

The Effects of an Individual Empowerment Program on Behavioral Outcomes in In-Hospital Adult Patients with Type 2 Diabetes Mellitus

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An educational or empowerment program for diabetes patients is crucial to glycemic controls in type 2 Diabetes. This study aimed to evaluate the short-term effects of an empowerment program on behavioral parameters in an inpatient setting of type 2 Diabetes patients. This was a quasi-experimental study with a pretest-posttest design. The inclusion criteria were hospitalized adult patients with type 2 diabetes over 35 years of age with HbA1C levels over 7%. Eligible patients were assigned to the control group or the intervention group. The control group received routine care, while the intervention group received similar care to the control group and the individual empowerment program. All patients were evaluated at the baseline when they were admitted to the hospital and again at the third and sixth months after discharge using the self-efficacy scale, the self-management scale and the Cantril quality of life-anchoring ladder scale. There were a total of 57 diabetes patients who participated in this study, of which 27 in the intervention group and 30 in the control group. At baseline, variables of the two groups were comparable. At three and six months after discharge, the intervention group had significantly higher scores in all aspects of outcome compared with the control group. For example, the quality of life score in the intervention group was significantly higher than the control group (9.44 vs. 6.60; $p < 0.001$). In conclusion, the individual empowerment program improved short-term behavioral outcomes in adult patients hospitalized with type 2 diabetes.

Keywords: Self-efficacy, Self-management, Quality of life

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Type 2 diabetes mellitus is a common disease and is associated with other major cardiovascular diseases. If diabetes mellitus is left untreated it can lead to various complications⁽¹⁾. The main strategies to control diabetes include lifestyle modification and hypoglycemic agents. Compliance in taking medication is usually not a problem for diabetes patients. However, self-care or life style modification is more difficult. An educational or empowerment program for diabetes patients is, therefore, crucial for effective treatment of the disease.

One meta-analysis showed that an empowerment program improves diabetes care in both

type 1 and type 2 diabetes mellitus⁽²⁾. Enrollment in an empowerment program has also been shown to improve glycemic control, lipid profiles, and blood pressure in type 2 diabetes mellitus patients⁽³⁻⁵⁾. Another study showed a 0.55 mmol/L decrease in HbA1C in patents who underwent an empowerment program compared to controls (p -value = 0.012)⁽⁶⁾.

Additionally, patients' knowledge and attitudes regarding the disease, as well as their management practices have been shown to improve after undergoing empowerment programs⁽³⁻⁵⁾. Patients enablement scores have also been shown to be significantly higher in patients who underwent an empowerment program compared to a control group (8.3 vs. 5.9; p -value < 0.005)⁽⁴⁾. In most previous studies, the empowerment program was long-term, lasting from 6-12 months, and was conducted in both group intervention and outpatient settings. This study aimed to evaluate the short-term effects of an empowerment

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program on behavioral parameters in an inpatient setting. There were three times of empowerment training on an individual basis in this study.

Material and Method

This was a quasi-experimental study with a pretest-post-test design and was conducted at a university hospital in Thailand. The study period was between October 2013 and June 2015. The inclusion criteria were hospitalized adult patients with type 2 diabetes over 35 years of age with HbA1C levels over 7%. Patients were excluded if they had critical conditions, required a mechanical ventilator, suffered from physical or emotional instability, or were unable to complete the program.

Eligible patients underwent purposive sampling. The first 30 patients to be enrolled were assigned to the control group and the latter 30 were assigned to the intervention group. The control group received routine care during the admission period. The intervention group received similar care to the control group and in addition, were enrolled in the individual empowerment program. The program consisted of four steps including 1) building self-awareness and assessing the patient's health needs and problems, 2) implementing nursing interventions to empower the patients individually, 3) evaluating outcomes, and 4) monitoring and supporting patient empowerment.

Nurses employed a self-reflection technique and a need-assessment tool in order to build self-awareness and help patients identify their own needs and problems related to the progression of the disease, symptoms and complications, medication compliance, diet control, exercise, stress and coping, foot care, and other additional problems. The patient's three most significant problems were then determined in order that the patient and a nurse could work together to solve them.

In order to empower the patients, study nurses provided through patient education and instructional materials which covered the contents of diabetes pathology, treatments, diabetic complications, diet control, exercise, medication compliance, stress management, foot care, and management of other risk factors. These educational items were divided into three sessions and all sessions were given to the patients prior to discharge. Additional information corresponding to each patient's particular needs and problems was also provided. During the first three months after discharge, nurses performed two phone calls (at the first and third week) to each patient to

monitor self-care and to promote empowerment. Between months three and six the patient was able to call the nurse any time he/she experienced health problems. In addition, the patients were scheduled for two follow-ups in the hospital at the third and sixth month. In this study, the patient-centered approach was used to promote self-care, decision making, goal setting, and behavioral practice. Nurses were trained to use the empowerment program and acted as coordinator, educator and supporter.

