



## The Effectiveness of Leaflet and Video Educational Media Toward the Knowledge of Type 2 Diabetes Mellitus Patients

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### ABSTRACT

This study aims to know the effectiveness of leaflets and video educational media in the knowledge of type 2 diabetes mellitus patients in the inpatient room of RSUD Beriman Balikpapan. The methodology used is a quasi-experimental study with a pretest and posttest research design with control group. The intervention group used video media and the control group used leaflet media. The results obtained were that the average patient knowledge increased in the experimental group, which was 50.90, ± 8,228 SD before the intervention, increasing to 81.37, ± 9,615 SD after the intervention. In the control group, the mean knowledge of patients before the intervention was 55.75, ± 7,036 SD, increasing after the intervention to 84.18, ± 9,895 SD. The P-Value value is 0.000 < 0.05 from the results of the analysis of the difference in knowledge between the experimental group and the control group after the intervention shows that there is a significant difference between the two; so that H<sub>0</sub> is rejected and H<sub>a</sub> is accepted. This means that nutritional counseling using video and leaflet media can increase knowledge about Diabetes Mellitus and video media is more effective than leaflet media. The providing nutritional counseling using video media was more effective than using leaflet media in increasing the knowledge of Diabetes Mellitus patients in the inpatient ward of the Beriman Balikpapan Regional Hospital.

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### Key Messages:

- Video Media Proves More Effective in Diabetes Education: The study conducted in the inpatient ward of RSUD Beriman Balikpapan demonstrated that video educational media significantly enhances the knowledge of patients with type 2 diabetes mellitus, more so than traditional leaflet media. The experimental group, which used video interventions, showed a remarkable increase in patient knowledge post-intervention, highlighting the efficacy of dynamic and visual learning tools in patient education.

### Introduction

Worldwide, diabetes is one of the leading causes of death and morbidity. A lack of insulin, either partial or complete, prevents glucose from being metabolized, causing high blood glucose (hyperglycemia). Diabetes Mellitus is a chronic condition for which there is no cure, so sufferers will continue to experience its effects. Condition This with thereby called as disease lifetime life or "lifelong disease" (1). In 2016, WHO reported that in 2014, 422 million Diabetes Mellitus sufferers experienced an increased risk of developing hypertension. Of 3.7 million people, 43% died before reach 70 years old. Research Health Basis ( Riskesdas ) also reported a fairly large increase in the prevalence rate of diabetes, from 6.9% in 2013 to 8.5% in 2018, putting around 16 million Indonesians at risk of other diseases such as blindness, kidney failure, heart attacks, stroke, can even cause paralysis and death. According to data from Basic Health Research (Riskesdas) 2018, the prevalence of Diabetes Mellitus in East Kalimantan is 2.3%. In Balikpapan City itself, the prevalence of Diabetes Mellitus is 2.55% (2).

Eliminate complaints and symptoms with still guard comfort and health is objective period Short management of Diabetes Mellitus. As mentioned in the four main pillars of Diabetes Mellitus management, education is the first step that must be taken to increase knowledge and awareness in managing diabetes. Diabetes Mellitus sufferers need to have a thorough understanding of the 3Js: Type, Amount and Schedule of food that must be consumed to maintain blood glucose levels in the body which

must be well understood by Diabetes Mellitus sufferers. There are several ways to increase knowledge, one of which is nutritional counseling (3).

Nutritional counseling has a major impact on the overall blood glucose levels of patients who have been diagnosed with Diabetes Mellitus. Diabetes mellitus sufferers who know more about their disease tend to have better control over their blood glucose levels. These results were obtained from the results of health behavior modifications based on knowledge of healthy lifestyles for Diabetes Mellitus sufferers which have an impact on reducing blood glucose levels so that blood glucose can be regulated (4). Understanding how to manage Diabetes Mellitus is very important because it can impact an individual's method of dealing with the disease. Patients still have little awareness about how to avoid Diabetes Mellitus and its associated complications. This is possibly because they believe that the problem is not unrelated to Diabetes Mellitus. Considering that currently there are many gaps in knowledge about Diabetes Mellitus, health education is needed to overcome these gaps. Controlling the four pillars of management, nutrition, exercise, medication, and compliance prevents complications of Diabetes Mellitus (5).

