

Original Research

The Effect of Health Education on Knowledge of The Prevention of Diabetes Mellitus



Dewi Wijayanti^{1*}

¹Department of Nursing, Faculty of Health Sciences, Universitas Borneo Tarakan, Tarakan, Indonesia

Article Info	Abstract
Article history: Received: 05 March 2022 Accepted: 29 March 2022	<i>Introduction:</i> Diabetes mellitus (DM) is a lifelong disease that cannot be cured permanently, which according to WHO estimates the number of people with diabetes will be the main cause of 7 deaths in 2030. One way to reduce the incidence of diabetes mellitus is to provide education about diabetes mellitus in the community so that early prevention of DM can be done. This study aims to determine the effect of health education on knowledge of diabetes mellitus prevention in the community of RT.03 Mambirdan Tarakan, North Kalimantan. <i>Methods:</i> The design of this study used an experimental one group pre post test design, with a sample size of 31 respondents, data collection using a diabetes mellitus knowledge questionnaires. The test carried out was a paired t test. <i>Results:</i> Knowledge increased by 58.06% with $p= 0.001 < 0.05$. There is a significant effect of effectiveness on the level of anxiety in elderly patients suffering from diabetes mellitus in the Al-Marhamah Tarakan nursing home, North Kalimantan. <i>Conclusion:</i> Health education has an effect on increasing knowledge of diabetes mellitus prevention in the community of RT.03 Mambirdan Trakan, North Kalimantan.
Keywords: health education, knowledge, prevention, Diabetes Mellitus	

*Corresponding Author:

e-mail: dewi.wijayanti8386@gmail.com



This work is licensed under a Creative Commons Attribution 4.0 International License.

INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia that occurs due to disturbances in carbohydrate, fat and protein metabolism, resulting in abnormalities in insulin secretion and insulin action or both [1]. Clinically, there are two types of diabetes mellitus, namely type I diabetes, which is caused by a metabolic disorder characterized by an increase in blood sugar levels due to damage to pancreatic beta cells due to a certain reason that causes no insulin production at all, so patients need extra insulin from outside. and type II diabetes, which is the most common case (90%-95% of all diabetes cases) which generally have a background of abnormalities with insulin resistance [2].

The 2015 PERKENI (Indonesian Endocrinology Association) consensus on the management and prevention of type 2 diabetes mellitus in Indonesia resulted in a management standard that also has a goal similar to the WHO mission, namely improving quality of life, and preventing or inhibiting complications with the ultimate goal of reducing DM morbidity and mortality [3, 4]. The management initiated by PERKENI is in the form of 5 pillars of specific management for type 2 DM, namely education, medical nutrition therapy (DM diet), physical exercise, pharmacological therapy, and monitoring [5]. One's knowledge can be increased by teaching and learning activities. The term health education has begun to be used in the world of health and began to be practiced as a learning practice in health in the 1980. Health education is stated

as a process of increasing one's knowledge and abilities and successfully growing the community's willingness to behave in a healthy life [6].

Health education is one of the basic factors that can condition a person to be able to improve their abilities, increase their knowledge, skills and attitudes, where the process of understanding DM patients occurs through health education [7]. By providing information so that awareness will arise in individuals or the community to behave in accordance with their knowledge, education is provided with the aim that information about diabetes mellitus is conveyed correctly and precisely to patients, so that patients can feel that they are healthier, can control diabetes mellitus, prevent complications, and ultimately reduce treatment costs [8].

Several government programs have been implemented for the prevention of diabetes mellitus and complications of diabetes mellitus, such as the preventive diabetes health education program, PROLANIS (Chronic Disease Management Program) which focuses on DM and hypertension sufferers [9]. The CERDIK program (regular health checks, get rid of cigarette smoke, diligently) physical activity, healthy diet with balanced calories, adequate rest and stress control) [10]. Then the next diabetes mellitus management program is PATUH (regular health checks, treat diseases with proper and regular treatment, keep a healthy diet, try to do safe physical activities, avoid cigarettes, alcohol and other carcinogenic substances) [11]. DM disease in North Kalimantan is the top 10 biggest diseases suffered by the community, including the people in the

Mambirdan sub-district, East Tarakan, North Kalimantan who need educational information about DM so that they can increase knowledge in preventing DM [12].

METHODS

This research is a quantitative research, with a pre-experimental research design one group pre-post test design. The researcher deliberately gave treatment (health education) to respondents who were only grouped into one group, namely the intervention group with the aim of studying the effects of treatment and not controlling strictly. The population was the society of Mambirdan sub-district, East Tarakan, North Kalimantan. This study used a purposive sampling technique, where purposive sampling technique is a sampling technique with certain considerations in accordance with the inclusion criteria set by the researcher [13]. The inclusion criteria of this study were the people in the Mambirdan sub-district, East Tarakan, North Kalimantan, age is 18 years old or above, people who can hear, read, and speak fluently in Bahasa Indonesia. The number of samples obtained was 31 people in community gathering activities.

