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**THE EFFECTIVENESS OF AN EDUCATIVE-SUPPORTIVE PROGRAM
ON IMPROVING PERCEIVED SELF-CARE EFFICACY AND
DIABETIC CONTROL IN UNCONTROLLED TYPE 2
DIABETIC PATIENTS : A CASE STUDY OF
A RURAL HOSPITAL IN THE SOUTH**

BUNTANA PHUMLENG

**With compliments
of**

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

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Buntana Phumleng
Miss Buntana Phumleng
Candidate

Somchit Hanucharurnkul
Prof. Somchit Hanucharurnkul,
M.S.N., Ph.D.
Major-Advisor

Prakong Intarasombat
Assoc. Prof. Prakong Intarasombat,
M.Ed.
Co-advisor

S.A. Surakiat
Assoc. Prof. Surakiat Achananuparp,
M.D., M.P.H.
Co-advisor

Liangchai Limlomwongse
Prof. Liangchai Limlomwongse,
Ph.D.
Dean
Faculty of Graduate Studies

Yuwadee Luecha
Assoc. Prof. Yuwadee Luecha,
Ed.D.
Chair
Master of Nursing Science
Faculty of Medicine
Ramathibodi Hospital

Thesis
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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Nursing Science (Adult Nursing)

on
January 7, 2002

Buntana Phumleng
.....
Miss Buntana Phumleng,
Candidate

Somchit Hanucharurnkul
.....
Prof. Somchit Hanucharurnkul,
Ph.D.
Chair

Pongamorn Bunnag
.....
Asst. Prof. Pongamorn Bunnag,
M.D.
Member

S.A. Surakiat
.....
Assoc. Prof. Surakiat Achananuparp,
M.D., M.P.H.
Member

Suntharee Panutat
.....
Assoc. Prof. Suntharee Panutat,
M.S.N.
Member

Prakong Intarasombat
.....
Assoc. Prof. Prakong Intarasombat,
M.Ed.
Member

Liangchai Limlomwongse
.....
Prof. Liangchai Limlomwongse,
Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Prakit Vathesatogkit
.....
Prof. Prakrit Vathesatogkit,
M.D., ABIM., FRCP.
Dean
Faculty of Medicine
Ramathibodi Hospital
Mahidol University

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KEYWORD : EDUCATIVE-SUPPORTIVE PROGRAM/ TYPE 2
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BUNTANA PHUMLENG: THE EFFECTIVENESS OF AN EDUCATIVE-SUPPORTIVE PROGRAM ON IMPROVING PERCEIVED SELF-CARE EFFICACY AND DIABETIC CONTROL IN UNCONTROLLED TYPE 2 DIABETIC PATIENTS: A CASE STUDY OF A RURAL HOSPITAL IN THE SOUTH. THESIS ADVISORS: SOMCHIT HANUCHARURNKUL, M.S.N., Ph.D., PRAKONG INTHARASOMBAT, M.Ed., SURAKIAT ACHANANUPARP, M.D., M.P.H., 128 P. ISBN 974-04-1137-1

This pre-experimental research aimed at testing the effectiveness of educative-supportive program on perceived self-care efficacy and diabetic control in patients with uncontrolled type 2 diabetes. Purposive sampling was used to select 42 patients from the Outpatient Department, Sombejpraboromrachininad Nathawee Hospital, Songkhla Province. The educative-supportive program consisted of: 1) one workshop for teaching, sharing experiences, and skill training for one day in 3 large groups of 11, 24, 11 patients; 2) small group discussion consisted of 8-10 patients per group meeting once a month for 3 months; 3) individual counseling for patients according to their needs. The demographic data, the perceived self-care efficacy questionnaire, and the diabetic control were assessed before and after entering the program.

The findings revealed that after entering the program: 1) the patients' mean scores on the total and each dimension on perceived self-care efficacy such as dietary control, medication management, exercise, self evaluation and prevention of hypo-hyperglycemia, hygiene care and foot care, and stress management were significantly higher than those before entering the program (all $p_s < .0001$); 2) the mean on fasting blood sugar level decreased significantly in each month as compared to before entering the program ($p < .0001$); 3) Also the mean score on diabetic control after entering the program was significantly higher than before entering the program ($p < .0001$).

This study indicated that the educative-supportive program could improve perceived self-care efficacy and disease control in-patients with uncontrolled type 2 diabetes.

4236660 RAAN/M: สาขาวิชา: การพยาบาลผู้ใหญ่; พย.ม. (การพยาบาลผู้ใหญ่)

นฤตนา พุ่มเล่ง : ประสิทธิภาพของโครงการสนับสนุนและให้ความรู้ต่อการปรับปรุงการรับรู้สมรรถนะในการดูแลตนเองและภาวะการควบคุมโรค ในผู้ป่วยเบาหวานประเภทที่ 2 ที่ควบคุมโรคไม่ได้: กรณีศึกษาโรงพยาบาลชนบทแห่งหนึ่งในภาคใต้ (THE EFFECTIVENESS OF AN EDUCATIVE-SUPPORTIVE PROGRAM ON IMPROVING PERCEIVED SELF-CARE EFFICACY AND DISEASE CONTROL IN UNCONTROLLED TYPE 2 DIABETIC PATIENTS: A CASE STUDY OF A RURAL HOSPITAL IN THE SOUTH). คณะกรรมการควบคุมวิทยานิพนธ์: สมจิต หนูเจริญกุล, M.S.N., Ph.D., ประคอง อินทรสมบัติ, M.Ed., สุรเกียรติ อชานานุกาพ, อ.ว. (เวชศาสตร์ป้องกัน), M.P.H., 128 หน้า. ISBN 974-04-1137-1

การวิจัยครั้งนี้เป็นการวิจัยก่อนการทดลอง แบบศึกษากลุ่มเดียว วัดก่อนและหลังการทดลอง มีวัตถุประสงค์เพื่อทดสอบประสิทธิภาพของโครงการสนับสนุนและให้ความรู้เพื่อปรับปรุงการรับรู้สมรรถนะในการดูแลตนเอง และภาวะการควบคุมโรค ในผู้ป่วยเบาหวานประเภทที่ 2 ที่ควบคุมโรคไม่ได้ กลุ่มตัวอย่างเลือกแบบเฉพาะเจาะจง จำนวน 42 คน ซึ่งมารับบริการที่แผนกผู้ป่วยนอก โรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี จังหวัดสงขลา รูปแบบโครงการแบ่งออกเป็น การประชุมเชิงปฏิบัติการ 1 ครั้ง โดยแบ่งเป็น 3 กลุ่ม จำนวนผู้ป่วย 11 24 11 คน ตามลำดับ ประกอบด้วย การบรรยายและอภิปราย แลกเปลี่ยนประสบการณ์ การสอนและการฝึกปฏิบัติ โดยใช้ชีวิตที่สมและคู่มือประกอบ และการเข้ากลุ่มย่อย 3 ครั้ง แต่ละครั้งห่างกัน 4 สัปดาห์ จำนวนผู้ป่วยครั้งละ 8-10 คน โดยผสมผสานวิธีการช่วยเหลือแบบกระบวนการกลุ่มและรายบุคคล รวบรวมข้อมูลโดยใช้แบบวัดการรับรู้สมรรถนะในการดูแลตนเองสำหรับผู้ป่วยเบาหวานประเภทที่ 2 และแบบประเมินภาวะการควบคุมโรคก่อนและหลังเข้าโครงการ และวัดระดับน้ำตาลในเลือดก่อนอาหารเช้า ก่อนเข้าโครงการ และในแต่ละเดือน เป็นเวลาติดต่อกัน 4 เดือน

