Padjadjaran Nursing Journal (Jurnal Keperawatan Padjadjaran)
ISSN 2338-5324 (print)
ISSN 2442-7276 (online)
Online di http://jkp.fkep.unpad.ac.id
DOI : 10.24198/jkp

The Effect of InGDEP on Type 2 Diabetes Patients' Knowledge and Self-Care

Hema Malini, Fitra Yeni, Dilya Eka Saputri
Faculty of Nursing, Universitas Andalas
Email: hema.maliniyusuf@gmail.com

Submitted: 20-2-2018 Accepted: 25-12-2018 Published: 25-12-2018

Abstract

In the recent years, there is an increasing number of the diabetes incidence worldwide. Self-care is believed as one of key in chronic disease management. In order to increase the capability to self-care, diabetics patients need to be empowered with the knowledge and skills through an educational program. There were some existed diabetes educational programs, however for developing country such as Indonesia, there was a need to develop a culturally relevant diabetes education program. This study was aimed to identify feasibility and the effect of the Indonesian Group-based Diabetes Education Program (InGDEP) on knowledge and self-care behaviors among type 2 diabetic patients. This quasi experimental with one group pre-and post-test only design involved 62 diabetic patients and 16 health professionals who actively delivered the program in four community health centers (Puskesmas). Data were collected using Diabetes Knowledge Questionnaire (DKQ) and Summary of Self Care Activities (SDSCA). Paired t-test used to analyze the effect of the InGDEP on the knowledge, self-care, and biometric measurement (HbA1c). The knowledge score for pre-test was 13.2+3.9 and post-test was 16.1±3.5, self-care activities score for pre-test was 3.31±1.10 and post-test was 3.99±1.27 and the HbA1C level was 10.56±2.32 The results showed there was the significant effect of InGDEP on diabetes patients' knowledge, some changes in self-care and biometric measurements even though it was not significant. The program also can be accepted by the health professionals where there was a good team work in delivering the educational program. It can be recommended that the InGDEP has an effect in improving knowledge and self-care among diabetics' patients, however since the effect on self-care and biometric changes was not significant, further research related to the factors that influence the self-care and biometric changes is needed.

Keywords: Active involvement, behavior, self-management.

Introduction

Worldwide, there is a significant increase in the number of people with diabetes, where one of the 11 adults suffers from diabetes (WHO, 2014). Data from International Diabetes Federation (IDF) (2015) showed that the incidence of diabetes in 2015 was 415 million people were suffering from diabetes, and it is estimated that in 2040 the number will grow to 642 million people. Moreover, the data also indicated that there are 193 million cases of diabetes, where around 5 million was undiagnosed (IDF, 2015).

Diabetes Mellitus is also known as "lifelong disease", cannot be cured, and people need to live with the condition after being diagnosed. Although diabetes cannot be cured, it can be controlled, and diabetic patients could life normally with their condition. Diabetes self-management (DSME) is the key aspect for managing chronic diseases and should be delivered in newly diagnosed people with DM (Funnell & Piatt, 2017). Diabetes self-management has been known as the effective program that can help people with DM manage their condition well. Diabetes self-management program focused on the changing behavior in maintaining the life style, diet management, activity and exercise. The diabetics patients need to perform a favorable behavior that known as self-management. The self-care behavior is an action in maintaining and managing the environment in order to regulate the function of a person and integrates the condition to maintain the quality of life (D'Souza et al., 2017). According to Indonesian Endocrinologist Association [PERKENI] (2015) one of the cornerstones in the managing DM is by providing the educational program. Health professionals need to actively provide some information regarding diabetes management, thus diabetics patients could have significant knowledge and skills in managing diabetes. All the health professionals especially who involved in providing health care directly to patients have some obligation which is become a support system for patients through their role as educators.

