

***EFFECT OF DIABETES TRAINING PROGRAM ON KNOWLEDGE AND ASSESSMENT SKILL  
AMONG GERIATRIC WORKER COMMUNITY IN SURABAYA***

**EFEK PROGRAM PELATIHAN TERKAIT PENYAKIT DIABATES TERHADAP PENINGKATAN  
PENGETAHUAN DAN KETRAMPILAN KOMUNITAS PEKERJA LANJUT USIA DI SURABAYA**

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**Abstrak**

Diabetes melitus (DM) merupakan penyakit degeneratif yang memiliki prevalensi lebih tinggi di antara penyakit degeneratif lainnya di Surabaya, Indonesia. Pemberian informasi saja masih dirasakan belum cukup untuk memperbaiki tingkat kepatuhan pasien diabetes dan mencapai tujuan terapi. Kesadaran pasien serta dukungan emosional dan sosial dari masyarakat berperan penting untuk meningkatkan kepatuhan dan hasil terapi. Oleh karena itu, program pelatihan diabetes dilakukan kepada komunitas pekerja lanjut usia (lansia) untuk meningkatkan pengetahuan mereka tentang penyakit DM dan ketrampilan dalam pemeriksaan kadar glukosa darah. Sebanyak 20 orang pekerja perempuan ikut serta sebagai peserta dalam program ini. Mereka menerima serangkaian materi tentang penyakit DM dan pengelolannya, serta mendapatkan praktek keterampilan untuk menggunakan tes glukosa darah secara mandiri. Sebagai evaluasi kegiatan, kuesioner diberikan kepada peserta pada awal dan akhir kegiatan. Kesadaran pekerja secara keseluruhan meningkat lebih dari 100%. Setelah akhir kegiatan, semua peserta bergabung dengan program konseling diabetes untuk pasien lansia di komunitas mereka. Tingkat glukosa dievaluasi dari pasien mereka untuk menilai hasil program konseling. Tingkat glukosa darah acak dan puasa menurun sekitar 31% dan 14%, berturut-turut. Studi ini mengungkapkan bahwa program pelatihan diabetes untuk pekerja komunitas lansia ini sangat bermanfaat untuk mengendalikan kadar glukosa darah di komunitas.

**Kata kunci:** program pelatihan diabetes, lanjut usia, apoteker.

**Abstract**

*The prevalence of diabetes mellitus (DM) is higher among other degenerative diseases in Surabaya, Indonesia. Providing information is not sufficient to improve diabetic patients' compliance and achieve goals of its therapy. Patients' good awareness as well as emotional and social supports from community plays an important role to improve their compliance and clinical outcomes. Therefore, diabetes training program was delivered to geriatric worker community to improve their knowledge on DM and assessment skill to check the blood glucose*

*level of geriatric diabetic patients. A total of 20 female workers were enrolled in the program. They received a series of lectures on diabetes and its management and gained practical skill on using the self-check blood glucose test. A validated questionnaire was administered to all workers at baseline and at final follow-up to assess knowledge and practice. The overall workers' awareness increased over than 100%. After finishing the program, all workers joined a diabetic counseling program for geriatric patients in their community. Glucose levels were evaluated from their patients to assess the outcome of the counseling program. The random and fasting blood glucose levels decreased around 31% and 14%, consecutively. This study reveals that diabetes training program for geriatric community workers is beneficial to control blood glucose levels.*

**Keywords:** *diabetes training program, geriatric, pharmacist.*

## INTRODUCTION

The prevalence of diabetes mellitus (DM) is higher among other degenerative diseases in Indonesia. Head of Department for Health in the East Java says about 69 thousand of the 37 million people are living with diabetes in the East Java (Bachtiar 2004). Surabaya becomes the region with the highest number of diabetic patients around 14,377 patients per year. An increasing number of diabetic patients with uncontrolled blood sugar in Surabaya can be attributed to the lack of understanding regarding the disease and its therapy. A preliminary study was conducted in adult diabetic patients in the district of Kedung Tarukan and Wonorejo Surabaya for the purposes of describing their diabetes-related knowledge and evaluating their current blood glucose levels (unpublished). The study revealed that most of them still have lack of understanding on diabetes and its therapy. This finding was then correlated to the high blood glucose levels among them. They need a comprehensive care not only from health care professionals but also from the geriatric community workers.

