

Conference Paper

Knowledge and Self-Efficacy Towards Eating Behaviors by People Living with Diabetes Mellitus

Lisa Anita Sari, Ani Astuti, and Diah Merdekawati

Bachelor of Nursing Program, Nursing Department, Institute of Health Science Harapan Ibu, Jambi, Indonesi

ORCID:

Lisa Anita Sari: <https://orcid.org/0000-0003-0222-0691>

Abstract

Diabetes mellitus sufferers have metabolic issues caused by insulin disorders which indicate hyperglycemia. Behavior related to food and eating, including the amount of calories, dietary choices, setting a meal plan, and control dietary challenges are particularly important for diabetes mellitus sufferers owing to the impact of these measures on the speed with which blood glucose levels increase. With better understanding, diabetic patients can analyze their food intake and adopt appropriate eating behaviors. Self-efficacy can affect the patient's commitment to their health. Knowledge and self-efficacy support healthy eating behavior patterns. This study aims to identify the relationship between knowledge and self-efficacy with regards to eating behaviors among people living with diabetes mellitus. Bandura's promotion model was provided as a conceptual framework. A simple random sampling technique was used to recruit 201 participants with diabetes mellitus type 2. Data collection was via a Demographic Questionnaire, an Eating Behavior Questionnaire, a Diabetes Knowledge Questionnaire (DKQ), and a Diabetes Mellitus Self-Efficacy Questionnaire (DMSQ). Data was analysed using univariate and bivariate analysis. The results indicate that participants' eating behavior, knowledge, and self-efficacy were at a low level. This study also indicated a significant relationship between knowledge ($p < 0,000$) and self-efficacy ($p < 0,00$) and eating behaviors. The results provide important information to suggests that community nurses should increase the knowledge about diabetes mellitus management and use self-efficacy to design effective intervention to promote healthy eating behavior to keep blood sugar in control.

Keywords: eating behavior, knowledge, self-efficacy, diabetes mellitus

1. Introduction

According to the World Health Organization in 2014 estimated that DM affects approximately 422 million adults in the world, the largest number of people living with diabetes were projected to come from Southeast Asia and West Pacific (1). Based on Basic Health Research data, there was an increasing number in diabetes mellitus sufferers, of 14.387 people were living with diabetes mellitus in 2017, and the number of people living

Corresponding Author:

Lisa Anita Sari

lisaanitasari10@gmail.com

Published: 15 March 2021

Publishing services provided by
Knowledge E

© Lisa Anita Sari et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the IVCN Conference Committee.

 OPEN ACCESS

with diabetes mellitus who registered in all of Primary Health Care in Jambi Province become increasing to 18.890 in 2018 (2).

Type 2 diabetes mellitus is a metabolic disorder due to the ineffectiveness of pancreas to produce insulin (3). Diabetes mellitus is one of the main causes of kidney disease, amputation, and blindness in the age of under 65 years (4). Besides, diabetes mellitus is also a cause of amputation which is not caused by trauma, disability, death. Another effect of diabetes mellitus could reduce life-expectancy (5).

Diabetes mellitus and its complication impacted the long treatment of medication, medical cost, loss of jobs, and income (6). It is very important to take preventive measures taken by diabetes mellitus sufferers to prevent complications. The action likes controlling blood sugar and doing good dietary regulation, so the risk of complications going reduced (7).

Diabetes mellitus is a disease related to the intake of food, which acts as a causative factor and also a treatment factor. Excessive dietary intake is the risk factor for diabetes mellitus. Food intake likes carbohydrate, protein, fat, and sugar. Intake of food with large portions has the possibility of increasing of blood glucose levels (8). Dietary behavior as an effort in regulating the amount and type of food with descriptive information to maintaining health, nutritional status, and prevent to cure of the disease (9).

According to Bandura in 1997 self-efficacy is an idea from the social cognitive theory. Bandura defines self-efficacy as an individual's belief in the ability to organize and perform certain tasks to get the expected results. Self-efficacy as an aspect of self-management which has a major influence on behavior (10).

Diabetes mellitus sufferers were advised to consume foods with a low glycemic index. A low glycemic index tends to release glucose level in the blood slowly and it does not increase blood glucose level (11). The blood glucose level usually increases in people living with diabetes mellitus caused by excessive intake of food (8).

The benefits of food consumption with low glycemic index and high fiber and can lead to blood glucose levels in postprandial and response of insulin become lower. Thus, it can improve lipid profiles and reduce the incidence of insulin resistance. Otherwise, the consumption of foods with a high glycemic index can increase blood glucose levels quickly (11). The knowledge about diabetes management is useful to help the participants to select better eating behaviors (12).

