



Effect of Health Education on Improving the Knowledge among Diabetes Mellitus Patients in the Prevention of Diabetic Ulcer in Regional Hospital of Tidore Island

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Abstract. International Diabetes Federation (IDF) reported that the number of diabetes mellitus patients worldwide increases every year. Diabetes mellitus is a chronic disease due to damage to the pancreas in producing enough insulin and characterized by impaired metabolism of fats, increased blood sugar, carbohydrates and protein both absolutely and relatively. Diabetic foot ulcers (DFU) are among the most common complications in diabetic patients and are associated with high mortality, morbidity, and health costs. This study was to determine the effect of health education on knowledge improvement about diabetic ulcers in the regional hospital of Tidore Islands. This research is a quasi-experimental type with a pretest-posttest without a control group design. The research sample consisted of 30 respondents who met the inclusion criteria. Data were analyzed using a paired test and processed with statistic version 21. Based on the research results, there was an improved knowledge in pre and post-health education counseling, where the average score before health education counseling was 11.6. After health counseling, the average value was 15.0. The results showed the effect of knowledge in the prevention of diabetic ulcers with a p-value=0,000. Health education is an effort to improve patient's ability to prevent diabetic foot ulcers that have been proven in several scientific studies. Health education methods provide additional information so that patients who previously wondered about their disease can directly ask health workers. Health education affects the knowledge improvement of Diabetes Mellitus patients in the Regional hospital of Tidore Islands.

Keywords: diabetes mellitus, health education, knowledge



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INTRODUCTION

World Diabetes Organization or international diabetes federation (IDF) in 2019 estimated 463 million people in the age of 20-79 years suffer from Diabetes Mellitus and causing death by 1.55117 million people (1). Diabetes has increased 3-4 times in the last three decades and became the ninth leading cause of death in the World (2). The prevalence of 9.3% from the total population of the same age. Indonesia was ranked 7th out of 10 countries with the highest number of patients were 10.7 million cases, and the only Southeast Asian country included (3). Diabetes Mellitus is divided into 2, namely Diabetes Mellitus Type I and Diabetes Mellitus Type II, but the prevalence of Type II Diabetes Mellitus is above 90% (4). Diabetes Mellitus is estimated to continue increasing and will reach 439 million by 2030 (5).

Regions in Indonesia generally have an increase in diabetes patients except in the Province of East Nusa Tenggara. Moreover, the four provinces with the highest prevalence in 2013-2018 were Yogyakarta, DKI Jakarta, North Sulawesi, and East Kalimantan. Data in 2018 showed the particular prevalence in the Maluku region, which was 1.1% and relatively low compared to others (6).

Impaired metabolism of carbohydrates, proteins, lipids, and chronic hyperglycemia caused by insufficient insulin secretion is a sign of Diabetes Mellitus (7).

Factors that cause Diabetes disease are numerous, and one of the most instrumental is the level of knowledge and education. Based on data from the Research and Development Agency of the Indonesian Ministry of Health in 2019, the proportion of people with Diabetes Mellitus according to the education level of respondents who graduated from University was higher by 2.2%, and lower education levels are less than 1%. This data proves that lifestyle is contributing as well (6).

Another study conducted by Alfani at one hospital in Malang, involving 30 respondents, showed that knowledge has contributed to the Diabetes Mellitus cure, so the role of Health workers emphasized health education to patients and families as a necessity (8). Oktorina's study also explained that using media education in a health or self-instructional module would improve the knowledge of Diabetes Mellitus (9).

Health education is to prevent disease, help patients and families, and maintain the health status (10). The tendency of a person to obtain information is directly proportional to the knowledge acquired so that more details will undoubtedly improve knowledge.

OBJECTIVE

The study aimed to examine the effect of health education on knowledge improvement about diabetic ulcers in the regional hospital of Tidore Islands.

METHOD

A quasi-experimental design with a One-group pretest-posttest design was applied in this stud. Thirty diabetes patients were involved and measured before and after receiving the intervention. The samples were recruited using the purposive technique sampling based on the inclusion criteria.

This research was conducted in the Regional Hospital of Tidore Islands. This study used a questionnaire with 20 items of questions,

Respondents consisted of two groups, the intervention group, and the control group. Observation and measurement were carried out first in both groups then the intervention group was given health education about DM specifically. The control group was still assigned health education. Still, with the general question form, after health education was provided, repeated

observations and measurements were made on both groups to determine the impact of the health education twice a week for two weeks. The time it took to intervention was 12 hours.

The informed consent process was carried out before the action, both in the control and intervention groups, and no sample drop out during the research process.