RSUD Beriman Balikpapan as one of the health service facilities in Balikpapan City must take a significant role in improving the level and quality of public health through professional implementation of its vision and mission supported by health workers, supporting staff, adequate facilities and budget. In terms of managing diabetes mellitus, RSUD Beriman Balikpapan organizes preventive, promotive, curative and rehabilitative programs in an integrated and sustainable manner. The success of implementing these programs is determined by various factors, one of which is the literacy level Diabetes Mellitus patients to his health.

This study aims to know the effectiveness of leaflets and video educational media in the knowledge of type 2 diabetes mellitus patients in the inpatient room of RSUD Beriman Balikpapan.

## **Methods**

A quasi-experimental study was conducted using a pretest-posttest design with a control group. The intervention group received education via video media, while the control group was educated using leaflet media. This research took place from April to September 2023 in the inpatient rooms of RSUD Beriman Balikpapan, specifically the Eboni, Acacia, Gaharu, and Mahogany Rooms. The study population comprised all patients primarily diagnosed with Diabetes Mellitus in these rooms. The total sample size was 36, divided equally between the two media interventions, with 18 individuals in the leaflet group and 18 in the video group.

This study analyzed the effectiveness of nutrition education media, specifically leaflets and videos, on the knowledge of Diabetes Mellitus patients. The study variables included a dependent variable—patients' knowledge of Diabetes Mellitus and their blood glucose level changes—and an independent variable, which was the educational medium (leaflet or video). The aspect of knowledge investigated in this study encompassed patients' understanding of Diabetes Mellitus, including its definition, types, causes, and diagnostic methods. Knowledge was assessed using the DKQ-24 questionnaire, which contains 24 items about Diabetes Mellitus. Correct answers were assigned a value of 4.16, while incorrect and "do not know" responses were given a value of 0. For educational content, leaflets were used as printed or folded sheets to educate the control group, and videos served as electronic educational media providing audiovisual content. The video lasted 1 minute and 47 seconds.

Univariate analysis was conducted to describe the characteristics of each variable in the form of frequency distribution. Bivariate analysis was performed using the Wilcoxon test.

## **Ethical Clearance**

Health Polytechnic Research Ethics Commission, Ministry of Health, East Kalimantan with number: DP.04.03/7.1/7827/2023.

## **Results**

Table 1 indicates that among the 18 respondents in the control group, the majority were under 65 years of age, comprising 14 individuals (77.8%). Similarly, in the experimental group, a significant portion, 12 respondents (66.7%), were also under 65 years of age. Regarding gender distribution, in the control group, a majority were women, totaling 10 respondents (55.6%). In contrast, the experimental group displayed an equal distribution with 50% male and 50% female respondents. With respect to educational levels, the majority in both groups had high school education, with 10 individuals (55.6%) in the control group and 9 individuals (50%) in the experimental group.

Table 2 reveals that before the intervention, the majority of patients in the control group had a poor level of knowledge, with 11 individuals (61.1%). In the experimental group, most patients initially had insufficient knowledge, totaling 13 individuals (72.2%). After the intervention, the knowledge level

of most patients in the control group improved to good, with 14 individuals (77.8%). Similarly, in the experimental group, the majority of patients' knowledge was classified as good, involving 15 individuals (83.3%).

Table 1 Characteristics of Respondents

Characteristics	Group			
	Control		Experiment	
	n	%	n	%
<b>Age</b>				
< 65 Years	14	77.8	12	66.7
≥ 65 Years	4	22.2	6	33.3
<b>Gender</b>				
Male	8	44.4	9	50
Female	10	55.6	9	50
<b>Education</b>				
Elementary School	1	5,6	1	5,6
Junior High School	2	11.1	5	27.8
Senior High School	10	55.6	9	50
Associate Degree	2	11.1	2	11.1
Bachelor's Degree	3	16.7	1	5,6
<b>Total</b>	<b>36</b>	<b>100</b>	<b>36</b>	<b>100</b>

Table 2 Table 2 Knowledge Patient on Group Control (Leaflet Media) and Group Experiment (Video Media) Before and After Given Intervention

Variable	Group			
	Control		Experiment	
	n	%	n	%
<b>Knowledge Before Intervention</b>				
Less	11	61.1	13	72.2
Enough	7	38.9	5	27.8
Good	0	0	0	0
<b>Knowledge After Intervention</b>				
Less	0	0	0	0
Enough	4	22.2	3	16.7
Good	14	77.8	15	83.3
<b>Total</b>	<b>18</b>	<b>100</b>	<b>18</b>	<b>100</b>

