

The Influence Of Diabetes Self Management Education On Stress Level Of Diabetes Mellitus Patient In Area Puskesmas Cempaka Banjarmasin

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ABSTRACT

Objective : To analyze the effect of DSME (Diabetes Self Management Education) on stress level of Diabetes Mellitus patient in area of Cempaka Public Health Center (Puskesmas) Banjarmasin.

Method : This study used pre-experimental design with one group pretest-posttest design. The sample used 15 people who live in area of Cempaka Public Health Center Banjarmasin. Data was analyzed using Wilcoxon test with a confidence level of 95%.

Results : Result showed a difference stress level in Diabetes Mellitus patients before and after treated by DSME. Therefore it means that there was significant effect of DSME on stress in Diabetes Mellitus patients ($p=0,001 < \alpha 0,005$).

Conclusion : Self- management education affected to stress level of Diabetes Mellitus patients after treated four weeks.

Keywords : Diabetes Mellitus, pretest-posttest design, Self- management education, Stress level.

I. INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder that causes blood glucose levels to increase as a result of damage to the synthesis of pancreatic beta cells or insulin secretion, or inability of tissues to use insulin [1]. Although developments in medicine and pharmacology have significantly advanced the treatment and management of diabetes in recent years, in clinical practice optimal diabetes control remains difficult to achieve and numerous studies have documented that suboptimal control of blood glucose, blood pressure and

lipids remains common in people with diabetes.

Diabetes Mellitus is divided into two types: DM type 1 and type 2. Type 1 DM or Insulin Dependent Diabetes Mellitus (IDDM) is caused by a lack of insulin secretion whereas DM type 2 or Non Insulin Dependent Diabetes Mellitus (NIDDM) is caused by reduced sensitivity of target tissue against Effects of insulin metabolism or called insulin resistance. Diabetes is a common, specially the condition associated with significant morbidity and mortality [2]. Recent studies have found dramatic increases in diabetes

during the last decade [3]. Diabetes self-management education (DSME), the process of teaching individuals to manage their diabetes, has been considered an important part of the clinical management of individuals with diabetes since the 1930s and the work of the Joslin Diabetes Center [4].

According to International Diabetes Federation (IDF) data, 2014 the prevalence of DM in the 40-59 year age group worldwide reaches 387 million people by 2014. This number is expected to increase to 592 million by 2035. IDF (2014) There are 9,1 million cases of DM in Indonesia. After India, China and the United States, Indonesia ranked 4th in 2010 with DM patients of 8,4 million people and is estimated to increase to 21,3 million by 2030 [5].

Based on national basic health research (RIKESDAS, 2013) the prevalence of diabetes mellitus incidence in Indonesia is at 2,1%. The highest prevalence of diabetes mellitus at age > 15 years. The highest prevalence of diabetes mellitus is Central Sulawesi (3,7%), North Sulawesi (3,6%) and South Sulawesi (3,4%). While the lowest is in Lampung Province (0,8%), then Bengkulu and West Kalimantan (1%) and Central Kalimantan (1,5%), and South Kalimantan (1%), Indonesia [6].

Increasing the number of patients with DM caused by several factors, such as heredity, obesity, indiscriminate diet, lack of exercise, drinking drugs that affect blood sugar, smokers, and stress. Increased diabetes

mellitus patients will have an impact on the psychological patient. One of the psychological impact is stress. Patients with diabetes mellitus will have higher levels of stress and if their stress increases then the patient's glycemic control will also worsen [7].

According to research from Wohpa (2015), often diabetic patients get stressed because many say that the disease is difficult to cure, and if the patient wants to recover it, she or he must be able to change his or her lifestyle with a strict diet so that patients will feel that his condition is difficult to recover. Stress and diabetes mellitus have a close relationship because stress is a psychic condition that can be experienced by patients with diabetes mellitus in order to decrease the awareness of the patient in managing the disease and may exacerbate the patient's glycemic control [8].

American Diabetes Association (ADA), 2015 mentions that one of the health education efforts that can be done is to use Diabetes Self-Management Education (DSME). DSME is an ongoing process used to assist in facilitating the knowledge, skills and abilities of DM clients to perform self care [9]. The goal of DSME is to support patients in making decisions, behaviors in self-care, problem solving and active collaboration with health teams to improve the quality of life and health status of patients [10]. The goals of self-management education are to optimize metabolic control, prevent

acute and chronic complications, and optimize quality of life, while keeping costs acceptable [11]. There are significant knowledge and skill deficits in 50–80% of patients with diabetes [12], and ideal glycemic control (HbA1c <7%) [13] is achieved in less than half of individuals with type 2 diabetes [14].

