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Effect of Health Education Management of Diabetes Militus with Media Posters on Increasing Family Knowledge

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Abstract

Diabetes Mellitus (DM) requires medical care and self-management education to prevent acute complications and reduce the risk of long-term complications. The purpose of this study was to determine the effect of Health Education Management of DM with poster media on increasing family knowledge based on Nola J Pender theory in the working area of the Tamalanrea Community Health Center in Makassar City. This study used a one-group pre-post design. Sampling using a purposive sampling technique. The results of the bivariate analysis used paired sample t-test which showed the influence significantly towards health education on DM management with Media Posters on Increasing Family Knowledge (p<a) which obtained a significant value of 0.000. This study concludes that there is an influence of Health Education Management of DM with poster media on increasing family knowledge based on the Nola J Pender theory here still shows a gap between knowledge and practice in the work area of Puskesmas Tamalanrea, Makassar City.

Article points

1. It is known that using poster media based on the Nola J Pender Theory in improving the management of Diabetes Mellitus (DM) health education can increase family knowledge. This study aims to determine the effect of Diabetes Militus health education management with media posters on increasing family knowledge.

2. It has been concluded that the level of family knowledge of people with diabetes mellitus has increased after the management of diabetes mellitus health education using poster media based on the Nola J Pender Theory.

3. The method of using poster media based on the Nola J Pender theory should be used by health workers, especially nurses in increasing knowledge of health education management in diabetes mellitus families.

Key words: Health education, DM management, knowledge;

Introduction

Diabetes mellitus (DM) is a chronic disease that requires the individual ability of the patient to comply with the disease management recommended by a doctor. According to the American Diabetes Association (ADA, 2010), diabetes mellitus is a group of chronic and metabolic diseases characterized by hyperglycemia caused by abnormalities in insulin secretion, insulin action or both require medical care and self-management education to prevent acute complications and reduce risk long-term complications (Nuari 2017). Of the 565 data sources reviewed, of which 170 sources from 110 countries were selected, in 2011 there were 366 million people with diabetes and this is expected to increase to 552 million people by 2030 (Interanational Diabetic Federation 2011). Most people with diabetes are in low- and middle-income countries, and this relationship will also see the biggest increase over the next 19 years (Whiting et al. 2011).

Diabetes mellitus takes a long time (because diabetes mellitus is a disease that will last a lifetime) and is very complex (it does not only require treatment but also requires lifestyle changes in the sufferer) so that sufferers often do not comply with medication and style changes. life and tend to despair by following a therapy program that is so long, complex and does not produce healing (Asti 2006).

Based on Basic Health Research data, it shows that there is an increase in the prevalence of diabetes mellitus in Indonesia from 5.7% in 2007 to 6.9% or approximately 9.1 million in 2013 (Kementrian Kesehatan Republik Indonesia 2008), (Kementerian Kesehatan Republik Indonesia 2014). Meanwhile, the international diabetes federation data in 2015 states that the estimated number of people with diabetes mellitus in Indonesia is estimated at 10 million (Kementerian Kesehatan Republik Indonesia 2016). According to the results of the Basic Health Research in 2013, the prevalence of diabetes mellitus in South Sulawesi diagnosed by doctors was 1.6% and 0.5%. Diabetes mellitus diagnosed by a doctor or based on symptoms was 3.4%. The prevalence of diabetes mellitus diagnosed by doctors was found to be the highest in the Pinrang district as much as 2.8%, Makassar City as much as 2.5%, North Toraja Regency as much as 2.3% and in Palopo City as much as 2.1%. Meanwhile, the highest prevalence of diabetes mellitus diagnosed by doctors or based on symptoms was in the Toraja Regency area of 6.1%, Makassar City as much as 5.3%, Luwu Regency as much as 5.2% and in North Luwu Regency as much as 4.0% (Kementerian Kesehatan Republik Indonesia 2014).

