

The Influence of Animated Video Education on Children's Knowledge about Type-1 Diabetes Mellitus in Primary School Negeri 1 Mujur Kroya

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ABSTRACT

Background: Type 1 diabetes mellitus (IDDM) is a chronic disease in children with an increasing incidence worldwide. The increase in the prevalence of DM sufferers in all ages in Central Java Province reached 152,075 cases. While there are 65 patients under 15 years old who are recorded to suffer from IDDM. Thus, there needs to be a preventive measure so that children understand more about the prevention and treatment of IDDM, one of which is by educating about type-1 diabetes mellitus through techniques that attract children, one of which is using animated videos. Objective: To determine the effect of animated video education on children's knowledge about IDDM at SD Negeri 1 Mujur Kroya. Method: This study uses the Pre-Experiment method with the design of One Group Pretest-Posttest Design. The sampling technique used is total sampling with a total of 40 research samples. Results: Showing the majority of respondents' characteristics are female, there is a history of DM descent. Knowledge before the category intervention was lacked and after the good category intervention was carried out. The results of the bivariate test showed that the value (p value $0.0001 < 0.005$) had a significant effect with a value of 0.001 on providing animated video education on children's knowledge about IDDM at SD Negeri 1 Mujur which was statistically tested to increase the average knowledge of children about type-1 diabetes mellitus by 9,464 based on the DKQ-24 questionnaire. Conclusion: Animated video education has an effect in increasing students' knowledge about IDDM.

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1. INTRODUCTION

Type 1 diabetes mellitus is a chronic disease whose prevalence is increasing in children. Type-1 DM is the most common in children [1]. Type 1 diabetes mellitus (DM) or insulin-dependent diabetes mellitus (IDDM) is a type of diabetes mellitus that depends on insulin to regulate glucose metabolism in the blood. This type of diabetes is caused by idiopathic or autoimmune damage to pancreatic cells, which causes the body's insulin

production to decrease or even stop. Everyone must realize that type 1 DM cannot be cured, but sufferers' quality of life can be maintained with good metabolic control [2], [3].

In children, age, gender, history of gestational diabetes, genetic factors, autoimmune diseases, and race are persistent risk factors for type-1 diabetes. Behavioral factors include drug consumption habits, socio-economic factors such as employment status and education, intermediate factors such as body mass index and psychological conditions, and environmental factors such as viruses and cold weather [4].

In a literature study on the incidence of DM in Central Java Province, there is an increase in the number of DM cases in all ages, reaching 152,075 cases. However, there were 65 cases of type-1 DM identified under the age of 15 years. Meanwhile, in Cilacap Regency, the number of DM sufferers in the 15–24-year age range reached 569, or 0.02% of the weighted population [4], [5].

One of the risk factors that influences children's behavior in preventing diabetes mellitus is school-age children's knowledge about diabetes mellitus. New knowledge does not always cause changes in attitudes, but it has a good relationship, namely that new knowledge can cause changes in attitudes and behavior [6].

Therefore, there is a need for treatment to reduce DM rates, especially in children, not only curatively but also preventively. According to IDAI (Indonesian Pediatricians Association), the five pillars of management of type-1 DM are insulin injections, blood sugar monitoring, nutrition, physical activity, and education [2], [7].

Education is an intervention priority for DM in children. This is because children and families can manage themselves independently in conditions such as hyperglycemia. Education has an important role in the management of type-1 DM because there is strong evidence that it has an effect on both glycemic control and psychosocial outcomes [2], [8].

There are various kinds of media to convey education regarding the prevention of type-1 DM, one of which is video media. Video media is very good for helping with learning. Because it plays live, the video is full of information. because students can see moving images and sound in the video. Video's ability to produce material images is very helpful in conveying information to the audience. Video media packaging with animation [9].

We have conducted a preliminary study of 20 (100%) children in Mujur Village; the results used the DKQ (Diabetes Knowledge Questionnaire, 24 items) questionnaire. There were 14 (70%) of whom had insufficient knowledge, 4 (20%) had sufficient knowledge, and the rest (2%) had good knowledge about the disease and dangers of DM. In addition, of the 20 (100%) children who were tested for blood glucose at the time, there were 4 (20%) who had a blood glucose level > 150 mg/dl; this indicates a high risk for children to develop diabetes mellitus in the future. The study was also conducted on the parents of children, and it was found that 42 (100%) of the respondents who answered through an online survey said they had offspring diagnosed with diabetes mellitus from their biological father or mother and/or from their grandparents. Other results also showed that 42 (100%) parents had never checked their blood sugar in the last 3 months.

Thus, it is necessary to take preventive measures so that children understand more about the prevention and management of type 1 diabetes mellitus, one of which is by educating them about type 1 diabetes mellitus. This problem provides a strong impetus for researchers to provide education regarding type 1 DM to children, considering that prevention is better than cure. This also provides ideas for researchers to find out more about the influence of animated videos on children's knowledge about type 1 diabetes mellitus at SD Negeri 1 Mujur Kroya.

