

## Health Education Using Booklet Improve Knowledge of Type II Diabetes Mellitus Patients in Mataram City, Indonesia

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### Abstrak

Hipoglikemia dan hiperglikemia merupakan kondisi yang menakutkan, berbahaya, dan berpotensi mengancam jiwa bagi pasien diabetes. Perawat dapat bertindak secara proaktif dan mengubah cara pemberian perawatan. Oleh karena itu, perlu dikembangkan cara yang aman dan efektif untuk mengelola diabetes dan hiperglikemia secara proaktif baik di rumah sakit maupun di rumah. Salah satu tindakan keperawatan yang paling penting untuk dilakukan adalah pemberian pendidikan kesehatan kepada pasien. Penelitian ini bertujuan untuk mengetahui pengaruh pendidikan kesehatan menggunakan booklet terhadap pengetahuan pasien diabetes melitus tipe 2. Penelitian ini menggunakan pendekatan kuantitatif dengan desain penelitian praeksperimental one group pre-posttest design. Sampel dalam penelitian ini sebanyak 32 responden yang dipilih dari populasi pasien DM tipe 2 di Puskesmas Karang Pule. Instrumen yang digunakan adalah DKQ-24 (Diabetes Knowledge Questionnaire). Data dianalisis menggunakan uji Wilcoxon. Hasil penelitian menunjukkan bahwa terdapat perbedaan skor rata-rata pengetahuan sebelum dan sesudah pendidikan kesehatan ( $P = 0,000$ ;  $p < 0,05$ ). Hasil penelitian menunjukkan bahwa ada pengaruh pendidikan kesehatan menggunakan booklet terhadap tingkat pengetahuan. Penelitian ini menandakan peran perawat dan perlunya media yang tepat seperti booklet untuk mengedukasi pasien DM tipe 2 dan meningkatkan pengetahuan mereka dalam mengelola glukosa darah stabil dan mencegah komplikasi.

**Kata kunci:** Diabetes Melitus; Pendidikan Kesehatan; Booklet

### Abstract

Hypoglycemia and hyperglycemia are frightening, dangerous, and potentially life-threatening for patients with diabetes. Nurses can act proactively and change the way care is provided. It is therefore necessary to develop safe and effective ways to proactively manage diabetes and hyperglycemia both in hospital and at home. One of the most important nursing actions to take is the provision of health education to patients. This study aims to identify the influence of health education using booklet in the knowledge of patients with type 2 diabetes mellitus. This study uses a quantitative approach with a pre-experimental research design of one group pre-posttest design. The sample in this study was 32 respondents selected from the population of type 2 DM patients in Karang Pule Health Center. The instrument used was the DKQ-24 (Diabetes Knowledge Questionnaire). Data were analyzed using Wilcoxon test. The results showed that there was a difference in the average score between knowledge before and after health education ( $P = 0.000$ ;  $p < 0.05$ ). The results of the study show that there is an influence of health education using booklet on the level of knowledge. This study signifies the role of nurses and the need of appropriate media such as booklet to educate patients with type 2 DM and increase their knowledge in managing stable blood glucose and preventing complications.

**Keywords:** Diabetes Mellitus, Health Education, Booklet

## INTRODUCTION

The 10th edition of the Atlas of *the International Diabetes Federation (IDF)* stated at the end of 2021 that diabetes is one of the fastest-growing global health emergencies of the 21st century. More than half a billion people worldwide live with diabetes, 10.5% (537 million people) this number is also expected to reach 11.3% (643 million) by 2030 and 12.2% (783 million) by 2045 (Ogurtsova et al., 2022).

*IDF* said that Indonesia is currently ranked 7th in the world with 10 million people with DM, and is expected to rise to 6th place in 2040 with a population of 16.2 million people. In addition to the large number of diabetics, it is estimated that the number of people with high blood sugar levels who are starting to increase or are in the pre-diabetic stage, namely glucose intolerance, will amount to around 541 million people in 2021. Diabetes in this population also causes a high rate of diabetes-related deaths, estimated at more than 6.7 million people in adults aged 20 to 79 years (IDF10, 2021 in Sundari1 & Sutrisno, 2023).

Diabetes mellitus continues to spread in all provinces in Indonesia, one of which is NTB. Based on data from the NTB Provincial Health Office, the prevalence of diabetes mellitus in 2021 was 63,488 and in 2022 was 64,544 Mataram City, as one of the regions in NTB province, recorded an increase in the incidence of diabetes mellitus that continued from year to year. In 2021, the incidence of diabetes mellitus in Mataram City reached 8,540 people, a sharp increase in 2022 to 8,741 (NTB Health Office. Health Profile). Karang Pule Health Center is one of the health centers in Mataram City. Based on data from the Karang Pule Health Center, the prevalence of diabetes mellitus in 2021 was 1,150 sufferers to 1,586 in 2022. Meanwhile, in January – September 2023, the number of diabetes mellitus is 1,315 in 2023.

