

# Level of Family Knowledge on Diabetes Mellitus Diet in Yogyakarta

Fahni Haris\* and Aulia Ayu Nugraheni

*School of Nursing, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta 55183, Indonesia*

An unhealthy diet contributes to the incident rate of people with type 2 diabetes mellitus (T2DM) in the world. The key to diet success is influenced by many factors and one of them is the level of family knowledge. This study aimed to assess the level of family knowledge on DM diet. The descriptive-analytic method was used by involving 45 respondents of the clustering system (sampling) with a total population of 276 people. The result of research is 53.3% of respondents were in poor knowledge. Family with age range 30–60 years had poor knowledge (37.8%), a vast of family were women (55.6%), level of education was graduated from high school (40%). Most respondents are unemployed (55.6%) and they had never known about the diabetes mellitus diet before (60%). The conclusion of the study is the family of DM patients in Kasihan, Yogyakarta had poor knowledge on DM diet. The healthcare professionals should provide more information in detail particularly on DM diet toward the family members of DM patients.

**Keywords:** Diabetes Mellitus, Diet, Family Knowledge Level.

## 1. INTRODUCTION

Diabetes mellitus (DM) is a global public health threat, about 90% of all DM patients in the world are DM type two.<sup>1</sup> Asia accounts for more than 60% of DM patients worldwide.<sup>2</sup> The prevalence of DM patients in Indonesia ranks 7th in the world with the number of patients as many as 12 million people and is expected to increase until 2030 to 21.3 million people.<sup>3</sup> The prevalence of DM patient in Yogyakarta is 72,207 people and DM alone includes in the top ten diseases causes mortality in Yogyakarta.<sup>3</sup> Epidemiological studies have shown an increase in prevalence, especially diabetes mellitus type 2, is closely related to poor diet.<sup>4</sup>

The people of Yogyakarta have high-risk food consumption patterns against DM such as consumption of sweet and fatty foods. Its habits were contadictive with the main key of therapy type 2 diabetes that is a healthy diet and lifestyle modifications.<sup>5</sup> The success of diet in patients with DM is influenced by the accuracy of diet and patient compliance. The research in Kediri shows that 56.14% of respondents are not obedient to diet and 57.89% DM sufferer complication.<sup>6</sup> Dietary compliance itself is influenced by the support and level of family knowledge because families with high levels of knowledge affect adherence of 96.3%.<sup>7</sup>

A preliminary study conducted at Tamantirto in January 2016 with interviews and questionnaires in 10 families of patients with DM found the family did not understand the right diet in DM

patients. Preliminary study results showed that families do not understand how to regulate the diet of DM patients based on 3J (available in Indonesia) principles (Type, Amount, and Schedule), in addition to misperception of the family because they assume that DM patients should not consume sugar if they want their blood sugar levels controlled.

Based on study in Muhammadiyah Hospital showed that DM patients and family in Hospital had good knowledge DM diet (93.8%)<sup>8</sup> but family knowledge of DM diet in Yogyakarta still unclear discussion. The researchers attracted to assess the level of family knowledge on DM diet in community.

## 2. EXPERIMENTAL DETAILS

This study was conducted on May until June 2016 as a community based cross sectional study with descriptive-analytic design.<sup>9</sup> Population in this research is a family of DM outpatient that has been diagnosed at Primary Care of Kasihan I, Bantul from Januari 2014 until Desember 2015. The population in this research are 276 people. Forty-five people or about 15% of population were included as respondents, used cluster sampling (6 village were included).<sup>10</sup> Respondents counted from Kasihan village (9), Tlogo village (9), Ngrame village (7), Kembaran village (7), Ngebel village (7) dan Bibis village (6).

Measurement of knowledge level used a family knowledge questionnaire about the DM patient's diet with 20 closed questions (multiple choice) related diet in DM patients and interview.

\* Author to whom correspondence should be addressed.

