



Erika Martining Wardani, Riezky Faisal Nugroho

## THE INFLUENCE OF DIABETES SELF MANAGEMENT EDUCATION WITH AVA ON THE KNOWLEDGE OF DIABETES MELLITUS TYPE 2

Erika Martining Wardani<sup>1\*</sup>, Riezky Faisal Nugroho<sup>2</sup>

<sup>1</sup>Departemen of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama, Surabaya, Indonesia

<sup>2</sup>Departemen of Nutrition, Politeknik Kesehatan Kemenkes, Surabaya, Indonesia

\* Corresponding Author : E-mail : [erika@unusa.ac.id](mailto:erika@unusa.ac.id)

### ABSTRACT

**Background:** High or uncontrolled blood sugar levels are still widely found, one of which is due to the patient's lack of knowledge about the disease, diet and treatment of DM sufferers. Overcoming these problems by providing health education. Diabetes self management education (DSME) is a process to support knowledge, skills and abilities in diabetes self-care. **Objective:** This study examines the influence of diabetes self management education with avas on the knowledge of diabetes mellitus type 2. **Methods:** The design of this study used a quasi experiment with a pre-test and post-test nonequivalent control group approach. The population in this study were all elderly people with Diabetes Mellitus as many as 170 people, the sample was 60 respondents who were taken using the simple random sampling technique. The instrument used was a questionnaire given before and after the intervention. Data were analyzed using the Wilcoxon Signed Ranks Test with  $\alpha = 0.05$ . **Results:** The research results obtained that the respondent's knowledge after (post test) giving intervention DSME with AVA obtained a Mean Rank value of 3.00 while the level of knowledge before it was carried out (pre test) obtained a Mean Rank value of 2.50 obtained a Sig value of 0.0001 which means if  $p < 0,05$  there is an effect of providing Health Education with AVA on knowledge of people with type 2 diabetes mellitus. **Conclusion:** DSME through audio-visual media is very useful to increase knowledge about Diabetes Mellitus. It is necessary to provide regular health education to increase knowledge of DM sufferers as a preventive measure.

**Keywords:** DSME, AVA, knowledge, DM

### INTRODUCTION

Diabetes Mellitus is a disorder of carbohydrate metabolism when insulin supply is not available, insufficient, or ineffective due to insulin resistance. Glucose is present in the blood but cannot enter the cells.<sup>1</sup> This case of Diabetes Mellitus can get worse about public awareness about diabetes so that it can make the incidence of Diabetes Mellitus in Indonesia increase.<sup>2</sup> A phenomenon in today's society, many people with diabetes mellitus have low levels of knowledge and can affect lifestyle and irregular eating patterns such as consuming excessive junk food, consuming excessive sugar and also rarely doing physical activity such as exercising so that it can worsen the diabetes mellitus suffered and can also cause complications.

According to the International Diabetes Federation (IDF) 2021, recorded 537 million adults (aged 20-79 years) or 1 in 10 people living with diabetes worldwide.<sup>3</sup> Indonesia is in the second highest position in the Southeast Asia region. According to the report on the results of Riskesdas (2018), the Ministry of Health of the Republic of Indonesia in 2018, the prevalence of people with Diabetes Mellitus in Indonesia increased from 1.5%

in 2013 to 2.0% in 2018 while the prevalence in East Java was 2.6%.<sup>4</sup> The city of Surabaya 3.5% of people with diabetes mellitus.<sup>5</sup>

Based on the results of interviews conducted at the Posyandu for the elderly in Menanggal, Surabaya by asking the cadre leader how the knowledge of the elderly about Diabetes Mellitus is. Elderly Posyandu cadres answered that the average elderly affected by Diabetes Mellitus had a low level of knowledge, sometimes the elderly still often consumed sweet foods, high carbohydrates and also rarely moved to do sports. From the initial data obtained at the Posyandu for the elderly in Menanggal Surabaya who were interviewed about knowledge of Diabetes Mellitus, 60% of the elderly had low knowledge, 30% had sufficient knowledge and 10% had good knowledge.