The level of knowledge is measured by the Diabetes Knowledge Questionnaire 24 (DKQ24) containing 24 questions developed by Garcia et al. which is a questionnaire developed from the DKQ60 with a Cronbach alpha value of 0.78. The aspects assessed were basic information (10 items), glycemic control (7 items) and prevention of complications (7 items). The answer choices were "yes", "no" and "don't know". The assessment is carried

out based on the number of items correctly answered by the subject, correct answers are given a value of 1, while answers that are incorrect or do not know are given a value of 0. The level of knowledge is said to be high if the score is 17-24, medium 10-16, and low 0-9 [14, 15].

Previous study by Rasdianah et al. [16] showed the validity of DKQ that r value >0,344 and Cronbach alpha 0,856. That means the questionnaire is valid and reliable to measure knowledge related to diabetes diseases.

Ethical Considerations

This research was declared ethically worthy with the number *03/KEPK-FIKES UBT/1X/2020*, in accordance with 7 WHO 2011 standards, namely: social values, scientific values, equal distribution of burdens and benefits, risks, persuasion, confidentiality and consent [17].

RESULTS

This research was conducted on 31 respondents who were residents of the Mambirdan sub-district, East Tarakan, North Kalimantan in February 2020 who conduct regular monthly meetings.

Table 1 shows that in the intervention group, the average respondent in middle adulthood is 21 people (68%), female is 26 people (83.9%), most education is at the senior high school level as many as 15 people (48.4%), and the most occupations owned by respondents were self-employed as many as 11 people (35%).

Table 2 shows that before the intervention in the form of DM Health

Education there was a different level of knowledge of respondents, where the level of knowledge was poor as many as 20 people (64.5%), and the level of knowledge was fair as many as 11 people (35.5%).

Table 3 shows the results of an increase in respondents' knowledge after being given DM Health Education intervention where low knowledge was 4 people (12.9%), fair

knowledge level was 18 people (58.06%), and high knowledge level was 9 people (29, 04%).

In the Table 4, the p value <0.05 and the difference in knowledge (difference) is greater than two, so statistically it can be interpreted that there is an effect of health education on knowledge of diabetes mellitus prevention.

Table 1
Characteristics of respondents (n=31)

Characteristics	Frequency	Percentage (%)
Age		
Middle adulthood	21	68
Older adult	10	32
Gender		
Man	5	16,1
Woman	26	83,9
Education		
Elementary	2	6,4
Junior High School	10	32,2
Senior high school	15	48,4
Higher education	4	13
Profession		
Does not work	10	32,2
Laborer	5	16,1
Farmer	2	6,4
Entrepreneur	11	5,5
civil servant	3	9,8
Total	31	100

Table 2
Frequency Distribution of Respondents' Knowledge Prior to Health Education Interventions (n=31)

Knowledge level	Frequency	Percentage (%)
Poor	20	64,5
Fair	11	35,5
High	0	0
Total	31	100

Table 3

Frequency Distribution of Respondents' Knowledge Level After Intervention (n=31)

Knowledge level	Frequency	Percentage (%)
Poor	4	12,9
Fair	18	58,06
High	9	29,04
Total	31	100

Table 4

Results of Comparison of Pre and Post Intervention (n=31)

	Average	Difference	P value
Pre	21, 51		
Post	30, 79	9,28	< 0,0001

DISCUSSION

It was found that education about DM was very effective (58.06%) where before the educational intervention was carried out it was found that the level of knowledge of the respondents was mostly at a low level of knowledge (64.5%). This is in line with research conducted by Apriani (2016), that health education can increase the level of patient knowledge [7]. Research conducted by Aji and Wahid (2016), the effect of DSME health education on blood sugar levels in type II diabetes patients showed that there was a significant effect of DSME health education on reducing blood sugar levels in type II DM patients [19].

Efforts to take self care, providing education by health workers are one of the actions that support the management of preventing DM in the community [20]. where diabetes mellitus is a common chronic disease, so education is urgently needed with the aim of receiving information that can

change behavior to increase public understanding of the importance of preventing DM [21, 22].

Changes in the results of education obtained by the community both in the form of knowledge and understanding of health, especially in the prevention of DM, followed by positive awareness of independent health, which can finally be applied in actions to minimize the incidence of exposure to DM in the community of the Mambirdan sub-district, Tarakan, East of North Kalimantan.

CONCLUSION

Health education has an effect on increasing knowledge of diabetes mellitus prevention in the community of RT.03 Mambirdan Trakan, North Kalimantan. Nurses can use health education in an effort to prevent DM with a good strategy so that DM can be prevented early. Good knowledge will help a person to take appropriate preventive actions in accordance with DM prevention guidelines.