Despite the high incidence of Diabetes Mellitus and its complication, there are still insufficient efforts in educating patients about how to manage a stable normal blood glucose and efforts to prevent complications. In the area of study, type 2 DM usually only received brief counseling about their condition and about blood sugar management for DM patients when they were examined at the Community Health Center or at the Elderly Health Post. There were no specific media that allow the patients to re-access the information they got. Whereas, health education can be delivered using various media. Effective media makes it easier for participants to quickly receive the information provided. The use of media is expected to be a tool for conveying information to ensure that the message conveyed is well received by respondents (Rochani & Pamboaji, 2022). Thus, the health education that will be provided also depends on the media to be used. The means used may vary depending on the needs. One of teaching aids or media for education that can be used are *Booklet* (Sepang et al., 2020). Booklet is type of book with a small size, contains specific information, usually full of color and pictures to related

to the information to make it easier to be delivered. Various study showed the effectiveness of booklet compared to other media such as leaflet, poster and etc (Faiqah, 2021; Utami, Chandra & Sopianingsih, 2020). This study aims to determine the effect of booklet improving knowledge of type 2 DM patients about how to manage a stable blood glucose within normal limit and prevent the possible complications.

## METHOD

This study uses a *pre-experimental* design with a *one-group pretest-posttest approach*. The sample were 32 respondents whom taken from the population of type 2 DM patients in the working area of Public Health Center in Mataram City through simple random sampling. The research instrument used to measure the respondents' knowledge about DM was the *Diabetes Knowledge Questionnaire (DKQ)* which consists of 24 questions. The booklet used in this study was design specifically by the researcher, involving experts including specialist and consultants, nurses and an editor to ensure the content is in accordance with the latest scientific developments and the appearance of the booklet's contents is attractive and uses language that is easy for the target readers to understand. This study received ethical clearance from the ethical commission of Mataram Health Polytechnic the Ministry of Health. Informed consents were obtained prior to data collection. Data on the knowledge of respondents were collected prior to health education (pre-test) and after the health education (posttest). The respondents were given health education in a form of mini lecture using booklet. The health education was given 40 minutes using booklet distributed to each respondent, then followed by a discussion session for 20 minutes. The respondents were given another 10 minutes to reread the booklet, then given the questionnaire to collect data on their knowledge after health education. The results of the study were analyzed using a *non-parametric statistical* test, namely the *Wilcoxon test* to determine the effect of health education through booklet media on level of knowledge of type 2 DM patients.

## RESULT

**Characteristic of the respondents based on age, gender, education, occupation, how long they suffered from type 2 DM, history of DM in family and the history of receiving health education about DM**

Table 1      Respondents based on age, gender, education, occupation, how long they suffered from type 2 DM, history of DM in family and the history of receiving health education about DM

Age	Number	Percentage (%)
Middle age (45-54 years)	14	43,8
Elderly (55-65 years old)	16	50,0
Young elderly (66-74 years old)	2	6,3

Gender	Number	Percentage
Male	12	37,5
Female	20	62,5
Last Education	Number	Percentage
Elementary school	10	31,3
Junior high school	7	21,9
Senior high school	15	46,9
Occupation	Number	Percentage
Self employed	6	18,8
Merchant	7	21,9
Farmer	11	34,4
Housewife	8	25,0
How long they suffered from type 2 DM	Number	Percentage
4 years	12	37,5
5 years	13	40,6
6 years	2	6,3
7 years	2	6,3
8 years	2	6,3
10 years	1	3,1
History of DM in family	Number	Percentage
None	14	43,8
There is history	18	56,3
History of receiving health education about DM	Sum	Percentage
< 1 month	0	0
1-6 months	17	53,1
> 6 months	15	46,9

Based on table 1, most respondents was in the elderly age group (55 – 65 years), which is 16 respondents (50%). Most of the respondents was female (20; 62.5%). The respondents mostly junior high school graduates (46,9%) and working as farmers (34,4%). The longest time in the diagnosis of DM was for 5 years (13; 40.6%). Most respondents had a history of DM in their family (18; 56.3%) and most of them has received a brief education about DM in the last 1-6 months (53.1%).