Preliminary studies conducted by researchers at the Banjarmasin City Health Office The case of diabetes mellitus in Banjarmasin in 2014 amounted to 5022 cases and in 2015 totaled 7708 cases. *Puskesmas Cempaka* was in the first with the incidence of diabetes mellitus in 2015 with 2001 cases.

The objective of this study was to evaluated influence of Diabetes Self Management Education (DSME) on stress level of Diabetes Mellitus Patient in area of *Puskesmas Cempaka Banjarmasin*.

II. METHODS AND PROCEDURES

The research used pre-experimental design, with one group pretest-posttest design. This type of research was to reveal causal relationships by involving a group of subjects. Subject groups were observed prior to intervention, then re-observed after intervention. In the study, researchers measured the level of stress before the intervention, after which given the intervention, then posttest by re-measured stress levels that exist.

The population used was people with diabetes mellitus who were in the area of *Puskesmas Cempaka Banjarmasin*. The

sampling technique used was purposive sampling and the number of samples was 15 people who have met the inclusion and exclusion criteria.

The study used the instrument in the form of questionnaires. The questionnaire used was Diabetes Disease Scale (DDS) [15]. Assessment of the severity of stress was assessed by calculating the average value of the scores that have been collected that is by summing up the score of each item statement then divided by 17. The minimum value was 1 and the maximum value was 6. If the average value of less than 2 was categorized as stress Mild or non-stressful, if the mean score of 2-2,9 was categorized as moderate stress, and if the mean value was equal to or greater than three was categorized as severe stress [16].

III. RESULTS

a. Level of stress before Diabetes Self Management Education was given

Table 1. Stress level before Diabetes Self Management Education was given

Stress Level	F	%	Mean	Median	Mode	Max	S.D
Low	2	13,3	2	2	1	3	0,5
Medium	10	66,7					
High	3	20					
Total	15	100					

Level of stress before DSME was given most respondents have medium stress was 10 people (66,7%), high stress 3 (20%) and low stress 2 (13,3%). So the average value of respondent stress before given DSME is 2 (medium moderate).

b. Level of stress after Diabetes Self Management Education was given

Table 2. Stress level after

Stress Level	F	%	Mean	Median	Max	S.D
Low	12	80	1,2	1	2	0,4
Medium	3	20				
High	0	0				
Total	15	100				

Level of stress after DSME was given, most respondents have low stress level 12 people (80%) and with medium stress 3 (20%). It showed that the average value of stress respondents after given DSME is 1,20 (medium stress).

c. Stress Levels Before and After DSME was given to Patients.

Table 3. Levels of Stress Before and After Treatment with DSME and tested by Wilcoxon

Stress Level	Before DSME		After DSME		P
	F	%	F	%	
Low	2	13,3	12	80	0,001
Medium	10	66,7	3	20	
High	3	20	0	0	
Total					

Respondents who have medium stress level before being given DSME were 10 people and decreased to 3 DSME and respondents who have high stress level before given DSME was 3, all decreased stress level. Obtained p value with $Asymp.Sig= 0.001$ data statistically has meaning ($Asymp.Sig. < 0,05$), H_a was accepted which means there was influence from DSME to stress level in Diabetes Mellitus patient in area *Puskesmas Cempaka Banjarmasin*.

III. DISCUSSION

Stress level before treatment with DSME had medium stress and after treated by DSME had low stress. It match to the Wohpa (2015) study that generally diabetics get stressed out of fear of complications, changes in lifestyle status of the economy and environment to be experienced, and long-term treatment [7]. These programs were delivered in either individual or group sessions, and their content was determined by the educator. Three meta-analyses, seven primary studies and seven systematic reviews were identified. The literature consistently supported patient education as a component of diabetes care. From the meta-analyses the following observations were made: lower quality studies tended to produce higher effect sizes; knowledge and skill performance was more improved in patient education programs of longer duration; knowledge and skill effects continued to improve over the longer term (to at least 1 year), however weight loss improvements depleted over the same time period; improvements in metabolic control peaked at between 1 and 6 months and then declined after 6 months, the opposite trend occurred with psychological outcomes; effect sizes for knowledge and disease status were smaller for those over the age of 40 compared to younger patients [17].

It was due to the quite good coping mechanism [18]. Stress and Diabetes Mellitus have a very close relationship especially in urban populations. The pressure of life and

unhealthy lifestyle is very influential, coupled with the rapid technological advances and various diseases that are suffered cause a decrease in a person's condition to trigger the occurrence of stress [19]. However, stress can be prevented or mitigated through good management. In line with the study of Maghfirah (2015) which states that the decrease of stress level in Diabetes Mellitus patient after progressive muscle therapy given by nurse is one form of educative support, that is assistance system given so that patient able to do self care independently [20].