Basically, people living with diabetes mellitus already know the dietary recommendations and healthy behavior, but they do not comply with the suggestions because consider that diet food for diabetes mellitus patients tends to be unpleasant, so they eat according to their wishes, especially if they have not shown serious symptoms (13).

Patients' knowledge and self-efficacy about diabetes mellitus are important tools to help treat them, so that the better knowledge and self-efficacy about diabetes mellitus can impact on managing their eating behavior. Furthermore, changing the behavior will be able to control the condition of the disease, so that it can survive longer and the quality of life is getting better.

Therefore, the participant has high knowledge and high self-efficacy are important to prevent their blood glucose from bad eating behavior. The objective of this study was to assess the health knowledge about diabetes mellitus and self-efficacy toward eating behavior among people living with diabetes mellitus type 2.

2. Methods and Equipment

2.1. Methods

2.1.1. Study design and sample

A cross-sectional study design was adopted in this study. The participants including adults with diabetes mellitus who registered in Putri Ayu Primary Health Care. The inclusion criteria included adult diabetic patients aged 18-59 years, diagnosed as having diabetes mellitus type 2 at least six months, able to communicate in the Indonesian language, having no mental health problem, willing to participate in this study, and able to complete the questionnaire independently.

2.1.2. Data Analysis

Descriptive statistics were used to determine the characteristics of participants (age, gender, level of education, occupation and income) and (knowledge, self-efficacy, eating behaviors). Bivariate analysis was used to find the relationship between variables by using the Chi-square test. Statistical Package for the Social Sciences (SPSS) version 24 for windows (SPSS Inc., STIKES Harapan Ibu, Jambi) was used for statistical analysis.

2.2. Equipment

2.2.1. Instrument

The data demographic form was designed by the researcher including age, gender, level of education, occupation, and monthly income. Assessment of the health knowledge

about diabetes mellitus by using the Diabetes Knowledge Questionnaire (DKQ) which developed by Garcia et al (14). It is composed of 24 items which consist of cause of the disease, complications, blood glucose level, diet, and physical activity and rated on 3 point, with responses ranging from 0 “don’t know”, 1 “wrong” and 2 “right”. The reliability in this study was 0.899 and the validity in this study was 0.326-0.690. The researchers categorized the knowledge based on two level, high and low.

Assessment of the self-efficacy about diabetes mellitus by using Diabetes Management Self-Efficacy Scale (DMSES) developed by Bijl et al (15). It is composed of 20 items which consist of specific nutrition factor, general nutrition factor, blood glucose control factor, physical activity and weight activity factor, and medical control factor and rated on 3 point, with responses ranging from 1 “unimportant”, 2 “necessary, but not important” and 3 “important”. The reliability in this study was 0.918 and the validity in this study was 0.344-0.791. The researchers categorized the self-efficacy based on two level, high and low.

The Dietary Behavior Questionnaire used a modified version from Primanda (12). It is composed of 33 items which consist of recognizing the amount of calorie needs, selecting a healthy diet and amount, arranging a meal plan, and managing dietary challenge and rated on 4 point, with responses ranging from 1 “never”, 2 “rarely”, 3 “sometimes”, and 4 “usually”. The reliability in this study was 0.932 and the validity in this study was 0.416-0.763. The researchers categorized the eating behavior based on two level, high and low.

2.2.2. Ethical Consideration

All instruments were translated into Indonesian version. Data were collected by researchers and three trained research assistants. This study has been approved by Health Research Ethics Committee Polytechnic of Jambi with the approval number: LB.02.06/2/121/2020 on July 2020. The participants in this study were freely to participate. The participants got the information. The participants also were allowed to ask questions regarding this study. The information provided by the participants was confidentially protected. After the participants clearly understood, they were asked to sign an informed consent form.

3. Results

The participants completed all of the self-administered questionnaires and their demographic data were analyzed.

TABLE 1: Distribution of number and percentage of demographic data of participants (n=201)

Characteristics		n	%
Age (39 – 59 years)			
	< 45 years	61	30.3
	≥ 45 years	140	69.7
Gender			
	Male	81	40.3
	Female	120	59.7
Sufficiency of income			
	Not Sufficient	68	33.8
	Sufficient	133	66.2
Educational level**			
	Basic education	57	28.4
	Advance education	144	71.6
Occupation			
	Unemployed	46	22.9
	Employed	155	77.1

*Sufficient depend on regional minimum wage

**Basic education compulsory 9 years of education

All of the participants were adult people. More than half of the participants (59.7%) were females, which is higher than the number of male participants. The result showed that more than half of the participants (66.2%) had sufficient income. The majority of the participants (71.6%) had finished their basic education and the majority of the participants (77.1%) were employed (See Table 1).

