Effects of an Education Program-based on the Common Sense Model on Illness Perceptions, Knowledge, and Self-efficacy among Patients with Type 2 Diabetes Mellitus in Cambodia*

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Abstract

Purpose: This study was to examine the effects of an education program-based on the Common Sense Model on illness perceptions, knowledge, and self-efficacy among patients with type 2 diabetes mellitus.

Design: Quasi-experimental study with pretest and posttest control group design.

Methods: The sample was patients with type 2 diabetes mellitus who were living in 12 villages under health services of a health center. The villages were randomly assigned to the control and experimental groups. The simple random sampling technique with paired matching method were used for selecting subjects in the villages. Consequently, 36 participants made up each group. The intervention group was invited in a one day education program, whereas, the control group received routine care. The outcomes were evaluated by using the demographic data and illness information, Brief Illness Perception Questionnaire, the 24-item version of Diabetes Knowledge Questionnaire, and the Thai version of Diabetes Management Self-Efficacy Scale. The intervention instruments were developed by the researchers based on the literature review. Paired t-test and independent t-test were used for data analysis.

Main findings: The result showed that the participants in the intervention group who received the education program had statistically significant higher mean scores of illness perceptions, knowledge, and self-efficacy than before, and those in the control group who received usual care (all p's < .05).

Conclusion and recommendations: The findings of the study illustrated that an education program-based on the Common Sense Model could improve illness perceptions, knowledge, and self-efficacy among patients with type 2 diabetes mellitus. This program should be approached for discharge plan to provide accurate perceptions, proper knowledge, and confidence to take care among patients with type 2 diabetes mellitus.

Keywords: education program, illness perceptions, knowledge, self-efficacy, type 2 diabetes mellitus

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ผลของโปรแกรมให้ความรู้โดยใช้แบบจำลองสามัญสำนึกต่อการรับรู้ความเจ็บป่วย ความรู้ และสมรรถนะแห่งตนในผู้ป่วยโรคเบาหวานชนิดที่ 2 ในประเทศกัมพูชา*

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บทคัดย่อ

วัตถุประสงค์: การศึกษาครั้งนี้เพื่อศึกษาประสิทธิผลโปรแกรมให้ความรู้โดยใช้แบบจำลองสามัญสำนึก (common sense model) ต่อการรับรู้ความเจ็บป่วย ความรู้ และสมรรถนะแห่งตนในผู้ป่วยโรคเบาหวานชนิดที่ 2

รูปแบบการวิจัย: การศึกษาแบบกึ่งทดลอง (quasi-experimental study) แบบวัดก่อนและหลังการทดลอง (pretest-posttest control group design)

วิธีดำเนินการวิจัย: กลุ่มตัวอย่างเป็นผู้ป่วยโรคเบาหวานชนิดที่ 2 ที่อาศัยอยู่ใน 12 หมู่บ้านภายใต้การบริการของศูนย์สุขภาพแห่งหนึ่ง โดยสุ่มเลือกหมู่บ้านเข้าเป็นกลุ่มควบคุมและกลุ่มทดลอง และคัดเลือกกลุ่มตัวอย่างโดยใช้วิธีสุ่มอย่างง่าย (simple random sampling) และจับคู่กลุ่มตัวอย่างให้แต่ละคู่มีคุณสมบัติเคียงกันมากที่สุดได้ตัวอย่างกลุ่มละ 36 ราย กลุ่มทดลองได้รับโปรแกรมให้ความรู้ที่มีระยะเวลาในการดำเนินโปรแกรม 1 วัน สำหรับกลุ่มควบคุมได้รับดูแลตามปกติ เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลประกอบด้วย แบบบันทึกข้อมูลส่วนบุคคลและประวัติการเจ็บป่วย แบบสอบถามการรับรู้ความเจ็บป่วย แบบสอบถามความรู้เกี่ยวกับเรื่องโรคเบาหวาน และแบบสอบถามสมรรถนะแห่งตนเกี่ยวกับการจัดการเรื่องโรคเบาหวาน และเครื่องมือที่ใช้ในการทดลองที่ผู้วิจัยสร้างขึ้นจากการทบทวนวรรณกรรม วิเคราะห์ข้อมูลโดยใช้สถิติทดสอบค่าที paired t-test และ independent t-test

