Self-Care Adherence Experience in Patient with Diabetes Mellitus Type 2: A Systematic Review

R.A. Gabby Novikadarti Rahmah, Anita Dewi Anggraini, Ika Endah Kurniasih and Ratri Ismiwiranti
Faculty of Nursing, Universitas Airlangga, Mulyorejo, Surabaya, Indonesia
r.a.gabby.novikadarti.rahmah-2017@fkp.unair.ac.id, anita.dewianggraini@gmail.com,
ikaendahkurniasih@gmail.com, ratri290386@gmail.com

Abstract: Background: Diabetes Mellitus is a metabolic disease that cause its patient need a long life maintenance. Diabetes Mellitus management in daily life is a complex activity and need an understanding about medicines, healthy diet, physical activities, and glycemic control. All those things is a personal responsibility of patient with Diabetes Mellitus Type 2. The objective of this systematic review was to describe the **s**elf-care adherence experience in patient with Diabetes Mellitus Type 2. Method: 15 best articles were found using PECOT framework in some databases; EBSCO, Science Direct, Scopus, and Journal of Universitas Airlangga. Those articles have been chosen based on some criteria. **R**esult: Self-care therapeutic regiment for patient with Diabetes Mellitus Type 2 are physical activities, diet, self-monitoring blood glucose (SMBG), and glycemic control. But most of respondents were disobey the therapy caused by various factors. Depression is one of the reason. Conclusion: Nursing intervention was needed to increase self-care adherence in patient with Diabetes Mellitus Type 2.

1 BACKGROUND

Diabetes Mellitus is a hyperglycemia disease characterized by absolute absence of insulin or a relative decrease in insensitivity of cells to insulin. In people with uncontrolled diabetes mellitus, there will be an increase in blood glucose (sugar), called hyperglycemia. Hyperglycemia that lasts for a long time will cause serious damage to our body system, especially on the nerves and blood vessels. Therefore, it is important to control glucose levels in the blood of Diabetes Mellitus patients. In the study of Yamashita, Kart, & Noe (2012) it was mentioned that the International Diabetes Foundation (IDF) in 2009 predicted an increase in the number of people with DM from 7 million in 2009 to 12 million by 2030. About 10% of adult Americans (age 20 years), or about 23.5 million adult Americans are diabetic, and 90 to 95% of them are people with type 2 Diabetes Mellitus.

Uncontrolled blood glucose levels in patients with diabetes mellitus will cause various complications, both acute and chronic. Diabetes Mellitus can be called "Long Life Disease" because it cannot be cured as long as the life span of the sufferer. So the patient requires "Long Life Maintenance" or long-term management. In his article Thompson (2014) revealed that diabetes management in everyday life is a complex activity and requires an understanding of medicines, a balanced diet, exercise, and blood sugar levels. Those are the personal responsibilities of a diabetic.

The success of a treatment, both primary and secondary, is strongly influenced by adherence of Diabetes Mellitus patients to maintain their health. With good adherence, primary and secondary treatment can be performed optimally and the quality of health can be felt. The reason is that if people with diabetes do not have self-awareness to be obedient then it can cause failure in treatment which resulted in the decrease of health. Even due to disobedience in maintaining health, can affect the complications of Diabetes Mellitus and can lead to death. This lifelong disease of Diabetes Mellitus demands a new lifestyle change and a diabetic must be able to adapt himself to undergo a lifelong change. The research question was how the experience of self-care adherence in patient with Diabetes Mellitus Type 2. The objective of this systematic review was to describe the **s**elf-care adherence experience in patient with Diabetes Mellitus Type 2.

2 METHODS

The method used in Systematic Review begins with the selection of the topic of Self-Care Adherence in Patient with Diabetes Mellitus Type 2. Then determined the keyword to search articles with several databases such as EBSCO, Science Direct, SCOPUS, and Journal of Airlangga University. Keywords used are "Diabetes Mellitus Type 2", "Self-Care", and "Adherence". This search was limited to the last 10 years range from 2007 to 2017. Found 111 articles in EBSCO, 40 in Science Direct, 63 in SCOPUS, and 8 in the Journal of Airlangga University.