TABLE 2: Distribution of number and percentage of variables (n=201)

Variables		n	%
Knowledge			
	High	82	40.8
	Low	119	59.2
Self-efficacy			
	High	97	48.3
	Low	104	51.7
Eating behavior			
	High	99	49.3
	Low	102	50.7

While Table 2 shows that more than half of the participants were at low knowledge and more than half of the participants were at low self-efficacy. The result showed that more than half of the participants were at low eating behavior.

TABLE 3: Relationship among knowledge, self-efficacy and eating behavior (n=201)

Variables	p-value
Knowledge	0.000**
Self-efficacy	0.000**

*p <.05; **p <.01

The result as shown in the Table 3 showed there was a relationship between knowledge and eating behavior ($p = < 0.01$) and there was a relationship between self-efficacy knowledge and eating behavior ($p = < 0.01$).

4. Discussion

According to the findings of this study. The current studies are in line with another study which explained that the majority of diabetic patients had aged more than 45 years (16), (17), (18), (10), (19), (20), (21). Diabetes mellitus type 2 will be increases with age, where adult people aged more than 45 years are risk to developing diabetes mellitus due to degenerative factors such as decreased body function and particularly the number of productive β cells become decreases to produce insulin to metabolize glucose. The results are in contrast with a previous study which explained that more than half of diabetic patients were male (16), (18). The findings are consistent with another study which showed that majority of diabetic patients were female (17), (22), (10), (23), (19), (20), (12), (21). According to this study, diabetes mellitus mostly attacks female which triggered by hormonal fluctuations that make the distribution of fat easily accumulate in the body so that the body mass index (BMI) increases with a higher percentage of fat. The studies are in contrast with other studies which showed that the majority of diabetic patients had basic education (22), (18). The findings are similar to other studies which explained that majority of diabetic patients had advance education (16), (17), (10), (23), (19), (20), (12), (21), (24). Level of education cannot change the wrong eating habits that exist in cultured society. However, higher education can increase patient awareness to looking for information about an appropriate lifestyle for people living with diabetes mellitus. The results are consistent with the previous study which explained that the majority of diabetic patients had a job (16), (20). The results are in contrast with a previous study which explained that the majority of diabetic patients had not a job (18), (23), (12). Job as an activity that a people must to do to fulfill their own life as well as their family's

daily needs. Job as a method used by people to get salary. People who have a job can be used to determine socioeconomic levels as well as health problems. Meanwhile, people who don't have a job will have difficulty to fulfill their daily nutritional needs so that the body will be susceptible to get the diseases. The findings are consistent with another study which showed that majority of diabetic patients had sufficient income (17), (10), (20), (12), (21), (24). Sufficiency of income can affect the ability of people with diabetes mellitus in managing their diet. People with sufficient income can provide a healthy diet and can monitor blood glucose levels independently in hospitals or other health services.

Literature were reviewed on published work regarding demographics data, knowledge, self-efficacy, and eating behavior among people living with diabetes mellitus type 2. There were different results in a different country in the world. The findings are consistent with a previous study which showed that more than half of diabetic patients had low knowledge (16), (22), (12). The studies are in contrast with another study which showed that the majority of diabetic patients had high knowledge (21). Knowledge is very important for people living with diabetes mellitus in order to avoid complications, so an intervention is needed to increase knowledge about disease, management processes, treatment therapy, interactions, diet, physical activity, and utilization of existing health facilities in the community (25).

The study findings are in contrast with a previous study which explained that the majority of diabetic patients had high self-efficacy (10), (23), (21). Self-efficacy gives a feeling of having control in a person to solve the problems and face the source of the problems by carrying out routine control to check blood glucose levels and regular to medical control (10).

The findings are in contrast with a previous study which showed that the majority diabetic patients had moderate level of eating behavior (19), (20), (21). Management of patients with chronic illness focused on patient-centered care. The nurse considers that patient as a person who know well about his health condition. The nurse also appreciates to the patient's subjective experience in maintaining health. Patient defined as people who take an active role to improve health. The patient could work together with the nurse to determine the appropriate intervention (26).