ผลการวิจัย: กลุ่มทดลองที่ได้รับโปรแกรมการให้ความรู้ มีค่าเฉลี่ยของคะแนนการรับรู้ความเจ็บป่วย ความรู้ และสมรรถนะแห่งตนสูงกว่าก่อนได้รับโปรแกรม และสูงกว่ากลุ่มควบคุมที่ได้รับการดูแลตามปกติอย่างมีนัยสำคัญทางสถิติ ($p < .05$)

สรุปและข้อเสนอแนะ: แสดงให้เห็นว่าโปรแกรมการให้ความรู้โดยใช้ Common Sense Model นี้มีประสิทธิภาพต่อการปรับเปลี่ยนการรับรู้ความเจ็บป่วย ความรู้ และสมรรถนะแห่งตนในผู้ป่วยโรคเบาหวานชนิดที่ 2 ดังนั้นจึงควรนำโปรแกรมนี้มาใช้เป็นแนวทางสำหรับวางแผนก่อนกลับบ้านเพื่อให้การรับรู้ที่ถูกต้อง มีความรู้ที่ถูกต้องและความมั่นใจในการดูแลตัวเองในผู้ป่วยโรคเบาหวานชนิดที่ 2

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Background and Significance

Globally, the prevalence of diabetes mellitus (DM) has raised from 108 million to 422 million from 1980 to 2014, respectively[1]. Moreover, type 2 diabetes mellitus (T2DM) is expected to raise from 415 million in 2015 to 642 million people in 20[2]. It was a significant cause of 1.6 million deaths in 2012, 2.2 million deaths in 2015, and the number of deaths will probably increase twice by 2030[1]. The Ministry of Health of Cambodia reported that the increasing number of patients with DM; that is, 29,730 in 2015, 41,958 in 2016, and 56,152 in 2017. Sequentially, from the number of patients with DM, T2DM accounted for 61%, 73%, and 82% in 2014, 2016, and 2017, respectively[3].

Most patients with DM were poorly controlled blood sugar and had complications. The Cambodia-Korean Twinning project reported that 82.9% of the patients with T2DM who received treatment could not reach recommended HbA1c level, and about one-third of them had HbA1c levels greater than 10%[4]. Furthermore, over half of adult (24-64 years old) patients with T2DM had kidney disease[5]. There are many factors causing patients to be poor glycemic control, such as lack of health care facility, ineffective education program[5], poor medication adherence, poor body weight control, loss of follow up, lack of knowledge about diabetes[6], and inaccurate illness perception about diabetes[7].

According to the Common Sense Model (CSM), Illness perceptions are defined as an individual's beliefs regarding his or her illness[8]. It is carried out the individual cognitive and emotional representations that determine the option of adapting processes and behavior in response to the obtained health threatening as well as an evaluation of treatment effects which toward their illness condition[9]. Moreover, illness perceptions consist of eight domains, including identity (label about the importance and symptoms), consequences (the outcomes and effects the patients expect as a result of their illness), cause (causal attribution that the patients assign to their illness), timeline (beliefs about the course of the illness and its expected duration), personal control (self-efficacy belief, which the patients believe that they can recover from or control the illness), treatment control (the context of patients' belief that they are controlled by the treatment), coherence (individual understanding of his or her illness), and emotional representations[9]. When the patients with T2DM are perceiving greater serious effects of diabetes and seeing diabetes as unpredictable and cyclical, they are out of the ability to control their illness, suffer greater emotional distress with a high concern, and are more prone to have poorly controlled glycemia. Moreover, when patients with T2DM attribute many of the symptoms they had experienced to their illness, they are more likely to lack of medication adherence which leads to have poorly controlled glycemia[10].