Diabetes management requires patient involvement for a better disease control. A research conducted by McPherson *et al.* revealed that patients who have a high level of knowledge and understanding in antidiabetic drugs are positively correlated to controlled blood sugar and improved treatment adherence (McPherson *et al.* 2008). Furthermore, social, financial and emotional supports from the family member and the community service were very influential on the success of therapy particularly for diabetic outpatients (Mayberry and Osborn 2012). It is clearly stated that providing information is not enough to improve diabetic patients' compliance and achieve goals of therapy. Patients' good awareness as well as emotional and social supports from family and community may play an important role to improve their compliance and clinical outcomes. Therefore, diabetes training program may become a new diabetes education program which can be implemented and tailored to the needs of community workers to deal with older diabetic patients.

## METHOD OF IMPLEMENTATION

The study was conducted in the district of Kedung Tarukan and Wonorejo Surabaya, Indonesia over a four-month period. It was approved by the Institute of Research and Community Services Universitas Airlangga. Diabetes training program was delivered by the pharmacists, doctors and nurses.

At the beginning of study, geriatric community workers were enrolled to the training program. They received a series of lectures on diabetes from doctors, diabetes therapy and management from pharmacists and gained practical skill on using the self-check blood glucose test from nurses. A validated questionnaire was administered to all workers at baseline and at final follow-up to assess knowledge and practice. There were a total of 12 questions, 6 questions related to knowledge about diabetes and its therapy and 6 questions to assess attitude and action towards the disease and medication. For scoring 1 point was awarded for each correct answer and none for an incorrect or blank answer, so the maximum possible score was 12. Data were analyzed by using simple descriptive statistics (frequency in numbers and percentages).

After finishing the program, all workers should apply their knowledge and skill by joining a diabetic counseling program for geriatric patients in their community. All patients received counseling and monitoring from the community workers once a month for a three-month period. Patients' glucose levels were evaluated at baseline and final to assess the outcome of the counseling program.

## RESULTS AND DISCUSSIONS

A total of 20 female workers were enrolled in the program. The diabetes awareness level was assessed using a questionnaire. On evaluating the questionnaire, the overall scores of patients in both groups increased by more than 100% at final follow-up (**Table 1**). On analyzing the responses, more workers answered correctly at the final program compared to the baseline. Another crucial finding was that at least half workers (50%) exhibited a basic understanding of diabetes and therapy.

**Table 1** Geriatric community workers' knowledge scores as assessed by the questionnaire.

No.	Questions (in Bahasa Indonesia)	Number of workers giving correct answers (%)	
		Baseline	Final
<b>Knowledge about diabetes and its therapy</b>			
1.	Penyakit Diabetes Melitus merupakan penyakit yang berkaitan dengan gangguan...	1 (10)	8 (80)
2.	Gejala penyakit Diabetes Melitus adalah...	6 (60)	9 (90)
3.	Tujuan pengobatan Diabetes Melitus adalah...	2 (20)	6 (60)
4.	Target capaian gula darah sesaat pada pengobatan Diabetes Melitus adalah kurang dari...	2 (20)	6 (60)
5.	Target HbA1c pada pengobatan Diabetes Melitus yaitu...	3 (30)	5 (50)
6.	Komplikasi jangka panjang Diabetes Melitus antara lain...	1 (10)	6 (60)
<b>Patients' attitude and action towards the disease and medication</b>			
7.	Aktivitas yang dianjurkan untuk mencegah Diabetes Melitus adalah....	5 (50)	7 (70)
8.	Glibenclamide, salah satu obat Diabetes Melitus, hendaknya <i>tidak</i> digunakan pada ....	1 (10)	5 (50)
9.	Obat Diabetes Melitus Acarbose (Glucobay®) sebaiknya digunakan....	3 (30)	6 (60)
10.	Cara menghindari efek samping obat Metformin dengan menggunakan....	2 (20)	7 (70)
11.	Salah satu efek samping obat Diabetes Melitus adalah hipoglikemia (kadar gula darah di bawah normal) yang ditandai dengan gejala....	3 (30)	7 (70)
12.	Cara cepat mengatasi hipoglikemia bila posisi di rumah adalah....	4 (40)	6 (60)
<b>Mean ± SD</b>		<b>2.5 ± 1.6</b>	<b>6.0 ± 1.2</b>

**Table 2** Patient characteristics of diabetes counseling program.

Parameters	Kedung Tarukan (n = 35) Number (%)	Wonorejo (n = 35) Number (%)
<b>Gender</b>		
Male	6 (17.1)	8 (22.9)
Female	29 (54.2)	27 (48.6)
<b>Age (years)</b>		
60-69	29 (82.9)	25 (71.4)
> 70	6 (17.1)	10 (28.6)
<b>Fasting plasma glucose (mg/dL)</b>		
≤ 126	0 (0)	2 (5.7)
> 126	0 (0)	2 (5.7)
<b>Random plasma glucose (mg/dL)</b>		
≤ 140	25 (71.4)	22 (62.9)
> 140	10 (28.6)	9 (25.7)

The study demonstrates that a majority of geriatric community workers have lack of understanding to diabetes and therapy. The questionnaire used in this study was developed to assess the knowledge of workers about diabetes and its therapy and to assess the change in the knowledge after the initiation of diabetes training program. Therefore, the study did not evaluate the effect of specific intervention applied in the program on diabetes awareness level. The overall scores of workers increased at final follow-up. It reveals that training sessions contribute more to improve workers' knowledge and practical skill.

