EFFECTIVENESS OF AUDIOVISUAL FOOT CARE-BASED EDUCATION ON IMPROVING KNOWLEDGE, ATTITUDES AND ACTIONS OF DIABETIC PATIENTS IN PREVENTING FOOT ULCER DIABETIC

Risma Dumiri Manurung[1], Lestari[2] , Suriani Br Ginting[3], Vicky Aprian[4]
[1234]PoliteknikKesehatan lkementerian kesehatan Medan
Email : [1]rismadumiri@gmail.com

ABSTRACT

Diabetic mellitus patients have a high risk of developing such as 15 % diabetic foot ulcers, which may lead to wounds, infection, and even amputation if not properly managed. Diabetic foot ulcer can rapidly progress if DM patient has decent knowledge and will to routinely take care and treat their foot. This study aimed to identify the effectiveness of video-audio-visual based education of foot care on knowledge, attitude, and action of diabetic patients on preventing diabetic foot ulcer. The methods used in this reseearch were pre-experiment pre-test – post-test with one group design. Samples were DM patients which visited the Tiara Medistra Clinic, samples wew selected using Purposive Sampling with total number of 30 people. Independent variable of health education, dependent variables of knowledge, attitude, and practice toward prevention of diabetic foot ulcer. Data acquired in this research were collected by implementing questionnaire. Data analysis was done by paired t-test with p value = 0.005 and N-gain. This research showed that there are significant differences before and after video-audio-visual based education of foot care on knowledge (p=0.000), attitude (p=0.000), and action (p=0.000) with mean of N-gain score of 0.7620 and N-gain percentage of 76.2032%. In conclusion, audio-visual–based health education on foot care is effective in improving knowledge, attitudes, and practices of diabetic mellitus patients. Regular and appropriate foot care education can help reduce the risk of diabetic foot ulcers.

***Keywords**: Diabetic mellitus, Foot care, Audio-visual education, Diabetic foot ulcer*

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder with multiple etiologies characterized by high blood glucose levels accompanied by impaired carbohydrate, lipid, and protein metabolism as a result of insulin function insufficiency. Diabetes mellitus is a chronic metabolic disorder characterized by blood glucose levels exceeding normal limits (Info DATIN, 2020). The International Diabetes Federation (IDF) estimates that at least 463 million people aged 20-79 worldwide suffered from diabetes in 2019, equivalent to a prevalence of 9,3% of the total population of that age.

The prevalence of diabetes mellitus is estimated to increase with age, reaching 19,9%, or 111.2 million people aged 65-79. This figure is predicted to continue to increase, reaching 578 million in 2030 and 700 million in 2045. The prevalence of diabetes among people aged 20-79 years, by region, reached 8,3% globally in 2019, and Southeast Asia ranked 3rd at 11,3%. Indonesia ranked 7th among 10 countries and was the only country in Southeast Asia to do so, thus significantly contributing to the prevalence of diabetes cases in Southeast Asia (Info DATIN, 2020).

The number of people with diabetes mellitus in Indonesia has reached 10,7 million. The 2018 Basic Research and Development Survey (Riskesdas) showed that the prevalence of diabetes mellitus in Indonesia was 2%. This figure shows an increase compared to the prevalence of diabetes mellitus in the Riskesdas (2013) results of 1,5%. There were four provinces with the highest prevalence of diabetes mellitus from 2013 to 2018: Yogyakarta Province, DKI Jakarta, North Sulawesi, and East Kalimantan. The prevalence of diabetes mellitus (DM) based on a doctor's diagnosis in those aged 15 years and older is 0.9% in East Nusa Tenggara (NTT) province, while the highest prevalence is in Jakarta (DKI Jakarta) at 3.4% (Indonesian Ministry of Health, 2019).

The number of people with diabetes mellitus (DM) in North Sumatra has increased annually. Data from the North Sumatra Health Office (Dinkes) indicates that from 2017 to 2018, the number of people with type I diabetes was 25,838 and type II was 84,843 (Dinkes Prov. Sumatera Utara, 2018). North Sumatra Province is one of the provinces with the highest prevalence of DM sufferers in Indonesia with a prevalence of 2.3% diagnosed by doctors based on symptoms, this makes North Sumatra Province one of the 10 provinces with the highest prevalence of DM in Indonesia (Kemenkes, 2018). Diabetes mellitus (DM) is a chronic disease, and its presence can lead to complications. Diabetic foot ulcers (DFUs) are one of the most common complications of diabetes mellitus, placing patients at high risk for amputation and even death. The prevalence

of diabetic foot ulcers is approximately 41% of the general population, with a higher prevalence in the elderly. Approximately 14-24% of DFU patients require amputation, with a frequency of 50% within three years. Approximately 15% of diabetic patients experience foot ulcers, and 15-20% of these require amputation. Mortality rates increase to 13%-40% after 1 year, 35%-65% after 3 years, and 39%-80% after 5 years (Sari *et al*., 2018).