Knowledge refers to awareness, understanding, or information that has been obtained by experience or study, and that is either in a person's mind or possessed by people generally[11]. Moreover, diabetes knowledge is related to the knowledge that an individual obtains from diabetes education, experience, observation, self-perception, and self-action, all of which are necessary for making decisions and adopting an attitude that helps one better respond to personal needs[12]. Furthermore, the diabetes knowledge was significantly associated with better blood control monitoring and better medication adherence[13] which were the scenarios of glycemic control in DM.

Self-efficacy refers to an individual's belief in his or her ability to execute behaviors necessary to produce specific performance attainments[14]. Moreover, the people will take an action when they believe that they are able to do it and will avoid when they belive that they may fail. Thus, self-efficacy is the necessity of a behavior and should be taken

into account as an independent part of basic skills[15]. The more perceived self-efficacy, the more improved self-care behaviors resulting in optimal glycemic control among patients with T2DM[16].

Furthermore, several education programs based on the CSM (such as the psychological family intervention[17], an eating behavior modification program[18], the family-oriented self-management program[19]) reported improvement in illness perceptions, knowledge, self-efficacy, self-care behaviors, self-care management, glycemic status, and other anthropologies among patients with DM. However, there are few health facilities (such as non-government organization, private health clinic, or public health clinics) processing adequate and effective education program about the diabetes program regarding screening, management, and treatment in Cambodia which can provide an inadequate and ineffective of an education program about diabetes[5]. Thus, the concept of illness perception based on the CSM was interested as the conceptual framework.

Objective

This study was proposed to examine the effects of an education program-based on the CSM on illness perceptions, knowledge, and self-efficacy among patients with T2DM.

Hypothesis of the Study

1. After receiving an education program, the participants in the intervention group had higher mean scores of illness perceptions than before.

2. The participants in the intervention group who received an education program had higher mean scores of illness perceptions than those in the control group who received an usual care.

3. After receiving an education program, the participants in the intervention group had a higher mean score of knowledge than before.

4. The participants in the intervention group who received an education program had higher mean scores of knowledge than those in the control group who received usual care.

5. After receiving an education program, the participants in the intervention group had higher mean scores of self-efficacy than before.

6. The participants in the intervention group who received an education program had higher mean scores of self-efficacy than those in the control group who received usual care.

Methodology

Design

The randomized control trial was used to evaluate the effects of an education program-based on the CSM on illness perceptions, knowledge, and self-efficacy among patients with T2DM.

Population and Sample

The participants were patients with T2DM who were living in 12 villages under health services of the Domkrovann Health Center, Cambodia. Twelve villages were randomized to divide the villages into two groups equally, six villages assigned for control group and another six villages for intervention group. After getting permission from the Khon Kaen University Ethics Committee in Human Research and the National Ethic Committee for Health Research of Cambodia, the researcher asked and gained name list of patients with T2DM about demographic information to do the pair matching from deputy head of the health center. Pair matching was performed by using age[20], gender[21], and duration of diabetes[22] to control the confounding factors. Then, the researcher used a simple random sampling technique participants and distributed them as the control and intervention groups according to assigned villages. The participants were eligible for this study based on the following criteria: 1) having age 18 years old and over; 2) being diagnosed with T2DM by a physician; 3) being able to write, read, and speak in Khmer language; 4) being able to give informed consent or willing to participants in the study;

and 5) no having cognitive, mental disorder, or life-threatening illness.

The sample size was calculated based on estimated effect size d = $| X_E - X_C | / SD_c$[23] from the outcome of domain of coherence score of the intervention group was 8.39 (SD = 1.89) and the control group was 6.28 (SD = 2.80) by Keogh, et al.[17], resulting with d = .75. The level of significance was set at α = .05 and a power of .80, resulting in 29 participants in each group based on power table for effect size from Cohen[24]. The sample was raised by 25% to prevent drop-outs, resulting in 36 participants per group.