ผลการศึกษาพบว่า ภายหลังเข้าโครงการสนับสนุนและให้ความรู้ (1) ผู้ป่วยมีคะแนนเฉลี่ยของการรับรู้สมรรถนะในการดูแลตนเองโดยรวมและรายด้าน ได้แก่ การควบคุมอาหาร การรับประทานยา การออกกำลังกาย การรักษาสุขภาพอนามัยของร่างกายและการดูแลเท้า การประเมินน้ำตาลในเลือด การป้องกันและแก้ไขภาวะน้ำตาลในเลือดสูงหรือต่ำเกินไปและเรื่องอื่นๆ สูงกว่าก่อนเข้าโครงการอย่างมีนัยสำคัญทางสถิติ ($p < .0001$) (2) ค่าเฉลี่ยของระดับน้ำตาลในเลือดก่อนอาหารเช้าในแต่ละเดือน เมื่อเริ่มโครงการจนถึงสิ้นสุดโครงการต่ำกว่าก่อนเข้าโครงการอย่างมีนัยสำคัญทางสถิติ ($p < .0001$) (3) ภายหลังเข้าโครงการสนับสนุนและให้ความรู้ ผู้ป่วยมีคะแนนเฉลี่ยของภาวะการควบคุมโรคสูงกว่าก่อนเข้าโครงการอย่างมีนัยสำคัญทางสถิติ ($p < .0001$) ผลการวิจัยครั้งนี้ชี้ให้เห็นว่า โครงการสนับสนุนและให้ความรู้สามารถพัฒนาการรับรู้สมรรถนะในการดูแลตนเอง ส่งผลให้ระดับภาวะการควบคุมโรคของผู้ป่วยเบาหวานดีขึ้น

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CHAPTER I

INTRODUCTION

Background and rationale of the study

Diabetes Mellitus is a chronic disease with significant health problems in this country. The total number of diabetes patients around the world in the year 2000 was approximately 150 million. It will be more than double in the year 2025. Much of this (170%) increase will occur in developing countries (WHO, 2001).

The prevalence of diabetes is also high among Thai people. The results from surveys in 1991 and 1996-1997 showed that the percentage of diabetic patients would rise from 2.3 to 4.5 and this will increase with advancing age, especially more than 45 years old. The World Health Organization (WHO) estimated that the number of Thai people with diabetes will be increasing from 952,000 in the year 1997 to 1,923,000 in the year 2050 (Junpen Chuprapavun, 2000: 241). The majority of all diabetic patients (99%) suffer from type 2 diabetes. Factors that contribute to this rising incidence includes an aging of population, prolonged life spans and unhealthy lifestyle and obesity (Thep Himathongkam, 2000; Zinman, 2001).

If diabetic patients cannot control their blood sugar at normal levels, they will have acute and chronic complications. These complications are the major cause of increased morbidity and mortality. Thep Himathongkam (2001: 19) stated that the major

causes of increased morbidity and mortality in diabetic patients were cardiovascular complications (75%), and microvascular (10%). The Region Hospital survey in 1996 showed that (50%) diabetes mellitus is a cause of cardiovascular problems (Junpen Chuprapavun, 2000: 241). The Ministry of Public Health (MOPH) reported that the mortality rate of diabetic patients increased in 1976 and 1998 from 1.8 to 8.0 per 100,000 population.

At present, despite rapid progress in medicine and technology, it has been found that only 3% of diabetic patients could control their blood sugar (Junpen Chuprapavun, 2000: 239). Even in university hospitals and general hospitals, where there are medical specialist, it was reported that 60-80% of patients were at a poor level of diabetic control (Rajata Rajatanavin, et al., 1987: 185; Phibul Suriyawongpaisal, 1997: 1). This is the same as in community hospitals, where there are primary care providers. 80.49% with type 2 diabetic patients could not control their blood sugar at normal levels (Pichai Siriveatchadaruck, 1996).

In addition, The Regional Government Hospital Department reported the cost of therapy for diabetic patients was 918.96 baht per visit per person or 1670.09 baht when admitted in the hospital (Surasake Thukjarurnsathean, et al., 1997 cited by Junpen Chuprapavun, 2000: 248). Also if there were complications, the cost will be more (Putsuk, P. 1999). This showed that diabetes mellitus did not only directly affect patients but also their families, as well as the social and economic system. The results of the United Kingdom Prospective Diabetes Studies (UKPDS) demonstrated that delaying or preventing the complications associated with diabetes is enhanced by lifestyle changes

that included intensive glycemc control (UKDPS Group, 1998). Therefore, diabetic patients need to develop the ability to take care of themselves to controlling their diabetes to reduce the effect of complications.

Literature reviews and results of research in Thailand have indicated that several strategies were used to increase knowledge and self-care agency in diabetic patients, for example descriptive research to determine factors related to self-care. Qualitative research studies related to self-care in diabetic patients provided the deep understanding of self-care from the patients perspective (Emic view) (Wanapa Sitranyarat, 1996). Experimental research tested the effectiveness of helping methods for developing patients' self-care to continuously control blood sugar at a normal level, and the strategies used educative- supportive (Sanaun, A. 1999), health education (Thumpenjit, S. 1998; Jaithum, K. 1998), patient participation in self-care (Keeratiyutawong, P. 1994; Poneploy, W. 1996; Tantayothai, V. 1997; Ratanapitake, U. 1997), counseling (Chuglin, W. 1991), planned teaching (Tantayotai, V. 1982; Siritarungsri, B. 1984; Siripakarn, P. 1990; Juntaramolee, S. 1992; Loachot, C. 1994; Dumrongwanish, S. 1994; Limpapanoont, S. 1994; Poomidandin, S. 1996), mutual goal setting between nurse and patients (Tongsawatwong, Y. 1990), social and family member support (Klaidee, W. 1987; Chomsamut, K. 1992), and self help groups (Lertprapai, K. 1996). These studies showed that the majority of helping methods that were provided by health care teams increased the level of knowledge. However, the effectiveness in blood sugar control was inconsistent.

Data from two meta-analysis (Hanucharunkul, S. et al., 2000; Likitrachoen, S. 2001) showed that educative-supportive intervention research for diabetes in Thailand indicated more effective in improving patient outcomes. And it also showed that interventions produced small to large effect size on gluco regulator (0.13-1.39), on disease control (0.73-1.79), self-care agency (0.32-3.47), and knowledge (0.96-3.00), and the effect size of self-care promotion intervention over a decade did not change in ten years (1988-1999). This data reflects the minimal impact of self-care research in clinical practice. In addition, the majority of researches were master's thesis with follow-up evaluation of only a maximum of 3-4 months (Hanucharunkul, S. et al., 2000: 22). Thus, sustainable of outcome is questionable. Furthermore most of the studies were conducted in large tertiary care settings and urban. Therefore, generalization is limited.

