Foot Care Knowledge and Education In An Effort To Prevent The Recurrent Of Diabetic Foot Ulcer (Dfu)

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ABSTRACT

Diabetic Foot Ulcer (DFU) is a complication of Diabetes Mellitus (DM), which is a major health problem throughout the world with a high recurrence rate. It is estimated that approximately 40% of patients have a recurrence within one year of ulcer healing, nearly 60% within three years, and 65% within five years. One of the efforts to prevent DFU recurrence can be made with foot care which is preceded by knowledge of foot care. This study aimed to compare the knowledge of DFU patients before and after being given education. This study is a pre-post-test with 21 respondents who routinely received wound care at Rumah Perawatan ETN CENTER. Measurement of initial knowledge using a questionnaire consists of 11 questions that have been tested for content validity (CVI > 80%). Then the patient is given foot care education using a video, and after that, the video link is distributed to the patient; patient knowledge was measured again after three weeks using the same questionnaire. There is a comparison of knowledge before and after being given foot care education with a p-value = 0.000. Foot care is one of the efforts to prevent recurrent DFU. There was an increase in patient knowledge after being given an education

Keyword: Diabetic, Foot Care, Knowledge Education, Recurrence

INTRODUCTION

Diabetes mellitus (DM) is a disease with high morbidity that poses a big burden to people around the world (Mohammad and Khresheh 2018). The prevalence of DM sufferers is 10.4% in 2019 increasing to 11.9% in 2045 (International Diabetes Federation 2019). Prevention of foot ulcer in diabetic patients is very important to help reduce the burden on health resources because the treatment of diabetic foot ulcer is complicated and expensive and the recurrence rate is estimated from 40% to 65% in the first five years (Mohammad and Khresheh 2018), (Jeffcoate et al. 2018),(Schaper et al. 2016). Therefore, to prevent injury, a preventive measure is needed.

One of the recommended prevention efforts is providing education to patients and families (Schaper et al. 2020). The International Working Group on the Diabetic Foot (IWGDF) states that providing education about foot care to patients who are at risk of experiencing foot ulcer has a much lower risk than patients who do not receive foot care education(Bus and Netten 2016). In addition, foot care education is an appropriate

nursing intervention in preventing more severe, painful and debilitating complications in diabetes patients (Saleh et al. 2012)

Many methods and media have been used in conveying foot care education to diabetic patients, including research by Rahaman et al. (2018) using demonstration methods and flipcharts related to foot care. Mahdalena and Ningsih (2016), Bahador et al. (2017) and Khuzaimah et al. (2018) use the lecture method using power points and simulations in conveying how to care for the feet, after which the patient is given a brochure to take home as a guide in perform daily foot care and patients are given a foot care package, namely small towels, nail clippers, and water-based lotion. One study conducted by Abrar et al. (2019) showed that the use of educational videos adapted to the local language of patients was effective in increasing understanding of foot care. Research conducted by Abdullah et al. (2019) shows that the better one's knowledge of foot care, the better the practice of foot care. Therefore the purpose of this video is to see a comparison of foot care knowledge before and after providing educational videos as an effort to prevent DFU.

MATERIALS AND METHODS

This type of research uses a Quasy Experimental research design with a pre-post test approach without control. The population in this study were all DM type 2 patients who visited the ETN CENTER Nursing Home. Sample criteria are DM type 2 patients aged $>$ 18 years, willing to take part in the study, have good eyesight and hearing, have an Android mobile phone (HP) and have the WhatsApp application. Data analysis technique using paired t test. The data collection process begins with determining sample criteria, after which patients who meet the criteria and are willing to be respondents will be given an explanation regarding the research procedure followed by an interview session directly related to patient demographic data.

Then an initial measurement (pretest) was carried out regarding the patient's knowledge of foot care using a foot care component questionnaire that had been tested for content validity (CVI) $>$ 80%. After that, the patient will be given education on foot care through a video played on a cellphone with a duration of $\pm$ 6 minutes. After the screening is complete, the patient and the accompanying patient's family are given the video file. Follow-up is carried out every week via WhatsApp messages to ask whether the patient is still using the video. The final measurement (Post Test) was carried out in the 3rd week when the patient arrived for further wound care

RESULTS

From the table it is known that the average age of the respondents was 53.90 (+11.24), the majority were Muslim (n: 20 respondents, 95.2%), the sex of the majority was female (n: 15 respondents, 71.4%). For the education level, the majority were high school (n: 9 respondents, 42.9%) and the majority worked as housewives (n: 15 respondents, 71.4%)

