http://ejournal.seaninstitute.or.id/index.php/healt
Jurnal Eduhealt, Volume 14, No. 04 2023
E-ISSN. 2808-4608

The Influence Of Education Through Video Media On Knowledge Of How To Use Insulin Pen In Diabetes Mellitus Patients At Pesanggrahan Hospital, Selatan Jakarta

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ARTICLE INFO

Keywords:
Education, Knowledge, Insulin Pen, Diabetes Mellitus

ABSTRACT

Diabetes is a series of chronic metabolic disorders caused by the pancreas not producing enough insulin, causing both absolute and relative insulin deficiency, resulting in increased glucose concentration in the blood. Pharmacological handling of insulin includes administering an insulin pen that is used correctly. This research aims to determine the effect of education through video media on knowledge of how to use insulin pens in diabetes patients. This research method uses a Quasi-Experimental design with a research design of "one group pre-test and post-test design. The population in this study were DM patients at Pesanggrahan Regional Hospital, with a total sample of 18 DM patients. The instrument in this study uses a questionnaire to measure the level of knowledge about insulin pens and a barcode containing a video of insulin pen use—a statistical test using T Dependent. This study's results significantly influence knowledge of how to use an insulin pen before and after providing education with a p-value of 0.000 (p-value < 0.05). It is hoped that the results of this research can become a basis for nursing services to provide education to diabetes mellitus patients regarding knowledge of how to use insulin pens using videos.

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1. INTRODUCTION

Diabetes Mellitus (DM) is a category of non-communicable disease which is a public health problem, both globally, regionally, nationally and locally. One type of metabolic disease that always experiences an increase in sufferers every year in countries around the world. Diabetes is a series of chronic metabolic disorders caused by the pancreas not producing enough insulin, thus causing both absolute and relative insulin deficiency, resulting in an increase in glucose concentration in the blood[1][2].

International Diabetes Federation In 2020, it was reported that 463 million adults in the world had diabetes with a global prevalence of 9.3 percent. However, a dangerous condition is that 50.1 percent of people with diabetes are not diagnosed. This makes diabetes' status as a silent killer still haunting the world. The number of diabetes is estimated to increase by 45 percent or the equivalent of 629 million patients by 2045. In fact, as many as 75 percent of diabetes patients currently in 2021 will be aged 20-64 years [3][4]. Southeast Asia region where Indonesia is ranked 3rd with a prevalence of 11.3%. IDF also projects the number of diabetes sufferers in the population aged 20-79 years in several countries in the world which has identified 10 countries with the highest number of sufferers, China, India and the United States are in the top three with the number of sufferers at 116.4 million, 77 million and 31 million. Indonesia is ranked 7th among the 10 countries with the highest number of sufferers, namely 10.7 million. Indonesia is the only country in Southeast Asia on the list, so it can be estimated that Indonesia's contribution to the prevalence of diabetes cases in Southeast Asia [5]

The results of Basic Health Research in 2018, the prevalence of people with diabetes mellitus is estimated to be 24 million, but only 50% are aware that they have it. The high number of patients is partly due to changes in people's lifestyles, awareness of maintaining health, regulating eating and drinking patterns, smoking habits and physical activity are also causal factors [1]. In 2018, almost all provinces showed an increase in prevalence, except East Nusa Tenggara Province. There are four

provinces with the highest prevalence in 2018, namely, DI Yogyakarta, DKI Jakarta, North Sulawesi and East Kalimantan. There are several provinces with the highest increase in prevalence of 0.9%, namely Riau, DKI Jakarta, Banten, Gorontalo and West Papua (Riskesdas, 2018). The prevalence of diabetes in DKI Jakarta based on the results of basic health research (Riskesdas) 2020 increased from 2.5% to 3.4% out of a total of 10.5 million people or around 250 thousand residents in DKI Jakarta suffering from diabetes. The national prevalence of diabetes is 10.9%. DKI Jakarta is the highest province because of its large population and the availability of many blood sugar checking facilities [6].

