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Education Effectiveness of Booklet Media in Quality of Life of Diabetes Mellitus Type 2 Outpatients in Anwar Medika Hospital

(Efektivitas Edukasi Media *Booklet* terhadap Kualitas Hidup Pasien Diabetes Mellitus Tipe 2 Rawat Jalan di Rumah Sakit Anwar Medika)

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Abstract: DM management is expected to improve the quality of life of patients because the quality of life is the final result of each medical intervention; therefore, it becomes a standard of every succesful therapy. One of the improvements in quality of life can be done through education. In providing education, booklet method can be an effective way to deliver information about the activities problem. This study used one-group pre-test post-test design. This study aims to determine the quality of life before and after giving education to outpatients in Anwar Medika Hospital from November 2017 to January 2018 with sample of 109 patients. The measurement of quality of life improvement was measured by the Diabetes Quality of Life (DQOL) score which has 4 domains: satisfaction domain, the impact of DM concerns due to DM and physical, psychological and social concerns. Quantitative analysis carried out by the Wilcoxon signed rank test and showed that there are differences in quality of life with significance of 0.000 ($p < 0.005$) from each domain. Therefore, it can be concluded that, education could impact an important role on improving quality of life.

Keywords: Education, booklet, quality of life.

Abstrak: Penatalaksanaan DM diharapkan dapat meningkatkan kualitas hidup pasien karena kualitas hidup merupakan hasil akhir dari setiap intervensi sehingga menjadi tolak ukur keberhasilan terapi. Salah satu peningkatan kualitas hidup dapat melalui pemberian edukasi. Dalam pemberian edukasi, metode *booklet* dapat membantu penyampaian informasi terhadap permasalahan. Pada penelitian ini menggunakan *one-group pre-test post-test design*. Penelitian ini bertujuan untuk mengetahui kualitas hidup sebelum dan sesudah pemberian edukasi pada pasien rawat jalan RS Anwar Medika dari November 2017-Januari 2018 dengan sampel 109 pasien. Pengukuran peningkatan skor kualitas hidup diukur dengan skor Diabetes *Quality of Life* (DQOL) yang memiliki 4 domain yaitu domain kepuasan, dampak DM, kekhawatiran karena DM dan kekhawatiran fisik, psikologi dan sosial. Analisis kuantitatif dilakukan dengan menggunakan uji Wilcoxon *signed rank* yang menunjukkan terdapat perbedaan nilai kualitas hidup total dengan signifikansi sebesar 0,000 ($p<0,005$) dari masing-masing domain sehingga dalam hal ini edukasi dapat berperan penting dalam peningkatan kualitas hidup.

Kata kunci: Edukasi, *booklet*, kualitas hidup

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INTRODUCTION

DIABETES mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia due to decreased insulin secretion, insulin action, or both[1]. WHO predicts an increase in diabetes sufferers by 2-3 times in Indonesia, which is 8.4 million sufferers in 2000 to 21.3 million in 2030. This is in line with the opinion of the International Diabetes Federation (IDF) that predicts an increase in DM patients in Indonesia in 2035 to reach 14.1 million[2].

Based on the 2012 Hospital's annual report in East Java, the second highest number cases of outpatients in government public hospitals type B and C are diabetes type 2[3]. Generally, diabetes mellitus type 2 occurs when lifestyle patterns and behavior have been formed. Handling people who suffers from diabetes type 2 requires active participation from patients, families, and the community. Healthcare team accompanies every patient in their progress of healthy behavioral life changes. In order to achieve successful behavior change, comprehensive education and efforts to increase motivation are needed. Poor management DM can decrease the quality of life. Therefore, education needs to be given to improve patient self-management. Education also can help to improve the quality of life within patient mental health by reducing anxiety and depression[4].