Table 1 : Distribution Characteristic Respondent

Characteristic	Frequency(n) = 21	Percentage (%)
Age (Year) (mean±SD)	53.90	11.24
Religion		
Muslim	20	95.2
Kristen	1	4.8
Gender		
Female	15	71.4
Male	6	28.6
Ethnic Group		
Bugis	6	28.6
Makassar	13	61.9
Tolaki	1	4.8
Toraja	1	4.8
Marital Status		
Marry	20	95.2
Not Married Yet	1	4.8
Education		
Elementary School	7	33.3
Junior High School	1	4.8
Senior High School	9	42.9
Bachelor Degree	4	19.0
Profession		
Housewife	15	71.4
Retired	3	14.3
Self Employed	1	4.8
Government Employed	2	9.5

The data shows the health status of respondents with an average systolic blood pressure of 119.52 (±12,836) while for diastolic 90 (±7,746). The average respondent's weight was 62.10 (+7.765), height 157.52 (±7.42) and in general BMI was in the overweight range (n: 11 respondents, 52.4%). For diabetes status, the average respondent had a GDS value of 155.38 (±69,003), the majority had diabetes for > 10 years (n: 11 respondents, 52.4%). Most of the DM treatments obtained were oral therapy (n: 13 respondents, 61.9%). All respondents are in the risk classification category 2 (n: 21 respondents, 100%).

Table 2. Characteristics of the Patient's Health Status and DM Status

Characteristics	Frequency (n)	Percentage (%)
Blood Pressure (BP) (mmHg)		
Sistol (Mean±SD)	119.52	±12.836
Diastol (Mean±SD)	90	±7.746
Weight (Kg) (Mean±SD)	62.10	±7.765
Height (Cm) (Mean+SD)	157.52	±7.420
Body Mass Index (Kg/m2)		
Under Weight	0	0
Normal Weight	10	47.6
Over Weight	11	52.4
GDS (mmol/L) (Mean±SD)	155.38	±69.003
DM History (Year)		
< 5 Years	5	23.8
5-10 Years	5	23.8
> 10 Years	11	52.4
DM Therapy		
Oral	13	61.9
Insulin	6	28.6
Traditional	2	9.5
Risk classification (IWGDF)		
Risk two	21	100

Table 3: Differences in Knowledge Scores Before and After Providing Education

	Mean ±SD	ean Difference±SD	*p*
Knowledge score before (n=21)	3.05±1.284	-7.90±1.26	0.000
Knowledge score after (n=21)	10.95±0.218		

Based on table 3 above, it can be seen that there is a significant difference in knowledge before and after the patient is given education with a significant value of $p = 0.000$

Table 4: Differences in Knowledge Scores for Each Question Item

No	Question Items	Pre	Post	Mean Difference	*p*
		Mean±SD	Mean±SD		
1	Diabetes is the same as diabetes	1.00±0.00	1.00±0.00	-	-
2	Foot care can prevent diabetic foot ulcer	0.10±0.301	1.00±0.00	-0.905±0.301	0.000
3	Foot examination includes the soles of the feet	0.62±0.498	1.00±0.00	-0.381±0.498	0.002
4	Foot examination includes the instep	0.14±0.359	1.00±0.00	-0.857±0.359	0.000
5	Examination of the feet including between the toes	0.19±0.402	1.00±0.00	-0.810±0.402	0.000
6	Washing feet using soap is	0.05±0.218	1.00±0.00	-0.952±0.218	0.000

	part of foot care				
7	Cutting nails done every week	0.86±0.395	1.00±0.00	-0.143±0.359	0.083
8	Cutting nails is done by cutting the toenails straight	0.00±0.00	1.00±0.00	-	-
9	Using socks is part of foot care	0.00±0.00	1.00±0.00	-	-
10	Socks are used inside and outside the home	0.00±0.00	0.95±0.218	-0.952±0.218	0.000
11	The inside and outside of shoes or sandals are inspected before and after use	0.10±0.301	1.00±0.00	-0.905±0.301	0.000

The table above shows that of the 11 question items, respondents were able to answer several questions correctly as evidenced by the significant value of the data processing results. Of the 11 question items, there are 7 question items that have significant value. There are other questions whose value is not significant because the respondent can answer the question correctly during the pre-test. For the value of each question can be seen in the table above

DISCUSSION

Based on the data it was found that most of the respondents in the study were women. Hormonal changes in women, especially progesterone, make diabetes more difficult to control, especially in pre-menopausal women and the risk of diabetic ketoacidosis is higher in women than men. Women are also consistently more likely to experience depression than men. In addition, the facts also show that in all countries, including high-income economies, women tend to receive less intensive care and treatment for diabetes than men (Anil and Seshiah 2017).

