ISSN 2354-8428
e-ISSN 2598-8727

JURNAL KEPERAWATAN

KOMPREHENSIF

COMPREHENSIVE NURSING JOURNAL

Sekolah Tinggi Ilmu Keperawatan PPNI Jawa Barat

Vol. 8 Special Edition, June 2022

JURNAL KEPERAWATAN KOMPREHENSIF	VOL. 8	Special Edition	Page 1-222	Bandung June 2022	ISSN 2354-8428 e-ISSN 2598-8727

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Vol. 8 Special Edition Juni 2022

Research Article

The Effect of Audiovisual-Based Education Media on Self Management in Type 2 Diabetes Mellitus Patients in the Work Area of UPT Puskesmas Ledeng

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Received : 20/04/2022
Revised : 22/06/2022
Accepted : 28/06/2022
Online : 30/06/2022
Published : 30/06/2022

Abstract

Aims: One of the management of diabetes mellitus type 2 is education. The provision of effective education is supported by the use of media that is attractive and more easily accepted by patients, one of which is using audiovisual media that contains elements of sound and images.
Purpose: This study aims to determine the existence of the effect of audiovisual-based educational media on self-management in Type 2 Diabetes Mellitus patients in the working area of UPT Puskesmas Ledeng.
Methods: This study is a quantitative study using a Quasi Experimental Two Group Pre-posttest Design where in this study there were an intervention group and a control group with 38 respondents. This research uses purposive sampling. Analysis using Paired Sample T-test and ANCOVA. The questionnaire used in this study was a demographic data questionnaire and Diabetes Self-management Questionnaire (DSMQ).
Results: The results of the study on demographic data of respondents 71.1% were female, the average age of respondent was 50.82 years old with a standard deviation (SD) = 6.345, the education level attained by respondents were Primary School 55.3%, 50.0% working as housewife, with a duration of illness 3.21 years, and 60.5% of respondents had received previous information about type 2 diabetes mellitus. The results of the study in the control group a p value =0,586 > 0,05, the intervention group a p value =0,039 < 0,05. There is a significant influence between the audiovisual-based education on self-management of patients with type 2 diabetes mellitus. Conclusion: Nurses can provide audiovisual-based education as a medium of information and approaches in increasing knowledge and self-management behavior so as to avoid complications.

Keywords :
Type 2 Diabetes Mellitus, audiovisual, self-management

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
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INTRODUCTION

Diabetes mellitus is often referred to as 'The silent killer' because the symptoms are often realized when the patient feels a complaint (1). The International Diabetes Federation in 2019 recorded a global prevalence rate of diabetes mellitus of around 9.3% (463 million) and is expected to continue to increase to 10.2% (578 million) in 2030 and 10.9% (700 million) in 2045 (IDF, 2019). This condition places Indonesia as the 4th country with the highest number of diabetes mellitus patients in the world which reaches 6.2%, which reaches more than 10.8 million people (2). The increasing prevalence of type 2 diabetes mellitus every year is influenced by poor self-management and not all patients are able or not optimal in doing so (3)

There are 4 main pillars in the implementation of type 2 diabetes mellitus, namely education, medical nutrition therapy, physical exercise, and pharmacological therapy (4). Education combines learning experiences designed to help individuals and communities improve their health (WHO, 2017). Effective education is supported by the use of interesting media and is more easily accepted by the target so that memory will be longer, one of which is using audiovisual media to produce learning videos that can be seen and heard simultaneously (5). Audiovisual is a tool that is considered appropriate in conducting counseling because it can be repeated, and easy to use (6).