Articles were selected for review based on studies that fit the inclusion criteria. The inclusion criteria in this Systematic Review are English and Indonesian articles, Self-Care in Diabetes Mellitus Type 2 patients, and the research design were Qualitative Study, Case Study, and Quasi Experiment. The 15 best articles reviewed.

3 RESULTS

3.1 Study Selection

Table 1 showed numbers of studies screened in this systematic review. The inclusion criteria were English and Indonesian articles, Self-Care in

Table 1: Literature search strategy

Searching tools - Database	EBSCO	Science Direct	SCOPUS	Journal of Universitas Airlangga
Results of searching	430	366	441	8
Full text, pdf, 2007-2017,	111	40	63	8
Similar titles	1	-	-	-
Eligible, suitable with the inclusion and exclusion criteria.	7	3	2	3
Final selected articles		15		

Diabetes Mellitus Type 2 patients, and the research design were Qualitative Study, Case Study, and Quasi Experiment.

3.2 Study Characteristics

The studies reviewed in this article are 15 articles for self-care adherence in Diabetes Mellitus Type 2 patients. Research methods used by various articles ranging from Qualitative Study (n = 10), Cross Sectional - Case Study (n = 3) and Quasi Experiment (n = 2). The total number of samples was 897 people.

3.3 Result of Individual Studies

3.3.1 Diabetes Mellitus Therapy Regimen: Physical Activity, Diet, SMBG, and Glycemic Control

Based on the review of the article, it can be argued that self-care therapy regimens for Type 2 Diabetes Mellitus in general are physical activity, diet, self-monitoring of blood glucose (SMBG), and glycemic control. However, most respondents did not adhere to the therapy regimen.

In Mogre, Abanga, Tzelepis, Johnson, & Paul (2017) research on Adherence and factors associated with self-care behaviors in Diabetes Mellitus Type 2 patients in Ghana stated that dietary compliance, Self-Monitoring of Blood Glucose, and foot care were very low . Self-care is often done by patients was the exercise and measurement of blood glucose by health workers. Only 1 patient performed routine SMBG every day, 13.9% checked their legs daily and 9.6% who checked their shoes every day. The low rate of adherence to self-care is due to a low level of knowledge. Patients with low knowledge and women may need additional support to improve adherence to self-care behavior in patients with Type 2 Diabetes Mellitus.

A similar case occurred in Chourdakis & Kontogiannis (2014) study, which stated that the majority of patients (75.7%) reported regular nutritional intake but were rich in fat. Most (90.3%) received prescribed medication, and 60.5% tested BG concentrations accordingly but only 27.1% of the study population reported daily BG levels. And only a third of patients are reported to have washed their feet every day for weeks. Thompson (2014) study found that there was a difference between personal and cultural activity that affects activity for diabetes management.

3.3.2 Supporting Factors: Family Support

One of the supporting factors for patients performing self-care is family support. As stated by Mayberry & Osborn (2012) that family support is essential in providing adherence effects to Type 2 Diabetes Mellitus patients. Costa (2012) in his research mentioned that partner and social-cognitive support is essential to adherence to SMBG in diabetic patients Mellitus Type 2.

Halkoaho (2014) study found that people with type 2 diabetes thought the source of coping in the management of diabetes mellitus was self-acceptance of disease, adherence to self-care, knowledge of disease, and support from various parties including nurses.

3.3.3 Inhibiting Factors: Individual Coping Ineffective

Many factors influence why patients with Type 2 Diabetes Mellitus do not do self-care. Based on the results of research Schwennesen, Henriksen, & Head (2016) obtained the results of personal reasons for the absence of Diabetes patients in Diabetes Self-Management Education (DSME) because of the disease and they feel this activity is less useful. While for external factors that affect Diabetes Type 2 patients do not follow Diabetes Self-Management Education is the location, time, and duration of Diabetes Self-Management Education.

This is in line with the results of the Gask, Ludman, & Schaefer (2006) study which says that obstacles in adherence to self-care of Diabetes Mellitus Type 2 patients are patient problems, difficulty in therapy, and inability to cope with the changes that occur after so long.

Research of Woodcock, Gillam, & Frcp (2013) get the results that patients knowing about the condition of the illness and the complications that will be experienced. Most say they are afraid of comatose complications. In addition, most have received adequate information about Diabetes Mellitus Type 2 from doctors and nurses, but there was still a misperception about the information so that patients do not undergo self-care well. Patients stated the importance of ongoing care to treat diabetes. Nurses and doctors play an important role for that. Angelica et al. (2016) mentions Diabetes Mellitus patients have knowledge of Diabetes management. However, the knowledge possessed is very superficial and not applicative in their routines.