Research Instruments

The research instruments in this study consisted of two types which were described as follows

1. Instruments for research intervention

Each participants received 2 handbooks which were developed by the researcher and based on the 8 domains of CSM[9], including coherence (the organs of human body, the progression of blood sugar from food, the association between glycemia and insulin, pathophysiology, definition of DM, and diagnosed with DM), causal representations (risk factors of DM), identity (signs and symptoms of hyperglycemia and hypoglycemia), personal control (diet, medication, using and storage insulin, exercise, smoking, and alcohol consumption, diabetic foot care), treatment control (diabetic medication and type of diabetic medication), timeline (progression pattern of diabetic complications), emotions (stress management), and consequence (diabetes foot ulcer, diabetes eyes problem, diabetes with high blood pressure and heart disease, and diabetes kidney disease). Moreover, poster of food pyramid and food exchange card was aimed in the teaching process.

2. Instruments for data collection

2.1 Demographic Data and Illness Information Questionnaire included age, gender, occupation, marital status, level of education, duration of diabetes, and types of medication.

2.2 Illness perceptions among participants were assessed by the Brief Illness Perception Questionnaire (BIPQ)[25]. It contains nine items which are used to assess nine aspects of illness perceptions, including consequence (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), identity (item 5), concern (item 6), understanding (item 7), emotional response (item 8), and causal representation (item 9). From item 1 to item 8 are rated with 0-10 score. Item 9 is an open-ended question that allows the participants to illustrate what they belief about the most three causes of DM. Note that the total scores cannot be summated for this scale; each item scores represent each aspect of the illness perceptions. The higher scores of each item, the more serious perception that a patient has about health threat his or her illness represents.

2.3 Diabetes Knowledge of the participants was assessed by the 24 items version of diabetes knowledge questionnaire (DKQ-24)[26]. Each item is responded with possible three answers, including "yes", "no", and "don't know" which are marked as correct or incorrect. One point is given to each correct response and no point for the incorrect an swer. The scoring of the DKQ-24 was related to summing up all the correct items of each participant, which the higher scores show the better knowledge.

2.4 Self-efficacy in participants was assessed by the Thai Diabetes Management Self-Efficacy Scale (T-DMSES)[27]. The 20 items of T-DMSES was used to represent the confidence of diabetic patients in their abilities to manage the illness regarding diet (9 items), monitor (4 items), physical (4 items), and regimen (3 items). All items were rated by a 5-point Likert scale from strongly disagree to strongly agree; the higher scores indicate the higher belief in their capacities to carry out certain activities.

The instruments for research intervention

were checked for the appropriateness of content, language, and activities. Then, all instruments were translated from English to Khmer by using the forward and backward translation method. Language equivalence was confirmed with a nurse and doctor who were working in diabetes health clinic, and three patients with DM. After that, reliability of instruments for data collection were tested with 30 people who had similar characteristic as study participates. The BIPQ and T-DMSES had showed internal consistency with Cronbach's alpha of .75 and .86, respectively. The DKQ-24 indicated internal consistency with KR-20 of .83.

Ethical Considerations

The Office of the Khon Kaen University Ethics Committee in Human Research (IRB00008614) and the National Ethic Committee for Health Research of Cambodia (No. 077 NECHR) approved this research. The consent and agreement were obtained from each participant. The participants were informed about the study aim, education program, confidentiality, risks, benefits, and their rights. They could ask the questions and withdraw from the study any time.

Data Collection

During the data collection, the researcher started collecting data with the control group first, and then followed by the implementation of the education program and data collection in the experimental group. The participants were collected, assigned, and appointed by village health volunteers.

Control group received routine care from the health center which included blood sugar and blood pressure monitoring, consultation and a brief instruction of self-care with less than 5 minutes, and medication follow-up.

Week 1: The researcher gave the questionnaire that consists demographic data and illness information, BIPQ, DKQ-24, and T-DMSES for baseline measurement.

Week 2: The researcher went to meet the participants in control group again at their houses at one week after baseline measure. The patients were invited to answer the questionnaires which consisted of BIPQ, DKQ-24, and T-DMSES.