REFERENCES

- [1] World Health Organization, "Global report on diabetes: executive summary," World Health Organization, 2016.
- [2] American Diabetes Association, "Diabetes Care" American Diabetes Association, 2019.
- [3] F. F. Nurmalisyah, A. S. Mubarok, and D. S. A. Sari, "Empowering the Role of the Integrated Foster Post Cadres in Improving the Quality of Life of Diabetes Mellitus Patients," *Babali Nurs. Res.*, vol. 2, no. 3, pp. 128–138, Nov. 2021, doi: 10.37363/bnr.2021.2348. [Online]. Available: <https://babalinursingresearch.com/index.php/BNR/article/view/48>
- [4] S. A. Soelistijo *et al.*, "Konsensus pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia 2015," *PB. PERKENI*, 2015.
- [5] Perkeni, "Konsensus Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 di Indonesia," 2011..
- [6] S. Notoadmojo, *Pendidikan dan Prilaku Kesehatan*. Jakarta: PT. Rineka Cipta, 2007.
- [7] S. Apriani *et al.*, "Pengaruh Program Edukasi Dengan Metode Kelompok Terhadap Perilaku Perawatan Diri Pasien Diabetes Melitus Tipe 2," no. 2008, 2012.
- [8] A. Lis, A. Gandini, E. Pranggono, and H. Ropi, "Pendidikan Kesehatan Terhadap Pengetahuan, Perilaku Dan Gula Darah Pada Pasien Diabetes Mellitus Tipe 2," *Husada Mahakam*, vol. III, no. 9, pp. 474–483, 2015.
- [9] BPJS Kesehatan, "PROLANIS Practical Guide," 2015.
- [10] Directorate of Health Promotion and Community Empowerment, Ministry of Health of the Republic of Indonesia, "CERDIK," 2019.
- [11] Ministry of Health of the Republic of Indonesia, "control hypertension with COMPLIANCE," 2019.
- [12] R. E. Izzaty, B. Astuti, and N. Cholimah, *LTA ASKEP DM*. 2021.
- [13] Sugiyono, *Metode Penelitian Administrasi*, Edisi 10. Bandung: Alfabeta, 2011.
- [14] A. A. Garcia, E. T. Villagomez, S. A. Brown, K. Kouzekanani, and C. L. Hanis, "The Starr County Diabetes Education Study," *Diabetes Care*, vol. 24, no. 1, pp. 16–21, Jan. 2001, doi: 10.2337/diacare.24.1.16. [Online]. Available: <https://diabetesjournals.org/care/article/24/1/16/21151/The-Starr-County-Diabetes-Education>
- [15] L. Larasati, T. Andayani, and S. Kristina, "Hubungan Tingkat Pengetahuan terhadap Outcome Klinik Pasien Diabetes Melitus Tipe 2," *J. Manaj. DAN PELAYANAN Farm. (Journal Manag. Pharm. Pract.*, vol. 9, Jun. 2019, doi: 10.22146/jmpf.43489.
- [16] N. Rasdianah, S. Martodiharjo, T. M. Andayani, and L. Hakim, "Pengaruh Pelayanan Kefarmasian di Rumah pada Pasien Diabetes Melitus Tipe 2 di Puskesmas Wilayah Kota Yogyakarta," *J. Manajemen dan Pelayanan Farmasi*, vol. 10, no. 2, p. 126, Jun. 2020, doi: 10.22146/jmpf.46240. [Online]. Available:

- <https://jurnal.ugm.ac.id/jmpf/article/view/46240>
- [17] World Health Organization, "Ethical standards for research during public health emergencies: distilling existing guidance to support COVID-19 R&D," 2020. [Online]. Available: <https://apps.who.int/iris/handle/10665/331507>. [Accessed: 10-Oct-2021]
- [18] S. N. A. Nuryani, I. B. P. Arnyana, N. N. Parwati, G. R. Dantes, and I. G. Juanamasta, "Benefits and Challenges of Clinical Nurse Educator Roles: A Qualitative Exploratory Study," *Open Access Maced. J. Med. Sci.*, vol. 10, no. G, pp. 38–44, Jan. 2022, doi: 10.3889/oamjms.2022.7706. [Online]. Available: <https://oamjms.eu/index.php/mjms/article/view/7706>
- [19] R. Aji and N. Wahid, "Pengaruh Pendidikan Kesehatan Diabetes Self Management Education (DSME) Terhadap Kadar Gula Darah Pasien Diabetes Program Studi S-1 Keperawatan Stikes Kusuma Husada," 2016.
- [20] D. Wijayanti, U. Sujianto, and A. Z. Juniarto, "Effect of Peer Education on Self Care Patients Diabetes Mellitus in RSUD Panembahan Senopati Bantul Yogyakarta," *J. Ners dan Kebidanan Indones.*, vol. 6, no. 3, p. 7, 2019, doi: 10.21927/jnki.2018.6(3).7-12.
- [21] M. Moshki, F. Zamani-Alavijeh, and M. Mojadam, "Efficacy of peer education for adopting preventive behaviors against head lice infestation in female elementary school students: A randomised controlled trial," *PLoS One*, vol. 12, no. 1, pp. 1–12, 2017, doi: 10.1371/journal.pone.0169361.
- [22] I. K. Artawan, Y. Aunguroch, I. G. Juanamasta, I. M. S. Wijaya, and K. A. J. Widyanata, "The Effect of Basic Life Support Course on Community Knowledge Level," *Babali Nurs. Res.*, vol. 2, no. 2, pp. 49–61, Jul. 2021, doi: 10.37363/bnr.2021.2252. [Online]. Available: <https://babalinursingresearch.com/index.php/BNR/article/view/52>