



Effects of Integrated Diabetes Counselling (Konter Diabetes) on the Level of Self-efficacy, stress levels related to Diabetes Mellitus, and HbA1C levels in Diabetes Mellitus Patients in the Outpatients Installation of Universitas Gadjah Mada Academic Hospital

Melina Dian Kusumadewi¹, Yusmiyati¹, Ayuk Rahadhian Subekti¹, Pratiwi Dinia Sari¹, Leiyla Elvazahro¹, Khusnal Efendi¹

¹Gadjah Mada University Academic Hospital

*Corresponding Author: m.lina_psi@ugm.ac.id

SUBMITTED January 2019

REVISED February 2019

ACCEPTED March 2019

ABSTRACT

Background: Nowadays the prevalence of diabetes mellitus (DM) was increased globally. The integrative service model for DM was needed.

Objective: this study was held to investigate the impact of group therapy for DM (Konter Diabetes) on self-efficacy, diabetes related stress, and HbA1c in DM outpatients in Universitas Gadjah Mada Academic Hospital.

Design: The method use in this study is quasi-experiment pretest and posttest design with control group. Konter Diabetes was delivered to 12 samples of experiment group for 7 weekly sessions @ 3 hours.

Results: The result showed that there was significant increase on self-efficacy and significant decrease on diabetes related stress in experiment group. The HbA1c in experiment group was not significantly decreased, but the decrease of the HbA1c in experiment group was better than control group's.

Conclusions: Konter Diabetes can be implemented to improve self-efficacy and to decrease diabetes related stress of DM outpatients.

KEY WORDS: Diabetes mellitus, Integrative diabetes group therapy, Self-efficacy, Diabetes related stress, HbA1c

1. Introduction

The Prevalence of Non-Communicable Diseases is increasing year to year. One of non-communicable diseases that increased in number of it's sufferers is Diabetes Mellitus. According to International Diabetes Federation (IDF) and World Health Organization (WHO), Indonesia is the country with the 7th highest number of people with Diabetes on 2013. The Incidence of Diabetes Mellitus in Yogyakarta Province is 2,6% and be the first province with the highest incidence of Diabetes Mellitus in Indonesia.

Diabetes Melitus in Universitas Gadjah Mada Academic Hospital was included in the top 10 diseases that were handled by hospitals with various case complications that reduce the sufferer's level of health. Universitas Gadjah Mada Academic Hospital has handled Diabetes Mellitus patients based on the pillars of Diabetes Melitus management: Education, medical nutrition therapy, sports recommendations, and pharmacological interventions. However, this management hasn't been carried out in an

integrated way, causing many diabetes patients return to the hospital with uncontrolled blood sugar or even complications.

Based on previous research, it is known that psychological factors such as stress could lead to the uncontrolled blood sugar levels. Vitaliano, et al¹ said that psychological factors, such as daily stressors, paddy, hostilities, and social support closely related to the level of insuline and blood glucose on Diabetic patients. The correlation of stress and blood glucose control is a crucial thing². Besides, the root cause in blood glucose control of Type-2 Diabetic Patients is self management³. Collaborative counselling is an effective way to reduce the A1C level on Diabetic patient significantly⁴.

Qualitative data from the monitoring and evaluation that has been done showed that patients who got nutritional counselling felt that it didn't help them a lot to make changes on their eating behavior and self management⁵. Patients who got diabetic counter treatment felt satisfied and helped in nutritional and psychological

assistance. This treatment results some changes in eating behavior which make it in line with the dietary Diabetes Mellitus recommendations and a better psychological condition. This is the background of researchers to continue the same research with a greater number of subjects and the addition of research variables in accordance with previous research recommendations. Researchers want to examine whether there is an effect of giving a diabetes counter to increased self-efficacy, decreased stress related to DM, and decreased HbA1c levels.