Intervention group received the education program by a group of 5-10 patients in 3 sessions which processed in one day at community by the researcher.

Week 1: The intervention group was interviewed by the researcher with demographic data and illness information, BIPQ, DKQ-24, and T-DMSES for baseline measurement. Then, they received 3 sessions of the education program on that day.

1) The first session was related to relationship creation between the researcher and participants at least 20 minutes which the researcher and participants introduced himself and themselves to make positive environment during the time of education.

2) The second session was covered domain of coherence, causal belief, identity, timeline and consequence and took around 60 minutes. The patients were encouraged to become aware of their current illness perceptions and accurate knowledge about diabetes. The basic information of diabetes including, definition of diabetes, pathophysiology, diagnosis in diabetes, risk factors, signs and symptoms of hyperglycemia and hypoglycemia, pattern of diabetes, and diabetes-related complications were focused in this session by using handbook.

3) The third session was covered domains of personal control and treatment control and took around 60 minutes. The participants were encouraged to aware of benefit and confidence to do the self-care. This education session focused on self-care (e.g. diet, exercise, medication, foot care).

Week 2: The posttest was measured by asking the participants to complete the questionnaires again which included only BIPQ, DKQ-24, and T-DMSES within a week after received education program.

Data Analysis

The chi-square, Fisher's exact test, and independent t-test were used to compare the differences between the demographic data and illness information of the control and intervention groups. The Shapiro Wilk test was used to assess the normality of the dependent variables. Paired t-test and independent t-test were used to compare the different mean scores of illness perceptions, diabetes knowledge, and diabetes self-efficacy within and between the control and intervention groups, respectively.

Findings

Characteristics of the participants

When comparing the characteristics of participants between the control and intervention groups, the result showed that there was statically significant difference at $p < .05$ (Table 1).

Table 1: Frequency and percentage of participants' characteristics with comparison between the control and intervention groups

Variable	Control Group (n = 36)		Intervention Group (n = 36)		p
	n	%	n	%	
Gender					.24[a]
Male	10	27.80	10	27.80	
Female	26	72.20	26	72.20	
Age (Year) ($\overline{X}$ ± SD)	50.69 ± 5.79		52.64 ± 6.00		.75[b]
35 – 39	2	5.56	2	5.56	
40 – 44	2	5.56	2	5.56	
45 – 49	4	11.11	4	11.11	
50 – 54	18	50.00	18	50.00	
55 – 59	10	27.77	10	27.77	
Marital Status					.84[a]
Married	28	77.80	26	72.20	
Widowed/Divorced	8	22.20	10	27.80	
Level of Education					.35[a]
Primary School	22	61.10	13	36.10	
Secondary School	7	19.40	14	38.90	
High School	7	19.40	9	25.00	
Occupation					.43[a]
Farmer	25	69.40	26	72.20	
Seller/Worker	11	30.60	10	27.80	
Duration of Diabetes ($\overline{X}$ ± SD)	6.19 ± 4.62		6.64 ± 4.99		.66[b]
1 - 5	24	66.66	24	66.66	
6 - 10	6	16.67	6	16.67	
> 10	6	16.67	6	16.67	
Type of medication					1.0[c]
Oral medication	34	94.40	35	97.20	
Oral medication and Insulin Injection	2	5.60	1	2.80	

[a] chi-square test, [b] independent t-tests, [c] Fisher's exact test

Effects of education program-based on the Common Sense Model

Within group comparison on the mean scores of illness perceptions, knowledge, and self-efficacy between pretest and post-test, the intervention group showed statistically significant increase of all illness perception dimensions, knowledge, and self-efficacy dimensions ($p < .05$, in each outcome) (Table 2).