Diabetic foot ulcers are a result of peripheral neuropathy. Poor foot care and hygiene are factors contributing to the development of foot ulcers in diabetic patients. Early detection of diabetic foot ulcers is crucial for improving quality of life (Fajriyah *et al*., 2020). Preventive measures to prevent diabetic foot ulcers include education. Early detection of diabetic foot ulcers is crucial to prevent their occurrence. Appropriate health education and educational media will facilitate the acceptance of information (Nurjanna *et al.*, 2020).

Diabetic foot ulcers will not occur if DM sufferers have knowledge and are willing to maintain and care for their feet regularly (Nurchayati and Hasanah 2014). However, many DM sufferers do not have knowledge of diabetic foot care and do not carry out the expected foot care. Foot care is one part of the practice of self-care for diabetics. Foot care behaviors need to be carried out regularly to prevent and delay potential complications. Diabetic foot ulcers can be prevented with good foot care behaviors, good behaviors are influenced first by the knowledge of diabetic patients (Ningrum *et al*., 2021). Foot care is one aspect of self-management behavior that needs to be done, including washing feet every day, airing feet after washing, and checking the inside of footwear. Therefore, nurses are also responsible for providing health education regarding foot care behavior (Amelia, 2018).

Counseling or education is a process of empowering individuals, groups, and communities to maintain, improve, and protect their health through increased knowledge, skills, and abilities. (Depkes RI, 2021). Education aims to increase the community's ability to maintain and improve their physical, mental, and social health levels so that they are productive both economically and socially. Health education is highly influential in improving a person's health by increasing the community's ability to perform health-related activities independently. One of the most effective educational media is the use of audiovisual media. Audiovisual media has the advantage of allowing a person to hear sound and images/animations simultaneously, making the information conveyed easier to understand. Health education in an effort to increase DM patients' self-awareness in performing foot care is not an easy matter. This is related to the way of educating with various characters and backgrounds of the participants. Effective health education is supported by the use of media that are interesting and more easily accepted by the target.

Research has shown that proper foot care education, along with adherence to foot care, can reduce the impact of foot ulcers by 3,1%. Good educational management will gradually increase knowledge, enabling patients to perform self-care independently (Netten *et al*., 2021). The use of audiovisual media is effective in improving a person's behavior because it is derived from what they hear and see (Mardianti *et al*., 2019). From the background above, researchers are interested in providing education about foot care using audiovisual videos in an effort to increase knowledge, attitudes and actions in preventing foot wounds in diabetes mellitus sufferers at the Tiara Medistra Clinic, Deli Serdang.

METHOD

The quantitative research design used is pre-test with pre-post test one group design. The research was conducted on 30 respondents before receiving education and then a post-test was conducted after education. The research was conducted at the Tiara Meidistra clinic in Deli Serdang with a population of DM patients who had not experienced diabetic foot ulcers who visited and controlled the Tiara Meidistra Clinic. The number of samples was 30 respondents with purposive sampling technique. The inclusion criteria included diabetic mellitus patients who visited and were registered at Tiara Medistra Clinic, were willing to participate, were able to communicate well, and had no history of diabetic foot ulcers. The exclusion criteria included patients with active diabetic foot ulcers, severe complications, and incomplete participation in the pre-test or post-test.

RESULTS AND DISCUSSION (12pt)

The results of the research conducted on 30 respondents, a description of the characteristics of respondents based on age, gender, education level, occupation and length of time suffering from Diabetes Mellitus can be seen in the following table.