A total of 70 type 2 diabetic patients were enrolled into the counseling program and randomized into group 1 (Kedung Tarukan) and group 2 (Wonorejo). Patient characteristics are presented in **Table 2**. Of these patients, 14 (20.0%) were males and 56 (80.0%) were females. The median age of patients was age 64.5 years with patients as old as age 89 years. There were over than 25% of patients who had either random or fasting blood glucose levels more than 140 mg/dL.

Patients of counseling program had high blood glucose levels prior to initiation of diabetes counseling program. Diabetic patients may develop complications due to low

**Table 3.** Impact of diabetes counselling program on plasma glucose levels

Parameters		Kedung Tarukan	Wonorejo
Fasting plasma glucose	Baseline	123.0	0
	Final	127.0	0
	% decrease	3.3	0
	% achieving target ( $\leq 110$ mg/dL)	0	0
Random plasma Glucose	Baseline	206.0	166.0
	Final	142.0	143.0
	% decrease	31.1	13.9
	% achieving target ( $\leq 110$ mg/dL)	60.0	37.1

level of awareness of diabetes and inadequate blood glucose control. Therefore, patient education constitutes a cornerstone in the management of diabetes. Previous research has shown that patient education adds value to diabetes management and that specific interventions aimed at improving patient knowledge can improve diabetes control (Asha et al. 2004). Education on self-management is essential to provide the diabetic patients with the knowledge and skills which are needed to perform self-care, manage therapy, and make lifestyle changes (Malathy et al. 2011).

Impact of counseling program activities on blood glucose levels was described in **Table 3**. Decreased level of fasting blood glucose could only be assessed in the group 1. The percentage reduction of random blood glucose level in the group 1 was higher (31.1%) than the other group (13.9%). Moreover, 60% patients in the group 1 had the glucose levels within the range of target levels.

Patients' knowledge levels can be improved in many ways, for instance through counseling and conducting group awareness programs (Malathy et al. 2011). The counseling program provided social, educational and emotional supports to the patients. There was an exchange of information on diabetes, its complications and therapy in each follow-up activity. Provision of relevant information provided to the diabetic patients and families of patients have been reported to have a relationship with increased treatment adherence (Lamberts et al. 2006). Several factors have influenced patients' adherence to medications used including the availability of drug-related information received by the patient, family support nearby, and the trust factor for illness and drug use (Lamberts et al. 2006). Of importance, social, financial and emotional supports from the family member and the community were very influential on the success of therapy (Mayberry and Osborn 2012).

The findings from this study emphasize the importance of patient education, particularly with training and counseling programs. Moreover, involvement of patients, their family member and community in the program plays a crucial role in enhancing patients' compliance to therapy. Counseling and monitoring delivered by community workers help to

improve glycemic control of older diabetic patients by more than 30% and to achieve target of therapy. This result is similar to several studies which have reported the positive effect of counseling on glycemic control and quality of life in the diabetic population (Adepu et al. 2007). Although HbA<sub>1c</sub> (glycated hemoglobin) level is the internationally accepted test, this study did not assess patients' HbA<sub>1c</sub> levels. Fasting and random blood glucose levels were used instead because these parameters are still recommended as the tool for monitoring glycemic control in practice settings.

The results of the study suggest that diabetes training and counseling program may improve awareness of disease, compliance to medications, diet, and lifestyle changes and thereby on glycemic control. An encouraging part of this study is that many patients were willing to attend all monitoring and counseling sessions over a three-month periods. This reflects the increased awareness of diabetic patients to their disease and therapy and also the lack of such programs in Surabaya. Establishing a trusting and professional relationship among geriatric community workers and patients as well as involving community health centers and other geriatric groups should be done in a further study to motivate more patients to participate in such education programs.

## CONCLUSIONS

In this study, to increase the diabetes-related knowledge and assessment skill of geriatric worker community in Surabaya, we conducted a training program that included lectures on diabetes, its therapy management and practical skill on self-check blood glucose. Lack of patients' understanding to their disease and therapy might correlate to low level of compliance and high blood glucose levels. The diabetes training program could provide beneficial to expand geriatric community workers' role in the diabetes management program. These workers may further help in improving patients' compliance to diabetes therapy and control blood glucose levels.

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