METHODS

This study is a quantitative study using a Quasi Experimental Two Group Pre-posttest Design. The sample in this study was 38 respondents, sample were calculated using G-Power software version 3.1.9.4 using *f-test, ANCOVA : fixed effects, main effects and interactions, A priori : Compute required sample size – given α, power.* Input parameters consist of *Effect size f* = 0.5, *α err prob* = 0.05, *power (1-β err prob)* = 0.8, *numerator* df = 1, *number of groups* = 2, *number of covariates* 1 then the output parameters consist of *Noncentraly parameter* = 8.5000000, *critical f* = 4.1596151, *Denominator df* = 31 with total sample size 34 (7). Minimum estimate with 34 plus attrition rate 10-15% with a total of 4 respondents, the total sample size is 38 respondents with a total of 19 respondents in each group. Who were divided into two groups, namely 19 respondents in the intervention group and 19 respondents in the control group. This research uses purposive sampling data collection technique, where by inclusion criteria such as no hearing loss, able to communicate well, have a phone with WhatsApp application, live with at least one family member and exclusion criteria such as have a diabetic foot wound and have complication such as stroke in accordance with the research objectives.

The instrument used in this research are educational media such as power points, module, telephone and the questionnaire used in this study was a demographic data questionnaire and Diabetes Self-Management Questionnaire (DSMQ). The intervention group was given audiovisual-based education (power point and video) as well as modules on disease information and self-management activities for type 2 diabetes mellitus, the content of the video that is shown about diabetes mellitus, five pillars of diabetes mellitus management and foot care in diabetes mellitus patients. While the content in the power point is about type 2 diabetes mellitus (symptoms, risk factors, complications, self-management, and foot care). With follow up through the WhatsApp application. In the control group, only the module was given. The data collection of this research was carried out in the working area of the UPT Puskesmas Ledeng. This research was conducted for 17 days. The intervention was given for 20 minutes with 2 meetings (pre-test and post-test), the intervention was given in the morning and 1 time follow up via WhatsApp.

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
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RESULTS

1. Univariate Analysis

Characteristics of respondents in the working area of the UPT Puskesmas Ledeng (n=38), including: gender, age, level of education, profession, duration of illness, and received previous information.

Table 1. Demographic Comparison of the Characteristics of Type 2 Diabetes Mellitus Patients in the Intervention Group and Control Group in the working area of the UPT Puskesmas Ledeng (n=38).

Table 1.
Demographic Data

Characteristics	Total (N = 38) %	Intervention Group N = 19 (%)	Kontrol Group N = 19 (%)
Gender			
Female	27 (71.1)	13 (68.4)	14 (73.7)
Male	11 (28.9)	6 (31.6)	5 (26.3)
Age (Mean ± SD)	50.82 ± 6.345	49.05 ± 4.859	52.58 ± 7.252
Level of education			
Primary school	21 (55.3)	9 (47.4)	12 (63.2)
Junior high school	6 (15.8)	3 (15.8)	3 (15.8)
High school	8 (21.1)	5 (26.3)	3 (15.8)
Bachelor	3 (7.9)	2 (10.5)	1 (5.3)
Profession			
Doesn't work	2 (5.3)	1 (5.3)	1 (5.3)
Housewife	19 (50.0)	10 (52.6)	9 (47.4)
Trader	5 (13.2)	3 (15.8)	2 (10.5)
Government employees	3 (7.9)	1 (5.3)	2 (10.5)
Pension	1 (2.6)	0	1 (5.3)
Laborer	7 (18.4)	3 (15.8)	4 (21.1)
Entrepreneur	1 (2.6)	1 (5.3)	0
Duration of illnes (Mean ± SD)	3.21 ± 2.517	3.05 ± 1.840	3.37 ± 3.095
Received previous information	23 (60.5)	12 (63.2)	11 (57.9)
Once	15 (39.5)	7 (36.8)	8 (42.1)
Never			

Based on Tabel 1 show that most of the 71.1% of respondents were female, the average age of respondent was 50.82 years old with a standard deviation (SD) = 6.345, the education level attained by respondents were Primary School 55.3%, 50.0% working as housewife, with a duration of illness 3.21 years, and 60.5% of respondents once received previous information about type 2 diabetes mellitus.

2. Bivariate Analysis

The results of bivariate analysis to show whether or not there is an effect of audiovisual-based educational media on self-management in patients with type 2 diabetes mellitus using parametric statistical tests using Paired Sample T-test and ANCOVA. Before determining the formula, the researcher conducted a normality test of the data using the Shapiro Wilk test.