Diabetes related education has been an important component of diabetes management since 1930. Education for patients with diabetes type 2 aims to regulate glycemic control, prevent microvascular and macrovascular complications and improve the quality of life by influencing knowledge, attitudes, behavior to be healthy[5]. On the treatment process of outpatient with time limitation it is necessary to have media to assist the implementation of education such as booklets. Educational material of early level in booklets can be DM pathophysiology, blood sugar control, pharmacological interventions, non-pharmacology, and management of hypoglycemia.

A study conducted by Faria *et al*. (2012) stated that the quality of life of people with diabetes mellitus before and after given an education showed significant results ($p < 0.005$). According to Rubin and Peyrot[6], the quality of life is a health result which is important for life, represents the ultimate goal of all health interventions so it is important to conduct research related to the effectiveness of education in the effort of changing the quality of life for patients with diabetes type 2 in Anwar Medika Hospital.

MATERIALS AND METHODS

METHOD. This research uses one-group pre-test post-test design. The research was conducted at Anwar Medika General Hospital, Krian Sidoarjo.

Research Instruments. The quality of life research instruments used Diabetes Quality of Life (DQOL) questionnaire that has been validated and reliable. The validation of questionnaire related to it language and how accurate it will able to be delivered to people is necessary and it validated by some expert opinion, expert examined the content of questionnaire, and they checked and decided whether the qustionnaire meet the domain and easy to understand or not. After the questionnaire being approved, researcher done the construct validity toward 20 patients in Anwar Medika Hospital then the data being processed used SPSS Program.

The question consider as valid if they have probability value of [sig. (2-tailed)] < significant value (α) 0.05 and it correlation can be seen by P*earson correlation* while questionnaire consider as reliable if *Croanbach's Alpha* > 0.7. Validity test produced 30 questions valid with the r value > 0.444 and reliability 0.967. Thus, this questionnaire has 30 questions with positive and negative questions. DQOL has 4 domains, namely satisfaction; impact of DM; worries about DM; concerns about physical, psychological, and social. The questionnaire was modified by Tyas from Munoz and Thiagaraj. Answers uses a Likert scale where positive questions on satisfaction, scale: 4 = very satisfied; 3 = satisfied; 2 = not satisfied; 1 = very dissatisfied. For positive questions about the scale's impact: 1 = never; 2 = rare; 3 = often; 4 = at any time. Meanwhile for negative questions has a score, namely: 4 = never; 3 = rare; 2 = often; 1 = at any time. The validation results show r > 0.444 with a reliability of 0.967 in 20 patients. Category data from the quality of life questionnaires are low, medium, and high ranges, by searching for mean values and standard deviations (SD) then analyzed by descriptive method.

Sample. Sampling was conducted by consecutive sampling method; in this method each patient who meets the criteria was included into the study until a certain period of time, therefore the numbers of required patients are fulfilled. The number of samples in this study is 109 obtained by the Slovin formula because the population in this study was known. Inclusion criteria, consist of diabetes mellitus type 2 patients from November 2017 to January 2018 with an age range of 18-60 years, able to communicate, with or

without complications. And for exclusion criteria were patients with diabetes mellitus type 1, who has other disease that burdened diabetes type 2, pediatric and geriatric diabetes were unable to communicate. Drop out criteria is patients who were loss contact or died.

Procedure. On the first meeting, patient was given an information concern and DQOL pre-test questionnaires. On the second, third, and fourth meeting, patient obtain an education for 15 minutes personally by researcher while they are waiting their turn to take the medicine in outpatient pharmaceutical installation Anwar Medika Hospital with booklet that has been examined by *National Institute of Diabetes and Digestive and Kidney Diseases*[7]. However, those booklet has been modified based on the first educational material from *Consensus on the Management and Prevention of Diabetes Mellitus Type 2 in Indonesia*[1].