By initial data obtained from the Tamalanrea Makassar Community Health Center, DM cases from 2014 to 2018 have increased and in 2018 there was 975 DM with a total visit per month of 81 people (Tamalanrea 2020). Initial observations of researchers around Tamalanrea sub-district as an option to conduct research, found that so many people pay less attention to the risk of diabetes mellitus, for example, are over 40 years old or under 40 years old, plus a weight that exceeds the ideal even is classified as obese, still pay less attention to diet and types of food and healthy lifestyles, then the condition of the place or area of the Tamalanrea Community Health Center is still a place where there are lots of foods that can cause an increase in blood sugar if the patient does not control the diet, and also appears to lack distribution health information to the community around the Tamalanrea Community Health Center Makassar.

Individuals with diabetes mellitus have a very big responsibility in managing themselves to take care of their disease. The ability of individuals to have control over their own lives and make choices regarding their health is known as self-empowerment. Self-empowerment in diabetes sufferers is known as psychological empowerment in which the capacity of a person/sufferer is realized to build trust, increase self-esteem and develop coping mechanisms to improve their skills. Efforts in increasing self-empowerment in diabetes mellitus patients must be supported by qualified promotional strategies from health workers, especially nurses. Empowerment strategies are developed for people with diabetes mellitus to improve their control over their disease by increasing physical activity, promoting better and more prosperous mental health and improving a healthy diet (Nuari and Kartikasari 2015).

According to Marriner-Tomey and Alligood (1998), a health worker, especially a nurse, must be able to integrate all aspects that support both individual and environmental aspects that can empower diabetes to continue to apply the five pillars in the management of diabetes mellitus based on the health promotion model. Health promotion model is a model intended for nurses to

explore complex biopsychosocial processes, which motivate individuals (M. Li et al. 2014) to behave in certain ways in improving their health status (Carpenter, DiChiacchio, and Barker 2019).

For this reason, efforts can be made to overcome this problem, namely providing counselling and health education which can provide information to add knowledge and awareness of sufferers and their families about DM in the care and treatment of DM disease independently (Gultom 2012). This education includes diet, exercise, proper use of oral drugs and insulin, monitoring blood and urine sugar levels and increasing motivation for diabetes mellitus sufferers to exercise regular control to relieve symptoms, prevent acute and chronic complications, reduce existing complications, maintain and create a sense of wellness, improve quality of life and reduce mortality (Soegondo, Soewondo, and Subekti 1995).

Based on the above background and the epidemiology that occurs globally, nationally, and in the province where the researcher conducts research; it is necessary to have health education that leads to diabetes management. The health education that is the focus of researchers is using poster media. As we know that posters have their own advantages in conveying the information that will be provided by the information provider. Therefore, the researcher is interested in conducting research entitled "The Effect of Health Education Management of DM with Media Posters on Increasing Family Knowledge based on the Nola J Pender theory in the working area of the Tamalanrea Community Health Center, Makassar City"

Methodology and search strategy

This study used an experimental design with a pre-experimental design approach with a one-group pre-post design (Cook, Campbell, and Day 1979; Nursalam 2015)**.** Research population: According to Sugiono in Jenita Doli Tine Donsu (2017) states that the population is all objects or subjects that have certain qualities and characteristics that have been determined by previous researchers and the population is homogeneous. The population in this study were all DM patients, amounting to 45 out of 2052 DM patients in the Tamalanrea Public Health Center in Makassar City.

Research sample: The sample is part of the total population. The sample in nursing was determined based on inclusion and exclusion criteria (Setiadi 2013). The sample size in this study was calculated using the Slovin formula (Zainuddin 2000). Thus, the sample size in the study was 45 DM patients.

Sampling in this study using purposive sampling which is also called judgment sampling. Judgment sampling is a technique in determining the number of samples by selecting samples among the population according to the wishes of the researcher (problem/objective in the study) so that the selected sample can represent the characteristics of the population that the researcher has known before (Nursalam 2015).

Sample Criteria, namely: First, Inclusion Criteria. Families who live with DM sufferers in the work area of Tamalanrea Community Health Center, Makassar City, willing to be research respondents, Families can read and write. Meanwhile, the Exclusion Criteria. Families of DM sufferers who refuse to continue research, families who are not cooperative, families who cannot see (read) and families who cannot write.