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

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The results of the Shapiro Wilk test for pre-test (0.061) and post-test (0.620), this shows that the data is normally distributed because the results are > 0.05. So the researchers used the Paired t-test and ANCOVA, the results were obtained as follows:

Table 2. Characteristics of respondents based on the level of self-management before and after being given education to the control group in the working area of the UPT Puskesmas Ledeng (n=38).

Table 2.
Self management level of control group

Variable	Mean	SD	Min-Max	*P*
Before	44.16	3.500	37-49	0.586
After	43.95	3.341	37-48	

Based on Table 2. shows that self-management behavior before giving an education in the control group with the mean score of 44.16 (± SD 3,500) and a minimum – maximum score were (37-49). Meanwhile, self-management behavior after being given education has a mean score of 43.95 (± SD 3,341) and the minimum – maximum value (37-48). This shows that there is no significant change after being given education to the control group

Table 3. Characteristics of respondents based on the level of self-management before and after being given audiovisual-based education to the intervention group in the working area of the UPT Puskesmas Ledeng (n=38).

Table 3.
Self management level of intervention group

Variabel	Mean	SD	Min-Max	*P*
Before	44.58	2.755	32-41	0,039
After	43.26	1.727	41-47	

Based on Table 3. shows that self-management behavior before providing education in the intervention group has a mean score of 44.58 (± SD 2,755) and the minimum – maximum value (32-41). Meanwhile, self-management behavior after being given education has a mean score of 43.26 (± SD 1,727) and the minimum – maximum value (31-47). This shows that most of the respondents have a good level of self-management behavior after audiovisual-based education is carried out where p = 0.039 <0.05.

Table 4. Analysis of Differences in Self Management Levels after being given education between the Intervention Group and Control Group in the Working Area of the UPT Puskesmas Ledeng (n=38).

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
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Table 4.
Differences in self management level the intervention group and the control group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
PRETEST	46.366	1	46.366	11.587	.002	.249
KELOMPOK	36.132	1	36.132	9.030	.005	.205
Error	140.055	35	4.002			
Total	73230.000	38				
Corrected Total	189.053	37				

a. R Squared = .259 (Adjusted R Squared = .217)

Based on Table 4. Shows that the significance value is p = 0.002 <0.05 so it can be said that the provision of audiovisual-based education has a positive and significant effect on increasing self-management in type 2 diabetes mellitus patients.

DISCUSSION

1. Characteristics of Respondents with Type 2 Diabetes Mellitus

Based on Table 1. shows that as many as 27 respondents (71.1%) were female, in the intervention group 13 respondents (68.4%) and the control group 14 respondents (73.7%). Women have a higher chance of developing type 2 diabetes mellitus, one of which is associated with obesity, where fat cells will produce several substances classified as adipocvtokine in large quantities and can cause insulin resistance (8). There was an increase in the prevalence of more patients in women (1.8%) than men (1.2%) (9).

Characteristics of the average age of respondents in both groups aged 50.82 years with a standard deviation (SD) = 6,345. According to the Depkes (2009) aged 46-55 are early elderly. According to International Diabetes Federation (10) adults from the age of 45-64 are the age group that is often diagnosed with type 2 diabetes mellitus. Diabetes mellitus, one of which occurs due to the aging process so that changes and decreases in the function of cells, tissues and organs (11). Increasing age will be followed by changes in the anatomy and physiology where the liver and pancreas shrink so that there is a decrease in the capacity to store and synthesize protein in digestive enzymes and will have an impact on decreasing insulin sensitivity to blood glucose levels (12).

Characteristics of education level, as many as 21 respondents (55.3%) educated elementary school (elementary school), as many as 9 respondents (47.4%) in the intervention group and 12 respondents (63.2%) in the control group. Handono (13) research states that the level of education has an influence on the incidence of type 2 diabetes mellitus where people with high education will have a lot of knowledge about health management and affect a person's way of thinking in dealing with something. However, according to (14) someone with low education does not mean absolutely low knowledge. The level of education generally affects a person's ability to understand information.