Table 2: Comparison of mean scores and standard deviations of illness perceptions, and self-efficacy of the intervention group between pretest and post-test (n = 36)

Variable	Intervention Group				t	df	p
	Pretest		Post-test				
	$\overline{X}$	SD	$\overline{X}$	SD			
Illness Perceptions							
Consequences	4.36	1.86	7.27	1.20	-8.43	35	.01
Timeline	6.25	2.37	9.47	.94	-7.70	35	.01
Personal Control	4.52	1.52	7.41	.73	-11.79	35	.01
Treatment Control	7.52	1.96	8.97	1.08	-3.96	35	.01
Identity	4.61	1.24	7.47	.69	-13.07	35	.01
Understanding	4.19	1.16	7.50	.73	-14.06	35	.01
Concern	5.05	1.65	7.19	1.01	-8.36	35	.01
Emotional Response	7.27	1.64	8.55	1.22	-4.42	35	.01
Knowledge	8.22	2.34	18.47	1.74	-15.76	35	.01
Self-Efficacy	56.27	6.20	67.63	3.39	-10.01	35	.01
Diet	21.77	4.10	27.38	2.72	-7.18	35	.01
Monitor	10.08	2.58	13.55	1.48	-6.85	35	.01
Physical	13.83	1.84	14.78	.89	-3.22	35	.003
Regimen	10.58	1.46	11.91	.28	-5.42	35	.01

When comparing the mean scores of illness perceptions, knowledge, and self-efficacy at pretest, the results indicated that there was no statistically significant difference between the control and intervention groups. However, when comparing the mean scores of illness perceptions, knowledge, and self-efficacy between the control and intervention groups at post-test, the results showed statistically significant increase of all illness perception dimensions, knowledge, and self-efficacy ($p < .05$, in each outcome). (Table 3).

Table 3: Comparison mean scores and standard deviations of illness perceptions, knowledge, and self-efficacy at pretest and post-test between the control and intervention groups

Variable	Pretest		p	Post-test		p
	Control	Intervention		Control	Intervention	
	$\overline{X}$ (SD)	$\overline{X}$ (SD)		$\overline{X}$ (SD)	$\overline{X}$ (SD)	
Illness perception						
Consequences	5.16 (2.22)	4.36 (1.86)	.10	5.00 (2.22)	7.27 (1.20)	.01
Timeline	5.47 (2.96)	6.25 (2.37)	.22	5.27 (2.84)	9.47 (0.94)	.01
Personal Control	4.72 (1.73)	4.52 (1.52)	.61	4.66 (1.82)	7.41 (0.73)	.001
Treatment Control	7.86 (1.43)	7.52 (1.96)	.41	7.80 (1.45)	8.97 (1.08)	.013
Identity	5.19 (1.78)	4.61 (1.24)	.11	5.33 (1.88)	7.47 (0.69)	.01
Understanding	3.52 (1.31)	4.19 (1.1.6)	.26	3.58 (1.31)	7.50 (0.73)	.028
Concern	5.55 (1.77)	5.05 (1.65)	.22	5.61 (1.76)	7.19 (1.01)	.02
Emotional	8.02 (1.90)	7.27 (1.64)	.07	7.94 (1.92)	8.55 (1.22)	.006
Knowledge	8.91 (2.75)	8.22 (2.34)	.25	9.41 (2.50)	18.47 (2.74)	.01
Self-Efficacy	55.16 (8.29)	56.27 (6.20)	.52	54.41 (8.17)	67.63 (3.39)	.01
Diet	23.91 (6.09)	21.77 (4.10)	.08	23.41 (6.33)	27.38 (2.72)	.001
Monitor	10.08 (2.25)	10.08 (2.58)	1.0	9.94 (2.30)	13.55 (1.48)	.01
Physical	11.50 (1.96)	13.83 (1.84)	.09	11.52 (2.00)	14.77 (0.89)	.01
Regimen	9.66 (2.17)	10.58 (1.46)	.32	9.69 (2.13)	11.91 (0.28)	.01

Discussion

Our findings suggest that an education program-based on the CSM for patients with type 2 diabetes mellitus led to improvements in illness perceptions, knowledge, and self-efficacy.