Diabetes Mellitus is one of the 10 most common diseases in Pesanggrahan Hospital, South Jakarta, followed by Non-Hemorrhagic Stroke, Hypertension and Ca Mamae. There were 62 cases of Diabetes Mellitus at Pesanggrahan Hospital, South Jakarta in the period August - September 2022. Then patients are at risk of complications from other diseases, such as: heart attack, stroke, blindness and kidney failure which can even cause paralysis and death. Diabetes Mellitus (DM) is a complex and progressive disease whose therapy needs to be gradually improved. If not managed properly, DM can cause long-term complications. Control of blood glucose in DM patients can be achieved starting from lifestyle changes, oral anti-hyperglycemia drugs, to insulin[7]. The increase in glucose is caused by chronic metabolic disorders, resulting in the pancreas not being able to produce enough insulin or the insulin produced being unable to be used effectively by the body [8]

The proper way of insulin therapy is bypay attention to the correct dose, correct method, correct time and correct location. Insulin therapy is carried out by determining the point on the body part where the insulin is injected [1][2]. Insulin therapy in diabetic patients in hospital is considered high risk medication. Insulin therapy is an important problem in treatment because errors in therapy are found quite often. Factors that cause errors in using insulin are due to limited skills, methods and knowledge[2]. Most of these errors are related to hyperglycemia conditions and others are due to hypoglycemia. These errors are caused by, among other things, limited skills (skill-based), methods (rule-based), and also knowledge (knowledge) in using insulin[2]. Insulin is given by injection, because it is less effective when given orally. Lack of understanding and bad behavior from patients is often caused by a lack of knowledge and understanding about drugs and everything related to therapeutic drugs [8]

Currently, insulin is available in flexpen packaging, which is a special pen-shaped device, used with a special needle. Insulin pens are the most commonly used today because they are patient-friendly, easy to adjust the dose and flexible to carry and use repeatedly [9]. One of the factors causing errors in using insulin by DM patients is the understanding factor. when administering insulin injections. Correct understanding of injections needs to be informed through audio-visual media with videos being more practical than non-visual media (flyers/posters)[10]. By providing video education about the correct use of insulin pens, optimal therapeutic effects can be achieved. The advantage of using video education is that sufferers can find out many things related to the use of insulin injections, starting from the injection site, time, method and dose for each injection, how long insulin can be used, how to insert a syringe, even how to dispose of used needles[8]. Audio visual media with video is an intermediary or introductory tool that functions to channel messages or information in the learning process[11]. Media is divided into three, namely audio media, visual media and audio-visual media. Audio visual media is a type of media that apart from containing sound elements, also contains image elements that can be seen, for example video recordings, various sizes of film, sound slides and so on [12]. One of the audio visual media used in this research is animated video. The animated video was chosen because it can help DM patients in the process of understanding how to use and care for an insulin pen so that it functions to clarify or simplify the process of self-injection of insulin[11]

Research conducted by Rofiah Darojatinisa in Malang Regency regarding the description of the ability to carry out independent insulin injections in patients with diabetes mellitus at the polyclinic in the "Kanjuruhan" Kepanjen Regional Hospital, Malang Regency, obtained several results, namely showing that the ability of respondents to carry out independent insulin injections was 42% in the good category. 55% are in the sufficient category and 3% are in the insufficient category and there are other factors that cause non-compliance with independent insulin injections due to DM patients' lack of understanding in implementing independent insulin injections at home. Azizah Vonna's research

[13] on evaluating the knowledge and skills of type 2 DM patients in using insulin pens, explains that most respondents received mixed insulin therapy (Novorapid flexpen and Levemir flexpen) (78.4%) and most respondents had used insulin in period of 1-5 years (63.6%). Only 8% of the total respondents used oral antidiabetic drugs together with insulin. Almost all respondents still made mistakes in injecting the insulin pen (97.7%).

Based on data obtained from DM patients at Pesanggrahan Regional Hospital from August to October 2022, 62 DM patients received inpatient treatment. The results of a preliminary study conducted by researchers on October 26 2022 through interviews with 10 DM patients at Pesanggrahan Hospital, of the 10 respondents, 7 respondents (70%) had never used an insulin pen, of 2 respondents (20%) did not correctly dial the correct insulin dose, and 1 respondent (10%) was wrong in the insulin injection location. Based on the background phenomena above, researchers are interested in conducting research on the effect of education through video media on knowledge of how to use insulin pens in diabetes mellitus patients at Pesanggrahan Hospital, South Jakarta.