Community hospitals provide primary care to the people in rural settings and serve most of the people in Thailand. The majority of diabetic patients in rural areas should receive their care in these community hospitals (Pisantantiwong, P. 1997). Sombejpraboromrachininad Nathawee is a community hospital at Songkhla Province. The number of patients with diabetes at the Outpatient Department in 1997, 1998, 1999 were 142, 180, 230, respectively. (Outpatient Department Record, 1999). It showed that the trend increased. In addition, the researcher did survey the out patients medical records of 271 diabetic patients during January to May, 2000 and found that 80% of 168 patients were not able to control their blood sugar (Criteria of control of fasting blood sugar is less than 140 mg%). The result indicated that controlling blood glucose level was ineffective. Health education was provided in a large group for the patients who were waiting to see

the physician at the outpatient clinic. Thus, patients were interrupted from the surrounding environment. At the same time, nurses could not teach according to the plan because they had to assist the physician and were busy with their routine work. The number of patients who visited the clinic were 37 to 62 per period. Thus, the physicians spent only 2-3 minutes for each visit and no time for teaching. Therefore, the health profession should establish a program for teaching self-care to the patients to control their blood sugar more effectively.

Thus, the purpose of this study is to test the effectiveness of self-care promotion program as outlined by Apiradee Plodnaimaung (1999) in a different hospital and environment. This program was selected because it organized the teaching through a workshop in a large group and was followed by small group meetings. These group meetings would help the patients in establishing network support and learning from each other. In addition, group teaching would save time and energy for the nurses. Furthermore, this program included various methods of helping synthesis from previous action research based on a nursing model (Keratiyuttawong, P. 1994; Phonploy, W. 1996; Tantayotai, V. 1997; Ratnapitak, U. 1997).

Conceptual Framework

This study was guided by Orem's conceptual model of nursing which included 3 related theories: theory of self-care, theory of self-care deficit, and theory of nursing system (Orem, 1995).

Self-care is the voluntary regulation of one's own human functioning and development that is necessary for individuals to maintain life, health and well-being

(Orem, 1995: 212). Self-care is goal-oriented, deliberate action that occurs as a process consisting of 2 related phases. The first phase consists of estimation and transitional operation. The second phase consists of production and evaluation of operations through decision making to maintain or terminate action.

To perform self-care behavior, the patients with diabetes must use their effort in taking whatever action they judge to be appropriate, even though it is neither pleasurable nor appealing to them. And they must have knowledge about themselves, their environment and understand the meaning and goals of self-care that needs to be done for control disease and its complications. Thus, knowing the goal of self-care should affect the selection of self-care activities (Orem & Taylor, 1986 cited by Somchit Hanucharunkul, 1997: 34).

Perceived self-care efficacy is an important aspect of motivation and is one part of power of component of self-care agency. It is the belief of a person that they are able to perform self-care actions that can bring about the desirable outcomes. Self-efficacy links knowledge and action, only knowledge is necessary but not sufficient for modify lifestyle (Moore, 1990: 22-23).

Perceived self-care efficacy is constructed when the people assess information and have decision-making such as performance accomplishments or varicarious experiences (Bandura, 1977: 79). When people perceive information and have self-confidence to act successfully, their confidence in their self-abilities will increase. Orem stated that capability for self-care operations consists of 3 abilities: estimation, transition, and

production (Orem, 1995: 230-234). Thus, perceived self-care efficacy can develop and is a factor that reflects the effectiveness in self-care of a person.

In helping patients to develop self-care agency, the nurses can design a nursing system to help the patients through social, interpersonal, and professional technological systems. The nursing system consists of 3 types: wholly compensatory, partly compensatory, and educative-supportive. This research uses an educative-supportive nursing system because the patients can operate their own self-care. The patients also have an important role in controlling their disease and prevention of complications. Nurses can teach, guide and provide an effective environment for the patients to develop and maintain their self-care agency (Orem, 1995: 145,291).

The concept of an educative-supportive nursing system used in this study is considered an integration of strategies, which include teaching, training by giving information about diabetes and increasing the ability of self-care. In addition, motivating by perceived self-care efficacy is encouragement for patients to continue to perform self-care. These effects of the program will make the diabetes patients increase their perceived self-care efficacy, and enable them to perform self-care action regularly, which would effect their blood sugar and body weight. The variables of this study are based on this conceptual framework as shown in Figure 1.

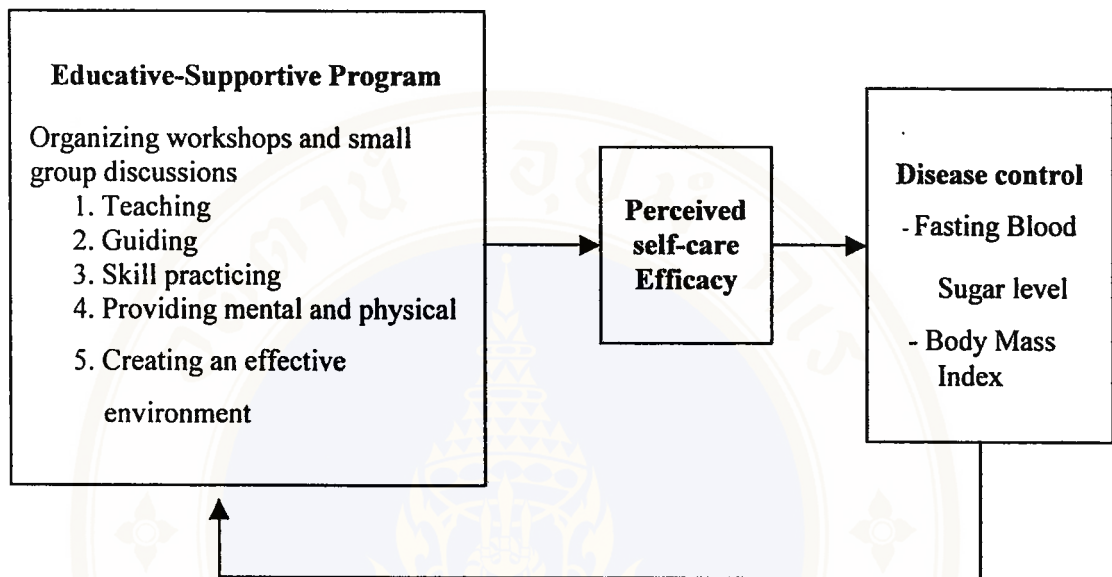


Figure 1: Conceptual framework for this study

Assumption

Diabetic patients have the potential to assess self-care efficacy and are able to develop self-care abilities with appropriate methods of helpings.

Objective of the study

1. To compare the mean scores of the total and each dimension on perceived self-care efficacy of diabetic patients before and after entering the program.
2. To compare the mean scores of diabetic control of diabetic patients before and after entering the program.

Hypothesis

1. After entering the program, patients' mean scores of the total and each dimension on perceived self-care efficacy are higher than before entering the program.
2. Patients' mean fasting blood sugar in each month after entering the program is lower than before entering the program.
3. After entering the program, mean scores of diabetic control would be higher than before entering the program.

Significance of the study

1. To provide a clinical guideline for healthcare providers in promoting self-care ability in uncontrolled patients with type 2 diabetes in order to control their disease and prevent complications.
2. To provide a nursing intervention program by educative-supportive program in other chronic diseases.
3. To provide a nursing theory based on developing knowledge for practice.
4. To provide innovation for advance practice nurses in primary care setting.

Scope of the study

This research aimed to study the effectiveness of a self-care promotion program in uncontrolled type 2 diabetic patients who had fasting blood sugars more than 140 mg% at 3 times consecutively before entering the program and who received oral medication

treatment at the Outpatient Department at Sombepjaboromrachinad Nathawee Hospital, Songkhla Province, during February to August, 2001.