Generally, this study aims to determine the effects of Diabetic Counter on levels of self efficacy, Diabetes Mellitus related stress, and HbA1c levels in Diabetes Mellitus patients. Specifically, the aims of this study are (a) obtaining a description of characteristics (age, sex, occupation, education, duration of illness, dietary adherence) of Diabetes Mellitus Outpatients at Universitas Gadjah Mada Academic Hospital, (b) knowing the level of self-efficacy, Diabetes Mellitus related stress, and HbA1c levels of Diabetes Mellitus Patients before and after treatment, (c) knowing the effect of giving Diabetic Counter to the level of self-efficacy in patients with diabetes mellitus, (d) knowing the effect of giving a Diabetic Counter to DM-related stress levels in patients with diabetes mellitus, (e) determine the effect of the Diabetic Counter on HbA1c levels in Diabetes Mellitus patients.

2. Method

This research is a quasi-eksperimental research with pre-test and post-test model on 2 treatment groups. The first group were given a nutritional counseling for about 30-60 minutes, and the second group were given a Diabetes Counter treatment for 7 sessions: 4 hours on each session. The results of pre-test and post-test were compared to determine the differences of treatment's effects to self efficacy, Diabetes Mellitus related stress, and HbA1c levels of Diabetes Mellitus patients. This research was conducted in Universitas Gadjah Mada Academic Hospital on July to Desember 2017. The population of this research is all of the Type-2 Diabetes Mellitus patients without complication who came for routine treatment in outpatient

clinic at Gadjah Mada Academic Hospital from January to May 2017.

The sampling method of this research is purposive sampling. All type 2 Diabetes Mellitus patients without kidney complications, hyperthyroidism, infection, chronic obstructive pulmonary disease (COPD), severe mental disorders, and gangrene, who came for routine treatment at the outpatient installation of Universitas Gadjah Mada Academic Hospital since January – May 2017 that meet the inclusion criterias were included as this research sample. The inclusion criterias are (a) Type 2-Diabetes Mellitus patients without kidney complication, hyperthyroidism, infection, obstructive pulmonary disease (COPD), severe mental disorders, and gangrene (b) HbA1c level > 6,5%, (c) patients were able to read and write (d) more than 60 years old, (e) got an OAD therapy without insuline, (f) patients who had a health insurance for government, (g) patients who are willing to become research respondents and follow the schedule of this research process. Meanwhile, the exclusion criterias are (a) Type 2-Diabetes Mellitus patients with kidney complication, hyperthyroidism, infection, obstructive pulmonary disease (COPD), severe mental disorders, and gangrene, (b) Type 2-Diabetes Mellitus patients who consumed herb or herbal medicine, (c) pregnant patients.

The number of Diabetes Mellitus Outpatients in Universitas Gadjah Mada Academic Hospital from January – May 2017 were 3476. The patients who met the inclusion criteria were 30 patients. It would be divided into two groups, which are treatment group and control group.

The variables of this research consist of dependent variable and independent variable. The dependent ones consist of self efficacy (a person's belief in his ability to perform diabetes self-care that would be measured on a self-efficacy scale, according to Hasanat's research⁶), stress related to Diabetes Mellitus (daily distress related to diabetic management, emotional distress, distress related to medication, and interpersonal distress that would be measured on a diabetes distress scale, according to Chin, et al's research⁷), HbA1c level (a value that indicates the monitoring of the respondent's blood sugar

control over the past 3 months based on the results of examining a blood sample in the laboratory which will be presented as a percentage. This variable would be measured with a fotometer).

The independent variables were integrated diabetes counseling intervention (integrated group counseling about nutritions and psychology for 7 sessions (4 sessions weekly and 3 monitoring sessions, once every two weeks), 4 hours for each session with Diabetes Mellitus self-care material sessions, family synergy, healthy diet, eating behavior, and happy life with diabetes mellitus) and nutrition counselling intervention (activities as a 2-way communication process to instill and improve person's understanding, attitudes, and behavior to help patients recognize and overcome nutritional problems through food and

beverage management carried out by nutritionists).