The instruments used in this study included a demographic data form, a self-efficacy scale, a self-management scale, and a Cantril quality of life-anchoring ladder scale. The researchers developed the self-efficacy scale by modifying the Diabetes Self-Efficacy Scale⁽⁷⁾. It consisted of eight items with a five-point Likert scale. Responses were rated on a scale of one to five, where one corresponded to "never", two to "low", three to "moderate", four to "good", and five to "very good". The reliability of the original scale is 0.85. The Cronbach's alpha of the revised scale was 0.74.

The self-management scale which was modified from the Summary of Diabetes Self-Care Activities (SDSCA) consisted of 21 items with a rating scale of one to three⁽⁸⁾. The tool was examined for its content validity by five experts and was tested for its reliability with 15 patients. The Cronbach's alpha was 0.89. The Cantril quality of life-anchoring ladder scale was used to measure patients' quality of life. The scale ranged from 0-10 (lowest rank to highest)⁽⁹⁾. The Cronbach's alpha was 0.88.

All patients were evaluated at the baseline when they were admitted to the hospital and again at the third and sixth months when they came to the hospital for follow-ups using the self-efficacy scale, the self-management scale and the Cantril quality of life-anchoring ladder scale. Data regarding patient characteristics and outcomes were compared between the control and intervention groups using descriptive statistics. All analysis was performed using the Statistical Package for the Social Sciences (SPSS) for Windows version 10.0 (College Station, Texas, USA).

Results

There were a total of 57 diabetes patients who participated in this study, of which 27 in the intervention group and 30 in the control group. Three patients withdrew before the study was completed. The patients in both groups were comparable in terms of age, proportion of men and women, and body mass index.

The average ages and body mass indices in the intervention and control groups were 59.0 vs. 59.4 years (p -value 0.854), and 23.2 vs. 25.3 kg/m² (p -value 0.150), respectively.

At baseline, the self-efficacy scores, self-management scores, and quality of life scores of the two groups were comparable (Table 1-3). At three and six months after discharge, the intervention group had higher scores in all aspects of outcome compared with the control group (Table 1-3). The intervention group had significantly higher self-efficacy score than the control group at three and six months after discharge (42.26 vs. 23.70; 43.04 vs. 26.37). Similarly to the self-management scores, the intervention group had significantly higher score than the control group at three and six months after discharge (48.44 vs. 40.13; 47.89 vs. 42.87). The quality of life score had risen to 9.44 in the intervention group, which was significantly higher than that of the control group (6.60) at $p < 0.001$ after six months of discharge.

Discussion

The individual empowerment program significantly improved behavioral parameters of adult patients hospitalized with type 2 diabetes. Self-efficacy, self-management, and quality of life scores were significantly higher in the intervention group compared with the control group (Tables 1-3). In this study, the empowerment program was conducted by trained nurses who each played a variety of roles, such as educator, coordinator, and supporter. The program began when the patients were admitted to the hospital and continued for six months after discharge.

A previous study from Sweden showed that self-efficacy was not significantly improved after a one-year empowerment program in patients with type 2 diabetes mellitus⁽¹⁰⁾. In that study, there were 42 and 46 patients in the intervention group and control group, respectively. The median self-efficacy scores were no different at one year after an average of 4.7 group sessions (9.8 versus 4.0; p -value 0.272). In contrast, in

Table 1. Self-efficacy scores of diabetes patients categorized by group of treatment at various times

Times	Intervention group(n = 27)		Control group(n = 30)		t	p
	Mean	S.D.	Mean	S.D.		
Baseline	31.04	3.78	28.16	10.89	1.378	0.176
3 months after discharge	42.26	2.07	23.70	6.78	14.277	<0.001
6 months after discharge	43.04	1.34	26.37	7.88	11.398	<0.001

Table 2. Self-management scores of diabetes patients categorized by group of treatment at various times

Times	Intervention group (n = 27)		Control group (n = 30)		t	p
	Mean	S.D.	Mean	S.D.		
Baseline	41.44	4.01	43.29	9.21	0.964	0.339
3 months after discharge	48.44	1.37	40.13	3.63	11.663	<0.001
6 months after discharge	47.89	0.85	42.87	4.89	5.534	<0.001

Table 3. Quality of life scores of diabetes patients categorized by group of treatment at various times

Times	Intervention group (n = 27)		Control group n = 30)		t	p
	Mean	S.D.	Mean	S.D.		
Baseline	6.37	1.33	6.30	1.78	0.167	0.868
3 months after discharge	9.15	0.66	6.70	1.44	8.370	<0.001
6 months after discharge	9.44	0.51	6.60	1.40	10.370	<0.001

this study the average self-efficacy score was significantly higher in the intervention group than in the control group both three and six months after discharge. These data may be explained by the short term of evaluation and also by the empowerment method that was used. The individual, patient-centered program may be a better approach to improving self-efficacy than the group process. We believe that self-efficacy should continue longer than six months. However, further long-term studies are required to confirm the effects of the individual empowerment program.