Table 1. Frequency Distribution of Respondent Characteristics Based on Age, Gender, Education, Occupation, and Length of Diabetes Mellitus Suffering

No	Characteristics	Frequency (n)	Percentage (%)
1	**Age**		
	36-50 year	4	13,3
	51-60 year	15	50,0
	61-70 year	11	36,7
	Total	**30**	**100,0**
2	**Gender**		
	Male	13	43,3

	Female	17	56,7
	Total	**30**	**100,0**
3	**Education**		
	SD	1	3,3
	SMP	16	53,4
	SMA/SMK	9	30,0
	Perguruan Tinggi	4	13,3
	Total	**30**	**100,0**
4	**Work**		
	Farmer	10	33,3
	Entrepreneur	7	23,4
	IRT	12	40
	Civil servants	1	3,3
	Total	**30**	**100,0**
5	**Long time of illness**		
	< 5 tahun	14	46,7
	> 5 tahun	16	53,3
	Total	**30**	**100,0**

Based on Table 1 above, the category of respondents with the most age was 51-60 years with 15 respondents (50,0%), the gender of the most respondents was female with 17 respondents (56,6%), the education level of the most respondents was junior high school with 16 respondents (53,6%), the most respondents worked as IRT with 12 respondents (40%), and based on the duration of DM, the most respondents had a history of DM more than 5 years with 16 respondents (53,3%).

Table 2. Frequency Distribution of Knowledge, Attitudes and Actions Before and After Providing Video Education Audio Visual Foot Care

No		**Before**		**After**	
		N	%	N	%
1	**Knowledge**				
	Good	6	10	21	70,0
	Sufficient	15	50	8	26,7
	Poor	9	40	1	3,3
	Total	**30**	**100,0**	**30**	**100,0**
2	**Attitude**				
	Positive	17	56,7	25	83,3
	Negative	13	43,3	5	16,7
	Total	**30**	**100,0**	**30**	**100,0**
3	**Action**				
	Done calmly	12	40	23	76,7
	Don't do it correctly	18	60	7	23,3

Total	**30**	**100,0**	**30**	**100,0**

Based on table 2 above, the level of knowledge of research including education, the majority of foot care is good, namely 15 respondents (50%), and after providing education, the majority is good, namely 21 respondents (70%). For current positive attitudes, there are 17 respondents positive attitudes (56,7%) and negative attitudes, namely 13 respondents (43,3%), and positive attitudes are increasing occurred in 25 respondents (83,3%) and negative attitudes decreased to 5 respondents (16,7%). Based on the follow-up measures in preventing foot wounds in the first place, that is, there are 18 respondents (60%) and after being given education, the majority are carried out the correct procedure, namely 23 respondents (76,7%).

Table 3. Effectiveness of Using Audiovisual Video Media in Improving Knowledge, Attitudes, and Foot Care Practices of Diabetes Patients in Preventing Diabetic Foot Ulcers

Category	**Mean**	**SD**	**Difference**	***p-value***
Knowledge Before education and After education	30,667	11,571	-14,516	0,000
Attitudes Before and After Education	44,550	8,867	-25,571	0,000
Actions Before and after education	16,667	10,283	-8,877	0,000

Based on table 3 above, the average of respondents' knowledge before and after being given audio visual education is 30,667 with a *p*-value of 0,000 (<0,05), while the average of respondents' attitudes before and after being given audio visual education is 44,550 with a *p*-value of 0,000 (<0,05)and the average of respondents' actions before and after being given audio visual education is 16,667 with a *p*-value of 0,000 (<0,05). The results of statistical tests showed significant effectiveness before and after providing foot care education using audio-visual media in increasing respondents' knowledge, attitudes and actions in preventing diabetic foots ulcer.

Table 4. N-Gain Value of the Effectiveness of Using Audiovisual Video Media in Improving the Knowledge, Attitudes, and Actions of Diabetes Patients in Preventing Diabetic Foot Ulcers

N-Gain	N	Minimum	Maksimum	Mean	SD

N-Gain score	30	0,30	1,00	0,7620	0,23522
N- Gain persen	30	30,00	100,00	76,2032	23,52174

Based on table 4 above, the average (Mean) N-Gain score of the effectiveness of using audiovisual video in improving the knowledge, attitudes, and actions of diabetic foot care providers in preventing diabetic foot ulcers is 0,7620 and the average (Mean) N-gain percentage is 76,20%. The results of the N-Gain test obtained a high and effective conclusion, meaning that the use of audiovisual video media has high effectiveness and is effective in improving the knowledge, attitudes, and actions of diabetic foot care providers in preventing diabetic foot ulcers.