3.3.4 Depression

Psychological variables are important because the belief in health, knowledge and behavior in Diabetes Mellitus patients will affect Diabetes Mellitus patients in controlling the disease. In the Tristiana, Kusnanto, Widyawati, Yusuf, & Fitriyasari (2016) study mentioned the results of interviews conducted on April 18, 2014 at the Mulyorejo health center, it was found that 3 out of 4 patients stated that the patient was saturated with the routine they were doing that caused the patient to disobey the pattern diet and physical activity undertaken. Two patients say despair of Diabetes Mellitus disease suffered, sometimes do not want to eat for fear of complications that will happen. A patient says to reduce the activity of gathering with his friends. A patient still would not accept if he was exposed to DM.

Qualitative research conducted by Kathleen M. Rayman (2004) suggests that as many as 43% of respondents are in the pre-engaged phase against Diabetes Mellitus suffered. In this class of respondents do not consider diabetes dangerous. They are not serious in performing self-care. They assume that diabetes care management is not difficult

Tristiana, Kusnanto, Widyawati, Yusuf, & Fitriyasari (2016) concluded that patients with type 2 diabetes undergo a transition process from healthy conditions to sick conditions. The transition process begins with a cyclic loss response that affects type 2 Diabetes Mellitus patients for self-control and makes decision-making rights for self-care. Self-control will make Diabetes Mellitus type 2 patients adapt and engage with new experiences of new habits for Type 2 diabetes patients. Self-Care will facilitate type 2 DM patients in adapting to internal and external environments and make DM type 2 patients have positive expectations in their life.

3.3.5 Self-Care Management-Holistic Psycho-spiritual Care

The long-term care that DM patients must undergo is very difficult to control effectively, so it is important to pay attention to the psychological aspects other than the physical aspects of Diabetes Mellitus Type 2 patients. To handle non-compliance in self-care patients can be done Self-Care Management-Holistic Psychospiritual Care, including the psychological and spiritual condition of Diabetes Mellitus Type 2 patients in performing self-care.

Kusnanto (2012) stated that statistic test result using Wilcoxon signed rank test and Mann Whitney u test obtained significant change value (p <0,05) related to Cognitive, Affective and Psychomotor (KAP) aspect in treatment group before and done interventions with the provision of self-care management-holistic psychospiritual care through self-contained diabetes module media. The results of the Independent-test obtained significancy value 0.000 (p <0.05) for 2 hours blood glucose PP and HbA1C, meaning that there is a significant difference after three months of integration of self-care management holistic psychospiritual care between the treatment group and comparison.

In addition, educational support can also be done to improve adherence to the self-care of Type 2 Diabetes Mellitus patients. Darmansyah, Nursalam, & Suharto (2013) studies obtained results Supportive educative models have positive and significant influence on self-regulation (0.651) and self-efficacy (0,548), self-regulation to self-care agency (0,592), self-efficacy to self-care agency (0,094), and self-care agency to HbA1c (0,130).

4 DISCUSSION

The low rate of self-care by patients with Type 2 Diabetes Mellitus is strongly influenced by ineffective individual coping factors. This is caused by long-term care that must be lived by DM patients are very difficult to control effectively, so it is important to pay attention to the psychological aspects in addition to physical aspects of Diabetes Mellitus Type 2 patients.

Self-care therapy regimens of Type 2 Diabetes Mellitus patients consisting of physical activity, diet, self-monitoring of blood glucose (SMBG), and glycemic control should be performed well to decrease HbA1C and minimize Diabetes Mellitus complications. One way that can be done to improve the number of self-care compliance DM2 patients is by the method of Self-Care Management-Holistic Psychospiritual Care.

5 CONCLUSIONS

5.1 Conclusion

Based on the review of the article, it can be argued that self-care therapy regimens for Type 2 Diabetes Mellitus in general are physical activity, diet, self-

monitoring of blood glucose (SMBG), and glycemic control. However, most respondents did not adhere to the therapy regimen because of many factors that prevent patients from performing self-care. Research about factors affect patient with Type 2 Diabetes Mellitus incompliance to therapy regimen should be comprehensively carried out in the future.