The program in this study also significantly improved self-management and quality of life in hospitalized patients with type 2 diabetes (Table 2 and 3). Self-management scores were significantly higher in the intervention group than in the control group at both three and six months after discharge (Table 2). This result was compatible with those of previous studies⁽⁴⁻⁶⁾. The improvement of patients' self-management scores in this study was approximately 15%, which was higher than the improvement shown in a previous study (approximately 6% in the areas of knowledge, attitude, and practice)⁽⁶⁾. Another previous study showed no improvement in quality of life in the empowerment group at one year⁽¹¹⁾, while the average quality of life score in this study had significantly increased from 6.37 to 9.44 six months after implementing the program (Table 3). The main differences between the two studies were the evaluation time (six and 12 months) and the empowerment technique used (group versus individual), as discussed earlier.

The strengths of this study were that the empowerment program focused on an individual approach, and that nurses were specially trained in the implementation of the program. Most empowerment programs in previous studies were based on a group approach, which may not solve individual patients' particular problems. However, this study has some limitations. First, it was performed at only one site, a university hospital. The results, thus, may not apply to other healthcare settings. Second, the study design was not a randomized controlled trial, and it was difficult to blind the patients and nurses. Finally, the results of this study represented only hospitalized patients, who may be more focused on treatment than those in an outpatient setting.

Conclusion

The individual empowerment program improved short-term behavioral outcomes including

self-management, self-efficacy and quality of life in adult patients hospitalized with type 2 diabetes.

What is already known on this topic?

The long-term empowerment program is effective to improve glycemic control and patients' life style in regards of diabetes control. Most studies are group-intervention conducted in an outpatient setting.

What this study adds?

The individual empowerment program is also effective in terms of short-term behavioral outcomes including self-management, self-efficacy and quality of life in adult patients hospitalized with type 2 diabetes.

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Potential conflicts of interest

None.

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ผลของการเพิ่มขีดความสามารถรายบุคคลต่อผลเชิงสุขภาพในผู้ป่วยเบาหวานชนิดที่ 2 ที่รักษา ในโรงพยาบาล

อัมพรพรรณ อีรานูตร, นงลักษณ์ เมธากาญจนศักดิ์, วาสนา รวยสูงเนิน, ดลวิวัฒน์ แสนโสม, ปัทมา สุริต, กิตติศักดิ์ สวรรยาวิสุทธิ

การให้ความรู้หรือการเพิ่มขีดความสามารถเพื่อการควบคุมระดับน้ำตาลในผู้ป่วยเบาหวานชนิดที่ 2 เป็นสิ่งสำคัญการศึกษานี้มีวัตถุประสงค์เพื่อประเมินผลของการเพิ่มขีดความสามารถเชิงพฤติกรรม ในระยะสั้นของผู้ป่วยเบาหวานชนิดที่ 2 ที่ได้รับการรักษาในโรงพยาบาล การศึกษานี้เป็นการศึกษาแบบ quasi-experimental โดยมีการประเมินแบบ pretest-posttest เกณฑ์คัดเข้าการศึกษาคือ ผู้ป่วยเบาหวานชนิดที่ 2 ที่มีอายุมากกว่า 35 ปีและมีค่า HbA1C มากกว่าร้อยละ 7 ผู้ป่วยที่เข้าเกณฑ์การศึกษาจะแบ่งเป็น 2 กลุ่มคือ กลุ่มควบคุมและกลุ่มทดลอง กลุ่มควบคุมได้รับการรักษาดตามปกติ ส่วนกลุ่มทดลองจะได้รับการรักษาเช่นเดียวกับกลุ่ม ควบคุมรวมกับการเพิ่มขีดความสามารถในการควบคุมเบาหวานเป็นรายบุคคล ผู้ป่วยทุกรายจะได้รับการประเมิน self-efficacy, self-management, และ Cantril quality of life-anchoring ladder scale เมื่อเริ่มเข้าการศึกษาและที่ 3 และ 6 เดือนหลังจากออกจากโรงพยาบาล มีผู้ป่วยที่เข้าการศึกษาทั้งหมด 57 รายแบ่งเป็นกลุ่มทดลอง 27 รายและกลุ่มควบคุม 30 ราย เมื่อเริ่มเข้าการศึกษาปัจจัยต่างๆ ของผู้ป่วยทั้ง 2 กลุ่มมีค่าใกล้เคียงกัน หลังจากออกจากโรงพยาบาล 3 และ 6 เดือน ผู้ป่วยในกลุ่มทดลองมีค่าผลลัพธ์ทุกตัวสูงกว่ากลุ่ม ควบคุมอย่างมีนัยสำคัญทางสถิติ อาทิ ค่าคุณภาพชีวิตในกลุ่มควบคุม มีค่าสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (9.44 vs. 6.60; $p < 0.001$) โดยสรุปการเพิ่มขีดความสามารถรายบุคคลสามารถทำให้พฤติกรรม การควบคุมเบาหวานในระยะสั้นดีขึ้นในผู้ป่วยเบาหวานชนิดที่ 2 ที่ได้รับการรักษาในโรงพยาบาล