The meeting of education done during their weekly check up. The educated material has different content every meeting. On second meets, the material regarding the education of lab result and something related to the diagnosis of DM type 2, DM pathophysiology, DM medicine knowledge, and its implementation when hypoglycemia happen. On the third meeting, the material provided was regarding therapy of non pharmacology and the fourth meeting, the material provided was regarding complication. Post-test done in fifth week, the patient have their DQOL in outpatient pharmaceutical installation of Anwar Medika Hospital.

RESULT AND DISCUSSION

Demography. Based on Table 1, it was found that most people with DM were at the age above 45 years old. This is consistent with the study of Smeltzer *et al*., who states that the majority of patients with diabetes type 2 mostly experienced by people around 40 years old and over. Because at the age of 40 years old and above, the insulin retention in diabetes type 2 will increase beside their history of heredity and obesity[7]. According to Gratia (2013) there is a relationship between age and incidence of DM type 2 which is, at the age of > 45 years old has higher risk of developing diabetes type 2 than the age under 45 years old. The older a person, the more physiological function of the organs will decrease, one of them is the endocrine system, decreased function of pancreatic beta cells to produce insulin. Moreover, in older individual there is a decrease in mitochondrial activity in muscle cells by 35%.

Table 1. Demographic characteristics of research subjects.

	Variable		Sum	%
1.	Age	26-35	2	1.8
		36-45	8	7.3
		46-55	57	52.3
		56-65	42	38.5
2.	Gender	Male	45	41.3
		Female	64	58.7
3.	Occupation	Pension	5	4.6
		Housewife	53	48.6
		Entrepreneur	17	15.6
		Civil servant	5	4.6
		Private employee	16	14.7
		Others	13	11.9
4.	Education	Low (SD-SMP)	66	60.6
		Medium (SMA-DIII)	18	16.5
		Higher (S1-S2)	25	22.9
5.	Period of suffering	< 10 years	85	77.1
		> 10 years	24	22.9
6.	Complication of DM	No	65	62.4
		Yes	44	37.6

That case related to an increase of fat levels in the muscles by 30% and cause resistance of insulin[8]. By the gender characteristics, mostly patients of diabetes type 2 are women within the percentage of 58.7%, this is in line with Adikusuma research (2010) which states that women are more suffered from type 2 diabetes, this is also supported by research in the United States which indicated that the patient of diabetes type 2 mostly women, because physically, women tend to have bigger opportunity to increase her body mass index, excessive fat deposits inside the body will cause a resistance[9].

Postmenopausal women condition after the ovary stops producing hormones, the estrogen hormone produced exclusively from androstenedione by the adrenal gland and encounter aromatization to estron in the process of converting peripheral extraglands. Mainly, this transformation occurs in fat tissue, thus it causes postmenopausal women have more fat tissue and changes in her body composition in. Fat accumulation of visceral, which is mainly central abdominal fat in menopausal women, affects the production of reduced adiponectin protein. Adiponectin works by making body cells more sensitive to insulin action. Low serum adiponectin levels are associated with insulin resistance conditions that can increase blood glucose levels and eventually develop into diabetes mellitus type 2[10].

The results showed that 48.6% of patients consist of housewives. Patients admitted, they are only stay

at home, only doing necessary activities and watching TV. Therefore, it reduced their activity. Beside, they rarely doing any excercise, patients who only doing small activity tend to have greater risk of developing diabetes mellitus, this was supported by research conducted in 13 European countries by Balkau *et al.* (2008). The study states that physical activity in daily life is the main factor that determines insulin sensitivity, so the less activity they carried out, the less insulin sensitivity, it causes a risk of causing DM type 2.

On education category, the higher results are elementary school with 60.5%. Minimum education system will lead into a lack of understanding regarding the risk factors for diabetes type 2, and this is in line with the research of Dedi Irawan (2010) which states that education levels have an influence on DM type 2[(11)]. The higher education level, the better knowledge they got to prevent diseases including DM type 2. Suffering period of diabetes mellitus in this study 77.1% were at <10 years this is likely to cause 62.4% have no complications. Duration of DM is counted from the beginning of the patient being diagnosed by the doctor having DM type 2. According to Issa & Baiyewu (2006) that the quality of life in DMs type 2 patients in Nigeria experiences a better quality of life with the period of having DM under 8 years[(12)].