5.2 Practical Implication

To overcome non-compliance in self-care patients can be done Self-Care Management-Holistic Psychospiritual Care, which is comprehensive management including the psychological and spiritual condition of Diabetes Mellitus Type 2 patients in performing self-care. Therefore, nurses should tailor-make diabetes self-management training programs for patients with a holistic approach, considering physical, psychosocial, cultural, financial and environmental factors. Furthermore, educative support is also needed to be developed to improve the self-care of Diabetes Mellitus Type 2 patients.

REFERENCES

Chourdakis, M., & Kontogiannis, V. (2014). Self-Care Behaviors of Adults with Type 2 Diabetes Mellitus in Greece, 972–979. https://doi.org/10.1007/s10900-014-9841-y

Angélica, J., Dias, A., Oliveira, Z. M. (2016). ORIGINAL ARTICLE DIABETES MELITUS CLIENTS ' CONCEPTIONS ABOUT THE TREATMENT, *10*(7). https://doi.org/10.5205/reuol.9106-80230-1-SM1007201622

Costa, V. (2012). Partner support , social-cognitive variables and their role in adherence to self-monitoring of blood glucose in type 2 diabetes, 81–87.

Darmansyah, A., Nursalam, & Suharto. (2013). Efektivitas Supportive Educative terhadap Peningkatan Self Regulation, Self Efficacy, dan Self Care Agency dalam Kontrol Glikemik Penderita Diabetes Mellitus Tipe 2. *Jurnal Ners*, 253-270.

Family Support, Medication Adherence, and Glycemic Control Among Adults With Type 2 Diabetes. (2012), *35*, 1239–1246. https://doi.org/10.2337/dc11-2103

Gask, L., Ludman, E., & Schaefer, J. (2006). Qualitative study of an intervention for depression among patients with diabetes : how can we optimize patient – professional interaction ?, 231–242. https://doi.org/10.1179/174592006X129509

Halkoaho, A. (2014). Type 2 diabetes patients ' perceptions about counselling elicited by interview : is it time for a more health-oriented approach ?, 13–19.

Kathleen M. Rayman, P. R. (2004). Home Alone : The Experience of Women with Type 2 Diabetes who Are

New to Intensive Control. *Health Care for Women International*.

Kusnanto. (2012). Model Self Care Management - Holistic Psychospiritual Care terhadap Kemandirian, Glukosa Darah, dan HbA1C Penderita Diabetes Mellitus Tipe 2. *Jurnal Ners*, 99-106.

Manderson, L., Canaway, R., Unantenne, N., Oldenburg, B., Lin, V., Hollingsworth, B., & M, D. C. (2012). Care seeking , use of complementary therapies and self management among people with type 2 diabetes and cardiovascular disease CAMELOT Phase I : an ethnographic approach, *24*(1).

Mogre, V., Abanga, Z. O., Tzelepis, F., Johnson, N. A., & Paul, C. (2017). Adherence to and factors associated with self-care behaviours in type 2 diabetes patients in Ghana, 1–8. https://doi.org/10.1186/s12902-017-0169-3

Schwennesen, N., Sociology, M. A., Researcher, P. D., Henriksen, J. E., & Head, D. (2016). Patient explanations for non-attendance at type 2 diabetes self-management education : a qualitative study. https://doi.org/10.1111/scs.12245

Thompson, M. (2014). Occupations , habits , and routines : perspectives from persons with diabetes, (September 2013), 153–160. https://doi.org/10.3109/11038128.2013.851278

Tristiana, D., Kusnanto, Widyawati, I., Yusuf, A., & Fitriyasari, R. (2016). Kesejahteraan Psikologis pada Pasien Diabetes Mellitus Tipe 2 di Puskesmas Mulyorejo Surabaya. *Jurnal Ners*, 147-156.

Woodcock, H., Gillam, S., & Frcp, F. (2013). ' A one-to-one thing is better than a thousand books ': views and understanding of older people with diabetes, 157–164.