CONCLUSION

Knowledge is the result of human perception, or the result of a human being's knowledge of an object through the senses he possesses. Perception occurs through the five human senses, namely the senses of sight, hearing, smell, taste, and touch. Most of human knowledge is obtained through the eyes and ears. Knowledge or cognition is a very important dominant factor for a person's actions. Table 2 shows the respondents' knowledge before being given educational care, the majority of respondents have sufficient knowledge, namely 15 respondents (50%). Judging from the characteristics of the respondents, more than half have a junior high school education level, so it can be said that their education is still good. Based on the theory that states that one of the factors that influences a person's knowledge is their level of education. Notoatmodjo (2012), reports that there are still many who do not understand how to properly examine feet so that foot injuries do not occur and how to use footwear that does not harm the feet. The results of the study on the behavior of foot care are very important to prevent foot wounds, namely how to maintain foot hygiene every day, cut nails well and properly, choose good footwear, care for the feet and the feet. After the education was carried out, the majority of respondents had good knowledge, namely 21 respondents (70%). The results of the statistical test obtained a *p* value of 0,000 (<0,05). This means that there is an increase in the knowledge of respondents, which initially the majority of knowledge was sufficient to become the majority of knowledge Good, although there are still those who have sufficient and less knowledge due to the age factor of the elderly 61-70 years. The factor that influences a person's knowledge is age (Notoatmodjo, 2012),

cause a decrease in intellectual ability, a decrease in memory and difficulty in receiving new information.

Attitude is a response or reaction of a person to a stimulus or a certain object that is prepared to provide a response to an object that is organized through experience and influences directly or indirectly on the practice of action in determining a complete attitude, knowledge, thoughts, beliefs and emotions that influence the role of the key in measuring attitudes so that it is difficult to measure and easy to change because it depends on personal experience, the influence of other people who are considered key, the influence of culture, mass media, educational institutions and religion as well as emotional factors from the egotistical nature of the respondent himself.

Table 2: Respondents attitudes in the prevention of foot ulcers in the past, including education, audio and visual, the majority were positive, namely 17 respondents (56,7%) and negative attitudes, namely 13 respondents (43.3%). According to education, positive attitudes increased to 25 respondents (83,3%) and negative attitudes decreased to 5 respondents (16,7%). The statistical test results obtained a value of p = 0,000 (<0,05) so that there were significant differences before and after education.

Negative responsive attitudes can occur due to lack of knowledge and information so that there is a lack of understanding about the need to use footwear in the house and if there is a leiceit wound on the foot, it should not be left because it will cause the occurrence of a foot injury. According to Purwanto (2014), one of the factors that influences the object of attitude is personal experience which becomes the basis for forming attitudes. Attitudes will be more easily formed if the personal experience occurs in a situation that involves emotional factors. The study of using audiovisual media meaningfully can improve the respondent's attitude to a positive attitude. The selection of appropriate media, simple visualization, explanation, sound images that can be easily understood by the respondent will make the information transfer process better.

Behavioral change is an effort to change a person's behavior. Foot care behavior is a daily activity of diabetic patients consisting of the details of diabetic foot disorders, foot and nail care, and foot exercises. This foot care can be carried out independently by patients and their families, where health workers in this case, nurses are required to provide education for patients and families to carry out foot care independently (Notoatmodjo, 2012). Based on table 2, respondents actions in the prevention of diabetic foot ulcers before being given 18 respondents (60%) and after giving eduction, the majority is carried out the correct procedure, namely 23 respondents (76,7%). The statistical test results obtained a value of p 0,000 (<0,05) so that there were differences before and after education. The value of the N-Gain score is 0,7620 and the average (Mean) N-Gain

score is 76,20 percent so that the results of the N-Gain test carried out are high and effective, meaning that there is an effectiveness in the use of visual media in increasing awareness of the attitudes and actions of diabetic foot care in preventing diabetic foot injuries. According to Yusra (2011), the level of education influences a person's behavior in seeking care and treatment for the disease they are suffering from, as well as choosing and deciding on the action or therapy that will be undertaken to overcome their health problems. This research is in line with the opinion of Mardianti *et al*, (2019). The use of audiovisual media is effective in improving a person's behavior because it is obtained from what they hear and see with a *p*-value of 0,000 (<0,05). The importance of educational media in assisting health workers is very significant in improving behavior, namely knowledge, attitudes, and actions for preventing diabetic foot wounds. Choosing the right media can increase attention, concentration, and imagination of respondents so that it is hoped that they will start learning well by implementing how to care for and prevent diabetic foot wounds. Good knowledge and attitudes will carry out actions with good intentions, thereby minimizing the risk of complications from diabetic foot wounds that occur.

Audio-visual–based education is considered more effective because it involves multiple sensory modalities, particularly visual and auditory stimulation, which can enhance understanding and retention of information. This method allows patients to better comprehend foot care procedures through visual demonstration. Therefore, audio-visual education can be recommended as an effective educational approach for healthcare workers in delivering foot care education to diabetic mellitus patients.

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