Instruments used in this research are (a) weight scales and calibrated height measures, (b) questionnaire containing respondents' subjective data, (c) informed consent, (d) blood sampling kit, (e) photometer, (f) DM self-efficacy scale, (g) diabetes-related stress scale, (h) Diabetes Integrated Counseling Modul which is an integration of Nutrition Care Standards and group psychotherapy, (i) food record which was the development of a standard form of Hospital Nutrition Services compiled by the Ministry of Health of the Republic of Indonesia⁸. The research data is processed by editing, coding, data entry, and tabulating process. The result were analyzed by Wilcoxon-non parametric statistic test.

Result

The results of this research presented on the distribution tables below.

Table 1. Frequency Distribution of Respondents' Gender

Gender	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Woman	6	50	8	67
Man	6	50	4	33
Total	12	100	12	100

Table 2. Frequency Distribution of Respondents' Age

Age (year)	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Adult (26-45)	3	25	2	16
Early Elderly (46-55)	5	42	5	42
Lately Elderly (56-65)	4	33	5	42
Total	12	100	12	100

Table 3. Frequency Distribution of Respondents' Education

Educational Background	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Elementary School	3	30	2	16
Junior High School	1	10	1	8
Senior High School	3	30	4	34
Diploma/ Bachelor Degree	3	30	5	42
Total	10	100	12	100

Table 4. Frequency Distribution of Respondents' Job

Educational Background	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Jobless	1	8	0	0
Housewife	2	16	3	25
Private Employees	2	16	3	25
Enterpriser	6	52	4	34
Civil servants	1	8	2	16
Total	12	100	12	100

Table 5. Frequency Distribution of HbA1c Levels before Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Good (<6,5%)	0	0	0	0
Moderate (6,5-8%)	5	42	6	50
Bad (>8%)	7	58	6	50
Total	12	100	12	100

Table 6. Frequency Distribution of HbA1c Levels after Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Good (<6,5%)	1	9	1	9
Moderate (6,5-8%)	4	33	5	41
Bad (>8%)	7	58	6	50
Total	12	100	12	100

The result of Diabetes Related Distress before and after Diabetes Integrated Counseling were presented on Table 7 and 8.

Table 7. Frequency Distribution of Diabetes related Stress Levels before Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Low ($x < 28,3$)	1	9	0	9
Moderate ($28,3 \leq x < 56,7$)	8	62	5	42
High ($56,7 \leq x$)	3	25	7	58
Total	12	100	12	100

Table 8. Frequency Distribution of Diabetes related Stress Levels after Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Low ($x < 28,3$)	6	50	8	62
Moderate ($28,3 \leq x < 56,7$)	3	25	3	25
High ($56,7 \leq x$)	3	25	1	9
Total	12	100	12	100

The result of respondents' self efficacies before and after Diabetes Integrated Counseling were presented on Table 9 and 10

Table 9. Frequency Distribution of Self Efficacy Levels before Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Low ($x < 20$)	1	9	11	91
Moderate ($20 \leq x < 28$)	8	62	1	9
High ($28 \leq x$)	3	25	0	0
Total	12	100	12	100

Table 10. Frequency Distribution of Self Efficacy Levels after Diabetes Integrated Counseling

HbA1c Level	Groups			
	Control		Treatment	
	Total	Percentage (%)	Total	Percentage (%)
Low ($x < 20$)	2	19	0	0
Moderate ($20 \leq x < 28$)	8	62	0	0
High ($28 \leq x$)	2	19	12	100
Total	12	100	12	100

To find out whether there are significant differences in HbA1c levels before and after treatment in each group, Wilcoxon non-parametric statistical tests were used. Meanwhile, Independent t-test was used to find out whether there were significant changes in

HbA1c between the treatment group and the control group. Statistical test results of differences in HbA1c levels before (pretest) and after intervention (posttest) are presented in table 11.

Table 11. The differences in HbA1c levels before and after intervention.

