

The Effect Of Foot Exercise Education With Demonstration Method And Booklet Media On Foot Exercises Knowledge Among Patients With Diabetes Mellitus

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ABSTRACT

Purpose: The incidence of diabetes mellitus shows that the prevalence increases every year. This condition is partly influenced by a lack of knowledge in managing diabetes mellitus. Foot exercise are physical exercises which become one of the five pillars of managing diabetes mellitus. Therefore, foot exercise education is very necessary to support efforts to prevent complications and disability in diabetes mellitus patients. The study aimed to determine the effect of foot exercise education using demonstration methods and booklet media on knowledge of foot exercise in diabetes mellitus patients at Prolanis Puskesmas (Chronic Disease Management Program in Community Health Center) Pleret.

Methods: Quantitative research method was applied, and this type of research used *Pre-Experimental* with a *One Group Pre-test Post-test Design* research design. The sample was taken using a *Purposive Sampling* technique, namely 43 respondents. The research instrument used a questionnaire about knowledge. Data analysis used the *Wilcoxon* test.

Result: The *Wilcoxon* test result before and after showed a value of 0.000 ($p < 0.05$), meaning that there was an influence of foot exercise education using demonstration methods and booklet media on foot exercise knowledge in diabetes mellitus patients.

Introduction

Diabetes mellitus (DM) is a serious non-communicable disease in which insulin cannot be produced optimally by the pancreas [1]. The International Diabetes Federation (IDF) (2021), states that there are 537 million people worldwide who suffer from diabetes mellitus in 2021, and this number is expected to increase to 643 million in 2030 and 783 million in 2045. In Indonesia, the prevalence of diabetes mellitus is high and is ranked 7th in the world with 19.47 million people with diabetes mellitus in 2021 [2].

The Special Region of Yogyakarta Province is the 3rd highest number of people with diabetes mellitus nationally. According to Yogyakarta Special Region Province Health Data in 2019 shows that there were 74,668 people with diabetes mellitus [3]. According to Yogyakarta Mayor Regulation Number 90 of 2019, the district or city in DIY with the highest prevalence of diabetes mellitus is Yogyakarta City as the first place at 4.9%. Meanwhile, the district or city in Yogyakarta with the lowest prevalence of diabetes mellitus is Gunung Kidul district, which is 2.4%. Bantul and Sleman are in the highest position after Yogyakarta City with the same prevalence of 3.3% [4].

The increasing prevalence of diabetes mellitus is caused by higher population growth, obesity, stress factors, unhealthy diet and secondary lifestyles such as lack of physical activity [5]. One of the complications of diabetes mellitus is ulceration that affects the lower limbs with or without infection and causes damage to the underlying tissue, also known as diabetic foot [6]. Diabetic foot gymnastics is one of the exercises or physical activities recommended for patients with diabetes mellitus which aims to improve blood circulation so that nutrients can enter the tissues more smoothly [7].

Knowledge is the main basis for successful treatment. The International Working Group on the Diabetic Foot (IWGDF) states that one of the five main things to prevent complications of diabetes mellitus is to provide education to patients or diabetics. Based on research conducted by [8] on the knowledge of foot exercises in patients with diabetes mellitus, it shows that only 22.5% of patients have a high level of knowledge about foot exercises and the remaining 77.5% of patients have a low level of knowledge of foot exercises.

Preliminary studies conducted by researchers at Prolanis Puskesmas Pleret on January 22, 2024 recorded 644 patients with diabetes mellitus and 50 of them participated in activities at Prolanis with the criteria that patients diagnosed with diabetes mellitus, active control every month for the treatment of diabetes mellitus and well-controlled fasting blood sugar. Routine activities once a month carried out at Prolanis Puskesmas Pleret include physical exercise, fasting blood sugar checks, health education once a month and complete laboratory checks every 6 months. The results of an interview with the person in charge of Prolanis Puskesmas Pleret said that education had never been carried out regarding diabetic foot exercises. Researchers also conducted interviews with several patients with diabetes mellitus. 5 patients said they had never known about foot exercises and 1 patient said they had heard about foot exercises on YouTube but could not practice them because they were confused by the explanation on YouTube.

This shows that education is needed to increase the knowledge of people with diabetes mellitus to do physical activity. Health education can increase the knowledge of people suffering from diabetes mellitus. The use of attractive and easily accepted media when providing education will support health education [9]. One of the media that can be used is a booklet because booklets provide more information with beautiful and attractive illustrations, so as to encourage readers to expand their knowledge. In addition, booklets also have benefits as a counseling medium because they can increase a person's knowledge in a very short time [11].

Based on the phenomena and various related studies described above, the authors consider it important to conduct research on “the effect of foot exercise education on foot exercise knowledge in patients with diabetes mellitus at Prolanis Pleret Health Center.”