Characteristics of work, as many as 19 respondents (50.0%) worked as housewife, where as many as 10 respondents (52.6%) in the intervention group and 9 respondents (47.4%) in the control group. The type of work affects the level of physical activity performed. Physical

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

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activity can increase tissue sensitivity thereby reducing insulin requirements and lowering blood glucose levels, but if the respondent does not do physical activity, tissue sensitivity decreases, resulting in diabetes mellitus (12)

Based on the average length of time respondents suffered from type 2 diabetes mellitus in both groups, it was 3.21 years with a standard deviation (SD) = 2,517. (14) shows that the average diabetes mellitus patient suffers from the disease for less than 5 years, in accordance with the theoretical concept that the occurrence of long-term complications that occur in type 2 diabetes mellitus patients does not occur in the first 5-10 years.

Based on previous information exposure, as many as 23 respondents (60.5%) had received information about type 2 diabetes mellitus and type 2 diabetes mellitus self-management. good knowledge to manage diabetes mellitus independently (15)

2. Differences in Self Management Behavior in the Control Group

Based on table 3, it shows that in the control group the average self-management behavior of respondents in the pre test measurement is 44.16 and in the post test measurement after being given the module it becomes 43.95 with a p value of 0.586 (p value > 0.05). This shows that there is no significant effect on the self-management behavior of patients with type 2 diabetes mellitus. The results of this study are in line with the research of Nurhaliza & Amir (16), which states that there is no increase in the average ability to perform a physical examination using the module.

Giving modules without being given education using audiovisual media is less effective and there are many mistakes in self-management. Respondents are still confused or have not been able to carry out self-management independently so that there is no increase in their ability to carry out self-management of type 2 diabetes mellitus. control group 52.58 years. This shows that the level of education and age can affect the level of knowledge of respondents in understanding the management of self management.

3. Differences in Self Management Behavior in the Intervention Group

Based on table 4. shows that in the intervention group the average self-management behavior of respondents in the pre-test measurement was 44.58 and in the post-test measurement after being given audiovisual-based education it became 43.26 with a p value of 0.039 (p value < 0.05). This shows that there is a significant effect between audiovisual-based educational media on self-management behavior in type 2 diabetes mellitus patients.

The results of this study are in line with Simamora's research (17), which states that counseling provided using audiovisual media can increase knowledge, where audiovisual media is one of the good media to be used as media in health education because it involves hearing and vision at the same time in one process. activity.

Providing education with interesting media will be more accepted or remembered quickly and for a long time, so that audiovisual media can be one of the effective media to be used as counseling media. The results showed that the education level of respondents in the intervention group was better than the control group, with an average age of 49.05 years which is the average age of respondents in the intervention group being younger than the control group. This shows that the level of education and age can affect the knowledge of respondents.

4. Analysis of the Effect of Audiovisual-Based Educational Media on Self Management in Type 2 Diabetes Mellitus Patients Control Group and Intervention Group.

So it was concluded that there was an effect of audiovisual-based educational media on self-management of type 2 diabetes mellitus

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

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patients in the working area of the UPT Puskesmas Ledeng. The results of this study are in line with Hastuti's research (18), which states that health education using audiovisuals is more effective than modules as a method of health education in improving clean and healthy attitudes and behaviors in Gunung Kidul Regency. Patients tend to prefer audiovisual media such as films and videos because they show like games and are in real situations (WHO, 2017). Changes in the behavior of patients with type 2 diabetes mellitus in carrying out good self-management to prevent complications, improve or improve quality of life, and reduce mortality.

CONCLUSION

Based on research results and data analysis, it can be it was concluded that there was an effect of audiovisual based educational media on self-management in type 2 diabetes mellitus patients in the working area of the UPT Puskesmas Ledeng with $P = 0.005 < 0.05$. With the results of hypothesis testing, it is found that Ho is rejected and Ha is accepted. Nurses can provide audiovisual-based education as a medium of information and approaches in increasing knowledge and self-management behavior so as to avoid complications.

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p-ISSN : 2354 8428 | e-ISSN: 2598 8727

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