Definition of Variables

An educative-supportive program refers to the nursing system as defined by the nursing theory of Orem, which can be used with patients who can control their movement and perform their self-care actions. The educative-supportive program consists of provision of guidance and support, as well as establishment of the environment to promote the patients' self-care abilities to meet therapeutic self-care demands as required by diabetes mellitus. The educative-supportive program was comprised of the following components:

- 1. Workshops and training program** refers to the provision of education to diabetic patients who cannot control their disease. The patients were divided into three groups, each consisted of 20 patients. The workshop lasted one day, and the relatives or caregivers of the patients were allowed to attend the workshop. The researcher provided knowledge to the patients by means of lectures, discussions to exchange experiences, videos, training, and distribution of documents. The content of the document provided included the causes and characteristics of diabetes mellitus, symptoms, complications, treatment, as well as appropriate self-care including dietary control, exercise, medication, self-care action to be performed when their blood sugar level is too low or too high, hygiene care and foot care, and stress management. This document was prepared by the researcher and two colleagues who conducted this intervention in two other institutions;

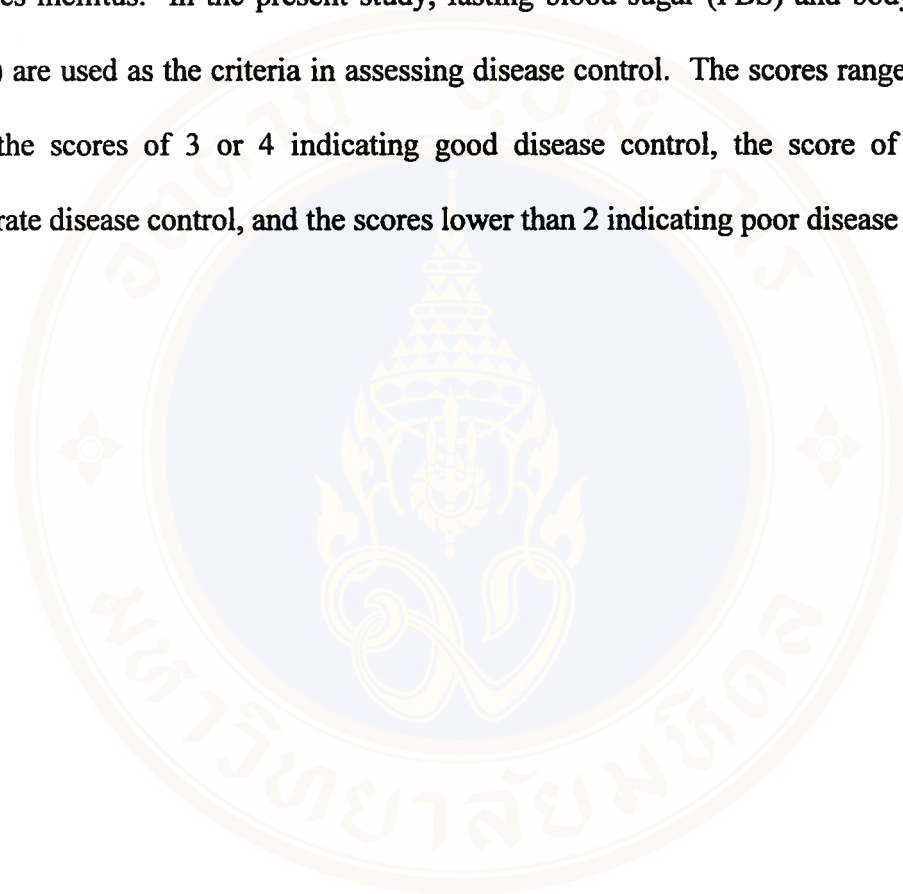
one in a General Hospital and the other in a Community Hospital. Moreover, the video was divided into four parts; quality of life of diabetic patients, diet for diabetic patients, diabetes mellitus and exercise, and how to take care of the feet. This video was produced by the Center of Community Health, Faculty of Medicine, Ramathibodi Hospital

2. Small group discussions provided the patients to participate in group discussions every four weeks for three times. There were 8 to 10 patients in each group. The responsibilities of the researcher included (1) conducting the group meeting, providing guidance and support by asking and answering patients' questions, both individually and in the group, giving advice to increase the patients' scope and depth of knowledge as the patients needed, and giving spiritual support to the patients both verbally and non-verbally (2) establishing the environment which promotes the patients' self-care agency by establishing good relationships between patients and health-care providers and between patients and other patients and creating opportunities for the patients to share their self-care experience and support each other, as well as setting up communication channels among the patients and health-care providers.

Perceived self-care efficacy of diabetic patients refers to the patients' feeling of confidence in themselves to successfully perform necessary self-care actions including dietary control, medication, exercise, assessment of blood sugar level, prevention and treatment of hyperglycemia or hypoglycemia, hygiene care and foot care, stress management, establishment of good relationships with other people, search for information and assistance, and seeking treatment. It is operational defined as the score on

perceived self-care efficacy questionnaire of diabetic patients developed by Walla Tantayotai (1993).

Disease control refers to an attempt to remedy irregular metabolism caused by diabetes mellitus. In the present study, fasting blood sugar (FBS) and body mass index (BMI) are used as the criteria in assessing disease control. The scores range from 0 to 4, with the scores of 3 or 4 indicating good disease control, the score of 2 indicating moderate disease control, and the scores lower than 2 indicating poor disease control.



CHAPTER II

LITERATURE REVIEW

This study is designed to test the effectiveness of the self-care participation promotion program on perceived self-care efficacy, and disease control in patients with uncontrolled type 2 diabetes at Sombejpraboromrachineenad Nathawee Hospital, Songkhla Province. In this chapter, the researcher reviewed the literature related in the following topics:

1. Type 2 diabetes mellitus and its effects.
2. Therapeutic self-care demands in diabetes patients.
3. Disease control in patients with type 2 diabetes.
4. Educative-supportive intervention program.

Type 2 Diabetes Mellitus and its effects.

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The current classifications proposed by the National Diabetes Data Group (NDDG) and the World Health Organization (WHO) are based on an etiologically and clinically heterogeneous group of disorders. These include: 1) Type 1 diabetes; 2) Type 2 diabetes; 3) other specific type-genetic defects of beta-cell function or insulin action, diseases of the exocrine pancreas, endocrinopathic drugs or chemically induced diabetes, infection and

uncommon form of immune-mediated diabetes, and other genetic syndromes; 4) Gestational diabetes mellitus (The expert committee on diagnosis and classification of diabetes mellitus, 2000: S5-S10).

Type 2 diabetes comprises 90% of all people with diabetes mellitus (ADA, 2001a: S28; WHO, 2001) and 99% in Asia (Thep Himathongkam, 2000: 19). Type 2 diabetes, previously referred to as non-independent diabetes, or adult onset diabetes, is a term used for individuals who have insulin resistance and usually have insulin resistance and usually relative (rather than absolute) insulin deficiency (The expert committee on diagnosis and classification of diabetes mellitus, 2000: S9).

In the pathogenesis of type 2 diabetes mellitus, endogenous insulin is representing, but it is diminished and its secretion impaired (Pritchard, 1996: 725-728; Chatchalit Ratarasan, 1998: 15). The risks of developing type 2 diabetes increase with age, obesity, lack of physical activity, stress, and low fiber with high fat diet (Pongamorn Bunnag, 1999; Teph Himatongkom, 2000; Surakiat Achananuparp, 2000; ADA, 2000e: S20).

