food

4. DISCUSSION

4.1. Intrinsic Factors

The demographic characteristics factor is the biggest factor with a percentage of 38% related to dietary adherence in people with diabetes mellitus. The demographic characteristic factors include age, gender, marital status, occupation, place of residence, education level, income/economics, type of family, level of knowledge, BMI, self-motivation, perception, family history with DM, disease duration and non-smoking.

Age in the moderate compliance category, namely 50-65 years, is positively related to implementing the Mediterranean diet. From the data obtained, respondents with this age adhere to the diet on the incidence of diabetes mellitus. (23). This statement is supported by (Dita Wahyu Hestiana, 2017) which explains that age is a factor affecting dietary compliance in the adult age category, namely 45-60 years compared to the elderly age category (14). In the journal that the researchers analyzed, it was revealed that men adhered to diets more than women (16). This is also supported by (Simbolon et al., 2019) which explains that men are more obedient in carrying out diet programs on the grounds that men have the responsibility as the head of the family to earn a living so that they think and are motivated to be healthier and maybe they get support from his wife or companion in managing his diet (20).

Research (Kyokunzire et al., 2018) also describes the marital status of caregivers in people with diabetes mellitus who are single or divorced who think they don't have many family tasks and have a lot of time for administering insulin, monitoring injections and maintaining the diet of children and adolescents (24). However, this study also says that children and adolescents who are cared for by married caregivers are supported and motivated for their care management and have joint responsibility from both parents for better management of their diabetes. Occupation as a housewife in research that has been analyzed by researchers states that housewives are four times more knowledgeable about diet programs than unemployed respondents, good knowledge and economic differences are considered related to dietary adherence compared to unemployed respondents and cooking is a daily activity housewives in Yemen, so planning or explaining eating patterns is easier (18).

The results of research from (Ebrahim et al., 2017) which the researchers analyzed explained that urban residents are more compliant in dieting because urban residents find it easier to find health services and easier to access health facilities than residents who live in rural areas where it is difficult to get health services and lack of education

about diabetes mellitus (18). Research also states that residents who live in urban areas have good dietary adherence (25). Education is related to knowledge, respondents with higher education have better knowledge, they are more obedient, it is easier to follow dietary advice or suggestions and know how to implement a healthy diet program (19). This has received support from (Ernawati et al., 2020) who explained that someone with a higher education is easier to grasp information and easier to practice in everyday life, especially in carrying out adherence to their diet program (16).

High incomes or wages above the minimum adhere to a diet more than those with low incomes. Because those who earn sufficient income can buy food staples for their diet program compared to those with low incomes because every year staples or healthy food costs increase (25). This is supported by previous research which said that respondents with sufficient income were able to control health workers to gain knowledge about a good diet program (10).

High knowledge can also control themselves in dealing with problems and have high self-confidence so that they can make decisions and take appropriate and good actions. Respondents can obtain knowledge or information through print media, mass media, health workers and their experiences (8). Overweight and obesity can cause metabolic disorders and insulin resistance, thus producing more fatty acids which are not good for the body as a result of increasing blood glucose levels (27). Therefore, this study explained that patients with BMI in the overweight and obese categories paid more attention and adhered to a diet program for their health (23).

4.2. Extrinsic Factors

Extrinsic factor is the third factor with a percentage of 29% which is related to dietary compliance in diabetes mellitus patients. Social factors consist of social support, family support, caregiver category, diet monitoring, food selection and education.

Good social support increases a person to adopt a healthy lifestyle and pay more attention to disease. Social support includes support from family, friends, the environment or those closest to them (28). In this study, good social support factors will motivate sufferers to do something obediently in implementing a diet (26). Family support is related to social support, family support has a close relationship with diet management for diabetics, the roles provided include informational support, emotional support, instrumental support and appreciation support. The family is the smallest social unit, support from the family can help overcome the difficulties or problems faced by sufferers. Families can also spend time, pay attention, provide a sense of comfort, be

appreciated, help regulate eating patterns, give advice, motivate, provide information and help sufferers make decisions. Therefore, family support can help sufferers increase adherence in carrying out diets (21). This is in accordance with research which explains that sufferers receive good family support, so that this support makes sufferers have the intention and are more obedient in carrying out diets (8).

The category of caregivers by siblings has a higher chance of obeying the diet than the mother, complex changes occur in the social environment and experience changes in social dynamics on him. Researchers explained that support from sibling caregivers might set aside more time and be willing for their siblings compared to parents who work or have other activities and this research also explains that there is conflict between adolescents and parents so that sibling caregivers pay more attention to treatment programs and management of diabetes in adolescents (24).