This study was analyzed with SPSS Version 22. The ethics committee approved this research of the Muslim University of Indonesia. Before the research is carried out, all respondents were allowed to fill out informed consent.

RESULTS

Data Demographic

Table 1 showed the frequency distribution of respondent characteristics of as many as 30 people. Based on education, the highest number of respondents was undergraduates, as many as 18 (60%), and the lowest was elementary school as many as two people (6.7%). Meanwhile, based on occupation, the highest number of respondents was civil servants, as many as ten people (33.3%). The lowest number of respondents was an entrepreneur, as many as two people (6.7%).

Table 1. Frequency of respondents characteristics based on education and occupation

Characteristic of Respondent	n	%
Level of Education		
Elementary	2	6.7
Junior High School	4	13.3
Senior High School	6	20
Undergraduates	18	60
Occupation		
Farmer	3	10
Entrepreneur	2	6.7
Civil Servants	10	33.3
Housewife	7	23.3
Retired	8	26.7
Total	30	100

Table 5.2 shows the number of respondents based on age groups according to the Ministry of Health 2008. The highest age was 56-65 years, as many as ten people (33.3%). Based on the length of suffering from DM, the highest range was <10 years as many as 25 people (83.3%). Meanwhile, based on income per month, the most significant number was \geq 3,000,000, as many as 16 people (53.3%).

Table 2 Frequency distribution of respondent characteristics based on age, length of suffering from dm, and monthly income

Characteristic of respondents	n	(%)
Age		
26- 35	2	6.7
36- 41	3	10
42- 54	7	23.3
55-65	10	33.3
66- 75		23.3
>76	1	3.3
Length of Suffering from DM		
<10 Years	25	83.3
≥10 Years	5	16.7
Monthly Income		
<3.000.000	14	46.7
≥3.000.000	16	53.3
Total	30	100

The effect of health education on improving knowledge among diabetes patients

Based on the research results, there was an improved knowledge in pre and post-health education counseling, where the average score before health education counseling was 11.6. After health counseling, the average value was 15.0. The Paired T-Test statistical test results showed the importance of $p = 0.000$ or $p < 0.05$. It can be concluded that health education affects the knowledge improvement on diabetes mellitus in preventing diabetic ulcers in Regional Hospital Tidore Islands. The following is the analysis table.

Table 3. Effect of health education on improving knowledge to prevent diabetic ulcers in the regional hospital of tidore island

Knowledge	n	Mean	SD	p-value
Before receiving the intervention	30	11.61	3.971	0000
After receiving the intervention	30	15	2.811	

DISCUSSION

Diabetic foot complications are leading causes of death in developing countries and becoming the most feared complications of diabetes Mellitus because they can cause permanent disability (12). Diabetic foot ulcers cause infections, hospitalizations, and amputations in patients with Diabetes Mellitus (13). Adequate knowledge of diabetic foot care can prevent infection (14). Theodehild et al., in their study, suggested one way to prevent diabetic foot ulcers, namely early prevention because peripheral neuropathy and peripheral artery disease are triggers of diabetic foot ulcers (15). Besides gender, the factors that influence the incidence of peripheral neuropathy and PAD are age. The higher the age of a

person, the greater the risk of developing neuropathy. Several studies have shown that increased age is associated with peripheral neuropathy and peripheral arterial disease (16).

This study demonstrates a significant effect of health counseling in improving knowledge of Diabetes Mellitus in the prevention of ulcers. The average pretest score was 11.6, and after health counseling, it increased by 15.0, which means that there are a change and improved knowledge.

This finding is consistent with research conducted by Windasari in Yogyakarta, involving 82 respondents. The results of his study suggest that education improves compliance cases of diabetic foot care (17). Damayanti's study also found the same about the effect of health education on knowledge in the prevention of diabetic foot ulcers, with the number of respondents was 54 people (18).

The tendency of patients to treat diabetic foot ulcers also increases along with the knowledge they have. Diani's study found that having sufficient knowledge of the patients was 2.38 times more likely to practice foot care. This study concludes that the knowledge gained through education cases contributes to diabetic ulcer prevention (19).

Improved knowledge through health counseling carried out by the nurse is significantly helping patients and their families get additional information about the disease and how to cope with recovery. A study by Gabby et al. found that factors associated with patients' adherence to self-care including family support, individual preference, patient's conception, and social and cultural activities (20). Another study also reported that family support was positive effect on health behaviors (21)

CONCLUSION

Health education is an effort to improve patient's knowledge in preventing diabetic foot ulcers that have been proven in several scientific studies. Health education methods provide additional information so that patients who previously wondered about their disease can directly ask health workers. Hence, the additional information is in line with the improved knowledge.

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