Diabetes Mellitus is caused by a lack of the hormone insulin produced by the pancreas to neutralize blood sugar in the body and the lack of knowledge from the public about Diabetes Mellitus.<sup>6</sup> Diabetes Mellitus in general is also caused by a lifestyle, namely uncontrolled food consumption habits or as a side effect of using certain types of drugs.<sup>7,8</sup> The increasing number of people with type 2



Erika Martining Wardani, Riezky Faisal Nugroho

diabetes mellitus can also be caused by changes in people's lifestyles, low levels of knowledge, and awareness of each individual to carry out early detection of diabetes mellitus and lack of exercise activity, especially for low levels of knowledge. This can determine whether it is serious or not.<sup>9</sup>

Efforts to increase knowledge in diabetic mellitus type 2 is by providing health education such as Diabetes Self-management education (DSME) with AVA. Audio Visual Aids Media (AVA) Audio visual aids media is media that has sound elements and image elements that can be seen and heard.. Rahmawati, *et al*, research (2021) prove that Diabetes Self-management education (DSME) is effective in improving knowledge in patients with diabetes mellitus type 2.<sup>10</sup> This is reinforced by Aminah, *et al*, research (2022) which shows that diabetes self-management education (DSME) can improve dietary compliance in type 2 DM patients.<sup>11</sup>

**METHOD**

This study is analytic with a quasi-experimental technique with a nonequivalent control group pre-test and post-test approach. The population in this study were all type 2 DM patients at Posyandu Lansia Menanggal with a total sample of 170 people. The sample in this study was 60 respondents determined by simple random sampling technique with the inclusion criteria of DM patients who were at the Posyandu for the elderly and willing to be respondents, suffering from DM for more than 1 year. Exclusion criteria for DM patients who did not follow the intervention to completion and DM patients with complications. This research was conducted for 6 months (March – December 2020).

Implementation of data collection is carried out gradually, starting with giving pretest to the intervention group and control a week before it's done intervention at different locations. Researchers are assisted by 3 enumerators who previously explained the procedure his research. Diabetes Self Intervention Management Education is carried out for 1 month 2 times a week. The material is presented using a question and answer method and discussions of about one hour on each meeting. Post-test a week after intervention in the intervention group and control in different places.

After the data is processed, the next step is to analyze the data, the analysis used is the Wilcoxon

Signed Ranks Test statistical test using the SPSS version 23.0 program for windows with a significant level of = 0.05. If the statistical test results show  $p < 0.05$  then the hypothesis is rejected, which means that there is an influence between the independent and dependent variables.

**RESULTS**

a. Demographic data

**Table 1.** Demographic data respondents (n=60)

Demographic data	n	%
Ages (Years)		
< 45	10	17
45-60	42	70
> 60	8	13
Gender		
Man	18	30
Woman	42	70
Level of education		
Elementary	14	23,3
Middle	40	66,7
High	6	10
Diet		
Yes	21	35
No	39	65
Exercise		
Never	6	10
Seldom	40	66,7
Often	14	23,3

Table. 1 shows that most of the respondents aged 45-60 were 42 people (70%), with female gender 42 people (70%). Level of education majority with middle as many as 40 people (66.7%). Almost half of the respondents did not go on a diet as many as 39 people (65%). Respondents also seldom exercise as many as 40 people (66.7%).

b. The influence of DSME with ava

**Tabel 2.** The influence of DSME with ava

Group	n*	Before			After		
		Intervention		p value	Intervention		p value
		Mean	SD		Mean	SD	
Intervention	30	2,50	0,630	0,107	3,00	0,000	0,001
Control	30	2,70	0,466		2,77	0,430	



Erika Martining Wardani, Riezky Faisal Nugroho

Tabel. 2 shows that there is an influence of DSME through AVA. The results of the Wilcoxon test obtained a p value of 0.001 ( $p < 0.05$ ), so it can be concluded that  $H_a$  is accepted, meaning that there is a significant effect on the level of knowledge before and after being given DSME through AVA in patients diabetes type 2.