2. METHOD

This type of research is quantitative, while the research method uses Quasi Experiment with a "one group pre test and post test design" research design. Research carried out by one group is measured before and after treatment, so the results of the treatment can be known more accurately because they can know the difference with the situation before the treatment was given.

The population in this study were all diabetes mellitus patients at Pesanggrahan Hospital, South Jakarta, on average 62 people were needed during the period August – October 2022. The number of samples in this study was 18 respondents. The sampling technique in this study was purposeful sampling based on criteria, namely DM patients who were using an insulin pen for the first time and DM patients who were able to do so independently. This research was carried out at Pesanggrahan Hospital, South Jakarta.

Data collection was carried out in October 2022 – January 2023. The instruments used in this research were questionnaires and educational media in the form of videos. For the knowledge variable, a questionnaire was used regarding skills in using and storing insulin pens with Guttman scale scoring, namely Score 1: Yes and Score 0: No. With a total of 14 questions. Meanwhile, the implementation of education was carried out through video media about how to use an insulin pen with a viewing duration of less than 15 minutes through:
https://drive.google.com/file/d/1K0LiTdCO2_JeAELdHHky4wCMMd61 snl_/view?usp=sharing

Bivariate analysis was carried out on two variables that were thought to be related or correlated. This research uses the dependent t test. Bivariate analysis in this research serves to examine the effect of education through video media on the skills of using and storing insulin pens in diabetes mellitus patients at Pesanggrahan Hospital, South Jakarta .

3. RESULTS AND DISCUSSION

Respondent Characteristics

Based on research conducted at Pesanggrahan Hospital, South Jakarta. Each respondent has met the inclusion and exclusion criteria for research. The following table shows the research results

Table 1. Age Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
46-55	9	50
36-45	4	22
26-35	3	17
Above 55	2	11
Total	18	100

Based onTable 1 shows that the distribution of characteristics of respondents in the age category is mostly 46-55 years, 9 patients (50%), 36-45 years old, 4 patients (22%), 26-35 years old, 3 patients (17%).), and age above 55 years as many as 2 patients (11%).

Table 2. Educational Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
high school	11	61
College	7	39
Total	18	100

Based onTable 2 shows that the distribution of respondents' characteristics in the Education category was mostly high school with 11 patients (61%), and university with 7 patients (39%).

Table 3. Job Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
Housewife/Not working	12	67 %
Private employees	2	11%
Civil servants	2	11%
Self-employed	2	11%
Total	18	100%

Based onTable 3 shows that the distribution of respondents' characteristics in the job category is mostly housewives/non-working with 12 patients (67%), private employees with 2 patients (11%) and civil servants with 2 patients (11%), and entrepreneurs as many as 2 patients (11%).

Level of Knowledge of Insulin Pen Use Before and After Intervention

Table 4. Level of Knowledge on how to use an insulin pen before intervention is provided via video media

Knowledge of how insulin use pen	Before Giving Education (Pre Test)	
	N	%
Good	7	39%
Not enough	11	61%
AMOUNT	18	100%

Based on table 4, it can be seen that in the intervention group before providing education via video media, it was found that the majority of respondents had poor knowledge of how to use an insulin pen, 11 people (61%).

Table 5. Level of Knowledge on How to Inject insulin pen after being given intervention via video media

Knowledge of How to Inject InsulinPen	After being given education (Post Test)	
	N	%
Good	11	61%
Not enough	7	39%
AMOUNT	18	100%

Based on table 5, it can be seen that in the intervention group before providing education via video media, in the intervention group after providing education via video media, it was found that the majority of respondents had good knowledge of using an insulin pen, 11 people (61%).

Table 6. Average Knowledge of Previous Use of Insulin Pen intervention was carried out

Knowledge of How to Inject Insulin Pen	Mean	elementary school	Min-Max
Pre-test	5.33	5.15	1-8

Based on table data 6. shows that the average score for knowledge of using an insulin pen before being given education via video media was 5.33 with a standard deviation of 5.15 and a range of values from 1 to 8.

Table .7 Average Knowledge of Using Insulin Pen After intervention was carried out

Knowledge of Ways Use Insulin Pen	Mean	elementary school	Min-Max
Post test	10.74	4.11	5-14

Based on the data in table 7, it shows that the average score for knowledge of using insulin pens after being given education via video media is 10.74 with a standard deviation of 4.11 and a value range of 5 up to 14.