The complications of type 2 diabetes can be categorized as acute and chronic. Acute complications include hyperglycemia and hyperosmolar nonketotic coma. Chronic complications can be categorized as microvascular and macrovascular problems which effect almost all organs. Retinopathy with potential loss of vision was found in 21% of patients with type 2 diabetes. This retinopathy has occurred at the time of first diagnosis (ADA, 2001b: S73) and it increases sharply 5 years after which correlated inversely to glycemic control (Voutilainen, et al., 2001: 10). Peripheral neuropathy, with the risk of

foot ulcers and amputation, is the result in loss of protection sensation (Umeh, et al., 1999: 60). Nephropathy leading to renal failure with hypertension in type 2 diabetes may also be associated with expanded plasma volume, increased peripheral vascular resistance, and low rennin activity (ADA, 2000b: S70). Autonomic neuropathy can cause gastrointestinal, genitourinary and cardiovascular symptoms and sexual dysfunction. The United Kingdom Prospective Diabetes Study (UKPDS) studied patients with type 2 diabetes and showed that improved blood sugar control in every percentage point decreased the HbA1c (eg. 9 to 8%). This lead to a 35% reduction in the risk of microvascular complications (ADA, 2000b: S74).

In order to prevent these complications, the diabetic patient should carry out their self-care behaviors to control their blood glucose levels within normal limits. This is the important goal of diabetic treatment. Thus, they need to have knowledge about diabetes and self-care practice to make decisions and to operate self-care behavior effectively.

Therapeutic self-care demands in diabetes patient

Diabetes self-care management includes dietary management, exercises, medication management, hygiene care and foot care, and stress management.

Dietary management

Dietary control in diabetes patients may be beneficial for both prevention and treatment (Vichai Tonpichit, 1987: 103; Savanceya Kongsomboomveat, 2000: 131). Bloomgarden (1995: 246) found that only 12% of non-insulin dependent diabetes mellitus

(NIDDM) patient could control their blood sugar on dietary management. American Diabetes Association (ADA) (2000c: S43) also stated that effective nutrition self-management training requires an individualized approach appropriate for personal lifestyles. The primary medical nutrition therapy (MNT) goal for individuals with type 2 diabetes is to achieve and maintain normal glucose, lipid, and blood pressure levels. The result of the study by Naphonluang, P. (1997) tested the effectiveness of patients to participate in dietary control for three months. It showed that after appropriate implementation, the HbA1c level decreased from 9.51 to 6.02 mole. In addition, the patient and their family increased their knowledge and understanding in food selection. Cennoy, N. (1999) studied the effectiveness of a health education program to modified dietary control among NIDDM patients. It was found that after entering the program, the fasting blood sugar increased. Thus, diet is the backbone of a treatment plan for diabetic patients (Ignatavicius, et al., 1995: 1890). Nutrition recommendations and principles for people with diabetes are as follows:

1. Calories requirement: For a person with diabetes is not different from those without diabetes. The National Institutes of health (1995: 103) suggested that the recommended caloric level is based on an individual's desired weight and activity pattern. It is divided into 3 categories of activity: poor, moderate, and high activity, which requires 25, 30, and 35 calories per kilograms per day, respectively. If the patient with type 2 diabetes is overweight, dietary restriction of total energy intake has been shown to influence fasting blood glucose and changes in bodyweight (Christinnsen, et al., 2000).

2. Carbohydrates: The ADA recommends that the amount of carbohydrates have been liberalized to 55% to 60% of total calories. Jiraniratsai, W. (1990) found that carbohydrates in food should be in the form of complex carbohydrates and the food should have dietary fiber of more than 16 grams per 1,000 calories. This would be effective to control the level of blood glucose. High-fiber diet, especially of the soluble variety, and soluble fiber supplements may offer some improvement in carbohydrate metabolism, lower total cholesterol and low-density lipoprotein (LDL), cholesterol, and have other beneficial effects in patients with non-insulin dependent diabetes (Vinik & Jenkins, 1988). Nithi Snuphboon & Vitaya Sridama (2000: 45) suggested that diabetic patients should have 40 grams carbohydrate fiber per day and a low glycemic index. With high glycemic index, the blood glucose level can rise too high and too quickly. Glycemic index is the effect of food on blood glucose levels as compared to response of an equivalent amount of glucose (rice in Thailand) (Keatnapa Takanchanavanid, 2000: 1).

3. Protein: American Diabetes Associate (2000c: S44) suggests that the protein intake of the adult diabetic patients is 10-20% of their daily caloric intake. It can be derived from both animal and vegetable sources. High protein intake and hyperglycemia can increase the glomerular filtration rate and workload of the kidney, and the progression of renal disease is delayed by early protein restriction. Results of several small studies in humans with diabetic nephropathy have shown that a prescribed protein- restricted diet of 0.6 gram per kilogram per day retards the rate of fall of glomerular filtration rate modestly (Wylie-Rosett, 1988: 143; ADA. 2000b: S71).

4. Fat: The National Cholesterol Education Program (NCEP), 1993 cited by ADA (2000c: S44) recommends that all individuals limit fat intake to less than 30% of their total calories. Saturated fat should be restricted to less than 10% of total calories and polyunsaturated fat intake should be less than 10% of total calories with monounsaturated fat in the range of 10% of total calories. Dahlan, W. (1999: 31) stated that high-monounsaturated fat diets improved plasma lipoprotein profiles leading to the lower risk of cardiovascular disease among diabetic patients. Madigan, et al. (2000: 1472) found that in well controlled type 2 diabetes patients, high-monounsaturated fat (olive oil) could reduce fasting blood glucose and insulin levels higher than high-polyunsaturated fat (sunflower oil).

Polyunsaturated fat from the omega-3 series is provided naturally in fish and other seafood, and the intake of this need not be curtailed in people with diabetes. Angkatavanich, J. (1999: 26) stated that the results from a recent meta-analysis revealed that the use of fish oil slightly increases the fasting blood glucose in type 2 diabetes. However, Montori, et al. (2000: 1407) found that fish oil supplementation in Type 2 diabetes had lowered triglycerides, increased LDL cholesterol, and has no statistically significant effect on glycemic control.

5. Sodium: People with diabetes have sodium sensitivity more than the general population (Tuck, 1990 cited by Nithi Sanuphboon & Vitaya Sridama, 2000: 55). American Diabetes Association (2000c: S45) suggests that people with diabetes should limit their sodium to no more than 3,000 mg/day, for diabetics with moderate

hypertension to no more than 2,400 mg/day, and for diabetes with hypertension and nephropathy to no more than 2,000 mg/day.

6. Alcohol: Wei, et al. (2000: 18) found that men with high alcohol intake (more than 276.6 g/week) may be able to reduce their risk of developing type 2 diabetes, if they drink less. Alcohol is not metabolized to glucose and it inhibits gluconeogenesis. If alcohol is consumed without food it can lead to hypoglycemia. Ball, et al. (2000: 1630) found that light-to-moderate alcohol consumption (0.5-0.99 drink/day) has been associated with increased insulin sensitivity, and it could be completely confirmed after adjustment for BMI and central adiposity. American Diabetes Association (2000c: S46) suggests that no more than two drinks per day for men and no more than one drink per day for women (1 alcoholic beverage = 12 oz beer, 5 oz wine).