## DISCUSSION

### a. Knowledge of respondents before being given DSME with AVA

Based on the results of the pre-intervention study providing DSME in the intervention group, the mean Rank value was 2.50. This is in line with research conducted by Shima et al showed a significant relationship between knowledge and self-management behavior in people with diabetes mellitus.<sup>12</sup> This is also the same as the research of Jayanti, *et al.* (2019), there is a difference in the average level of knowledge in the experimental group.<sup>13</sup> Where the level of knowledge of respondents before (pre-test) providing health education with the audiovisual method obtained a Mean Rank value of 0.00 and the level of knowledge of respondents before getting treatment was 5 (71.4%).

Factors that can affect knowledge to be less include age and education. As you get older, your memory will decrease. While someone who has low education will also affect the lack of information about Diabetes mellitus.

### b. Knowledge of respondents after being given DSME with AVA

Based on the results of the pre-intervention study providing DSME in the intervention group, the mean Rank value was 3.00. The increase in respondents' knowledge reflects the increase in knowledge influenced by the existence of media assistance which makes it easier for respondents to remember the material provided. According to Nurhidayat (2015) regarding increasing the knowledge of the elderly about Diabetes Mellitus by using the media, it is concluded that it is very necessary for the media as a tool to improve the ability to remember in the elderly so that it is faster to understand the information provided from the media in the form of video.<sup>14</sup> Audio-visual media is an educational tool that aims to convey health

messages by stimulating the senses of sight and hearing.<sup>15</sup>

This is in line with Andriyanto's research (2017) showing data on the distribution of respondents by gender in both the control group and the experimental group, the majority of which are female, namely 53.3%. Based on age, the majority of respondents aged 46-60 years in the control group were 73.3% while the experimental group was 60.0%. The most occupations in the control group were private employees as much as 46.7% and the experimental group with work as laborers as much as 40.0%. Education, the control group with the most dominant high school education level is 46.7%, while the experimental group for education levels from junior high school, senior high school, and diploma is 33.3% each. The longest suffering from T2DM in the control group and the experimental group was the longest suffering <5 years as much as 60.0% in the control group and 66.7% in the experimental group.<sup>16</sup>

Information with motion models can increase the respondent's desire to show what information is presented in the audio-visual show. The information contained in the audio visual was then clarified with an explanation by the researcher as the provision of health education so that it could increase the respondent's knowledge.<sup>17,18</sup>

Audio-visual media in the form of videos to be able to increase the knowledge of the elderly with audio-visuals the elderly better able to understand a material presented through images and sound, but some are unable to understand maybe because they don't listen and listen well so they don't understand the provision of health. education through audio-visual.

### c. Effect of DSME with AVA on knowledge

Based on the results of the study, there were differences in the intervention group before and after being given DSME, the Mean Rank value was 2.50, while the level of knowledge before being carried out (pre-test) obtained a Mean Rank value of 0.00 and a P value of 0.001 was obtained.

According to Jayanti, *et al* (2019) From the results of the respondents' answers, it was found that the knowledge of the respondents had a better understanding of the meaning, factors, complications and prevention of Diabetes Mellitus, so that the results showed that there was an effect of health