Bivariate Results

Results of bivariate analysis carried out on two variables that are thought to be related or correlated. This research uses the dependent t test.

Table 8. Dependent T Test Analysis Results

Knowledge How to inject	N	Mean	Std. Deviation	*p-value*
Before (Pre Test)	18	5.33	5.15	0,000
After (Post Test)	18	10.74	4.11	0,000

Source: data processing results, 2023

Based on table 8, it can be seen that the average skill score for using insulin pens for the group before the intervention was 5.33 or the skills for using insulin pens were still poor. Then when the intervention was carried out, it decreased to 10.74 or knowledge of how to use the insulin pen was good. Based on the dependent t test, the p-value is 0.000. It can be seen that the p-value is 0.000 < (0.05), so the test decision is that Ho is rejected and Ha is accepted. It can be concluded that there is a significant influence on how to use the insulin pen before and after providing education.

Discussion

The results of the analysis showed that the average value of knowledge of using insulin pens for the group before the intervention was 5.33 or knowledge of using insulin pens was still poor. Then when the intervention was carried out, it decreased to 10.74 or knowledge of using insulin pens was good. Based on the dependent t test, a p-value was obtained of 0.000. It can be seen that the p-value is 0.000 < (0.05), so the test decision is Ho is rejected and Ha is accepted. It can be concluded that there is a significant influence of education via video media on knowledge of how to use an insulin pen before and after being given education.

This is in accordance with the provision of education which is very important to improve the ability of diabetes mellitus patients to carry out self-management, in this case using an insulin pen. A low level of knowledge can influence wrong eating patterns which will ultimately result in an increase in blood glucose levels, therefore education is needed [14]

The results of this study are in line with research by Rondhianto [15] which also stated that education was proven to have a positive influence on increasing self-confidence and changing self-care behavior in DM patients. The results of this research are also strengthened by research by Ridwan [16], that the family's educational ability to care for patients with DM complications who received education was higher compared to the group who did not receive education. The results of this research are in accordance with the research results of the Directorate for Control of NCDs of the Republic of Indonesia that the majority of unhealthy lifestyles, lack of physical activity are the causes of DM. During the research, several things that are expected to be developed in educational programs as an effort to control DM are structured health education and sustainable. The educational material that can be applied is skill-based knowledge and motivation to change behavior in sufferers. To obtain optimal results, the health education process is expected to run continuously.

This is also in line with research conducted by Martiningsih [17] regarding the influence of DM complication care education on family anxiety in caring for family members who experience DM complications in Lawang District with the result P = 0.000, which means that mental education has a significant influence on the level of family anxiety. in caring for family members who experience DM

complications in Lawang District. Education is a process of change in humans that is related to achieving individual and community health goals[18]. Mental education in the family is aimed at increasing the level of optimal health for the individual and all family members.

Researchers, providing education about DM is very important to sufferers, to increase knowledge of healthy lifestyles in DM sufferers. In reality, health education or diabetes education programs have not been implemented optimally, even though this education is important in providing nursing care to DM sufferers. The education that is currently taking place is only limited to when clients go to the Puskesmas so that with limited and relatively short time only a little information can be conveyed to clients and is individual in nature. Apart from that, there is no use of audiovisual media that can support the process of providing information to clients. In this research, providing education can provide many benefits for DM patients, education can provide positive results, both short, medium and long term results. Short-term results include blood sugar control, physical control (body weight, leg injuries and blood pressure), physical activity, diet and smoking habits. Medium-term results increase knowledge, use of medicines, and utilization of health facilities. In this study, an educational intervention on the Skills of Using an Insulin Pen was structured according to the needs of diabetes mellitus patients. Education on the Skills of Using an Insulin Pen was provided using a booklet containing material about diabetes mellitus, components regarding diet, blood sugar control, physical exercise or sports, drug therapy, prevention of diabetic ulcers and is implemented directly by diabetes mellitus patients.

4. CONCLUSION

Based on the dependent t test, a p-value of 0.000 was obtained. It can be seen that the p-value is 0.000 < (0.05), There is an influence of education through video media on knowledge of how to use insulin pens in diabetes mellitus patients at Pesanggrahan Hospital, South Jakarta. Based on the results of this research, it is hoped that it can be used as a basis for nursing services to provide education to Diabetes patients regarding knowledge of using insulin pens with insulin pen videos.

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