Education Effectiveness to The Quality of Life. The results of total quality of life before and after education showed significant results with $p < 0.005$ (Table 2). The quality of life questionnaire had 30 questions with 4 domains which was positive satisfaction, positive and negative DM impacts, negative DM concerns, and negative physical, psychological, and social concerns. From four overall domains, it showed significant of $p = 0.000$ (Table 2).

On questions of satisfaction domains, the value of a low classification question found in DM knowledge, satisfaction, and satisfaction of sleep quality (Table 3). Knowledge of diabetes mellitus type 2 patient is important to be improved because patients who get adequate knowledge will improve their understanding and it will affect their behavior. According to Bloom's theory, to change the attitude of patients due to education, the patient must experience the stages from knowing to understanding that have an impact on behavior changes therefore to obtain a better attitudes continuity education should be given.

On the question of quality of sleep satisfaction obtain low points because someone who suffers from diabetes mellitus type 2 usually feels discomfort due to symptoms or signs of the disease that affects patient's sleep quality. On the case of patients with

Table 2. The difference result of pre-test and post-test on quality of life.

Variable	Statistic	
	Z	Asymp. Sig. (2-tailed)
1. Total post-test QOL and total pre-test QOL	-9.065[b]	0.000
2. Post-test satisfaction domain and pre-test satisfaction	-9.032[b]	0.000
3. DM effect post-test domain and DM effect pre-test domain	-9.071[b]	0.000
4. DM concern post-test domain and DM concern pre-test domain	-8.646[b]	0.000
5. Physical, mental, and social worries post-test domain and physical, mental, and social worries pre-test domain	-8.555[b]	0.000

a. Wilcoxon signed ranks test
b. Based on negative ranks

Table 3. Average results of pre-test and post-test satisfaction test based on DQOL questionnaire question.

No	Question	Average of pre-test (x)	Category	Average of post-test (x)	Category
1	Satisfaction	2.368	Medium	2.985	High
2	DM Effect	2.517	Medium	3.284	High
3	DM Concern	2.449	Medium	3.495	High
4	Physical, mental, and social worries	2.491	Medium	3.573	Medium
5	Satisfaction of DM knowledge	2.119	Low	2.835	Low
6	Quality of total sleep	2.193	Low	2.872	Low
7	Satisfaction to a social relation	2.651	High	3.037	Medium
8	Sense about social activity	2.486	Medium	2.954	Medium
9	Satisfaction in daily activities	2.257	Medium	2.954	Medium
10	Sense about performance	2.550	High	3.018	Medium
11	Satisfaction of time doing exercise	2.394	Medium	2.917	Medium
12	Satisfaction of relaxing time	2.394	Medium	3.082	High
13	Satisfaction to the whole of life	2.220	Low	3.064	Medium

Table 4. Average results of pre-test and post-test domains impacts of DM based on DQOL problem.

No	Question	Average of pre-test (x)	Category	Average of post-test (x)	Category
14	Sense of pain	2.303	Medium	3.083	Medium
15	Shame sense because of DM	3.101	High	3.725	High
16	Normal blood sugar	2.669	Medium	3.321	Medium
17	Unable to sleep at night	2.312	Medium	3.174	Medium
18	Boundary to friendship	2.936	High	3.596	High
19	Total good feeling	2.303	Medium	2.927	Low
20	Being limited by diet	2.523	Medium	3.312	Medium
21	Boundary of exercising because of DM	2.615	Medium	3.312	Medium
22	Unable to do activities	2.394	Medium	3.339	Medium
23	Relaxing activity is disturbed because of DM	2.385	Medium	3.468	Medium
24	Able to tell about DM to others	2.431	Medium	3.128	Medium
25	Frequently going to the bathroom	2.229	Low	3.027	Low

Table 5. Average results of pre-test and post-test domain concerns due to DM based on DQOL questionnaire questions.