### Knowledge before and after receiving health education using Booklet

Table 2 Knowledge of the respondents before and after receiving health education using Booklet

No.	Knowledge	Pre-test		Posttest	
		Sum	Percentage (%)	Sum	Percentage (%)
1.	Good	0	0	15	46,9
2.	Sufficient	15	46,9	12	37,5
3.	Poor	17	53,1	5	15,6
	Total	32	100	32	100

Based on table 2, on pretest, most of the respondents have poor knowledge (17; 53.1%) and there were no respondents with good knowledge. On posttest, most of the respondents have good knowledge (15; 46.9%) and still there were 5 respondents who have poor knowledge (15,6%).

### Statistical Analysis of Knowledge

Table 3 Result of the Wilcoxon signed ranked-test

Posttest – Pretest	
Asymp. Sig. (2 – tailed)	<,001 reviews

Results showed  $p$  value  $0.000 < \alpha = 0.05$ , which means there was a difference in the level of knowledge of the respondents on pretest and posttest.

## DISCUSSION

Respondents knowledge before intervention mostly in poor knowledge (17; 53.1%) and there were 15 respondents with sufficient knowledge (15; 46.9%) and none of the respondents had good knowledge (0%). One of the factors that affects the knowledge of the respondents is the last level of education, the respondents in this study have a last level of education that varies with the highest level of high school (secondary education). The higher a person's education, the higher the knowledge about health they have, but this does not apply to the high school education level and below (Purqoti, 2020). A good level of health knowledge is possessed by someone who has stepped on the last level of higher education. This was also found in the research of Cantaro (2016) which stated that there was no relationship between the level of education and knowledge about diabetes mellitus for people with diabetes mellitus who had the last education of high school equivalent, but higher knowledge was seen at the last level of undergraduate education

The results in this study show that there is a variation in knowledge in terms of work, meaning that there is an influence of respondents' work on respondents' knowledge, the results are in accordance with research conducted by Nirmaya (2015) which obtained the result that work is one of the things that affects the knowledge of diabetics. Nirmaya stated that civil servants, private employees, and entrepreneurs have better knowledge than housewives. Jobs related to higher education affect knowledge about diabetes because they are likely to gain knowledge from the seminars they attend and from the ability to use the internet. The low knowledge in this study is due to the characteristics of the majority of respondents who have jobs that do not allow the addition of information through seminars and the lack of use of the internet as a means of obtaining information.

The aging process is an anatomical and physiological change that normally occurs, but diabetes mellitus makes the aging process faster, for example, in a person aged 55 to 64 years, diabetes

lowers the life expectancy by 8 years, a 57-year-old person with diabetes is equivalent to a 65-year-old person with diabetes (Caspersen, 2012), this may be related to the same level of knowledge of respondents even though the respondents consists of two age groups.

The length of diagnosis of DM (duration of DM) should also affect the knowledge of people with diabetes mellitus, as in the Cantaro (2016) study which found that there is a relationship between the duration of DM and knowledge about DM, namely diabetics with a disease duration of more than 12 years have good knowledge about DM. In accordance with the results of the study in this study, the longest duration of suffering from DM is 10 years and the average respondent has less knowledge.

Respondents knowledge before intervention mostly in good knowledge (15; 46.9%) and there were 12 respondents with sufficient knowledge (37.5%) and there were still 5 (15,6%) had poor knowledge. In this case, the respondents' knowledge picture after being given health education is influenced by several factors, especially related to a person's ability to learn. A person has different abilities depending on physical and cognitive factors, developmental level, physical health, and intellectual learning process (Potter and Perry, 2012).

In old age, there are changes that can affect the learning process during health education, including physical and physiological changes. Degenerative physical changes can lead to a decrease in sensory function, namely hearing, vision, feeling and the ability to respond. Other physiological changes may lead to changes in perception and memory, learning and problem-solving abilities (Narmawan, Ananda & Helma, 2020). These changes can affect the learning ability of the elderly during health education, but a study shows that the elderly can learn and remember effectively if the learning process is carried out appropriately and the materials provided are in accordance with their needs and abilities (Deakins, 1994 in Potter and Perry 2012).

The results of *the wilcoxon test* were obtained with a  $p$  value of  $0.000 < \alpha = 0.05$ , meaning that there is an influence of Health Education through booklet media on the level of knowledge. Booklet media Has photos or supporting images of the material, arranged with an attractive and colorful design, can be used as a tool or medium for independent learning, the material can be studied easily. Booklet is not only containing text but also images that can create a sense of beauty and increase understanding and passion in learning (Ali et al., 2018). In addition, booklets including visual learning media can increase comprehension through sight by 75-87% (Ali et al., 2018).

## CONCLUSION

It can be concluded that the health education using booklet was significantly improve the knowledge of type 2 DM patients. This booklet was design specifically for type 2 DM patients involving

the experts, thus it contains relevant information and with simple words that can be easily understood. The booklet in this study can be produced more and distributed to the patients or even the family.

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