Previous research explained that patients who have knowledge about the selection of recommended types of food have a good level of adherence. There are 3 types of food that are recommended, namely carbohydrates, for example white rice, protein, for example tofu and tempeh, vegetables, for example, long beans, spinach and bananas, of course, with balanced portions (29). This is supported by (Tirfie et al., 2020) who have analyzed researchers who say that sufferers with good and balanced food choices adhere to a diet more than those who do not pay attention to healthy types of food or eat carelessly, because usually they are always provided with food for their diet program (26). Meanwhile, a study from (Adem et al., 2020) also explained that respondents who received nutrition education could increase their knowledge, understanding and be able to implement it in managing their diet properly (25).

5. CONCLUSION

The results of research on literature studies from 12 national and international journals on factors related to dietary adherence of people with diabetes mellitus, it can be concluded that there are 2 factors, namely intrinsic factors consisting of (age, gender, marital status, occupation, place of residence, level of education, income/economy and type of family, (level of knowledge, perception, duration of disease, self-motivation, BMI (Body Mass Index), not smoking and family history of DM) are the most influential factors in factors related to dietary adherence and factors extrinsic (social support, family support, education, type of treatment, diet monitoring, caregiver category and selection of food). Overall these factors have a relationship with dietary adherence so that it is

expected to be able to design various nursing strategies to help people with diabetes mellitus in increasing adherence their diet.

References

[1] Müller-Wieland PD, Nauck M, Petersmann A, Müller-Wieland D, Schleicher E, Müller UA, et al. Definition, Classification and Diagnosis of Diabetes Mellitus. Diabetologe. 2019;15(2):128–34.

[2] Termini E, Description FP, Street D, Id BS, Schedule E, Code FF, et al. LITERATURE RIVIEW. TINGKAT KECEMASAN PADA PENDERITA DIABETES MELLITUS. 2020;21(1):1–9.

[3] Hardianto D. Telaah Komprehensif Diabetes Melitus: Klasifikasi, Gejala, Diagnosis, Pencegahan, Dan Pengobatan. J Bioteknol Biosains Indones. 2021;7(2):304–17.

[4] Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. Diabetes Research and Clinical Practice. 2019;157:107843.

[5] Simamora A, Daulay NM. IBM Self Management (Manajemen Diet, Latihan Fisik, dan Perawatan Kaki) Pada Penderita Diabetes Mellitus di Puskesmas Labuhan Rasoki Kota Padangsidimpuan. Jurnal Pengabdian Masyarakat Aufa. 2019;1(1):1–4.

[6] Suciana F, Arifianto D. Penatalaksanaan 5 Pilar Pengendalian Dm Terhadap Kualitas Hidup Pasien Dm Tipe 2. J Ilm Permas J Ilm STIKES Kendal. 2019;9(4):311–8.

[7] Badan Penelitian dan Pengembangan Kesehatan RI. Laporan Nasional Riset Kesehatan Dasar. Kementerian Kesehatan Republik Indonesia. 2018;1–582.

[8] Delima N, Lisnawaty R, Fithria A. Faktor Yang Berhubungan Dengan Kepatuhan Diet Diabetes Mellitus pada Pasien Diabetes Mellitus di Rsud Kota Kendari Tahun 2018. Jurnal Gizi dan Kesehatan2020;1(1):20–5.

[9] Mohammed MA, Sharew NT. Adherence to dietary recommendation and associated factors among diabetic patients in Ethiopian teaching hospitals. Pan Afr Med J. 2019 Jul;33:260.

[10] Zeilen Fitriana1 EAS. ANALISIS FAKTOR YANG MEMPENGARUHI KEPATUHAN MENJALANKAN DIET PADA LANSIA PENDERITA DIABETES MELLITUS TIPE DUA. J Keperawatan Silampari. 2021;4(2):6.

[11] Mayssara A. Abo Hassanin Supervised A. ANALISIS KEJADIAN KOMPLIKASI AKUT DAN KRONIS PADA PASIEN DIABETES MELITUS TIPE-2. Pap KnowlTowar a Media Hist Doc. 2019.

[12] Nasution Z, Zendrato EK. Hubungan Dukungan Keluarga Dengan Kepatuhan Menjalani Diet Pada Pasien Diabetes Melitus di Puskesmas Padang Bulan Medan. 2021;8(April):23–30.

[13] Zaenab M. Syahid[1] 1. Jurnal Ilmiah Kesehatan Sandi Husada. 2021;10:147–55.