Exercise

Exercise is an essential component of diabetic management by preventing or delaying the onset of type 2 diabetes (ADA, 2000a: S52-S53). Before entering into any type of exercise program, all patients should have a complete history and physical examination. Ulchaker (1999: 1148) stated that exercise was contraindicated during periods of hyperglycemia of 250 mg/dl or higher and ketosis because if exerting a physiological stress on the body it will result in progressive hyperglycemia. During the 40 minutes of exercise, energy is provided by hepatic glucose production. Fat provides energy for exercise sessions lasting longer than 120 minutes (Ignatavicius, et al., 1995: 1892). To achieve long-term effects, exercise at least three times or were more frequent, can help to reduced glycosylated hemoglobin HbA1c level (Lehmann, 1998 cited by

Rodger, 2000: 886). For the effect of regular exercise training on carbohydrate metabolism and insulin sensitivity, exercise must be done 3-4 times a week for 30-60 minutes (ADA, 2000a: S52). Uranee Ratnapituck, et al. (1993: 179) studied aerobic exercise in NIDDM patients. The exercise composed of warm ups (5 minute), exercise (20 minute), and cool-down (5 minute). The result showed that the diabetic patients after entering the program lowered their HbA1c significantly to normal levels more than before entering the program. Thus exercise is essential for people with diabetes in daily life.

Medication management

Medication administration is indicated when a patient with type 2 diabetes is not able to achieve normal blood glucose level which dietary modification and regular exercise or stress management (Ignatavicius, et al., 1995: 1876). Pharmacotherapy for type 2 diabetes can be divided in oral hypoglycemic therapy and insulin therapy that indicated drug failure or conditions such as illness, surgery, and severe stress interfering with control of glucose levels and necessitate treatment with insulin. After recovery, oral hypoglycemic therapy may be successfully reinstated (Surakiat Achananuparp, 1995: 20). This study described only oral hypoglycemic therapy because all the subjects were treated with oral medication. Oral hyperglycemic agents can be divided into 3 groups; Insulin secretagogues, Insulin sensitizers, and Alpha-Glucosidase inhibition.

1. Insulin secretagogues: Augmenting insulin secretion could be divided into two categories; sulphonylurea and non-sulphonylurea. These groups are used to lower blood glucose levels by stimulating the release of insulin, enhancing the number of sensitivity and receptor sites on the cell for interaction with insulin. First generation of

sulphonuryrea (Chlorpropamine, Tolazamide, Tobutamide, Acetohexamide) have a higher risk of side effects such as hypoglycemia. The second and third generation sulphonylureas (Gligenclamide, Gliclaside, Glipiside) have short duration of action, and less side effects. Sulphonylurea agents have benefit when fasting glucose levels greater than 250 mg/dl because beta-cell functions tends to deteriorate with time, limiting the effectiveness of the drugs. These drugs are not used with patients who have developed an impairment of kidney function.

2. Insulin sensitizes: These drugs decrease insulin resistance and decrease insulin sensitization. They include Biguanide and Thiazolidinedione. Drugs in this class include Metfomin (Glucophal, Diamet), but only Biguanide is available in Thailand. Biguanide is a more logical choice for the obese patient in whom insulin resistance is thought to be a major factor since significant bodyweight gain is not a feature of use (UKDPS, 1998). Biguanide can be usefully combined with sulphonylureas. The action includes the inhibition of hepatic glucose production and a shorter duration than the sulphonylureas (Evans & Krentz, 1999). The main side effect is nausea and taking it with food can minimize this effect. Troglitazone, the first in a new class of insulin sensitizing drugs. The used of Thiazolidinediones can cause severe hepatotoxicity. Other agents in this class include Rosiglitazone, Pioglitazone which are under development.

3. Alhpla-Glucosidase inhibitors: Drugs in this class include Acarbose (Glucobay) and Vogibose (Basen). The action decreases postprandial blood glucose by directly interfering on the digestion and absorption of dietary side effect carbohydrates. Acarbose is most commonly used as adjunctive therapy to metformin or sulphonylureas.

The side effect is increased intestinal gas problem. Acarbose needs to be taken with the first bite of the meal (Evans & Krentz, 1999).

Providing hygiene care and foot care

People with uncontrolled diabetes have an increased risk of infection. This is especially true in warm, moist areas (between the toes, under the breasts and in axilla and groin) because it encourages the growth of organisms (*Streptococcus*). From uncontrolled diabetes (blood sugar more than 200 mg%), it cause lead to loss of fat deposits under the skin, loss of glycogen, and catabolism of proteins. Protein loss can hamper the inflammatory response and wound healing and impair leukocyte function, migration of leukocytes to the site of infection, phagocytosis and bacterial kill, all of which are involved in combining an infection. Circulation impairments can also delay healing. It is extremely important that a person with diabetes carries out hygienic measures daily for prevention of infection, with special emphasis on foot care. The patients should understand the implications of the loss of protective sensation, the importance of foot monitoring on a daily basis, the proper care of the foot, including nail and skin care, and the selection of appropriate footwear (Amornchai Hanpadunkhama, 1996; Jarun Mahornata, 1999; Sukchai Jantaraamornkul & Teph Himathongkam, 2001: 6-7).

For foot problems, approximately 15% of all patients with type 2 diabetes will develop a foot or leg ulcer during the course of the disease. There are three major factors: neuropathy, ischemia, and sepsis (Halpin & Golgsmith, 1999: 26). The diabetic neuropathy, which affects 60% to 70% of those with diabetes, often leads to foot ulcers

and can lead to extremity amputation, both of which are preventable (Zangaro & Hull, 1999: 57). American Diabetes Association (2000f: S41) has suggested that all individuals with diabetes should receive a thorough foot examination at least once a year to identify high-risk foot conditions. This exam should include an assessment of protective sensation, foot structure, vascular status, and skin integrity.

Stress management.

In diabetes, stress could alter blood sugar level in two ways. Firstly, people under stress may not take well care of themselves (medication, diet, and exercise). Secondly, stress hormones may also alter blood sugar levels. Also chronic psychosocial stress and anxiety is related to metabolic control in diabetes among adults (Cox, et al., 1984 cited by Perot & McMerry, 1992: 842). Results of a study by Thrapnud, P. (1998) found that age and duration of disease affected stress. Mazze, et al. (1984) found that personality had no relationship to the level of glycoemic control. In contrast, anxiety or depression showed a significant relationship to metabolic control. Perot & McMerry (1992: 842) found that a higher level of stress results in higher glycoemic levels among people who do not cope effectively with stress, whereas the glycoemic control of those who cope more effectively with stress is not affected. They have suggested that the deleterious effects of stress can be minimized through the use of stress-management techniques, such as social support, coping behavior, and relaxation response. Consistent with this Thanee, T. (1998) has suggested that assisting individuals to cope with stress may have an important impact on their blood glucose. The relaxation can be done in many ways such as mediation, yoga, or muscle relaxation. Thus, this was necessary to help

patients to cope with stress management and problem-solving techniques which are appropriate in life.

Diabetic patients who have adjusted their behaviors for an appropriate action in their lifestyle can have control of their disease. Treatment in the disease requires continuing medical care and education to prevent acute complications and to reduce the risk of long term care. This should be the target for treatment and self-care.

Disease Control in Patient with Type 2 Diabetes

The desired outcome of disease control in type 2 diabetes includes history and physical examination, and laboratory evaluation.