Erika Martining Wardani, Riezky Faisal Nugroho

education with the audio visual method on increasing the knowledge of Diabetes Mellitus patients in the room. treatment at Labuang Baji Hospital Makassar. So the assumption of the researcher in this study is that there is an effect of providing health education using the audiovisual method in Diabetes Mellitus patients at Labuang Baji Hospital Makassar. The level of knowledge of the patient after (post test) providing health education with the audiovisual method obtained a Mean Rank value of 3.00 while the level of knowledge before being carried out (pre test) obtained a Mean Rank value of 0.00, a Sig value of 0.025 was obtained, which means if  $p < 0.05$  then , there is a significant effect on the level of knowledge with audiovisual methods in patients with diabetes mellitus. By using the Wilcoxon ranks test, the p value is  $p = 0.025$  and for the provision of health education using the audiovisual method, which means  $p < 0.05$ , there is an effect of providing health education using the audiovisual method on the level of knowledge in Diabetes Mellitus patients at Labuang Hospital. Makassar wedge.<sup>13</sup>

In this study, before being given audio-visual media, the average respondent had sufficient and less knowledge. Factors that can affect knowledge to be less include age and education. As you get older, your memory will decrease. While someone who has low education will also affect the lack of information about Diabetes mellitus. In this study, the researchers provided audio-visual media in the form of videos to increase the knowledge of the elderly with the presence of audio-visuals, the elderly were better able to understand the material presented through images and sound so that the knowledge of the respondents could be better, but there were also those who could not understand maybe because they don't listen and listen well so they don't understand the provision of health education through audio visual.

## CONCLUSION

There is the influence of DSME with AVA on knowledge in patients with type 2 Diabetes Mellitus.

The AVA media referred to in this study is in the form of a video containing about DM. The DSME program must be given routinely, both at the puskesmas and in hospitals so that patients know about Diabetes, both the disease, diet and treatment.

## ETHICAL APPROVAL

This research has passed the ethical test at Nahdlatul Ulama University Surabaya with no 028/EC/KEPK/UNUSA/2020.

## CONFLICTS OF INTEREST

There is no conflict of interest. We have not published this article yet before.

## FUNDING

The authors are responsible for all of the study funding without a grant or any external funding source.

## AUTHOR CONTRIBUTIONS

All authors have contributed to this research process, including conception and design, analysis and interpretation of the data, drafting of the article, critical revision of the article for important intellectual content, final approval of the article, collection and assembly of data.

## ACKNOWLEDGMENTS

Our gratitude goes to LPPM Universitas Nahdlatul Ulama Surabaya dan Politeknik Kesehatan Kemenkes Surabaya, who have motivated, and supported us to be active in creating, researching, writing, and publishing scientific papers.

## REFERENCES

1. Hurst, Marlene. Belajar Mudah Keperawatan Medika-Bedah. Jakarta: EGC. 2016; pp 34-7.
2. Nurrahmani. 2012. STOP Diabetes Mellitus. Yogyakarta: Familia Nursalam. 2013. Metodologi Penelitian Ilmu Keperawatan Edisi 3. Jakarta: Salemba Medika. 2012; pp 15-18.
3. International Diabetes Federation (IDF). IDF international atlas 10th edition (online) 2021 (diakses 25 Maret 2022).
4. Kementrian Kesehatan Republik Indonesia. Riset Kesehatan Dasar 2018. Jakarta: Kementrian Kesehatan Republik Indonesia. 2018; 4 (8), 1-200.
5. Dinas Kesehatan. Hasil Utama Riset Kesehatan Dasar Jawa Timur 2018. Jakarta: Badan Penelitian dan Pengembangan Kesehatan, Kementrian Kesehatan Republik Indonesia. 2018; 1-82.