Yamashita, T., Kart, C. S., & Noe, D. A. (2012). Predictors of adherence with self-care guidelines among persons with type 2 diabetes : results from a logistic regression tree analysis, 603–615.

https://doi.org/10.1007/s10865-011-9392-y

APENDIX

Table 1: Journal Analysis Table

No	Title	Author, Year	Samples	Method	Result	
					Measured	**Finding**
1.	Patient Explanations for Non-Attendance at Type 2 Diabetes Self-Management Education: A Qualitative Study	Schwennesen , Henriksen, & Head, 2016	15 people	qualitative Study	To explore the reasons people with Type 2 diabetes do not follow Diabetes Self-Management Education (DSME). Instrument: Structured interviews	Results of the study are personal reasons in the absence of Diabetes Self-Management Education because of illness and they feel it less useful activities. As for the external factors that affect people with Type 2 diabetes do not follow Diabetes Self-Management Education is location, time, and duration Diabetes Self-Management Education

2	Adherence to and factors associated with self-care Behaviors in Type 2 Diabetes Patients in Ghana	Mogre, Abanga, Tzelepis, Johnson, & Paul, 2017	187 people, with inclusion criteria: - Suffering from DM type 2 - Following diabetes treatment at the clinic at least 2 times in the last 12 months - An outpatient of a hospital	Cross-sectional survey	1) To know patient compliance Diabetes type 2 on self-care are: diet, exercise, blood sugar check, and foot care. 2) To find out the relationship between self-care compliance with demographic characteristics such as age, gender, education, and religion. 3) To find out the relationship between self-care compliance with patient's body weight as measured by BMI and waist circumference	Adherence to diet, Self-Monitoring of Blood Glucose, and foot care is very low. Patients with low knowledge and women may need additional support to improve adherence to self-care behavior in patients with Type 2 Diabetes Mellitus
3	Family Support, Medication Adherence, and Glycemic Control Among Adults with Type 2 Diabetes	Maybery & Osborn (2012)	61 respondents	Qualitative Study with FGD approach	1) Demographic data 2) Drug compliance 3) Family perceptions and knowledge about self-care in diabetes (supportive or unsupportive)	Family support is very important in providing adherence effects to the care of people with Diabetes Mellitus Type 2.
4	Home Alone : The Experience of Women with Type 2 Diabetes who Are New to Intensive Control	(Kathleen M. Rayman, 2004)	14 respondents	Qualitative Study	To know the experience of studying Self Care Management and the perception of women with Diabetes who just follow intensive control	Engagement As many as 57% of respondents included in the Engage class. In this class, respondents follow the rules of self-care and are consistent in performing self-care as a lifestyle. Pre-engaged. (43%) In this class of respondents do not consider diabetes dangerous. They are not serious in performing self-care. They assume that diabetes care management is not difficult.
5	Occupations, habits, and routines: perspectives from persons with diabetes	Thompson (2014)	8 people (5 male and 3 female) Inclusion Criteria: - Diagnosed type 2 diabetes - Age> 18 years old - Can operate digital camera	Qualitative Study	To describe the perception of diabetics about the busyness associated with diabetes management	There are four themes inferred: "Changes over time"; "What to eat"; "Habits and routines"; and "Family: Occupational impacts" There is a distinction between personal bustle and culture that affects activity for diabetes management.

6	Adherence to and factors associated with self-care Behaviors in Type 2 Diabetes Patients in Ghana	Mogre, Abanga, Tzelepis, Johnson, & Paul, 2017	187 people, with inclusion criteria: - Suffering from DM type 2 - Following diabetes treatment at the clinic at least 2 times in the last 12 months - An outpatient of a hospital	Cross-sectional survey	4) To know patient compliance Diabetes type 2 on self-care are: diet, exercise, blood sugar check, and foot care. 5) To find out the relationship between self-care compliance with demographic characteristics such as age, gender, education, and religion. 6) To find out the relationship between self-care compliance with patient's body weight as measured by BMI and waist circumference	Adherence to diet, Self-Monitoring of Blood Glucose, and foot care is very low. Patients with low knowledge and women may need additional support to improve adherence to self-care behavior in patients with Type 2 Diabetes Mellitus
7	Family Support, Medication Adherence, and Glycemic Control Among Adults with Type 2 Diabetes	Maybery & Osborn (2012)	61 respondents	Qualitative Study with FGD approach	4) Demographic data 5) Drug compliance 6) Family perceptions and knowledge about self-care in diabetes (supportive or unsupportive)	Family support is very important in providing adherence effects to the care of people with Diabetes Mellitus Type 2.
8	Home Alone : The Experience of Women with Type 2 Diabetes who Are New to Intensive Control	(Kathleen M. Rayman, 2004)	14 respondents	Qualitative Study	To know the experience of studying Self Care Management and the perception of women with Diabetes who just follow intensive control	Engagement As many as 57% of respondents included in the Engage class. In this class, respondents follow the rules of self-care and are consistent in performing self-care as a lifestyle. Pre-engaged. (43%) In this class of respondents do not consider diabetes dangerous. They are not serious in performing self-care. They assume that diabetes care management is not difficult.
9	Occupations, habits, and routines: perspectives from persons with diabetes	Thompson (2014)	8 people (5 male and 3 female) Inclusion Criteria: - Diagnosed type 2 diabetes - Age> 18 years old - Can operate digital camera	Qualitative Study	To describe the perception of diabetics about the busyness associated with diabetes management	There are four themes inferred: "Changes over time"; "What to eat"; "Habits and routines"; and "Family: Occupational impacts" There is a distinction between personal bustle and culture that affects activity for diabetes management.