Providing health information through health education program for people with diabetes known as diabetes self- management education (DSME). This program has goals on empowering patients with knowledge and skills in order the diabetic patients able to perform proper self-management independently. There are several educational programs for diabetics' patients that has been developed and proven as an effective program in increasing knowledge and skills. Dose Adjustment for Normal Eating (DAFNE), Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) are some of the diabetes education program that have been implemented in several countries especially in developed countries (DAFNE study group, 2003; Davies et al., 2008; Deakin & Whitham, 2009). These programs in general have the same impact in lowering the glucose level of diabetics' patients, improve patients' understanding of diabetes and its management, and also improve the lifestyle of diabetics patients (Malini, Copnell, & Moss, 2017). However, those programs were effective where all the systems have been established. For country like Indonesia, where most of the health professionals were overload with their jobs, where the ratio between nurse and patient is still 87 per 100,000 people, there is a need for an alternative and effective approach in conducting a structured health education program. Thus, in order to support their job, a suitable program with their situation. Moreover, the materials especially regarding the diet and activity alternatives information, not all the information from the established program suit to Indonesian situation. Some of information such as food choices and activity alternatives need to slightly changes to match with Indonesian setting.

In choosing a health education program that would suit for Indonesian society requires some consideration including cultural, ethnic, accessibility and geographical issues. Thus, the Indonesian Group-based Diabetes Program (InGDEP) was developed as a culturally relevant education program with Indonesia situation (Malini, Copnell, & Moss, 2017). However, the implementation of the program in the previous research is limited to only small number of patients. Further investigation is needed to prove that the program has similar impact to

other respondents with different cultural background such as in West Sumatera. The aim of this study was to investigate the feasibility and the effect of InGDEP to the glycemic control, self-care knowledge and behaviors among people with T2DM.

Method

This study used quasi experiment with one group pre-and post-test only. There were 62 people with type 2 DM that live in working area of community health center (Puskesmas) in Solok city, West Sumatera that recruited based on some criteria namely willing to participate during four sessions of educational program in a month; able to read; able to do activities independently; no complication because of diabetes yet; age between 35–65 years old. This study also involved four health professionals from each Puskesmas, consist of nurse, doctor, nutritionist, and public health who act as the team member of educational program and attended two-days training provided with local diabetes educators prior program implementation. Training materials cover diabetes and its management and conveyed in the active learning style.

Diabetes Knowledge Questionnaire with 24 questions (DKQ-24) developed by Garcia, Villagomez, Brown, Kouzekanani, and Hanis (2001) was used to measure T2DM patients' knowledge. The questionnaire consisted of six domains including the definition of diabetes; recognize the diabetes symptoms; perception towards the diabetes management (diet, activities, lifestyle, and complication). The high scores indicate a better understanding on diabetes. Summary of Diabetes Self Care Activities (SDSCA) by Toobert, Hampson, and Glasgow (2000) was used for measuring T2DM patients' self-care behaviors. It consisted of diet, exercise and activities, foot care, medication and smoking behavior. For all the four components were measured using the average days of people with diabetes performed it. For the smoking components, it was measured by asking whether the respondents smoking or not, if the answer was yes, the respondents need to provide the number of cigarettes in a day. Both questionnaires have been translated into Indonesian and have been applied in some research (Malini, 2015). For the glycemic control, within cooperation with local government health laboratory which have obtained ISO, this study conducted a measurement of the HbA1c. The HbA1c were measured before the program started (baseline result) and were measured again three months after the respondents finish the program. Between at the end of program until the second measurement of HbA1c, the respondents were visited by the researcher once a week to examine their self-care behavior recorded in the diary including diet intake, activities and foot care. The data analysis was measured using the paired t-test to identify the changes of knowledge and self-care behavior, and also the glycemic control before and after attending the program. The program consisted of two days educational training for health professionals as the educator team, four education sessions provided by the educator team to the group of patients once a week for a month. Each session last for 45–60 minutes. After the whole session finished, regular home visit was conducted once a week for one month. The total length of the educational sessions and home visits were two months.

This study was conducted in accordance with good clinical practices as defined by Helsinksi Declaration for research using human as subjects (World Medical Association, 2001). The study was approved by the ethical committee of Faculty Medicine, Universitas Andalas, and also granted permission from The Health Office of Padang, West Sumatera.