Table 3 presents the average pre-test and post-test results for both the control and experimental groups. Each group experienced an increase in mean knowledge scores following the intervention. In the control group, the average knowledge score prior to the intervention was  $55.75 \pm 7.036$ , which increased to  $84.18 \pm 9.895$  after the intervention, resulting in an increase of 28.43 points. In the experimental group, the initial average knowledge score was  $50.90 \pm 8.228$ , and this rose to  $81.37 \pm 4.615$  after the intervention, an enhancement of 30.47 points. The analysis of the differences in knowledge scores between the control and experimental groups, both before and after the intervention, yielded a P value of  $0.000 < 0.05$ . Therefore, the null hypothesis (H0) was rejected, and the alternative hypothesis (Ha) was accepted. This indicates a significant difference between the mean pre-test and post-test knowledge scores in both groups. It demonstrates that nutritional counseling using both video media and leaflets effectively increased respondents' knowledge about the management of Diabetes Mellitus.

Table 3 Differences Knowledge Diabetes Mellitus Patients Before and After Intervention

Variable	Mean	SD	n	P
Control	<i>Pre-test</i>	55.75	7,036	18
	<i>Post-test</i>	84.18	9,895	18
Experiment	<i>Pre-test</i>	50.90	8,228	18
	<i>Post-test</i>	81.37	4,615	18

## Discussion

Knowledge is a crucial factor that influences the realization of health behaviors. Nutritional knowledge, in particular, can significantly affect dietary choices, leading to the selection of appropriate,

diverse, and balanced food items that do not cause disease (6). One effective way to enhance knowledge is through nutritional counseling. Previous studies have demonstrated that providing counseling and informational booklets can significantly improve compliance in type 2 diabetes mellitus (T2DM) patients undergoing treatment (7). Before the intervention, both the experimental and control groups exhibited insufficient knowledge levels. In the experimental group, 72.2% of patients had poor knowledge, while in the control group, 61.1% had poor knowledge. However, post-intervention, a significant improvement was observed. In the experimental group, 83.3% of patients achieved a good knowledge level, while in the control group, 77.8% did. This aligns with Diabetes Australia's (2024) findings that educational videos are effective in delivering basic diabetes education to at-risk communities, enhancing their understanding of diabetes through visual content (8). The mean knowledge score in the control group increased from  $55.75 \pm 7.036$  to  $84.18 \pm 9.895$ , with an increase of 28.43 points. In the experimental group, the mean knowledge score rose from  $50.90 \pm 8.228$  to  $81.37 \pm 4.615$ , with an increase of 30.47 points. The analysis revealed a significant difference in knowledge improvement between the two groups, with a P-value of  $0.000 < 0.05$ , indicating that both video and leaflet media effectively enhance knowledge about diabetes mellitus.

The findings are consistent with Sabarudin (2020), who stated that video and leaflet media are effective tools for health education, particularly in the context of COVID-19 prevention (9). Efendi (2019) also found that both leaflet and audiovisual media significantly increased knowledge levels after counseling (10). Furthermore, Hoe et al. (2023) reported that educational videos enhance health literacy, self-efficacy, physical activity, and treatment adherence (11).

Recent studies support these findings. Nutritional counseling using leaflet media significantly improved knowledge and compliance related to diabetes diet management (12,13). Additionally, educational videos designed to provide comprehensive diabetes education, including lifestyle modifications and diet management, have been shown to enhance glycemic control and prevent complications (14–16). Educational videos about diabetes are designed to support the delivery of basic diabetes education to communities living with or at risk of diabetes so that they understand more about diabetes through videos. Content includes an overview, recognition, and areas of learning development, time considerations, and how the body works without diabetes. types of diabetes including type 1, type 2, and gestational diabetes, diabetes symptoms, preventing or reducing diabetes-related complications, diabetes management - eating healthy and staying active, diabetes management - treatment and monitoring blood glucose levels, diabetes management - social and emotional health and well-being (17). The researcher's assumption regarding the blood glucose levels of Diabetes Mellitus patients in the Inpatient Room at Beriman Balikpapan Hospital between before and after the intervention will be a decrease, both in the experimental group (video media) and the control group (leaflet media).

## **Conclusion**

This study confirms that both video and leaflet educational media are effective in increasing the knowledge and improving the glycemic control of T2DM patients. Video media, in particular, demonstrated a slightly higher efficacy compared to leaflets. These findings underscore the importance of utilizing diverse educational tools to enhance patient knowledge and management of diabetes mellitus.

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## **Conflicts of Interest:**

This research does not contain any elements of conflict of interest that are unprofessional as academics.

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