**Table I. Respondent characteristics (n = 45).**

No.	Respondent characteristics	Frequency	Percentage (%)
1.	Age		
	18–25 years	1	2.2
	26–35 Years	3	6.7
	36–60 years	33	73.3
	>60 years	8	17.8
2.	Sex		
	Male	25	55.6
	Female	20	44.4
3.	Education (graduated school)		
	Not Graduated	2	4.4
	Elementary	15	33.3
	Junior high school	3	6.7
	Senior high school	18	40
	College	7	15.6
4.	Job		
	Employee	20	44.4
	Unemployed	25	55.6
5.	DM diet information		
	Already informed	18	40
	Not informed yet	27	60

Answers to the questionnaire if it is incorrectly assigned a value (0) if correctly assigned a value (1). The scale used in this variable is the ordinal scale. The range of values that may be obtained is between 0–20.<sup>10</sup>

Respondents will get good category if they answered correctly >15 questions (76–100%), fair 12–15 questions (56–75%), and poor <12 questions (≤55%). The data analysis used is univariate analysis.<sup>11</sup>

Researchers make limitation and arranged inclusion criteria to choose the respondents:

1. ≥18 years old.
2. Family member (wife, husband, parent, children) who have DM patient in one house.
3. Active checked up their blood glucose (last month).

### 3. RESULTS AND DISCUSSION

Based on the table above it is known that most respondents aged 36–60 years ( $n = 33, 73.3\%$ ), a vast of family were female ( $n = 25, 55.6\%$ ), graduated from senior high school education ( $n = 18, 39.8\%$ ). Most of them were unemployed ( $n = 25, 55.6\%$ ) and were not informed about diet in DM patients before ( $n = 27, 60\%$ ).

The table above shows that the knowledge level of respondents by age is a mostly in poor knowledge ( $n = 17, 37.8\%$ ) at 36–60 years of age, a vast of family were female had poor level of knowledge ( $n = 15, 33.3\%$ ). Most of respondents was graduated from senior high school had fair level of knowledge ( $n = 10, 22.2\%$ ). The level of knowledge of respondents by employment status in the poor category ( $n = 14, 31.1\%$ ) for respondents who are unemployed and they had never get information about DM diet before, were fair and poor level of knowledge respectively ( $n = 13, 28.9\%$ ).

#### 1. Respondent Characteristics

##### a. Age

Respondents in this study were dominated by the age group of 36–60 years category, this was the age of 36–60 years includes in adulthood when degenerative process of the body function began so this age group suffered a lot of DM and the

**Table II. Description of the level of family knowledge about diabetes mellitus diet in Yogyakarta (n = 45).**

No.	Respondent characteristics	Level of knowledge		
		Poor f(%)	Fair f(%)	Good f(%)
1.	Age			
	18–25 years	–	1 (2.2)	–
	26–35 Years	2 (4.4)	1 (2.2)	–
	36–60 years	17 (37.8)	15 (33.3)	1 (2.2)
	>60 years	5 (11.1)	3 (6.7)	–
2.	Sex			
	Male	9 (20)	10 (22.2)	1 (2.2)
	Female	15 (33.3)	10 (22.2)	–
3.	Education (graduated school)			
	Not Graduated	1 (2.2)	1 (2.2)	–
	Elementary	7 (15.6)	8 (17.8)	–
	Junior high school	2 (4.4)	–	1 (2.2)
	Senior high school	8 (17.8)	10 (22.2)	–
	College	3 (6.7)	4 (8.9)	–
4.	Job			
	Employee	10 (22.2)	10 (22.2)	–
	Unemployed	14 (31.1)	10 (22.2)	1 (2.2)
5.	DM diet information			
	Already informed	11 (24.4)	7 (15.6)	–
	Not informed yet	13 (28.9)	13 (28.9)	1 (2.2)

majority of support systems in this study are couples that have same age with DM patients. A survey in Indonesia shows that 65% of men married women aged 5 years younger.<sup>12</sup>