According to findings of this study, knowledge and self-efficacy regarding to diabetic management were significantly with eating behavior. The results are in line with the previous studies that was statistically having significant relationship between knowledge and eating behavior (12), (24). The findings are in contrast with the previous studies that was statistically were not significant relationship between knowledge and eating

behavior (21). The reason related to the participant's knowledge. The participants receive informal information from nurse or physicians in the Primary Health Care. But, they just got general information about the disease. This caused the participants' knowledge about diabetes management did not improve. Regarding to the cultural consideration of the participants. Indonesian people feel that they have not really had a meal, if they did not eat rice. Although they have eaten some cake or food. The participants did not pay attention to the amount of foods that they eat when they enjoying their foods. Although the foods had high calories and high sugar. Knowledge help the individual to make a choice and effort to move forward in maintaining their life-spanning task.

The findings are similar with the previous studies that show a statistically significant relationship between self-efficacy and eating behavior (20), (21). The reason come from the participant's self-efficacy. During the participants had been diagnosed with diabetes mellitus type 2, the participants develop their self-learning process about what the healthy diet that they need to consume in order to control their blood sugar level. The participants realized that they had to avoid fatty food and sugar, but the participant's habit still unable to reduce the portion of food. After the participants had been diagnosed with diabetes mellitus type 2, they could manage their eating behaviors by managing dietary, selecting healthy food, arranging meal plan, and recognizing amount of calorie. But over time, the participants feel bored if they have to think about eating habits all the time. The patients with chronic illness are experts on their own lives and they learn to manage their disease (12).

5. Conclusion

Some factors relate to these findings like the participant's knowledge about diabetes management and the participant's self-efficacy about managing the disease found to be associated with eating behavior. The participants with diabetes mellitus type 2 should increase knowledge, self-efficacy, and keep eating behavior well. It will prevent complications of diabetes. Lack of knowledge and less self-efficacy could increase the burden of disease in the community. There is a need to improve the participant's knowledge, self-learning, and provide to educate them. The results of this study provided information that can be used to construct education based on community programs to maintain health among people living with diabetes mellitus. The effective management of diabetes mellitus requires to maintain health. The treatment not only from medication but the patient awareness about lifestyle modification also appropriate.

Funding

This work was supported by Competitiveness Growth Program of the STIKES Harapan Ibu Jambi.

Acknowledgement

The researcher would like to thank to STIKES Harapan Ibu Jambi for contribution and support to the research. The researchers are also thankful to all of the participants who willing to participate in this study and helped in completing the questionnaire.

Conflict of Interest

The authors have no conflict of interest to declare.

References

- [1] WHO. (2016). *Global Report on Diabetes*. Retrieved from: http://www.who.int/about/licensing/copyright_form/index.htmlhttp://www.who.int/about/licensing/copyright_form/index.html<https://apps.who.int/iris/handle/10665/204871><http://www.who.int/about/licensing/>.
- [2] Riskesdas. (2018). Hasil Utama Riskesdas 2018. Kementerian Kesehatan RI: Badan Penelitian dan Pengembangan Kesehatan. Vol. 44, issue 8, pp. 1–220.
- [3] Smeltzer, S. C. and Bare, B. (2013). *Buku Ajar Keperawatan Medikal Bedah* (8th ed.). Jakarta: EGC.
- [4] Hill, J. (2011). Diabetes Monitoring: Risk Factor, Complications and Management. *Independent Nurse.*, vol. 9, issue 3, pp. 122–30.
- [5] Garnita, D. (2012). Faktor Resiko Diabetes Mellitus di Indonesia. In Fakultas Kesehatan Masyarakat Universitas Indonesia (FKM UI). *University of Indonesia Library.*, p. 1–189.
- [6] Kemenkes RI. (2019). *Hari Diabetes Sedunia Tahun 2018. Pus Data dan Inf Kementrian*. Kesehat RI. Jakarta. pp. 1–8.
- [7] MB Arisman. (2011). *Buku Ajar Ilmu Gizi Obesitas, Diabetes Mellitus dan Dislipidemia*. Jakarta: EGC.