History and physical examination

The routine follow-up examination should include the following: height, weight, blood pressure, sexual maturation, and feet examination. Visual examinations should be performed annually by an ophthalmologist or optometrist who is knowledgeable and experienced in the management of diabetic retinopathy. This should be done for all patients aged 10 years and older or who have had diabetes for 3-5 years. The patients diagnosed after age 30 should have their feet examined at least once a year to identify high-risk foot conditions. This examination should include an assessment of protective sensation, foot structure, vascular status, and skin integrity (ADA, 2000f: S36).

Laboratory evaluation

1. Urine testing: Direct measures of blood glucose provide only a rough estimate of prevailing blood glucose levels. The variability of the renal threshold (the

point at which the kidney excretes glucose), for most patients is 180 mg/dl (10 mmol/l). Some adults have blood glucose levels of 250 to 300 mg/dl before glucose is found in the urine. As a result of the aging process, or kidney damage, the renal threshold rises, so these tests correlate even more poorly with blood glucose values.

2. Blood glucose: Whole blood glucose value was provided for the self-monitoring of blood glucose (SMBG), and the laboratory methods measure plasma glucose. Many blood glucose monitors are approved for home use and some test strips now calibrate blood glucose readings to plasma values. Plasma glucose values are 10-15% higher than whole blood glucose value.

3. Glycosylated Hemoglobin Assays: Glycosylated Hemoglobin Assays is a term used to describe a series of stable minor hemoglobin components formed slowly and nonenzymatically from hemoglobin and glucose. Measurement of glucosylated hemoglobin (HbA1c) reflects the previous 2-3 months of glycemic control (the average erythrocyte life span of 120 day). Glucosylated hemoglobin testing three to four times a year provides information about control of blood glucose value. The normal value range is from 4% to 5 % (ADA, 2000f: S33).

4. Glycosylated serum protein or Albumin: One of glucosylated albumin is serum fructosamine that is measured and reflects blood glucose control over the proceeding 1-2 weeks (half-life of human serum albumin is 14-20 day)

Target indicators for diabetic control

Target indicators for diabetic control are based on criteria by ADA and European Policy Group cited in Charnchai Derothjanawong (2000: 13); Sarat Sunthonrayothin (2000: 260-261); Thep Himathongkam (2000) as follows:

Table 1. Target indicators for diabetic control.

Indicator	Normal	Target	Additional action suggested
Fasting Plasmas Glucose (mg/dl)	<115	80-120	>140
Postprandial Glucose (mg/dl)	<140	<160	>200
Bed time Glucose (mg/dl)	<120	100-140	<80, >160
HbA1c (%)	<6	<7	>8
Blood Pressure (mm.Hg)	<120/80	<130/85 or 130/80	>160/95
Cholesterol (mg/dl)	<200	<200	>250
LDL-Chol (mg/dl)	<100	<100	>130
HDL-Chol (mg/dl)	>45	>45	<35
Triglyceride (mg/dl)	<200	<200 or 150	>400
BMI (kg/m ²)	Male	20-25	>27
	Female	19-24	>27

Criteria of Disease control

Disease control is a variable that is used to measure the outcome of a person's health. In this study, disease control is composed of blood sugar and body mass index (BMI) which was modified based on the criteria: disease control defined by ADA (Table 2), European NIDDM Policy Group (Table 3), and Body mass index (BMI) using criteria of Wannee Nithiyant (1992: 3), specifically proposed for Thai people (Table 4).

Table 2. Target of disease control for people with type 2 diabetes (ADA, 2000f: S33)

Indicator	Normal	Goal	Additional action suggested
Whole blood values			
Average preprandial glucose(mg/dl)	<100	80-120	<80/>140
Average bedtime glucose(mg/dl)	<110	100-140	<100/>160
Plasma values			
Average preprandial glucoes(mg/dl)	<110	90-130	<90/>150
Average bedtime glucoes(mg/dl)	<120	110-150	<110/>180
HbA1c(%)	<6	<7	>8

Table 3. Target of disease control for people with type 2 diabetes (European NIDDM Policy Group cited by Chatahalit Ratanasan, 1998: 19)

Indicator	Good	Borderline	Poor
FBS(mg/dl)	80-100	<140	>140
Postprandail(mg/dl)	80-144	180	>180
HbA1c(%)	<6.5	7.5	>7.5
BMI(kg/m ²)-Male	20-25	<27	>27
-Female	19-24	<26	>26
BP(mmHg)	<140/90	<160/90	>160/90

Table 4. Criteria of body mass index (BMI) (Wanee Nithiyant, 1992: 3).

Health status	BMI (kg/m ²)	
	Male	Female
Malnutrition	<18.0	<17
Underweight	18.0-19.9	17.0-18.9
Normal	20.0-25.0	19.0-24.0
Overweight	25.1-27.0	24.1-26.0
Obesity	>27.0	>26.0

The goal of treatment is to control diabetes with various related dimensions. When people have diabetes, they have health deviation. Thus, they should have knowledge about diabetes and their goals treatment for themselves to make decisions and to operate the self-care behavior, which includes many strategies to help diabetic patients.

Educative-Supportive Intervention Program

There are many studies related to educative-supportive intervention programs to improve diabetic control in patients with diabetes. This review showed the development of research related to an educative-supportive intervention for diabetic patients and meta-analysis on diabetic educative-supportive intervention research, especially in Thailand.

As early as the 1920s, systemic efforts were made to establish diabetes education programs for the training of insulin-related patients. Josin created the diabetes nurse educator and diabetes wandering nurse specialist who delivered the educational programs in the hospital and at the homes of patients (Josin, 1924 cited by Assal, et al., 1985: 602- 613).

For a long time, before the 1960s through the 1970s, diabetes education interventions were most likely hospital based and individualized for each patient. The patients were not responsible for their own self-care or nor did they participate in their treatment and care. The physicians prescribed the appropriate insulin dose, gave the patient a daily list and provided as adequate information about the disease as possible. However, these diabetic patients clearly possessed inadequate knowledge about their disease (Beaser, 1956; Elzwiler, 1962 cited by Wikblad, 1991: 837).

Subsequently, after the beginning of the 1970s, and in the later 1970s a variety of educational programs were developed to increase this knowledge and the patient' compliance with their treatment (Wikblad, 1991: 837). Graber, et al. (1977 cited by Wikblad, 1991: 837) studied the effect of most programs which resulted in improvement of the theoretical knowledge about diabetes, but effect on metabolic control, treatment compliance, and self-care were seldom achieved.

Later, during the 1980s, the educational programs were developed to provide patient participation in diabetic care. These were improvements of the ability of the patients to understand and manage their daily life (Wikblad, 1991: 838). The National Diabetes Advisor Board (1983 cited by Brown, 1990) found that patient knowledge of

self-management principles reduces the consequences of diabetes, including both the long-term complications and the considerable financial costs for both patients and social. Thus, most of the interventions revealed effectiveness on diabetic knowledge.

Increasing diabetic knowledge of patients resulted from a meta-analysis of 47 studies conducted by Brown (1988 cited by Brown, 1990: 189) indicated that diabetic patient education had a moderate to large effect, particularly on patient knowledge and metabolic control. Weight mean effect size for patient knowledge ranged from 0.41 to 0.91; for skill performance 0.25 to 0.38; for metabolic control 0.06 to 0.84. Conhen (1997 cited by Brown, 1990: 190) developed guidelines for interpreting effect size: 0.2 = small effect size, 0.5 = moderate effect size, 0.8 = large effect size.