This research are same with another research states that couple has a significant relationship as a support system for DM patients.<sup>13</sup> The DM patients aged 30–69 years caused by poor lifestyle.<sup>13</sup> The middle-aged group is the respondent of DM patients with the largest percentage (56.3%).<sup>14</sup> Middle-aged people have begun to experience the aging process and there are various decreases in body function, causing them at risk of chronic illness including DM.<sup>13</sup>

#### b. Gender

The greater respondents were female, this happened because the most of DM patients are male so that the partner who is the support system is female. The study congruent with results of a survey from Centers for Disease Control and Prevention (CDC), men are more likely to suffer DM than women.<sup>15</sup> The larger part of patients with DM are men with 59.4% in total.<sup>16</sup>

Women are more likely to act as givers and recipients of social support because of their caring and sensitive nature.<sup>17</sup> Women are more concerned because they tend to involve their feelings.<sup>18</sup>

#### c. Educational Level

The education of respondents in this research is dominated by the high school level, this was based on the conditions found by researchers when conducting home visits in the research processes. The education of respondents classified into secondary education, this because research area is in the location where the people could access many educational facilities.

Most of the respondents who are ≥45 years old were in the high school level.<sup>14</sup> Most of the middle-aged respondents dominated by high school level.<sup>19</sup>

#### d. Job Status

The highest number of respondents were unemployed. Almost respondents were housewives. This supported by

conditions found by researchers during home visits and interviews with respondents. The results equal with studies in which female respondents aged 15–49 years are mostly unemployed,<sup>20</sup> furthermore 58% of adult women do not work.<sup>21</sup>

#### e. Information Exposure

Based on information exposure, most respondents were never received information on diet for DM patients before. This happened because usually, only DM patients who got the health education and not involving their family. This research similar with the conditions found by researchers when conducting interviews with respondents and nutritionists at Primary Health Center Kasihan I Bantul.

The results of this research are supported by the other research which stated that the respondents in the study mostly received poor exposure to health information.<sup>22</sup> Information on health problems and health care programs in the community are still low.<sup>23</sup> Exposure to information may be related to the location of the respondent's demographics, the respondents in the village (rural area) are more difficult to obtain and access information about their health.<sup>24</sup>

## 2. Description of the level of family knowledge about diabetes mellitus diet in Yogyakarta

### a. Age

The knowledge of respondents by age was dominated by fair and poor category (36–60 years old). Respondent's knowledge is inadequate especially about how to regulate the amount of diet for DM patient (56,7%). Respondents have still not been able to calculate the amount of diet needed, but they know how the DM diet in general, respondents feel if diet were done just by reducing eating or sweet drinks.

Most DM patients know diet principles for DM patients but do not understand yet how to apply it.<sup>25</sup> Age can also affect a person's knowledge, age ranged 36–60 years pertained to adulthood where the decline in the function and way of thinking. The results of this study are supported by other research which states that the respondents dominated by middle-age adults were in the knowledge fair and poor category.<sup>9</sup> Middle-age is the period when beginning the decline in sensory ability, mindset, memory, and health in general so it could affect their knowledge.<sup>14</sup> Aging processes for a person will lead to decline function and memory and it makes that person having difficulties to receive information and eventually can be misunderstanding while learning about the information.<sup>26</sup> Middle age cannot accept information related to DM optimally, and within fair knowledge makes consequences that the family cannot assess the needs of DM patients, also cannot motivate DM patients for treatment.<sup>27</sup>

In the other hand, only one respondent who had good level of knowledge even though she was 53 years old. The respondent's family had long suffered from DM so that respondent has a lot of experience and knowledge about diet for DM patients. The respondent always support her husband to check up his blood glucose regularly at primary health care. She knows about how to manage her husband's blood glucose with serve food (respondent called "big meal" for breakfast, lunch and dinner. And one type of "meal" for support diet: fruits, milk, potato, tea, cassava) every three hours and reduce consuming sweet drinks. For example, when she serves "big meal" at seven o'clock and she will serve "meal" for the next

three hours. Its meal ("big meal-meal") will continue until three times per day.