2. RESEARCH METHOD

This research uses a quantitative method with a pre-experiment research method with a one-group pretest-posttest design [10]. Measurements of research variables were carried out before and after providing education in the form of animated videos without any control variables. The research was conducted with the aim of finding out the effect of providing animated videos on children's knowledge about type 1 diabetes mellitus at Mujur Kroya State Elementary School.

This research uses a non-probability total sampling technique with a sample size of 40 children, with details of 20 children in grade 5 and 20 children in grade 6. Knowledge measuring tools using the DKQ-24 questionnaire and the IDAI (Indonesian Pediatricians Association) animation video were played once. This research has gone through ethical testing. The analytical test used is the paired T test, or paired T sample.

3. RESULT AND DISCUSSIONS

3.1. Characteristics of respondents

Table 1. Distribution of Respondent Characteristics in Research (N = 40)

Characteristic	n	%
Age (years)		
10	14	35

Characteristic	n	%
11	16	40
12	7	17,5
13	3	7,5
Gender		
Male	18	45
Female	22	55
Parent education		
Elementary school	11	27,5
Junior High School	8	20
Senior High School	16	40
University	5	12,5
Parent work		
Employee	9	22,5
Farmer	6	15
Self-Employed	5	12,5
Labor	11	27,5
Not Working	9	22,5
Family History of DM		
There are	12	30
None	28	70
Have been exposed to information about DM type 1		
Ever	0	0
Never	40	100

The characteristics of the children at SD N 1 Mujur Kroya are mostly female, with the largest age being 11 years; there are 12 children with a history of their parents having DM; and most of the children have never been exposed to knowledge about type 1 DM.

3.2. Knowledge of Children at SD Negeri 1 Mujur About Type-1 Diabetes Mellitus Before and After Providing Animation Video Education

Table 2. Analysis of Children's Knowledge about Type-1 DM

Knowledge of DM Tipe-1	n	%	Min-Max	Mean±SD	95% CI
Before					
Less	40	100			
Enough	0	0	8,32-54,08	31,82±13,27	27,58-36,07
Good	0	0			
After					
Less	8	20			
Enough	19	47,5	49,92-95,68	70,41±12,41	66,41-74,38
Good	13	32,5			

Table 4.2 shows that the value of children's knowledge about type-1 diabetes mellitus before being given animated video education was the lowest at 8.32 and the highest at 54.08, with the average value before animated video education being 31.82.

3.3. Effect of animated videos on children's knowledge at SD Negeri 1 Mujur about Type-1 Diabetes Mellitus Before and After Providing Educational Video Animation

Table 3. Paired Sample T-Test of Children's Knowledge about Type-1 DM

Children's Knowledge About DM Type-1	Difference		t _{value}	p _{value}
	Mean	SD		
After – Before Providing Animated Video Education	38,584	17,242	14.153	0,000

The results of calculating the difference in means of the paired sample t-test show that the average difference before and after providing animated video education increased by 38.584 knowing that the t-table (df 39; α 0.05) was at a critical value of 2.023 while t-value = 14.153 and p-value = 0.000. Thus, there is a significant effect of providing animated video education on children's knowledge about type-1 diabetes mellitus with a significance value of 0.000, so animated video education has proven to be significant in increasing children's knowledge about type-1 diabetes mellitus.

Based on the DKQ-24 questionnaire, the results of this study show that educating children about type-1 diabetes mellitus through animated videos has a significant effect at SD Negeri 1 Mujur. This is because the average child's knowledge about type-1 diabetes mellitus has been shown to increase. Research from Molavynejad et al. [11] also showed the same thing in providing education via video: there was a significant influence within groups and between groups compared to the control group (within and between groups) on the HbA1c value, which is an indicator in determining blood sugar levels in patients with diabetes mellitus; however, there were no differences within groups or between groups in fasting blood sugar values [11].

Thus, based on previous studies and existing research results, animated video education about type 1 diabetes mellitus has been proven to be able to increase students' knowledge at SD Negeri 1 Mujur. After providing animated video education about type 1 diabetes mellitus, there was an increase in score of 38,584, which supported this.

4. CONCLUSIONS AND RECOMMENDATIONS

This study concluded that there was a significant effect with a value of 0.001 in providing animated video education on children's knowledge of type-1 diabetes mellitus at SD Negeri 1 Mujur, which was statistically proven to increase the average child's knowledge of type-1 diabetes mellitus by 9.464 based on the DKQ-24 questionnaire.

Future research is expected to be able to compare educational animated videos about type-1 diabetes mellitus with the control group so as to provide a more specific picture of the educational effects of animated videos.

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