Methods

The type of research used is pre experimental with a research design design of one group pretest posttest design, namely the subject group is observed before the intervention is carried out then observed again after the intervention is carried out. The population in this study were patients with diabetes mellitus at Prolanis Pleret Health Center, totaling 43 respondents. The sampling technique used is non probability sampling technique with purposive sampling method where the sampling technique uses certain considerations in accordance with the desired criteria to be able to determine the number of samples to be studied.

The inclusion criteria in this study were patients with diabetes mellitus at Prolanis Pleret Health Center, aged no more than 65 years, willing to become respondents and patients with diabetes mellitus who had recovered from diabetic ulcers. The exclusion criteria are people with diabetes mellitus who are sick or have complications that make it impossible to participate in activities, people with diabetes mellitus who have diabetic ulcers, people with diabetes mellitus who follow counseling but do not finish, people with diabetes mellitus who are unable to communicate well and people with diabetes mellitus who cannot read and write.

The research variables consisted of foot exercise education as the independent variable and foot exercise knowledge as the dependent variable. The research instrument was a questionnaire, namely a knowledge questionnaire. While the statistical test used is a non-parametric test, namely using the Wilcoxon formula.

Results

This study was conducted on Prolanis members with the number of respondents selected according to the inclusion criteria of 43 respondents, who were then grouped based on age, gender, occupation, education, income, length of diabetes mellitus and also have learned or have never learned related to diabetic foot exercises described in table 1.

Table 1. Frequency Distribution of Respondent Characteristics at Prolanis Pleret Health Center

Characteristics	Respondetsn (F)	Respondents (%)
Age		
36-45	3	7
46-55	12	28
56-65	28	65
Total	43	100
Gender		
Male	11	26
Female	32	74
Total	43	100
Work		
Not working	16	37
Farmer	9	21
Self-employed	18	42
Retired	0	0
Total	43	100
Education		
Not in School	2	5
Elementary School	22	51
Junior High School	9	21
Senior High School	9	21
College	1	2
Total	43	100
Income		
No income	17	40
<1million	9	20
1million-5million	17	40
>5million	0	0
Total	43	100
Long Suffering		
<1 year	9	21
>1 year	34	79
Total	43	100
Never learned foot exercises		
Never	36	84
Ever	7	16
Total	43	100

Based on table 1, it is known that the characteristics of the majority of respondents are respondents aged between 56-65 years (65%) and female (74%). 42% of respondents have self-employed jobs with the last education of the majority of elementary school (51%). Meanwhile, the respondents' income was known to be 1 million-5 million and no income was equally large (40%). Respondents suffered from diabetes mellitus for >1 year (79%) and 84% of respondents said they had never learned foot exercises.

Table 2: Distribution of Knowledge Level of Foot Gymnastics Before and After Foot Gymnastics Education

Knowledge	Before		After	
	F	%	F	%
Good	1	2	42	98
Enough	8	19	1	2
Less	34	79	0	0
Jumlah	43	100	43	100

Table 2 shows that the respondents' knowledge of foot exercises before education related to foot exercises was mostly poor (79%). Knowledge of foot exercises after foot exercise education is mostly good (98%).

Table 3. Wilcoxon Pair Test Results Knowledge of Foot Gymnastics

Variabel	Mean	Z	Asymp. Sig. (2-tailed)
Foot Gymnastics Knowledge		-6.180 ^b	0,000
<i>Pretest</i>	9,69		
<i>Posttest</i>	20,18		

Table 3 shows that the results of the Wilcoxon matched pair test obtained a Z value of -6.180b with Asymp. Sig (2-tailed) (p) of 0.000 indicates that there is an effect of foot exercise education on foot exercise knowledge, which means Ho is rejected and Ha is accepted.

Discussion

1. Respondent Characteristics

Based on the results of the study, the age characteristics of respondents mostly ranged from 56-65 years, namely 28 respondents with a percentage of 65%. Age affects an individual's perspective in solving problems. This is supported by [10] that one of the factors that influence a person's actions is age. Age is one of the factors that can determine a person's maturity both thinking, acting and learning. Maturity in one's thinking can affect both one's knowledge, attitudes, and practices. The stages of a person's life can provide experiences that are not easily forgotten.

In addition, gender is also one of the factors associated with the occurrence of diabetes mellitus. According to [11]. Women tend to be more at risk of diabetes mellitus. This is because women have higher cholesterol than men and there are also differences in doing all daily activities and lifestyles.

Occupational factors affect the risk of diabetes mellitus. Someone who has a fairly busy daily activity or job will be more at risk of developing diabetes mellitus. Based on the results of the study, the majority of respondents worked as self-employed as much as 42%. This is in line with research conducted by [12] which examines the characteristics of patients with diabetes mellitus based on occupation and shows the results that the majority of respondents have self-employed jobs.