No	Question	Average of pre-test (x)	Category	Average of post-test (x)	Category
26	Fear of passing away	2.358	Medium	3.495	Medium
27	Fear of body looking different	2.761	High	3.633	High
28	Fear of occurring complication	2.229	Medium	3.358	Medium

Table 6. Average results of pre-test and post-test domain physical, psychological, and social concerns based on DQOL questionnaire questions.

No	Question	Average of pre-test (x)	Category	Average of post-test (x)	Category
29	Fear of losing job	2.367	Medium	3.495	Medium
30	Fear of being unable to go far or travelling	2.615	High	3.651	High

neuropathy complications, extreme pain is a symptom which causes patients to wake up frequently. This is a common complaint in patients with diabetes mellitus type 2, especially in chronic patients with poor glucose control[13]. Beside the pain, sleep disorders also caused by nocturia at night which interferes with sleep and patient the sleep cycle. If blood sugar levels above 160-180 mg/dL, glucose will reach urine. If the levels are higher, the kidneys will throw excessed water away to dilute a large amount of lost glucose. Because the kidneys produce excessive amounts of urine, patient often urinate in large amounts. Thus, patient will feel excessively thirsty; and this condition will disturb patient's sleep at night because they often wake up just want to drink[13].

On the questionnaire domain regarding the impact of DM, the lowest score on the question whether the patient feels good and about the feeling of going to the bathroom more often than normal people (Table 4), for good feelings the results of the study showed that patient has a low score because according to Noerhayati (2014) bad quality of life is experienced by people with DM type 2 and their perception about thir disease has not showing any improvement or recovery. This related to negative feelings about DM type 2 that suffered by patient, based on the theory (King & Hinds, 2007) a decrease in physical function for patients with DM will indirectly affect their psychological state such as the emergence of feelings of sadness, disappointment, anxiety, and depression and that will reduce their happiness[14]. Patients who have negative feelings such as despair, anger, shame, and feel they do not care about improving their health, will affect their quality of life[14].

Regarding the questions about necessary of going to the bathroom more often than normal people is caused by one of the symptoms from DM called polyuria. Polyuria occurs because blood glucose increases and exceed the absorbency of the kidneys, and it causes osmotic diuresis. The characteristic of glucose is inhibit the water reabsorption by kidney tubules and it causes the large amounts of water expense along with glucose in form of urine[15].

In the domain of concern regarding DM type 2, lower score come from the questions of the worries on complications (Table 5). Patients feel that the disease can be worse and causing other additional disease. According to Nugroho and Purwanti (2010) patients who know that they are diagnosed with diabetes mellitus will be worry of what happen in the future

on their life. Furthermore, this condition causes an anxiety that can eventually cause stress and can be worsen the condition of Diabetes Mellitus[16]. While in the domain of concern for physical, psychological, and social aspects, the lowest results occur on the question regarding job loss (Table 6). Diabetes Mellitus gives psychological effect and physiological as well. On physical concern, patient can be stress on managing their self such as diet, physical activity, recovering the symptoms, and treatment. On psychological concern, patient can be stress of rejection, worry, feelings helpless and had a bad stigma about disease[17]. Patients in this study experienced a fear of their physical abilities will be reduced. Therefore, they choose to not carry out a hard activity such as work and ofcourse it will influence their loss of job regarding their feeling of DM type 2. It will affect their physical and their amount of activities.

CONCLUSION

Based on the explanation regarding diabetes mellitus type 2 and their effect on physical and psychological, and the importance of education system for diabetes mellitus type 2 patients to prevent their bad impact on health, it can be concluded that applying one of method which is booklet method will give a significant difference on before and after doing the intervention.

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