### b. Gender

The knowledge of respondents based on sex was dominated poor category by female, especially how to regulate the amount of diet in DM patient (52,8%). Respondents in this research are mostly housewives who have a lot of activities, such as taking care of children and completing housework become obstacles for respondents to access information about the DM patient's diet. The respondents also have in fair knowledge about how to access information.

In Indonesia, women are taken role as someone who must serve the husband and take care of the family so what was ordered by the husband will be followed by the wife. The results show that most of DM patients are men, and wife as support system are deficit to get information related to managing of DM diet so they cannot do much because of the growing culture. This is in line with research in Pakistan that support system plays an important role, but many women do not get it adequately and it would affect the level of their knowledge.<sup>27</sup>

Most women cannot access information about DM diet adequately. They said that DM diet came from health practitioners (nurses, doctors, midwifery) at primary health or leaflet but still inadequate. They also tried access to the internet to seek DM diet resources. She got information DM diet already, but confuse how to practice it. In contrast, knowledge of DM diet in a developing country was good. Respondent's content satisfaction score was satisfactory because they can access internet or other resource to know DM diet and how to applying it.<sup>28</sup>

Moreover, not only lack how to access information, women who have received information about DM diet also unable to organize their partners (DM patients) to convey their knowledge, which results inadequate recall of DM-related knowledge gained so that most respondents have poor and fair knowledge level.<sup>13</sup> The results of this study are in line with another research where 71% of female respondent's knowledge is in the poor category.<sup>20</sup> Society's knowledge in developing countries, especially women tends to be inadequate due to the many obstacles when accessing information.<sup>29</sup>

### c. Educational Level

The knowledge of respondents based on the educational level is in the fair and poor categories dominated by respondents with high school level. Poor knowledge of respondents especially about how to regulate the amount and schedule of diet in DM patient (54,4%). The education of respondents is in the secondary education level, but their knowledge is in the poor category because there are still other factors that affect knowledge.

Factors that affect knowledge are age, sex, education, occupation, culture, and information exposure.<sup>11</sup> Knowledge of respondents in this research is poor because most of the respondents never got information or health education about diet in DM patient. The study consistent with another research where the knowledge of respondents with the elementary and high school education level is in the category of poor and fair. Most respondents who have an education was dominated by fair knowledge about 49.1% and poor by 27.9%.<sup>19</sup>

Respondents who had fair knowledge partially understand about blood sugar control, diet limitations, and exercise. Most respondents already know how to check blood sugar, they

should have checked up at primary health care at least a month but if they do more than one time a month is better.<sup>28</sup> About diet limitations already discussed in another chapter. This However, some respondents considered the limitations of DM diet still difficult to understand. They assume that they have told their partner to keep doing their activities, but the proper training for DM therapy is still not understood yet by some respondents. This is supported with a research states that DM respondents feel distressed with the support system for DM exercise.<sup>30</sup>

#### d. Job Status

The results of this research were dominated by unemployed respondents and with poor knowledge category 52.8% and 31.1% respectively. They had poor knowledge about how to regulate the amount of diet in DM patients. Respondents provide food, but do not know yet how to set a good meal. From interview, some respondents assumed that they were provide tea or coffee with minimal sugar but they cannot prohibit their family member who suffering DM to reduce the amount of rice.

