ORIGINAL ARTICLE

Effect of Integrated Care Programs on Self-Efficacy and Self-Management Behaviors among Diabetic in a Primary Health Care in Indonesia

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ABSTRACT

Introduction: Diabetes mellitus is one of the serious health problems in the world including in Indonesia. The diabetic prevalence is continuously increasing and it is identified as a disease that requires complex management, produces high complications incidence, and results in numerous negative impacts. However, most of the available programs are fragmented and involve a single discipline. Thus, an Integrated Diabetes Care Program (IDCP) in the community setting is needed. This study aimed to evaluate the effect of an IDCP in the community on patients' self-efficacy and self-management behaviors. **Methods:** This quasi-experimental method with one group design was applied to 30 type-2 diabetic patients recruited through consecutive sampling from a primary health center in West Java, Indonesia. Respondents received an IDCP including regular visit in community health center and home visits carried out by a multidisciplinary team (physician, nurse, nutritionist, and pharmacist) in 5 weeks. Self-efficacy data were measured using the Diabetes Management Self Efficacy Scale (DMSES) questionnaire. Self-management data were measured using a Diabetes Self-Management questionnaire. The data were analyzed descriptively and inferentially using paired t-test. **Results:** The results showed a significant difference in the mean self-efficacy and self-management scores before and after receiving the IDCP (p-value 0.000). **Conclusion:** The developed IDCP seemed to effectively improve diabetic patients' self-efficacy and self-management behaviors. Although this finding should be clarified through a stronger research design, the program showed some beneficial impacts on patients' outcomes.

Keywords: Diabetes, Integrated care, Self-efficacy, Self-management

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INTRODUCTION

The increasing mortality and morbidity rates of non-communicable diseases have become a global concern today. According to the World Health Organization (WHO), 66% of mortality rates were from people with non-communicable diseases. It was also noted that the top 4 diseases of adults who died and required palliative care were cardiovascular disease (38.5%), cancer (34%), chronic respiratory disease (10.3%), and diabetes mellitus (4.5%)(1). Ministry of Health of the Republic of Indonesia (MOHRI) reported that the prevalence rate of Diabetes Mellitus (DM) based on the physician diagnoses in Indonesia in 2018 was 2.0%, and West Java was noted as the province with the highest number of DM people contributors (131.846). Moreover, the prevalence rate of DM based on the blood glucose level that was much higher than that based on the physician diagnoses (10.9% vs. 2.0%) indicated that there were a very high number of diabetic patients in Indonesia who were late to be diagnosed or even diagnosed and treated once they developed DM-related complications (2).

Diabetic-related complication impacts are worrying. Not only physically, but sooner or later, it was also identified to be lessening the patients' adherence and quality of life as well as increasing patient and family financial burdens (3). Psychologically, diabetic patients are also vulnerable for some types of psychological problems such as depression, anxiety, and emotional disorder (4, 5).

For minimizing those risks, patients are expected to actively manage their diabetes through diet, physical exercise, medication, as well as blood glucose regular check and control (6–9). Studies found that diabetic patients with better self-management behaviors

experienced less complication and had high quality of life (10–14). Unfortunately, studies found that most of DM patients in Indonesia had HbA1c level > 7% or even > 10% (higher than the targeted level)(15). On the other hand, in most Asian countries including Indonesia, chronic diseases management is not managed collaboratively/fragmented and lack continuity of care as well as sufficient facilities (16, 17).

Diabetes mellitus care in Indonesia is still centralized more in hospitals. In the community setting, the government released Prolanis program focused on hypertension and DM. However, this program does not seem to run as expected yet and only few patients actively join the program and their attendance decreases every month and according to (18), adherence level of the participants is 3.59 out of 6 times. Thus, it is necessary to develop and examine the effect of integrated diabetes care in the community setting.

MATERIALS AND METHODS

This pilot study used a quasi-experimental method with one group design. In this study, type-2 diabetic patients received an integrated care program provided by multidisciplinary staff (nurse, physician, nutritionist, and pharmacist) within 5 weeks.

Samples and Settings
The respondents in this study were type-2 diabetic patients in a primary health center who were willing to participate in this study. The recruitment was conducted in a primary health center in West Java, Indonesia. The researcher accompanied by the primary health center nurses approached the patients who stayed in the primary health center area, explained the research objectives and procedures, and asked their willingness to participate in this project. Patients who were willing to participate were provided inform consent forms to be signed.