Stress level after has been given by DSME (table 2), 12 people were experiencing changes in stress levels because they were able to understand and follow well when given DSME for four times in a row. While 3 people had the same level of stress before DSME and after DSME. It was in line to the proposed by the American Diabetes Association (2015) that DSME has a positive effect on the clinical, psychosocial, and behavioral aspects of diabetes. DSME is reported to reduce the incidence and / or development of diabetes complications, improve quality of life and lifestyle behaviors such as having a healthier diet and engaging in regular physical activity, self-efficacy and empowerment, enhancing healthy coping, and reducing diabetes-related distress and depression.

Diabetes Self-Management Education (DSME) is one of the most advanced diabetes management methods by facilitating

knowledge, and skills. One aspect which plays an important role in the management of diabetes mellitus is education. Education to diabetes patients is important as a first step in controlling diabetes. One form of education that is commonly used and proven to be effective in improving the clinical outcome and quality of life of diabetic patients is Diabetes Self Management Education (DSME) [21].

The health education approach using the DSME method is not only a direct or indirect method of counseling but has been developed by encouraging the participation and cooperation of diabetics and their families. This method is necessary in diabetics since the traditional method of putting the patient on a passive role is no longer sufficient to capture the complexity of the treatment and the nature of the disease that requires not only the health worker but also the patient's active role in Care [22].

Administration of DSME may alter patient behavior through information provided to patients. Providing information to patients is a stimulus that can increase knowledge, thus raising awareness to behave in accordance with the expected so that it can change the patient's psychological status. DSME grants can yield results that are short-term, medium-term outcomes, and long-term outcomes. Short-term outcomes include glycemic control, physical control, lifestyle modification, and mental status control. Medium term outcomes include increased

knowledge, skills, psychological status, and utilization of health care facilities [21]. Norris et al. have conducted the most extensive reviews of the evidence for the effectiveness of self-management education in diabetes. Norris et al. [23] conducted a systematic review of randomized controlled trials (RCTs) for the effectiveness of self-management training in type 2 diabetes. Seventy-two studies, reported in 84 articles were included, the purpose of the interventions were broadly categorized as knowledge/information, lifestyle behaviours, skill development and coping skills. Where follow-up self-management training was associated with improvements in knowledge, frequency or accuracy of blood glucose self-monitoring, self-reported dietary habits and glycaemic control. Variable effects were reported for lipids, physical activity, weight and blood pressure. In studies with longer follow-up, interventions using regular reinforcement were sometimes more effective in improving glycaemic control. The studies showed no evidence of effectiveness for disease-related events or mortality.

Obtained sig. value (table 3) which means the influence between stress levels before and after given DSME. This is in line with those described in Rahmawati (2016) that the DSME has an effect on increased knowledge, increased diet, increased physical exercise, increased pharmacological therapy and increased blood glucose monitoring in Diabetes Mellitus patients [21]. DSME can

also improve knowledge, attitudes, self-management practices and receiving glycemia [24].

DSME interventions also have a positive impact on the quality of life and mental health of diabetics [25], and research from Rahayu (2014) states that education with the principle approach Diabetes Self Management Education (DSME) can improve the quality of life in people with Diabetes Mellitus [1]. This is also consistent with the results of Marina's research (2016) which states that there are significant differences in stress values between treatment groups and control groups after being given DSME, as evidenced by the value of $p < \alpha$ (p value = 0.001) [9]. It can also be an additional reference for reducing stress levels in Diabetes mellitus patients by providing education in Diabetes Self Management Education conducted continuously for four meetings within four weeks. Further research is needed to better define effective interventions for reducing GHb in persons with diabetes, particularly interventions aimed at long-term maintenance of initial behavior change.

V. CONCLUSION

DSME has been effective in controlling and stabilizing stress levels to people with Diabetes Mellitus.