This was also revealed by Kautzky-Willer, Harreiter, and Pacini (2016) that anxiety and eating disorders and depression are more common in diabetics, especially in women. For the occupational category, it was found that housewives (IRT) had more diabetes (n: 15, 71.4%). This is in line with the research of Borhanuddin et al. (2018) which in his research showed that as many as 2419 (20.5%) respondents from 17,059 IRT suffer from DM type 2. With all the daily housework that needs to be done, the assumption is that these housewives will have an optimal BMI. In contrast, studies have shown that housewives have a higher chance of developing metabolic diseases. Despite having busy schedules, there is a high prevalence of physical inactivity among them. These observations suggest that their daily tasks are insufficient to achieve the appropriate level

of physical activity to maintain optimal health.

Characteristics of the Patient's Health Status and DM Status

For health status, systolic and diastolic BP are within the normal range (119.52±12.836) and (90±7.746). while for the BMI category, most of the respondents were in the Overweight category (n: 11, 52.4%). Obesity and type 2 diabetes are associated with insulin resistance. Pancreatic cells in the islets of Langerhans release insulin in sufficient quantities to overcome the normal decrease in insulin levels, thereby maintaining normal glucose tolerance. When someone has DM type 2, they tend to experience endothelial dysfunction accompanied by obesity/insulin resistance in diabetic and prediabetic conditions (including people with impaired glucose tolerance and/or impaired fasting glucose). Obesity is considered the most important factor in the development of metabolic diseases. Adipose tissue influences metabolism by secreting hormones, glycerol, and other substances including leptin, cytokines, adiponectin, and proinflammatory substances, and by releasing nonesterified fatty acids (NEFAs) (Al-Goblan, Al-Alfi, and Khan 2014).

For the IWGDF classification category, all respondents in this study fell into category two, because one of the respondent criteria was patients who were experiencing diabetic foot wounds and were given education with the aim of preventing recurring injuries to patients. The fact was found in the service that some patients came back with injuries after recovering, which were around 1-4 years. This is as stated by (Armstrong, Boulton, and Bus 2017) that approximately 40% of patients experience recurrence within 1 year after ulcer healing, nearly 60% within 3 years, and 65% within 5 years. Therefore providing education for DM patients is needed to prevent recurring injuries.

Changes in Knowledge Scores Before and After Providing Education

The results of this study show an increase in knowledge before and after being given education using video. In addition, research on the use of video as an educational medium has been carried out in many other populations such as the asthma patient population Riera et al. (2017) the patient population at risk of developing skin cancer (Lenczowski et al. 2017), the glaucoma patient population (Rahaman et al. 2018) and the results show an increase in respondents' knowledge after watching the video.

Providing education to DM patients is one of the efforts that can be made in preventing DFU. IWGDF recommends 13 components in efforts to prevent DFU and one of the components is to provide education to DM patients who are at high risk to increase

knowledge and behavior of foot care (Bus and Netten 2016). The development of electronic media including video is growing rapidly so that it becomes an option educational media that can be used to convey messages (Armstrong et al. 2010). In addition, videos can be used to convey learning concepts in a short time, facilitate training and are considered as cheap and affordable educational media (Dilley et al. 2014). The use of video as an educational medium is an approach that has been proven effective in various health fields (Calderón et al. 2014). Educational videos have been shown to be superior to written information in terms of patient satisfaction and information acquisition (Mora et al. 2018). Research conducted by Abdullah et al. (2019) and (Abrar et al. 2022) shows that the better one's knowledge of foot care, the better the practice of foot care.

Changes in Knowledge Score for Each Question

Item In this section, the researcher presents data for each question item which is attached as a measuring tool to assess patient knowledge which consists of 11 items. For item 1, an analysis cannot be carried out because the patient can answer correctly before being given education. For items 2 to 6 there is a change in knowledge after being given an educational video. One of the items recommended by the IWGDF is Advise patients with diabetes at risk to inspect their feet daily as well as the inside of their shoes, wash their feet daily and dry between the toes carefully. In addition, instruct patients who are at risk not to walk barefoot, use socks, or wear thin, standard sandals either at home or outside the home (Bus and Netten 2016).

For item 7 the changes were not significant because most of the respondents were able to answer correctly before being given education. In addition, item 7, namely cutting nails every week, is a habit for the majority of respondents, especially those who are Muslim, as a form of sunnah which is carried out every Friday every week. Items 8 and 9 could not be analyzed because all respondents did not answer these two items correctly before being given education. While items 10 and 11 there were significant changes because the patient was able to answer correctly after being given education

CONCLUSIONS

This study shows an increase in the knowledge of DM patients after being given education and followed up for 3 weeks. Foot care is one form of education that can help patients prevent recurrence of diabetic foot wounds and can be a reference for health workers in providing education on foot care. further research can be done to see changes

in patient behavior in foot care

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