Respondents who do not work will be less to interact with other people than employee, therefore they obtained limit information. This is same with another research states that knowledge of respondents who do not work is in the poor category about 66.79% due to inadequate interaction with the others.<sup>11</sup> An unemployed has poor knowledge level is about 65%, in contrast people who working will easily get information from other resources that could increase his/her knowledge.<sup>31</sup>

Unemployment is one of factor that influence the knowledge level because they can't expend their money to seeking DM diet information. Financial problem that happen in respondents affect their habits.<sup>32</sup> Based on interview, unemployment respondents spend their time at home for some reasons: just stay at home all day, taking care their children, watching tv cinema. Respondents missed to checking DM diets' family member. They were serve food per six hours, reduce sugar when making tea or coffee but they do not reduce the rice portion. They assumed, rice must be consuming and no excuse for leftovers food. It's make DM patients disobey DM diet rule that should reduce the food which contain high calories such as rice.

Due to they have no enough money, some respondents unwilling to companies DM family member for checkup blood glucose regularly. It's make respondents and DM family member will miss chance to get new information about DM diet from health practitioners.

#### e. Information Exposure

Respondent's knowledge based on the information exposure was dominated by the respondents who never got information about the diets for DM patients, including the fair and poor categories. Respondents would get information through mass media: social networks, television, radio, smartphone and others.<sup>32</sup>

Based on interview, respondents argued that they familiar with mass media like television, radio even smartphone but they used them for consolation devices such as listening music, watching television. Moreover, that mass media lack of health promotion about DM diet. Television makes the respondents lazy to seeking DM diet information. Some women who

unemployment said that I've wasted my time for watch serial television program.

Most women cannot operate their smartphone to improve their knowledge of DM diet. Respondents said that they had smartphone are just for make a call, even though their phone are compatible for seek information with internet access. In contrast, one respondent assumed how local government can develop mass media to support DM diet in Yogyakarta, especially Kasihan 1 Primary Health care. She said, it perhaps has a lot of benefit if DM diet information available on an application (smartphone).

Respondents were poor knowledge due to how to regulate the amount of diet in DM patient (55,7%). The respondents know if patients with diabetes mellitus should implement DM diet, but the respondents have not been able to determine the appropriate amount for the diet. Information exposure greatly affects the knowledge of a person, the more often a person gets information the better knowledge they get.<sup>33</sup> Exposure of information will also affect a person's learning process and knowledge.<sup>22</sup>

Respondents had miss perception about DM diet information. Some health practitioners tough to the respondent and DM family member for reduce sweet food or drinks, it caused respondents cannot control DM family member eating time. They also had miss perception about DM eating time, respondents knew if DM eating time is no change or the same with normal people (per six hours). That's contradictive with Indonesian Doctor of Endocrine Association that suggest DM patients should eat (big meal, meal, big meal, meal, big meal and meal) each per 3 hours with highly discipline restriction diet.<sup>8</sup>

## 4. CONCLUSION

Based on data analysis and discussion, it can be drawn the conclusion as follows:

1. Most family knowledge in this study was in the poor category.
2. Family knowledge based on age was in the fair category at the age of 36–60 years (37.8%).
3. Family knowledge by sex was in the poor category dominated by female (55.6%).
4. Family knowledge based on the level of education was in the fair category at the great part graduated from senior high school (40%).
5. Family knowledge based on employment status was in the poor category for unemployed respondents (55.6%).

## References and Notes

1. World Health Organization, *Diabetes Program About World Diabetes Day (2015)*.
2. A. Ramachandran, C. Snehalatha, A. S. Shetty, and A. Nadiitha, *World Journal of Diabetes* 3 (2012).
3. Y. T. Gultom, Karya Tulis Ilmiah Strata Satu, Depok: Fakultas Ilmu Keperawatan, Universitas Indonesia (2012).
4. M. L. Susanti and S. Tri, Dukungan Keluarga Meningkatkan Kepatuhan (2013).
5. Kompas, Jarak Ideal Usia Calon Istri (2008).
6. Q. P. Rasajati, B. R. Bambang, and N. A. N. Dina, *Unnes Journal of Public Health* 3 (2015).
7. M. Amelia, N. Sofiana, and E. Veny, *Jurnal Program Studi Ilmu Keperawatan Universitas Riau* 1 (2014).
8. Pertiwi, Lingga Multi. Universitas Muhammadiyah Yogyakarta, Indonesia (2014).