Group	n	HbA1c means		P*	Δ HbA1c	P**
		Pre-test(%)	Post-test(%)			
Treatment	12	8,55 ± 1,78	8,05 ± 1,26	0,083	-0,49 ± 0,89	
Control	12	8,71 ± 1,50	8,65 ± 1,6	0,563	-0,06 ± 1,07	0,293

*Wilcoxon test ** Independent sample t-test ***Significant ($p < 0,05$)

To find out whether there are significant differences in respondents' self efficacies and diabetes related stress before and after treatment in each group, Kolmogorov-smirnov non-parametric statistical tests were used. Meanwhile, Independent t-test was used to find out whether there were significant changes in

respondents' self efficacies and diabetes related stress between the treatment group and the control group. Statistical test results of differences in HbA1c levels before (pretest) and after intervention (posttest) are illustrated in table 12 and 13.

Table 12. The differences in self efficacy levels before and after intervention.

Group	n	Self efficacy means		P*	Δ HbA1c	P**
		Pre-test(%)	Post-test(%)			
Treatment	12	13,42	41,92	0,450	28,5	0 000
Control	12	17,92	20,42	0,477	2,5	0, 378

*Kolmogorov-smirnov test ** Independent sample t-test ***Significant ($p < 0,05$)

Table 13. The differences in diabetes related stress before and after intervention.

Group	n	Stress related to Diabetes Means		P*	Δ Stress Level	P**
		Pre-test(%)	Post-test(%)			
Treatment	12	62,08	17,42	0,387	44,6	0 000
Control	12	52,25	45,17	0,272	7,08	0, 256

*Kolmogorov-smirnov test ** Independent sample t-test ***Significant ($p < 0,05$)

3. Discussion

The results of bivariate analysis showed that there is a significant decrease on the stress level of treatment group after receiving Integrated Diabetes Counseling. It could happen because (1) the participants were more able to accept their condition so that diabetes is not a stressor, and have a bigger willing to admit their disease in the social environment, (2) participants were able to upgrade their adaptive coping to face the daily stressor, diabetes stressors, and cognitive distortion that has been internal stressors for them, (3) participants found the values of their life that made them more motivated to maintain their healthiness (4) participants were able to work with their families to support diabetes' treatment and behavioral changes related to diabetes care.

The results of the analysis also showed a significant increase in the self-efficacy of the Diabetes Center treatment group. This is the same as the results of Morrison and Weston⁹'s research which stated that behavioral interventions succeeded in increasing general and specific self-efficacy. Increased self-efficacy will improve the control of blood sugar levels, self care behavior, and perceptions of improving general health, mental health, and social function in diabetic patients. De Palma¹⁰'s research also mentioned that self-efficacy was significantly related to diabetes self-care. Perception of social support behavior is positively related to increasing diabetes self-efficacy.

Participants who reported getting more support and appreciation also reported that they got higher self efficacies. This condition is proven to be achieved through administration of the Diabetes Center. The results of the bivariate analysis showed that there was a decrease in HbA1c in both groups. However, the decrease in the two groups was not statistically significant ($p > 0,05$), but it could be seen that the decrease in HbA1c in the treatment group was higher than the control group who did not receive integrated diabetes counseling. This result shows that diabetes integrated counseling still has a role in reducing the value of HbA1c compared to individually counseling. It was in line with the results of a meta-analysis conducted by Tang,

Funnel, and Anderson¹¹ which shows that group education brings greater results and benefits compared to individual education.

In addition, there was no significant decrease in HbA1c after diabetes integrated counseling, possibly because it was not measured or managed by the other two pillars of Diabetes Mellitus management that had an effect in controlling blood sugar, physical activity, and pharmacological intervention. Kurniawan¹² stated that the factors that influence blood sugar control are adherence to lifestyle modifications, such as diet, exercise, and the adherence to taking hypoglycemic drugs. Besides, the presence of other diseases, progression of Diabetes Mellitus disease, and consumption of other drugs could lead to insulin resistance, affecting insulin release, increasing liver glucose production, and affecting blood sugar control.