Result

There were 62 respondents completed the four sessions of educational program, with around 16 health professionals in four Puskesmas actively delivering the program. The mean age of participants was 49.7 years old, and the mean of patients were diagnosed with diabetes was 4.2 years. Post test score of patients' knowledge (16.1+3.5) was significantly higher ($p = 0.021$) than the pre-test score (13.2+3.9). Meanwhile, there is

Table 1 DKQ 24 Score Before and After Attending the Educational Program InGDEP for People with Type 2 Diabetes in 2017 (N=62)

Variable and domains	Pre Test	Post Test	p Value
Diabetes Knowledge	13.2±3.9	16.1±3.5	0.021
Definition of Diabetes	2.3±1.2	3.1±1.1	
Recognize the Symptoms	3±1.5	2.5±0.8	
Perception of Diabetes	0.2±0.4	0.9±0.8	
Diet	1.8±0.7	2±0.7	
Life Style	2.7±1.1	3.9±1.1	
Diabetes Complication	3.2±1.0	3.6±0.6	

Table 2 SDSCA Score Before and After Attending the InGDEP for People with Type 2 Diabetes in 2017 (N=62)

Variable and Domains	Pre Test	Post Test	p Value
Self-Care Behaviors	3.31±1.10	3.99±1.27	0.043
Diet	3.16±1.59	4.32±1.62	
Exercise	1.23±1.48	2.83±2.02	
Foot Care	4.05±1.56	4.69±1.52	
Medication	4.52±3.21	4.57±3.10	
Blood Check	1.00±1.14	3.14±3.27	
Number of Smokers (n (%))			
No	62 (100)	62(100)	
Yes	0 (0)	0 (0)	

significant changes for self-care behaviour. There were some changes, the post test of HbA1c scores, the three months measurement after the program, (10.56±2.32) significantly lower (p=0.001) than the pre-test score (12.48±2.61).

Discussion

This study measured the effect of InGDEP in improving knowledge, behaviours and the glycaemic control (HbA1c) by comparing between pre and post test. Based on the analysis, this study found that InGDEP has some influence on changing the knowledge related to diabetes (pre 13.2 ± 3.9; post 16.1 ± 3.5; p value = 0.021). This result indicates there is increasing of knowledge of respondents towards diabetes and its management. The improvement of knowledge was followed by the changes in self-care behavior. Before the program, most of the respondents performed the self-care behavior was 2 days in average, after attending the program, it increases to 3 days in average (see Table 2 for SDSCA from 2.31 to 3.99). Even the number of days of performing self-care behavior only increase by one day, it still shows significant changes. Meanwhile, patients' glycemic control improved indicated by lower HbA1c level after three months, however generally the level of HBA1c is still above normal for people with diabetes (value of 8.5–9.0).

The diabetes education program is performed in order to improve knowledge and skill of people with diabetes in performing self-management toward their illness. Based on the results of the study, the average age of respondents is 49 years old, this shows that diabetes is experienced by people in the productive age. It is expected that at this age,

some person would be on the best performance of their careers and life. Within the diagnosis of diabetes, it meant that this person should consider their productivity should be suit to their health status. On the other hand, people at their productive age, tend to have sedentary lifestyle that can lead to diabetes or make the condition with diabetes worse if they cannot perform diabetes self-management well. In terms of, length of diabetes experience, the average time would be 4.2 years, shows that most of the respondents in this study have experience chronic condition. The chronic condition meant that people who experience it, need to have significant knowledge and skill on managing their disease in order to prevent further complication.

The result of this study shows some changes on knowledge, self-care and followed by the glycemic control. The implementation of group-based diabetes education program has some expected impact. The awareness of respondents towards the definition of diabetes, the symptoms and its complication have some impact on how they willing to perform the self-care behavior in daily routine. Ideally, people with diabetes need to manage their intake nutrition, exercise, lifestyle, foot care and medication every day. The involvement of health professionals in the program provide social support which is needed by people with chronic disease. It is believed that the involvement of health professionals could increase the awareness of diabetes patients with their self-care management includes diet, foot and eye care (Ruggeri et al., 2018). The role of health professionals in diabetes management considered as significant role in improving knowledge and skill through a diabetes education program.

Diabetes education program has been proven could enhance the knowledge and change behavior when there is some support to the patients. Study of Sari, Haroen, and Nursiswati (2016) shows that educational program has an impact in increasing the foot care among people with diabetes when the family involvement was existing.