9. S. Aspuah, Kumpulan Koesioner dan Instrumen Penelitian Kesehatan, Medical Book, Yogyakarta (2013).
10. S. Arikunto, Prosedur Penelitian Suatu Pendekatan Praktik, Rineka Cipta, Jakarta (2013).
11. R. Bilous and R. Donnelly, Buku Pegangan Diabetes, 4th edn., Bumi Medika, Jakarta (2015).
12. L. Lestari, Z. Reni, and T. A. Larasati, *Medical Journal of Lampung University* 2 (2013).
13. H. M. M. Herath, N. P. Weerasinghe, H. Dias, and T. P. Weeraratna, *BMC Public Health* 17, 1 (2017).
14. A. Kristinato, D. S. Anton, W. Anthony, A. K. Caroline, I. Farha, and W. Budi, Departemen Obstetri dan Ginekologi Fakultas Kedokteran Universitas Indonesia (2012).
15. Centers for Disease Control and Prevention, Atlanta, GA, U.S. (2011).
16. A. Ridwan and P. P. Heri, *Jurnal Akper Pemenang Pare Kediri* (2012).
17. Departemen Kesehatan Republik Indonesia, *Riset Kesehatan Dasar* (2015).
18. A. K. Wardani and M. A. Isfandiari, *Jurnal Berkala Epidemiologi*, Departemen Epidemiologi Fakultas Kesehatan Masyarakat Universitas Airlangga, Surabaya (2014), Vol. 2.
19. F. Rahmawati, E. P. Setiawati, and T. Solehati, Telaah Literatur, Universitas Padjadjaran, Bandung (2014).
20. H. A. Tyas and A. Setia, Seminar Psikologi dan Kemanusiaan, Fakultas Psikologi Universitas Muhammadiyah Surakarta, Surakarta (2015).
21. M. Nasihah and L. B. Sifia, *Jurnal Midpro edisi 2. Universitas Islam Lamongan* (2013).
22. H. E. Phitri and Widiyaningsih, *Jurnal Keperawatan Medikal Bedah* 1 (2013).
23. International Diabetes Federation, *Risk Factors* Diakses Oktober (2015), dari <http://www.idf.org/about-diabetes/risk-factors>.
24. M. Hasbi, Karya Tulis Ilmiah Strata Dua, Fakultas Ilmu Keperawatan. Universitas Indonesia (2012).
25. A. Senuk, S. Wenny, and O. Franly, *Ejournal Keperawatan (e-Kp)*, Universitas Sam Ratulangi Manado (2013), Vol. 1.
26. N. Ramadhani and M. S. Nelly, *Jurnal Penelitian Kesehatan* (2015).
27. Saeed Ur Rashid Nazir, Mohamed Azmi Hassali, Fahad Saleem, Sajid Bashir, and Hisham Aljadhey, *Alternative Therapies* 22, 8 (2016).
28. R. Amutha, K. Y. C. Carina, O. Brian, H. Zanariah, and F. Q. Kia, *Int. J. Behav. Med.* 22, 365 (2015).
29. Melati, Karya Tulis Ilmiah Strata Satu, Universitas Indonesia, Depok (2012).
30. S. Mohammed, S. Islam, T. Biswas, F. A. Bhuiyan, K. Mustafa, and A. Islam, *BMC Res. Notes* 10, 1 (2017).
31. N. D. Pratita, Calyptra: Jurnal Ilmiah Mahasiswa Universitas Surabaya, Fakultas Psikologi Universitas Surabaya, Surabaya (2012), Vol. 1.
32. Mbogo and McGill, *BMC Health Services Research* (2016), Vol. 16, p. 413.
33. B. A. Riyanto, Kapita Selekta Kuesioner Pengetahuan dan Sikap dalam Penelitian Kesehatan, Salemba Medika, Jakarta (2013).

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