- [8] Tjokroprawiro, A. (2012). *Garis Besar Pola Makan Dan Pola Hidup Sehat Sebagai Pendukung Terapi Diabetes Mellitus*. Surabaya: Fakultas Kedokteran Unair.
- [9] Department of Health. (2015). *Badan Penelitian dan Pengembangan Kesehatan*. Jakarta. Kementerian Kesehatan RI.
- [10] Kusuma, H. and Hidayati, W. (2013). Hubungan Antara Motivasi Dengan Efikasi Diri Pada Pasien Diabetes Mellitus Tipe 2 Di Persadia Salatiga. *Jurnal Keperawatan Medikal Bedah*, vol. 1, issue 2, pp. 132–41.
- [11] Hartono, R. (2014). *Buku Ajar Ilmu Gizi*. Jakarta: EGC.
- [12] Primanda, Y., et al. (2011). 211 Dietary Behaviors among Patients with Type 2 Diabetes. *Nurse Media Journal of Nursing.*, vol. 1, issue 2, pp. 211–23.
- [13] Andri Setyorini. (2017). Stres dan Koping pada Pasien dengan Diabetes Mellitus Tipe 2 dalam Pelaksanaan Manajemen Diet di Wilayah Puskesmas Banguntapan II Kabupaten Bantul. *Health Sciences and Pharmacy Journal.*, vol. 1, issue 1, pp. 1–9.
- [14] Garcia, A. A., et al. (2001). The Starr County Diabetes Education Study: Development of the Spanish-Language Diabetes Knowledge Questionnaire. *Diabetes Care.*, vol. 24, issue 1, pp. 16–21.
- [15] Van der Bijl, J. and van Poelgeest-Eeltink, A. (2001). The Psychometric Properties of the Diabetes Management Self-Efficacy Scale for Patients with Type 2 Diabetes Mellitus. *Journal of Advanced Nursing.*, vol. 30, issue 2, pp. 352–361.
- [16] Bano, A., et al. (2017). Dietary knowledge, Attitude and Practices of Diabetes Patients at Services Hospital Lahore. *International Journal of Applied Sciences and Biotechnology.*, vol. 5, issue 2, pp. 227–36.
- [17] Dawkins NL., et al. (2016). SM Group SM Journal of Food and Nutritional Disorders Responses to Health Knowledge and Behavior Questionnaire: Implications for Nutrition Intervention. *SM Journal of Food and Nutritional Disorders.*, Vol. 2, issue 1, pp. 1–6.
- [18] Bukhsh, A., et al. (2019). Association of Diabetes Knowledge with Glycemic Control and Self-Care Practices among Pakistani People with Type 2 Diabetes Mellitus. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy.*, vol. 12, pp. 1409–17.
- [19] Aklima, C. and Kritpracha, P. T. (2013). Dietary Behaviors among Patients with Type 2 Diabetes Mellitus in Indonesia. *Nurse Media Journal of Nursing.*, vol. 3, issue 1, pp. 499–509.
- [20] Om, P., Deenan, A. and Pathumarak, N. (2013). Factors Influencing Eating Behavior of People with Type 2. *Journal of Science, Technology, and Humanities.*, vol. 11, issue 2, pp. 129–38.

- [21] Putra, K. W. R. and Toonsiri, S. J. C. (2015). Factors Influencing Eating Behaviors among Type 2 Diabetes Mellitus Patients in Sidoarjo Sub-district, East Java, Indonesia. *Thai Pharmaceutical and Health Science Journal.*, vol. 10, issue 2, pp. 39–48.
- [22] Dussa, K., Parimalakrishnan, S. and Sahay, R. (2015). Assessment of Diabetes Knowledge Using Diabetes Knowledge Questionnaire among People with Type 2 Diabetes Mellitus. *Asian Journal of Pharmaceutical and Clinical Research.*, vol. 8, issue 2, pp. 254–6.
- [23] Ariani, Y. and Sitorus, R. (2012). Motivasi dan Efikasi Diri Pasien Diabetes Mellitus Tipe 2 dalam Asuhan Keperawatan. *Jurnal Keperawatan Indonesia.*, vol. 15, issue 1, pp. 29–38.
- [24] Wijaya, K., *et al.* (2019). Monthly Income of Family, Educational Level, Knowledge, and Eating Behaviors among People with Type 2 Diabetes Mellitus in Sidoarjo. *International Conference of Kerta Cendekia Nursing Academy.* Vol. 1, issue 2, pp. 169–73.
- [25] Pengurus Besar Perkumpulan Endokrinologi Indonesia. (2015). *Konsensus Pengelolaan dan Pencegahan Diabetes Mellitus Tipe 2 di Indonesia.* Jakarta: PB PERKENI.
- [26] Potter and Perry. (2010). *Fundamental of Nursing* (7th ed.). Jakarta: Salemba Medika.