Erika Martining Wardani, Riezky Faisal Nugroho

6. Wardani, E. M., Zahroh, C., & Ainiyah, N. Diabetic Foot Spa Implementation in Early Neuropathy Diagnosis Based on Blood Glucose Levels, Foot Sensitivity and the Ankle Brachial Index in Patients with Diabetes Mellitus. *Jurnal Ners.* 2019;14(1), 106-110. DOI:10.20473/jn.v14i1.9950.
7. Wardani, E. M., Nugroho, R. F., & Setiyowati, E. Pemeriksaan dan Perawatan Kaki dengan SPA Kaki Diabetik Bagi Penderita Diabetes Mellitus di Kabupaten Bondowoso. *Jurnal Indonesia Berdaya*, 2022; 3(3), 393-402. DOI: <https://doi.org/10.47679/ib.2022234>.
8. Wardani, E. M., Wijayanti, L. & Ainiyah, N. The effect of diabetic foot spa on ankle brachial index and foot sensitivity of diabetes mellitus type 2. *Jurnal Keperawatan Respati Yogyakarta*. 2019; 6(3), pp. 672-676. DOI: <https://doi.org/10.35842/jkry.v6i3.391>.
9. Wardani, E. M., Wijayanti, L., Ainiyah, N. Pengaruh spa kaki diabetik terhadap kualitas tidur dan sensitivitas kaki penderita diabetes mellitus tipe 2. *Jurnal Ners LENTERA*. 2019; 7(2): 130-141.
10. Rahmawati., Nurhidayah, I., Jufrizal., Kasih, L.C. Pengaruh Diabetes Self-Management Education Terhadap Pengetahuan Pada Penderita Diabetes Melitus Tipe 2. *Jurnal Ilmu Keperawatan*; 2021, 9(1), pp. 101-110.
11. Aminah., Siti., Amelia, K.R., Rianto, B., Safitri, V.D. Pengaruh edukasi self management education (DSME) dengan media booklet terhadap kepatuhan diet pasien DM tipe 2 di puskesmas Cimahi Selatan. *Malahayati Nursing Journal*; 2022, 4(2), pp. 432-442. DOI : 10.33024/mnj.v5i2.5912.
12. Ghannadi, S., Amouzegar, A., Amiri, P., Karbalaefar, R., Tahmasebinejad, Z., & Kazempour-Ardebili, S. Evaluating the Effect of Knowledge, Attitude, and Practice on Self Management in Type 2 Diabetic Patients on Dialysis. *Journal of Diabetes Research*; 2016, 3730875. <https://doi.org/10.1155/2016/3730875>.
13. Jayanti, A., Falah, F., Dasong, S. Pengaruh Pendidikan Kesehatan Dengan Metode Audiovisual Terhadap Peningkatan Pengetahuan Pasien Diabetes Mellitus Diruang Perawatan RSUD Labuang Baji Makassar. *Journal Scientific Solutem*; 2019, 2(1), pp. 18-23.
14. Nurhidayat, S. Pendidikan Kesehatan Keperawatan. Jakarta: Salemba Medika. 2015; pp. 56-61.
15. Notoatmodjo, S. 2015. Promosi Kesehatan dan Perilaku Kesehatan. Jakarta: Rineka Cipta. 2015; pp. 47-52.
16. Andriyanto, G. Pengaruh Pendidikan Kesehatan tentang Perawatan Kaki Diabetik terhadap Pengetahuan Perawatan Kaki pada Diabetes Mellitus di RSUP Dr. Soeradji Tirtonegoro Klaten. Skripsi thesis, Universitas Muhammadiyah Surakarta. 2017.
17. Wardani, E. M., Nugroho, R. F., Bistara, D. N., Fitriyani, A., Wijayanti, L., Ainiyah, N., Septianingrum, Y. Level of student education and knowledge about sinovac vaccine with immunization participation. *Bali Medical Journal*; 2022, 11(2), pp. 738-741. <https://doi.org/10.15562/bmj.v11i2.3153>.
18. Nugroho, R. F., Wardani, E. M. Edukasi gizi pada kader posyandu sebagai upaya peningkatan pengetahuan kader di wilayah kerja puskesmas Medokan Ayu kota Surabaya. *SELAPARANG: Jurnal Pengabdian Masyarakat Berkemajuan*; 2022, 6(2), pp. 967-970. DOI: <https://doi.org/10.31764/jpmb.v6i2.8625>.