The data collection technique in this study previously started from the researcher observing the research site, interviewing health workers, namely the head of administration at the Tamalanrea Public Health Center and nurses who served in the internal disease room of the Tamalanrea Public Health Center. After obtaining the data the researcher wants, then entering it into the background as initial data, then during the study, the researcher will determine the sample of the treatment group then the researcher will distribute a questionnaire which will later be used to measure the respondent's knowledge before being given treatment. After that the treatment group was given a media poster for health education, this poster contains health education about DM Management. After that, the questionnaires were distributed again to measure knowledge after being given treatment. The data from this questionnaire will be processed by researchers using statistical tests.

Data analysis was performed using the SPSS (Statistic Program for Social Science) computerized program, which is a descriptive analysis to see the frequency distribution of variables. Data analysis was carried out in two stages. First, univariate analysis was used to test the hypothesis. According to Notoadmodjo (2005), this analysis serves to summarize the measurement results into useful information. Second, Bivariate Analysis, namely data analysis which analyzes two variables. This type of analysis is often used to determine the relationship and influence of x and y between variables with one another. Later in this research, the normality test will be carried out from the data obtained. If the data distribution is normal, then it is statistically tested by using paired t-test. If the data distribution is not normal, then it is statistically tested by man witney (Suyanto and Gio 2018).

Hypothesis testing using reasoning (logical consistency) is used to support hypothesis testing by using facts/data in research that uses descriptive methods, historical methods and others that are not experimental. By using logic, conclusions are obtained based on facts by providing reasons or reasoning (Sumanto 2014). In this study, testing variable hypotheses using a nominal scale in which the nominal scale is the simplest scale arranged by type (category) or the function of the number is only a symbol in determining differences in characteristics with other characteristics. (If the p-value is greater than α (p value> α), then Ho is accepted. This means that DM management health education with poster media increases family knowledge conversely, if the p-value is ≤ α then Ho is rejected, which means that DM management health education with poster media to increase family knowledge, with an α value of 0.05.

Results

The results of research evaluating the level of family knowledge about DM management in the work area of the Tamalanrea Makassar City public health center, which was carried out on May 21, 2019 to June 10, 2019, with 45 respondents in this study.

Table 1. Frequency Distribution of Respondents Based on Pre and Post-Test Family Knowledge about DM Management Based on the Nola J Pender Theory

Criteria	Treatment Group (n=45)	Percentage (%)
Pre-Test		

Enough	43	95.6
Less	2	4.4
Post-Test		
Enough	45	100.0
Less	0	0

Source: SPSS Data Processing Results

Based on table 1 above, of the 45 respondents (100%) who were studied, it is known that the pre-test knowledge of respondents about DM management is 43 (95.6%) respondents with sufficient knowledge and 2 respondents (4.4%) who have less knowledge.

Table 1 above also explains the 45 respondents (100%) studied. It is known that the total frequency distribution of family knowledge measured after being given health education using posters with sufficient knowledge were 45 respondents (100%).

Table 2 Overview of Normality Test Table of Influence of Helath Education DM Management with Poster Media on Increasing Family Knowledge Based on Nola J Pender theory.

	Kolmogorof-smirno [a]		
	Statistics	Frequency	Sig
Pre Test	.229	45	.000
Post Test	.145	45	.019

Source: SPSS Data Processing Results

In table 2 above, of the 45 respondents (100%) studied. The output for the Kolmogorov-Smirnov a normality test is obtained by the p-value for the pre-test and post-test knowledge = 0.019, which is greater than the value of a = 0.05, so it can be concluded that the data is normally distributed.

Table 3: The Effect of Health Education on DM Management with Media Posters on Increasing Family Knowledge Based on the Nola J Pender Theory.