When comparing the mean score of illness perceptions between pretest and post-test, the intervention group illustrated statistically significant changes of all illness perception dimensions at the level of .05. Moreover, the result showed that the mean score of each illness perception dimensions of participants in intervention group after received education program were statically significant higher than the mean score of each illness perception dimensions of participants in the control group who had received usual care at level of .05, indicating that patients who attained education program had more accurate belief about diabetes. Based on the domains of CMS[9], the contents of education program with colorful picture that provide more effectiveness for easy to understand and caught the concept of learning with diabetes mellitus included the contents of nature of DM (e.g. the body organs and insulin, how to get blood sugar in body, type of DM), causing, test, signs and symptom (hyperglycemia and hypoglycemia), life pattern after they were diagnosed with DM, diabetes complications (diabetic foot ulcer, amputation, diabetic retinopathy, hypertension, heart disease, stroke, and kidney disease with hemodialysis), diet control (e.g. food exchange), introduction suitable in-door exercise methods, how to adjust oral medication when they forget to take, how to keep medication, how to adapt with sign of hypoglycemia, how to accommodate with emotional distress with DM, and how to perform foot care.

This finding of the research study that motivate the accurate perception, and aware the pros and cons of illness representation among patients with T2DM was responded to the previous study by Wattanakorn, et al.[18]

Moreover, the psychological family-based intervention reported that illness perceptions were statically significant increase excluded consequence and timeline[17] while DESMOND program reported statically significant changes in domains of understanding, timeline, personal control, and seriousness[28].

Moreover, When comparing the mean score of knowledge before and after intervention, the intervention group reported statically significant changes of knowledge at the level of .05, and the means score of diabetic knowledge of participants in intervention group after obtained education program was significantly higher that the diabetic knowledge of participants in the control group who had received the usual care at level of .05, indicating that patients who attained education program had more knowledge about diabetes. This result was confirmed by Wichit, et al.[19] Keogh, et al.[17] Khunti, et al.[28] and Al-Qazaz, et al.[13] which reported about progrssion of diabetes-specific knowledge after received the educational intervention.

Futhurmore, intervention group reported significant improvement in diabetes management self-efficacy, indicating that patients who attained education program had more confidence to perform an accurate self-care after participated education program. In education program, the activities of exercise by using a chair to help maintain the body posture was adhering during the intervention among the researcher and participants, how to exchange foods which contained type of food, the number of serving in each type of food, amount in each food were provide in the with the colorful picture were provided to the participants in the intervention group. The finding of the study in the term of self-efficacy were confirmed by the psychological family intervention by Keogh, et al.[17] and the family-oriented program by Wichit, et al.[19] which reported that the intervention group was statically significant increase self-efficacy over time.

Limitations

Like all studies, this study had limitations. Generalizability is limited with participants were coming from a community on one province in Cambodia. Moreover, only immediate outcomes were measured (illness perceptions, knowledge, and self-efficacy), therefore future research should consider with long-term outcomes that can be the effects of the education program, such as self-management, self-care behavior, and glycemic control status. Furthermore, only Cambodian people with type 2 diabetes mellitus were studied. Thus, the applicability in other culture context is limited.

Conclusion and Recommendations

The finding of the study illustrated that an education program-based on the Common Sense Model could clarify any inaccurate perception, increase knowledge, and motivate self-efficacy among patients with type 2 diabetes mellitus. Thus, the researcher would like to give some recommendations as follows:

1. Recommendation for nursing practice

Nurses should take the education program to approach for discharge plan to the patients with diabetes mellitus for providing the accurate perceptions, proper knowledge and the confidence to take care for themselves about diabetes mellitus, which are the indicators for glycemic control and protection from complications.

2. Recommendation for nursing education

The contents of the education program can be used by nurse students for gaining knowledge of how to care the patients with DM.

3. Recommendation for future research

The immediate outcomes were measured (illness perceptions, knowledge, and self-efficacy) in this study. Thus, long-term outcomes, such as self-management, self-care behavior, and glycemic control status should be considered in future research.

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