The measurement of self-care using the SDSCA shows that in general that most of the respondents still do not perform the expected behavior every day. However, in terms of category, there is a difference in the frequency of changes in diet, exercise and foot care category before and after attending the program. This change indicates that most of the respondents aware that diet and exercise are important for their condition. For the foot care, most of respondents are Moslem, so it should become their habits for the respondents to check their foot every day. However, in this study, the foot care was not performed everyday due to there is still limited information on patients how they should perform foot care. However, for the blood glucose level checking, most of the respondents did not have the Glucotest, thus they only perform it when they attend to the Puskesmas once a week. Some of the respondents only check their blood glucose once a month or if it is necessary. All of the respondents in the study taking the drug orally to control blood sugar levels, the majority of respondents do some exercise and activities, but not much in accordance with the rules of activity, exercise in diabetes patients which consider the intensity, the durations, and endurance that is appropriate.

The increase in the value of knowledge is significant because health education was designed to improve knowledge and ability through a learning process and active involvement from the health providers. This study has proven that a diabetes education program that conducted by multi health professional could increase the knowledge and self-care of people with diabetes. Health education program consider as the best way in providing support for people with chronic disease. It is expected that the program would beneficial not only for the person who suffer the disease but also for the family in preventing and improving potential health problems in future. A study conducted by Siwi, Putri, Yudianto, and Kurniawan (2013) found that there is significant relationship between knowledge and self-care of diabetes management. The study found that through providing information to patients and family, the health behavior is improved.

There is some limitation to this study

which the involvement of family member has not explored further yet. A study by Sari et al. (2016), the family involvement has significant impact on the ability of diabetics' patients in conducting foot care. Family involvement is a very necessary supports for diabetics' patients in the treatment against the disease. Theory and research aforementioned explain that health education can enhance the ability of patients to perform self-care activities. The group-based education program has several advantages compare to individual approaches, the excess of which education is more attractive, dynamic intervention, and has social aspect of support to each member (Mensing & Norris, 2003). Thus, it is recommended that for the further development of the proposed educational program in this study need to include and emphasize more on the family involvement.

The InGDEP as a group-based model in health education program provides not only health information materials, but also there was a sharing of experiences among patients with patients and between patients with health care professionals in Puskesmas (Malini et al., 2017). During the implementation of the program, based on the observation conducted by the researcher, most of the session would contain some process of sharing information among the attendee both health professionals and patients, health professionals are the expert in the health related information, meanwhile the patients are the expert of their health condition. The presence of being valued as a person who knew better of the health condition make the patients seem more open to health professionals.

Research conducted by Shrader, Martin, and Cogdill (2013) found that the education program on diabetics patients who exercise in groups is effective in controlling blood sugar, HbA1c levels, systolic blood pressure, resulted in weight loss, and increase the knowledge of the patients. It can be concluded that providing health education effect on self-care behavior, but the influence is greater when health education conducted in groups, structured and involved a multidiscipline of health professionals. Educational group session which involved multidiscipline health professionals provide reinforcement to the patient, where the patients would feel that many health professionals concerned with their health condition. Thus, the program provided supports not only for the patients but also for the health professionals since they worked together as a team which enhance interprofessional collaboration.

This study has some limitation. First, the education program was implemented for research goals only, thus, the sustainability of the program need to be further investigated. Second, this study need to explore more on how the experience and perspective of all the participants involved in this program, so, qualitative research method need to be implemented in future research. This present study has provided a new insight of diabetes education program should conducted even further research need to conduct to measure the effectiveness of the education program.

Conclusion

The implementation of InGDEP as a diabetes educational program has been successfully enhanced knowledge and self-care of people with diabetes in three Puskesmas. The program has increased the knowledge and self-care activities especially in diet, exercise, and lifestyle. The group-based approach that used in this proposed education program provide a supporting environment for the patients since in the group approach, patients could learn from each other's.

For the measurement of HbA1c level, there is some decrease from the basis line level steadily to the three months level after patients completed the educational session. InGDEP has shown significant changes in knowledge, even though the self-care did not change significantly. However, in term of the active involvement, all respondents and health professionals felt some benefits of the program. It is expected that in future the program will be developed more, and the further research is still needed to search the effectiveness of the program.