Intervention Group	Total (n = 45)	
	Mean	*P*
Pre-test	25,20	0,000

Post-test	26,84	
Total		100,0

Source: SPSS Data Processing Results

Based on table 3 above, it provides an overview of knowledge in the intervention group before and after treatment. Obtained the mean value of pre-test knowledge is 25.20 (0.000), while the average value of post-test knowledge is 26.84 (0.000). Families with sufficient knowledge before being given health education on DM management with poster media were 43 respondents (95.6%) and less knowledgeable amounted to 2 respondents (4.4%). While families with sufficient knowledge after being given health education on DM management with posters as many as 45 people (100.0%). And after being tested the Paired Samples T-Test, the p-value for the treatment group was 0,000, which means that the p-value <α = 0.05.

Table 4 Overview of Paired Sample T-Test Table of Effect of Health Education Management of DM with Poster Media on Increasing Family Knowledge Based on the Nola J Pender Theory.

	Paired Samples Test		
	t	df	Sig
Pre Test Post Test	- 7. 234	44	.000

Source: SPSS Data Processing Results

Based on table 4 above, of the 45 respondents (100%) studied. Explaining the paired sample t-test, obtained a significant value of 0.000. This means that H0 is rejected because a significant value <0.05 and Ha is accepted, with a t-count value of -7234 and a t-table value (df) of 44.

Discussion

Based on gender, the prevalence of DM management knowledge. shows that the prevalence of women is higher than men. The results of the study are in line with the results of research conducted by Sultan Baliz Erkoc et al (2012), based on gender that the level of knowledge of hypertension management in women is higher than that of men. This happens because of the strong desire of women to seek information about the conditions around them (Ulya, Iskandar, and Triasih 2018), Furthermore, the role of women in low-income families in improving the quality of family life (Tamsah et al. 2020).

According to the assumptions of the researchers, this was due to the fact that the schedule for examining and taking medicines was often carried out in the morning at the same time as the proteins visit so that most of the residents who attended the examination and taking medicine

were women, so the knowledge between men and women was also different from one another. From the results of previous research with the results of this study indicate an equation in which statistically, gender affects the level of knowledge resulting from the behaviour and attitudes that arise from each type.

Based on the level of education, the prevalence of respondents with knowledge of DM management shows that the highest education is at the college level. This study shows that the level of education can affect the level of knowledge. This can be seen in research where most respondents have a high or sufficient level of knowledge. The results of this study are in line with the research of Bertalina and Aindyati (2016), where the level of education is the level of formal education that the respondents have completed from interviews using a questionnaire measuring tool. The level of education affects the knowledge a person has. Another study shows that the role of social media is a consideration in increasing the knowledge of DM patients (Cooper and Kar 2014; Gabarron, Arsand, and Wynn 2018; Siopis, Colagiuri, and Allman-Farinelli 2021). Furthermore, studies on health education regarding symptoms and modification of risk factors for DM are needed (Kassahun and Mekonen 2017) in Saudi Arabia shows that most people with DM have poor and moderate health education management (Alanazi et al. 2018).

From the results of previous research and current research, it shows that the higher the level of education that has been taken, the easier it is to absorb new information. But the results of this study are not in line with the theory of Nola J Pender et al. (2006); that someone with good knowledge will be able to determine good attitudes and behaviour (Saryono 2013). The study of nursing interventions such as education is a necessity in DM management (DeSouza and Nairy 2004) with the intervention of education, nutrition management, physical activities, and stress management have a contribution in increasing the knowledge of DM patients (Andriyanto, Rekawati, and Rahmadiyah 2019; R. Li et al. 2014). Furthermore, self-management education has a contribution in the management of DM (Kurnia, Amatayakul, and Karuncharernpanit 2017; Lambrinou, Hansen, and Beulens 2019) and lifestyle modification and metformin are effective in preventing DM (Beulens et al. 2019) because their knowledge will increase. Bahkan dengan memberikan kombinasi media lainnya seperti music memberikan indikasi penyembuhan lebih cepat (Ji et al. 2015).

According to the assumptions of the researchers, where someone with higher education will be able to receive information well, but in the application of health information there are still gaps, this is one of the reasons there is always an increase in DM sufferers every year. This can be seen from the behaviour based on data on the incidence of DM in 2019 in January-June, which was 491 people.