Measurements
The data in this study were collected through questionnaires. The first part of questionnaire was employed to collect respondents' demographic and characteristic data. Second questionnaire (Diabetes Management Self Efficacy Scale (DMSES)) was applied to measure self-efficacy. It included four domains: diet, medication, physical exercise examination, and blood sugar check using a score of 1-5, namely not sure to very sure. The third questionnaire was applied to measure self-management data. It included four factors, namely diet, medication, physical exercise examination, and blood sugar check. Diabetic respondents' self-management behaviors were measured based on their activities in the last 7 days with the following choices: never (not at all in 1 week), rarely (done 1-3 days in 1 week), often (done 4-6 days in 1 week), always (always done within 1 week). All instruments are in accordance with the

validity and reliability tests. The DMSES questionnaire uses product moment correlation to test its validity with an r-value of above 0.658, while in the reliability test using the alpha test, the obtained value of cronbach's alpha is 0.975.

Diabetes integrated care program

Preparation phase
Initially, the first author conducted training for healthcare staff of the Community Health Center (CHC)(nurse, physician, nutritionist, and pharmacist). Later, they would be a part of the program conducted in the community. The PI explained the research procedures as well as the roles of health care staff in the implemented program including the procedures for filling out the questionnaires. Then, the PI explained the training materials including the concept of DM, self-management and self-efficacy behaviors of diabetic patients, and conducted simulations on how to conduct a multidisciplinary health education program focused on improving patients' self-efficacy and self-management behaviors. The PI conducted training for the IDCP team for 2 days. Then, the final evaluation was carried out at the end of the training and the program was interviewed.

Implementation phase
The program was implemented totally in a 5-week duration. The length of the intervention program was based on several previous studies. Initially, the diabetic patient met the physician in the CHC to receive reviews of the current conditions, regular treatment and medication, as well as health education regarding general DM treatments. The patient also met the nurse for the initial consultation regarding DM care program. Then, the patient received a 1-week follow-up program conducted by the nutritionist. In this home visit program, the patient received a diet review and additional education on diabetic diet program and how to develop meal plan. In the second week, a follow up was conducted by the pharmacist with focus on reviewing medication management and blood glucose check and control. The 3rd week home visit follow up was implemented by the nurse (the first author) with focus more on reviewing and improving patient's physical activities and foot care behaviors. The nurse (the first author) also conducted the 4th week home visit follow up that focused more on reviewing the patient's difficulties in implementing the aspect of self-management behaviors and discussing the possible solutions. Lastly, in the 5th week follow up, the patient re-visited the CHC to meet the physician and nurse (the first author) to receive regular treatment and additional consultation.

Data Collection
Data collection was conducted twice using three questionnaires: demographic data, self-efficacy, and self-management questionnaires. These questionnaires were given to patients prior to the intervention (the first

meeting with physician and nurse in the CHC) as well as in the end of program when the patients revisited the CHC (5th week). Data collection was conducted by the first author (the nurse who also conducted the 3rd and 4th week follow up visits).

Data Analysis
The collected data were analyzed descriptively and inferentially using paired t-test (significant at p < 0.5).

Ethical Consideration
This study has obtained ethical approval from the ethic commission of the Faculty of Medicine UNPAD with certificate number: 878/UN6.KEP/EC.

RESULTS

Table I showed that most of respondents were of non-elderly age (73.3%), female (66.7%), married (76.7%), unemployed (76.7), graduated from elementary school level (43.3%), had health insurance (76.7%), and had comorbid diseases (56.7%).