References

D'Souza, M.S., Karkada, S.N., Parahoo, K., Venkatesaperumal, R., Achora, S., &

Cayaban, A.R.R. (2017). Self-efficacy and self-care behaviours among adults with type 2 diabetes. *Applied Nursing Research, 36,* 25–32. https://doi.org/10.1016/j.apnr.2017.05.004.

DAFNE study group. (2003). Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: Dose adjustment for normal eating (DAFNE) randomized controlled trial. *Diabetic Medicine: A Journal of the British Diabetic Association.* https://doi.org/10.1034/j.1600-6143.2003.000987_3.x.

Davies, M.J., Heller, S., Skinner, T.C., Campbell, M.J., Carey, M.E., Cradock, S., … Khunti, K. (2008). Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: Cluster randomised controlled trial. *BMJ (Clinical Research Ed.)*. https://doi.org/10.1136/bmj.39474.922025.BE.

Deakin, T., & Whitham, C. (2009). Structured patient education: The X-PERT Programme. *British Journal of Community Nursing, 14*(9), 398–404. https://doi.org/10.12968/bjcn.2009.14.9.43916.

Funnell, M.M., & Piatt, G.A. (2017). Incorporating diabetes self-management education into your practice: When, what, and how. *Journal for Nurse Practitioners, 13*(7), 468–474. https://doi.org/10.1016/j.nurpra.2017.05.019.

Garcia, A.A., Villagomez, E.T., Brown, S.A., Kouzekanani, K., & Hanis, C. L. (2001). The starr county diabetes education study. *Journal Diabetes Care, 24*(1), 16–21. https://doi.org/10.2337/diacare.24.1.16.

Group, D.P.P.R. (2002). The diabetes prevention program: Description of lifestyle intervention. *Diabetes Care, 25*(12), 2165–2171. https://doi.org/10.2337/diacare.25.12.2165.

International Diabetes Federation (IDF). (2015). Diabetes Atlas. International Diabetes Federation.Brussels, Belgium.

Malini, H. (2015). *Development of Indonesian Group-Based Diabetes Education Program (InGDEP): A Mixed Method Study.*

Malini, H., Copnell, B., & Moss, C. (2017). Considerations in adopting a culturally relevant diabetes health education programme: An Indonesian example. *Collegian, 24*(2), 183–190. https://doi.org/10.1016/j.colegn.2015.11.002.

Mensing, C.R., & Norris, S.L. (2003). Group education in diabetes: Effectiveness and implementation. *Diabetes Spectrum, 16*(2), 96–103. https://doi.org/10.2337/diaspect.16.2.96.

PERKENI. (2015). *Konsensus pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia 2015*. Jakarta: PERKENI.

Ruggeri, M., Drago, C., Moramarco, V., Coretti, S., Köppen, J., Islam, M.K., … Elliott, R.F. (2018). New professional roles and patient satisfaction: Evidence from a European survey along three clinical pathways. *Health Policy, 122*(10), 1078–1084. https://doi.org/10.1016/j.healthpol.2018.07.020.

Sari, C.W.M., Haroen, H., & Nursiswati. (2016). Pengaruh program edukasi perawatan kaki berbasis keluarga terhadap perilaku perawatan kaki pada pasien diabetes melitus tipe 2. *Padjadjaran Nursing Journal, 4*(3), 305–314. https://doi.org/10.1007/s11119-010-9200-7.

Shrader, S.P., Martin, A., & Cogdill, B. (2013). Effect of group diabetes self-management education classes on clinical outcomes and patient satisfaction in a family medicine clinic. *Journal of Pharmacy Technology, 29*(1), 35–39. https://doi.org/10.1177/875512251302900106.

Siwi, D., Putri, R., Yudianto, K., & Kurniawan, T. (2013). Perilaku self-management pasien diabetes melitus (DM) self-management behaviour of patient with diabetes mellitus (DM), *1*(April 2013), 30–38.

Toobert, D.J., Hampson, S.E., & Glasgow, R.E. (2000). The summary of diabetes self-

care. *Diabetes Care, 23*(7), 943–950. https://doi.org/10.2337/diacare.23.7.943.

World Medical Association. (2001). Declaration of Helsinki World Medical Association Declaration of Helsinki. *Bull World Health Organ, 79*(4), 373–374. https://doi.org/S0042-96862001000400016 [pii].

WHO. (2014). Health Systems. World Health Organization. Geneva