Based on the results of the pre-post test family knowledge research, it was found that from the proportion of respondents studied there was an increase in knowledge from before being given health education on DM management with poster media after being given. Judging from the average value, there is an increase between the pre and post values. This data illustrates that respondents can receive information received through health education or health education with poster media, which is one of the most effective learning media to help respondents understand health education materials.

Based on the results of the pre-post test family knowledge research, it was found that from the proportion of respondents studied there was an increase in knowledge from before being given health education, DM management with poster media after being given. Judging from the average value, there is an increase between the pre and post values. The data illustrates that respondents can receive information received through health education or health education using posters, which are one of the most effective learning media to assist respondents in understanding health education materials.

The results of this study are in line with the results of previous studies of Ulya *et al.,* (2018) where the difference in the increase in knowledge scores of hypertension management, this study shows that knowledge scores on hypertension management in the control group and the intervention group both experienced an increase after being given treatment. However, there was a significant difference in the increase in knowledge scores between the intervention group and the control group.

Based on the theory of Nola J Pender et. al., (2006) regarding behavior change, increasing knowledge can increase self-awareness for healthy living, change an unhealthy lifestyle to be healthy, adhere to therapy and live a more quality life. According to the assumptions of the researchers, the level of knowledge possessed by the family is in the sufficient category, but in terms of application, there are still gaps. So, increasing the respondent's knowledge is one of the goals of health education to be achieved, but it cannot be separated from the behaviour that is generated by the respondents themselves.

Based on the research results, the proportion of respondents studied. The output for the Kolmogorov-Smirnov a normality test, the value for pre-test knowledge is obtained, the value of p> a, it can be concluded that the data is normally distributed. So, to find out whether there is a difference in knowledge before and after being given health education, DM management with poster media, a paired t-test is used. Based on the results of the research in table 4 regarding the description of family knowledge about DM management, the pre-test means the value has increased, using the T-Test and obtained p <a value, so it is concluded that there is an effect of DM management health education with poster media on increasing knowledge family based on the Nola J Pender Theory in the working area of the Tamalanrea Community Health Center in Makassar.

The results of this study are in line with research conducted previously by Ulya et al., (2018) where this study found differences in score increases in knowledge of management of hypertension, both the intervention group and the control group both experienced an increase after treatment. However, there was a significant difference in the increase in knowledge scores between the intervention group and the control group. This shows that health education through poster media is more effective in increasing knowledge compared to providing health education without using posters. The results of this study are by this theory. This research is also supported by the research of Yusnita and Nurmaria (2016) where the results of the dependent t-test in each group showed a value of p <a which means that each media showed a significant increase in student knowledge.

The results of this study are in line with the Nola J Pender theory, so several factors influence the increase in knowledge that cannot yet influence the life behaviour of sufferers and their families (Pender et al. 2006). According to the researcher's assumption that there is indeed an increase in

knowledge before and after being given health education on DM management with poster media, but the increase is not too significant then there are some samples whose knowledge remains. Increased knowledge, in this case, can be based on experience, contradicting the knowledge and perceptions of sufferers, individuals who do not care about the health and cultural problems, so that the incidence of DM still occurs and often increases.

Conclusion

The conclusion of this study was performed prevalence of DM management knowledge based on gender which shows that the prevalence of women is higher than men. In addition, the prevalence of respondents with knowledge of DM management based on the level of education shows that the highest education is at the college level. Furthermore, this study was found that from the proportion of respondents studied based on the results of the pre-post test family knowledge research which there was an increase in knowledge from before being given health education on DM management with poster media after being given. Based on this, it is concluded that there is an influence after being given DM management health education with media posters on increasing family knowledge based on the Nola J Pender theory in the working area of the Tamalanrea Public Health Center, Makassar City. In this case, the results of this study concluded that the data obtained after conducting research on the influence of health education management of DM with poster media on increasing family knowledge based on the Nola J Pender theory, that the respondents are knowledgeable in sufficient categories.

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