Stress and self efficacy factors also affect blood sugar control. The research of De Palma, et al¹⁰ stated that self efficacy was significantly related to diabetes self care. According to Lyons and Chamberlain¹³, stress affecting someone's health through behavior, lifestyle, acceptance of symptoms, the role of pain, and physiological functions that include the neuroendocrine systems, autonomic nervous system, and immune system.

4. Conclusion

The results of this study indicate that there is a significant increase in the level of self efficacy and significant decrease in stress levels related to Diabetes Mellitus after the administration of Diabetes Integrated Counseling in the treatment group. There was no significant decrease in HbA1c levels after the administration of Diabetes Integrated Counseling in the treatment group. However, the decrease in HbA1c in the treatment group was higher than in the control group who did not receive integrated diabetes counseling.

References

1. Vitaliano, P. P., Scanlan, J. M., Krenz, C., & Fujimoto, W. 1996. *Insulin and glucose: relationship with hassles, anger, and hostility in nondiabetic older adult*. Psychosomatic Medicine, 58, 489-499

2. Riazi, A., Pickup J & Bradley, C. 2004. *Daily stress and glycaemic control in type 1 diabetes: individual differences in magnitude, direction, and timing of stress-reactivity*. *Diabetes Research and Clinical Practice*, 66 (3), 237-244
3. Uchino, B. N. 2006. *Social Support and Health: A Review of Physiological Processes Potentially Underlying Links to Disease Outcomes*. *Journal of Behavioral Medicine*, 29 (4), 377-387. <http://doi.org/10.1007/s10865-006-9056-5>
4. Diggins, K. 2014. *Family Nurse Practitioner/Pharmacist Collaborative Medication Counseling in Patient with Diabetes*. *Journal for Nurse Practitioners* 10(9):741-744. <http://doi.org/10.1016/j.nurpra.2014.05.0>
5. Kusumadewi, M.D., Yusmiyati, Subekti, A.R, Sari, P.D., Sulisty, O.H. 2016. *Preliminary study : Pengaruh Konseling Terpadu Diabetes (Konter Diabetes) Terhadap Tingkat Stres Dan Kadar HbA1c Pada Pasien Diabetes Melitus Di Instalasi Rawat Jalan Rumah Sakit Universitas Gadjah Mada*
6. Hasanat, NU. 2015. *Manajemen Diri Diabetes Analisis Kuantitatif Faktor- Faktor Psikososial Pada Pasien Diabetes Melitus Tipe II*. Disertasi. Yogyakarta : Universitas Gadjah Mada
7. Chin, YW., Lai, PSM., Chia, Y.C. 2017. The validity and reliability of the English version of the diabetes distress scale for type 2 diabetes patients in Malaysia. *BioMedCentral Family Practice* : 18:25, DOI 10.1186/s12875-017-0601-9
8. Kementerian Kesehatan Republik Indonesia. *Pedoman Pelayanan Gizi Rumah Sakit*. 2013. Kementerian Kesehatan RI, Jakarta
9. Morrison, G., Weston, P. 2013. Self-efficacy: A tool for people with type 1 diabetes managed by continuous subcutaneous insulin infusion. *Journal of Diabetes Nursing* 17: 32-7
10. DePalma, M.T., Trahan, L.H., Eliza, J.M., Wagner, A.E. 2015. The relationship between diabetes self-efficacy and Diabetes self-care in american indians and alaska natives. *Diabetes Self-Care Vol 22, No.2*
11. Tang, T.S., Funnel, M.M., Anderson, R.M. 2006. *Group education strategies for diabetes self-management*. *Diabetes spectrum*, 19,2, 99-105
12. Kurniawan, Indra. 2010. *Diabetes Melitus Tipe 2 pada Usia Lanjut*. *Majalah Kedokteran Indonesia*, Volum: 60, Nomor: 12, Desember 2010
13. Lyons, A. C., & Chamberlain, K. 2006. *Health Psychology. A Critical Introduction*. Cambridge University Press, Cambridge