10	Partner support, social-cognitive variables and their role in adherence to self-monitoring of blood glucose in type 2 diabetes	Costa (2012)	179 respondents	Case Study	Analyze the relationship between partner support, Social-Cognitive Variables on Self-Monitoring of Blood Glucose (SMBG), Adherence, and Glycemic Control in Diabetes Mellitus Type 2 patients.	The importance of partner support and social-cognitive on SMBG compliance in Diabetes Mellitus Type 2 patients.
11	Care seeking, use of complementary therapies and self-management among people with type 2 diabetes and cardiovascular disease CAMELOT Phase I: an ethnographic approach	Manderson et al. (2012)	69 consumers, 20 people healthcare providers (alternative medicine and biomedical)	Qualitative – Ethnographic Study	Reasons for using complementary and alternative therapies, choice and frequency, economic, socio-cultural, and information considerations related to adherence to diabetes management	1) Generally consumers tend to have a personal, proactive and positive motivation to report that they are having chronic conditions and are well managed and have a positive alternative treatment experience. 2) The average consumer has DM and CVD disease aged 66.8 years (range 46-85 years), Overweight (mean IMT 29 kg / m2, range 19-48 kg / m2), QoL score> 7 and income low.
12	Type 2 diabetes patients' perceptions about counselling elicited by interview: is it time for a more health-oriented approach?	Halkoaho (2014)	15 orang	Qualitative Study	Describe the perception, coping, and counseling experiences of Type 2 Diabetes Mellitus patients	People with type 2 diabetes think the source of coping in the management of diabetes mellitus is self-acceptance of disease, adherence to self-care, knowledge of disease, and support from various parties including nurses.
13	Qualitative study of an intervention for depression Among patients with diabetes: how can we optimize Patient–professional interaction?	Gask, Ludman, & Schaefer (2006)	The participants were 25 patients	Qualitative Study	To describe the communication between the depression care specialists (DCS) nurses and patients with both depression and diabetes in an intervention study.	Constraints in compliance with self-care patients with Type 2 Diabetes Mellitus is the patient's problems, difficulties in therapy, and inability to cope with the changes that occur after illness for so long.

14	'A one-to-one thing is better than a thousand books': views and understanding of older people with diabetes	Woodcock, Gillam, and FRCP (2013)	13 people	qualitative Study	(1) Reviews their understanding of diabetes, (2) Reviews their views on the information they had received, and (3) Reviews their views on the quality of Reviews their care	Patients know about the condition of the disease and complications that will be experienced. Most say they are afraid of the complications of coma. In addition, most have obtained adequate information about Type 2 Diabetes Mellitus of doctors and nurses, but there are misperceptions about the information that the patient is undergoing treatment with good self. Patients expressed the importance of continuous treatment to deal with diabetes. Nurses and doctors play an important role for it.
15	Diabetes Mellitus Client's Conceptions about The Treatment	Angelica et al., 2016)	11 people	qualitative Study	To describe patients with diabetes mellitus knowledge about the disease.	Patients with Diabetes Mellitus have knowledge of diabetes management. However, knowledge is very superficial and not applicable in their routines.