The majority of respondents had an elementary school education level with a percentage of 51%. Education level has an influence on the incidence of diabetes mellitus. Someone with a high level of education will usually have a lot of knowledge about health. In a study conducted by [13] on the relationship between education level and the incidence of diabetes mellitus, it was found that there was a relationship between education level and the incidence of diabetes mellitus. A person with a low level of education is 27 times more at risk of suffering from diabetes mellitus than someone with a high education.

The results of the characteristics of respondents based on income, the majority do not earn and earn between 1 million and 5 million. According to [14] income above MSE is protective against diabetes mellitus, meaning that someone whose income is above MSE can prevent diabetes mellitus. This is because someone with a high income can fulfill their nutritional needs as needed and can continue to check and control blood sugar levels. The same thing was stated by Funakoshi (2017) that someone who has a low income or low socioeconomic status has a high risk of suffering from diabetes mellitus. Conversely, someone with a high income will have a lower risk of developing diabetes mellitus.

Research conducted by [15] says that the length of time suffering from diabetes mellitus greatly affects the quality of life of patients with diabetes mellitus. Diabetes mellitus that has occurred in sufferers if not handled optimally will result in complications in other organs such as the kidneys, eyes, blood vessels in the heart and nerves. In this study the majority of respondents suffered from diabetes mellitus for more than 1 year with a percentage of 79%. This states that low quality of life in patients with diabetes mellitus is influenced by the duration of diabetes mellitus, so that it will have negative effects including physical health, emotional health, social relationships due to the development of complications that have arisen.

The characteristics of respondents based on previous knowledge of foot exercises found that the majority of respondents had never learned foot exercises with a percentage of 84%. Knowledge is an important aspect to help someone control their disease. This knowledge can be a support that can help patients carry out diabetes therapy, so the better the patient understands about his disease, it is hoped that it can help change health behavior so that and can stabilize blood sugar levels so that his body condition will be stable.

2. Knowledge of Foot Gymnastics Before Foot Gymnastics Education

The results showed that the knowledge of patients with diabetes mellitus related to foot gymnastics before foot gymnastics education was mostly lacking with a percentage of 79%. According to [14] says that lack of knowledge is caused by several factors including age, experience and mass media / information.

Age affects a person's capacity and mindset, the more the capacity increases, the more knowledge is gained. According to the World Health Organization (WHO) (2019) an elderly person is someone who has entered the age of 60 years and above. In this study the majority of respondents were aged 56-65 years. This causes changes in the structure and physiology of various tissues and systems in the human body so that there is a deterioration both physically, psychologically and emotionally, causing the ability of the mindset in the elderly to decrease.

Experience is a source of knowledge as a way to get the truth by repeating knowledge gained in the past to solve problems. The respondent's lack of experience related to foot exercises causes the respondent to have less knowledge. Meanwhile, information is one of the important aspects that influence knowledge. Someone who has many sources of information will definitely have a broad knowledge. In this study, respondents said they had never received information related to foot exercises so that the results of knowledge about foot exercises were mostly lacking.

3. Knowledge of Foot Gymnastics After Foot Gymnastics Education with Demonstration Method and Media Booklet

Knowledge of foot gymnastics after foot gymnastics education is mostly in the good category with a percentage of 98%. This can be caused by various factors, one of which is age. Age affects a person's attention span and mindset. In this study, the age of the majority of respondents fell into the elderly category, however, the posttest which was carried out with a 4-day break and the respondents did an independent roleplay of foot exercises resulted in good memory for the respondents, so that good knowledge results were obtained in the respondents.

In addition, information or mass media is another factor that causes knowledge to increase from 2% to 98%. This was also influenced by the media given to respondents, namely booklets. In accordance with research conducted by Puhun (2023) said that booklet media is a very useful tool to support health promotion and has proven effective in increasing respondents' knowledge. This can result in an increase in respondents' knowledge.

Socio-culture and habits can influence a person's knowledge, perception and attitude towards something. The majority of respondents also said that knowledge obtained from health workers would be more obedient than that obtained from other people or mass media. This behavior is consistent with the fact that some respondents have learned foot exercises through mass media such as YouTube, but their knowledge is still lacking. However, after health education by health workers there was an increase in knowledge by these respondents. This is in accordance with research conducted by Pratiwi (2019) explaining that education provided by health workers will be more obeyed by patients than education that comes from families. Therefore, these socio-cultural factors greatly affect a person's level of knowledge.

Limitations of this research are the lack of adequate facilities and infrastructure, such as a busy environment, so that respondents lack focus when filling out the questionnaire. Suggestions for future research are that it is hoped that future research can focus more on the implementation of leg exercises.

Conclusion

Respondents' knowledge related to foot exercises before foot exercise education was mostly in the poor category as many as 34 respondents (79%). Respondents' knowledge related to foot exercises after foot exercise education was mostly in the good

category as many as 42 respondents (98%). And there is a significant effect of foot exercise education on foot exercise knowledge in patients with diabetes mellitus at Prolanis Pleret Health Center, indicated by the results of the Wilcoxon test obtained a significant value of 0.000.

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