REFERENCES

- [1]. Rahayu Eva. Pengaruh program diabetes self management education berbasis keluarga terhadap kualitas hidup penderita Diabetes Melitus Tipe II di wilayah Puskesmas Baturraden. *Jurnal Keperawatan Soedirman*, 2014, 9 (3).
- [2]. U.S. Department of Health and Human Services: National diabetes fact sheet [article online], 2002. Available from www.cdc.gov/diabetes/pubs/factsheet.htm. Accessed 14 May 2002.
- [3]. Mokdad AH, Ford ES, Bowman BA, Nelson DE, Engelgau MM, Vinicor F, Marks JS: Diabetes trends in the U.S.: 1990–1998. *Diabetes Care*, 2000, 23:1278–1283.
- [4]. Bartlett E: Historical glimpses of patient education in the United States. *Patient Educ Counsel*, 1986, 8:135–149.
- [5]. International Diabetes Federation. *IDF Diabetes Atlas Sixth Edition*. [serial online] https://www.idf.org/sites/default/files/EN_6E_Atlas_Full_0.pdf, 2014.
- [6]. Riset Kesehatan Dasar (RISKESDAS). Jakarta Badan Penelitian dan Pengembangan Kesehatan, Departemen Kesehatan, Republik Indonesia, 2013.
- [7]. Wohpa, Purwanti OS, Yulian V. Description And Management Of Stress Of Diabetes Mellitus Patients In Internal Disease Polyclinic Dr. Moewardi General Hospital. Surakarta: Universitas Muhamadiyah Surakarta. 2015.
- [8]. Marina S W. Pengaruh Diabetes Self Management Education and Support (DSME/S) terhadap stress pada pasien Diabetes Melitus Tipe 2 di Wilayah Kerja Puskesmas Patrang Kabupaten Jember [Skripsi]. Universitas Jember. 2016.
- [9]. Funnell M. National Standards for Diabetes Self Management Education. *Diabetes Care*, 2008, Volume 31 Supplement 1: p. S87-S94.
- [10]. Haas, L., *et al.* National Standards for Diabetes Self-Management Education and Support. *Diabetes Care*, 2012, Volume 35: p. 2393-2401.
- [11]. de Weerd I, Visser A, van der Veen E: Attitude behavior theories and diabetes education programmes. *Patient Educ Counsel*, 1989, 14:3–19.
- [12]. Clement S: Diabetes self-management education. *Diabetes Care*, 1995, 18:1204–1214.
- [13]. American Diabetes Association: Standards of medical care for patients with diabetes mellitus (Position Statement). *Diabetes Care*, 2001, 24 (Suppl. 1):S33–S43.
- [14]. Harris MI, Eastman RC, Cowie CC, Flegal KM, Eberhardt MS: Racial and ethnic differences in glycemic control of adults with type 2 diabetes. *Diabetes Care*, 1999, 22:403–408.
- [15]. Polonsky, W. H., *et al.* Assessing Psychosocial Distress in Diabetes.

- Diabetes Care*. 2005, Vol. 28 (3): 626-631.
- [17]. Campbell E, Redman S, Moffitt P, Sanson-Fisher R: The relative effectiveness of educational and behavioral instruction programs for patients with NIDDM: a randomized trial. *Diabetes Educ*, 1996, 22:379–386.
- [18]. Clark M. Diabetes self-management education: A review of published studies. *primary care diabetes*, 2008, 2: 113–120.
- [19]. Izzati, W & Nirmala. Hubungan Tingkat Stres Dengan Peningkatan Kadar Gula Darah Pada Pasien Diabetes Mellitus Di Wilayah Kerja Puskesmas Perkotaan Rasimah Ahmad Bukit tinggi, 2015, 1-7.
- [20]. Derek. Hubungan Tingkat Stres Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus Tipe Ii Di Rumah Sakit Pancaran Kasih Gmim Manado. *e-Journal Keperawatan (e-Kp)*. 2017, 5 (1).
- [21]. Maghfirah. Relaksasi Otot Progresif Terhadap Stres Psikologis Dan Perilaku Perawatan Diri Pasien Diabetes Mellitus Tipe 2. *Jurnal Kesehatan Masyarakat*, 2015, 10 (2): 137-146.
- [22]. Yuanita. Pengaruh Diabetes Self Education Terhadap Resiko Terjadinya Ulkus Diabetik Pada Pasien Rawat Jalan Dengan Diabetes Melitus Tipe 2 di RSUD dr. Soebandi Jember. *e-Jurnal Pustaka Kesehatan*, 2014, 2 (1).
- [23]. Rahmawati. Pengaruh Program Diabetes Self-Management Education Terhadap Manajemen Diri Pada Penderita Diabetes Mellitus Tipe 2. *Jurnal Ilmu Keperawatan*, 2016, 4 (1).
- [24]. S.L. Norris, M.M. Engelgau, K.M. Narayan, Effectiveness of self management training in type 2 diabetes: a systematic review of randomized controlled trials, *Diabetes Care*, 2001, 24 (3), 561–587.
- [25]. Ku GMV, et al. Effects Of The First Line Diabetes Care (Fildcare) Self Management Education And Support Project On Knowledge, Attitudes, Perceptions, Self-Management Practices And Glycaemic Control: A Quasi Experimental Study Conducted In The Northern Philippines. *BMJ. Open*, 2014,4.
- [26]. Sugiyama. Effect Of A Community-Based Diabetes Self management Empowerment Program On Mental Health-Related Quality Of Life: A Causal Mediation Analysis From A Randomized Controlled Trial. *BMC Health Services Research*, 2015, 15:115.