Table II described that the respondent's self-efficacy and self-management mean scores after receiving the diabetic integrated care program (80.9 + 6.34 and 87

Table I: General characteristics and health information of respondents (n=30)

Variable	f	%
Age		
<65 years old	25	73.3
>65 years old	5	16.7
Gender		
Male	10	33.3
Female	20	66.7
Marital Status		
Married	23	76.7
Widow/er	7	23.3
Ethnic		
Sundanese	16	53.3
Javanese	14	46.7
Employment		
Unemployed	23	76.7
Actively Works	7	23.3
Education Background		
Elementary and lower	14	46.3
Junior & senior high school	15	50
University	1	3.3
Exercise		
Never	9	30.0
Do some exercises	21	70.0
Follow Regular Diet		
Yes	6	20.0
No	24	80.0
Received Foot Education		
Yes	9	30.0
No	21	70.0
Co-morbid disease		
Yes	17	56.7
No	13	43.3
	Mean	SD
Length of DM (years)	4.96	5.11
Fasting Blood Glucose Level (mg/dl)	187.77	66.29

Table II: The mean different before and after diabetes patients receiving integrated care program in primary health care in Indonesia

Variable	Before		After		P value
	Mean	SD	Mean	SD	
Self-Management	68.47	6.339	87	6.07	0.000
Self-efficacy	59.60	10.842	80.9	6.34	0.000

+ 6.07) were significantly higher (p = 0.000) than those before receiving the intervention (59.60 + 10.842 and 68.47 + 6.339).

DISCUSSION

This pilot study indicated that the integrated diabetic care program implemented produced positive effect on patients' self-efficacy and self-management behaviors. It is similar to researches by (19) and (21). The collaboration between personel and regular home visits by health workers can improve the quality of life of the respondents. The results showed a significant difference in the average self-efficacy scores before and after receiving an integrative diabetes care program in the community (p-value 0.000). There was a significant difference in the average self-management scores before and after receiving an integrative diabetes care program in the community (p-value 0.000).

The increases in self-efficacy and self-management scores after this integrated care treatment were because the treatment service strategy in collaboration with various health workers was given to respondents as a program starting from activities inside and outside the building (home visits). This integrative care program combined different intervention approaches from several professions at the public health center, both inside and outside the building, in a series of health education and counselling provided in the Nursing Center counselling room and home visits for 60 minutes using modules for direct care counselling. As a result, the respondents were directed and fostered to plan activities in performing self-management behaviors.

The counselling given related to knowledge about the meaning of DM, causes of DM, signs and symptoms of DM, and complications of DM was carried out by doctors in the first week. The nutritionist conducted a home visit to provide health education about the DM diet in the second week. In the third week, the pharmacist performed home visits and provided health education to the interviewees treated with DM. In the 4th week, the nurse conducted a home visit to educate on exercises and foot exercises and evaluated self-controlled diabetes management. Home visits used individual education methods at respondents' homes through counselling, guidance, and interviews.

It is in line with a research conducted by (22), which showed that health education interventions about diabetes through home visits could significantly reduce

HbA1c values in month 6 (CI -2.2% to -1.2%, P < 0.001) and in month 12 (CI -1.9% to -1.0%, P < 0.001), and there was also a significant improvement in the levels of knowledge and self-management of diabetes.

A research conducted by (23) showed that family-oriented self-management programs could improve self-efficacy, self-management, quality of life, and knowledge of Diabetes over time in the intervention group (P < 0.05). In addition, another study conducted by (12) stated that family-based educational program interventions could significantly increase knowledge, self-efficacy and foot care behaviors in DM patients.

The results of a research conducted by (24) pointed out that the inclusion of nurse practitioners in the primary care service team to provide innovative ways to help adults with uncontrolled hyperglycemia could improve the clinical outcomes and self-efficacy of patients with type-2 diabetes. In addition, the results of the review and the meta-analysis of (25) pointed out that, overall, self-management support interventions positively affected the reductions of HbA1c, diastolic/systolic blood pressure, and LDL in diabetic patients. Based on this, Diabetes is a disease that can be prevented through self care. In addition, empowering patients to manage the illness and fostering patient-centred activities can effectively reduce complications or disease reactivation that can shorten life. IDCP is an approach that is used by following the principles of primary health care. IDCP emphasizes strengthening diabetes care at the primary level.

Though this study showed the significant effect of the integrated diabetic care program implemented, the results should be carefully interpreted due to the bias natures of the pilot study and small sample population involved.

CONCLUSION

There was a significant increase in diabetic patients' self-efficacy and self-management behaviors after receiving the integrative diabetes care program. IDCP is an effective way to improve the quality of life of diabetic patients and integrate care at the primary health services level. Further study with a stronger design is needed to clarify some biases related to this study design.

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