[14] Dita Wahyu Hestiana. FAKTOR-FAKTOR YANG BERHUBUNGAN DENGAN KEPATUHAN DALAM PENGELOLAAN DIET PADA PASIEN RAWAT JALAN DIABETES MELLITUS TIPE 2 DI KOTA SEMARANG. Journal of Health Education. 2017;25(1):57–60.

[15] Rohani R, Ardenny A. Analisis Faktor Yang Berhubungan Dengan Kepatuhan Diet Penderita Diabetes Melitus. Jurnal Kesehatan Masyarakat. 2019;7(2):61–7.

[16] Ernawati DA, Harini IM, Signa N, Gumilas A. Faktor Faktor yang Mempengaruhi Tingkat Kepatuhan Diet pada Pasien Diabetes Melitus Tipe 2 di Kecamatan Sumbang Banyumas. J of Bionursing. 2020;2(1):63–7.

[17] Joanna Briggs Institute. Critical Appraisal Tools. The University Of Adelaide. 2020.

[18] Ebrahim A, Alhariri A-A, Daud F, Almaiman A, Saghir AM. FACTORS ASSOCIATED WITH ADHERENCE TO DIET AND EXERCISE AMONG TYPE 2 DIABETES PATIENTS IN HODEIDA CITY, YEMEN Assessment of factors associated with adherence to diet and exercise among type 2 diabetes patients. Yemen View project Evaluation of the Anti-Hypothesis. 2017;7(September):264–71.

[19] Jadawala HD, Pawar AB, Patel PB, Patel KG, Patel SB, Bansal RK. Factors Associated With Non Adherence to Diet and Physical Activity among Diabetes Patients: A Cross Sectional Study. 2017;8(2).

[20] Simbolon YI, Triyanti T, Sartika RA. Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Diet Pada Penderita Diabetes Melitus Tipe 2 Di Puskesmas Kecamatan Pasar Minggu Tahun 2018. Jurnal Kesehatan Komunitas. 2019;5(3):110–7.

[21] Sianturi SR. Dukungan Keluarga Meningkatkan Kepatuhan Diet Pasien Diabetes Melitus Tipe 2. An Idea Nursing Journal. 2020;11(1):17–23.

[22] Datuela N, Akbar H, Langingi AR. Hubungan Motivasi Diri dengan Kepatuhan Diet pada Penderita Diabetes Mellitus di Klinik Kotamobagu Wound Care Center. Jurnal Fakultas Kesehatan Masyarakat. 2021;11(2):158–63.

[23] Mirahmadizadeh A, Khorshidsavar H, Seif M, Sharifi MH. Adherence to Medication, Diet and Physical Activity and the Associated Factors Amongst Patients with Type2 Diabetes. Diabetes Therapy. 2020 Feb;11(2):479–94.

[24] Kyokunzire C, Matovu N, Mayega RW. Corrigendum: Factors associated with adherence to diabetes care recommendations among children and adolescents

with type 1 diabetes: A facility-based study in two urban diabetes clinics in Uganda [corrigendum. Diabetes, Metabolic Syndrome and Obesity. 2018;11:595.

[25] Mohammed AS, Adem F, Tadiwos Y, Woldekidan NA, Degu A. Level of adherence to the dietary recommendation and glycemic control among patients with type 2 diabetes mellitus in Eastern Ethiopia: A cross-sectional study. Diabetes. Diabetes, Metabolic Syndrome and Obesity. 2020 Jul;13:2605–12.

[26] Tirfie M, Tadesse S, Woldie H, Weldegiorgis T, Birhanu M, Shibabaw T. Dietary non-adherence and associated factors among individuals with diabetes who are on treatment follow up at Felege-Hiwot Referral Hospital, Northwest Ethiopia. Heliyon. 2020 Aug;6(8):e04544.

[27] Ardiani HE, Permatasari TA, Sugiatmi S. Obesitas, Pola Diet, dan Aktifitas Fisik dalam Penanganan Diabetes Melitus pada Masa Pandemi Covid-19. Muhammadiyah J Nutr Food Sci. 2021;2(1):1.

[28] Karimy M, Koohestani HR, Araban M. The association between attitude, self-efficacy, and social support and adherence to diabetes self-care behavior. Diabetol Metab Syndr. 2018 Nov;10(1):86.

[29] Kartika K, Suryani I, Sari T. Hubungan Dukungan Keluarga Terhadap Kepatuhan Diet Pasien Diabetes Mellitus Tipe 2 Di Wilayah Kerja Puskesmas Gamping 1. J Nutr. 2017;19(1):17–24.