The reported follow-up meta-analysis by Brown (1990) which had an additional 35 studies was consistent with previous meta-analysis and lend support to the effectiveness of diabetic education in improving patient outcomes. Results from this meta-analysis indicated that diabetic patient education had a moderate to large effect size on knowledge, and a relatively smaller effect on physiologic parameters such as weight loss and metabolic control.

Brown (1992) reported a reanalysis of previous meta-analysis of 73 diabetic patient education to determine the influence of methodological characteristics of the study and substantive characteristics on patient outcome. The results indicated that patient education appeared to be more effective in younger patients (25-39 years), particularly for knowledge. For all patients, their glycosylated hemoglobin levels improved between 1 and 6 months post intervention, but decreased to 1 month levels after 6 months. Length of the

educational did not appear to influence outcomes. Results of this study suggested that we must be more systemic in our education effort. Interventions must meet the individual needs of patients. The greatest challenge will be to identify creative ways to meet these individual needs under the current economic constraints on the health care system and time restrictions of most diabetic educators.

In Thailand, research on diabetic patient education has been extensively studied with in the last 25 years (from beginning in year 1997 to 2001). Methods to communicate with diabetic patients are individual (one to one) and group education (Browing & Ezra, 1994: 270). Their advantages and disadvantages are as follows:

1. Individual education is giving information with the direct problems and client requirement. The disadvantage is that it can waste more time and resources. Learning without planning may be able to deal with every problem.

2. Group education gives information to more than 2 people to share knowledge, opinions, and experiences leading to motives in learning because they have similar problems. Thus, they stimulate and encourage learning in how to solve each other's problems to empower themselves. The disadvantage is that some people may not fully participate in learning, and the content of the discussion may be not relevant to all of them. McGill & Beaty (1995 cited by Pastzes, et al., 2000: 1001) stated that using groups to facilitate reflection rather than individual methods is useful because of a belief that group process and group dynamics would be a more powerful way of generating insights and understanding of complex issues. Professional issues through sharing, supporting, challenging and feedback, may also be barriers to such learning.

Educational materials were used to support and promote the patients learning. Selection of materials must be suitable for patient's ability to learn. Factors, which should be considered are; the patient's eye vision, reading level, and socioeconomic level. Videotapes, specifically designed to provide information and promote active participation in treatment decisions, can be an effective tool for empowering patients (Krouse, 2001: 748).

In this review, the investigator would describe the educative-supportive intervention programs in 2 phases: phase 1) from the beginning to year 1987, and phase 2) during the year 1988 to present 2001 to indicate the development of the educative-supportive intervention programs.

Phase 1. From the beginning to year 1987, studies in this phase were influenced by teaching learning theories from the educational field. It is believed that knowledge was important to change behavior. It was found that the education intervention programs on diabetic patients with various methods are as follows:

At the beginning, Pongthip Chaiphalsarisbi (1978) studied the effect a program lesson on self-care for daily activities in clinical setting. The study was one group pretest-posttest design in 40 diabetic patients. The result indicated that after teaching 3 days, this program could enhance diabetic knowledge in this group.

Subsequently, Tantayotai, V. (1982) conducted a study with an one group pretest- posttest design in 55 poorly controlled NIDDM by giving systemic diabetic teaching using color slides as the tool in a clinical setting and individual instruction with 5 contacts. Twelve weeks after the teaching was completed, the knowledge of the patients



decreased when compared to the level of knowledge right after the teaching. There was no correlation between knowledge and metabolic control as measured by FBS both before and after entering the diabetic teaching program.

Wisuvarn, V. (1984) studied the effect of health education program on self-care ability and knowledge in patients with diabetes less than 5 years at Rajavithree Hospital. There were 40 subjects in the experimental group and were 44 subjects in the control group. The experiment group received group education in a clinical setting, using flip charts and documents as media. Self-care practices were encouraged and social support by mail was done. While the control group received regular teaching by hospital staff. After the program, it was found that the knowledge, self-care ability, attitude and FBS values of the experiment group improved with a statistical significance.

Siritrugsri, B. (1985) studied the effectiveness of a health education program on 30 NIDDM patients. The subjects were divided into 2 groups, each of which were composed of 15 subjects. The experimental group was given information for 2 hours and individual counseling for 15-30 minutes. The sessions of intervention were once a week during the 10 weeks of study. The control group received routine care in which information was provided to the patients by doctors and nurses at the clinic. The results indicated that the knowledge and self-care behavior in the experiment group improved significantly, whereas the patients' level of HbA1c decreased but not significantly different compared to levels before entering program. However, the study did not control for age, education, income, and occupation.

Klaidee, W. (1987) studied the effectiveness of health education programs to patients with social support from relatives on diabetic patient's behavior at Inburi Hospital, Singburi Province. The sample was divided equally into 2 experimental groups. Each group consisted of 40 patients, and was divided into subgroups with about 8-10 people in each group. The experimental group 1 received a health education program plus advice from patient's relatives using flipcharts and documents. They were contacted once a month for 3 months. While the experimental group 2 received a regular health education program. The results showed that after the experiment, self-care behavior and satisfaction of service of group 1 was higher than group 2. The difference was statistically significant.

These programs provided strategies to increase diabetic knowledge, using systemic planned teaching by content experts as educational programs. The investigator provided education by groups, using media such as flipcharts, color slides, and model. The majority of the results indicated that educational programs affect the knowledge of the patients, their attitude, and behavior. However, some studies found no correlation between knowledge and metabolic control on both before and after the diabetic teaching.

Phase 2. In year 1988 to present, during this phase, the influence of nursing theories was prominent. Especially, general theory of nursing as proposed by Orem. The theory emphasized the nurses role in self-care agency development using various methods; teaching, supporting, guiding, providing and establishing environment. Also, client's participation in their own care was emphasized. Other theories, which seem to be helpful in behavior change such as social support, cognitive social learning theories, behavioral modification were also used to guide the study as follows:

Thannil, C. (1989) studied the effect of participation in nursing process and goal setting with nurses on self-care ability in IDDM patients. Orem theory and King theory were modified as the conceptual framework. The experiment group met 4 times in 1 week, for an 1 hour session of intervention and they were mailed reminders for the follow up dates. Regular advice from the department of out patient was given to the control group. The results showed that the patients who participated in nursing process had a total and each dimension score (diet, drug, other of self-care ability) higher than those in the regular advice control group significantly. The result also indicated that the total mean score of self-care ability to participate in nursing group was significantly better than the control group.

Thongsawatwong, Y. (1990) studied the effect of mutual goal setting with nursing specialist on self-monitoring of blood glucose on disease control and satisfaction with care among diabetic patients. The subjects were selected purposively and 15 of them were assigned to an experimental group, while another 16 were assigned to the control group. However, the results of this study indicated that after 12 weeks HbA1c and satisfaction with care were not statistically significance difference between the two groups.

Siripakarn, P. (1990) studied the effects of structured information-giving program on level of knowledge and adaptation of diabetic patients. The conceptual framework used in the study was constructed based on the Roy's adaptation model of nursing, Thondriker's learning theory, and Knowles's principle of adult learning. There were 40 subjects and they were equally randomly assigned into 2 groups: the experimental group and the control group. The structured information-giving program was taught daily

for half an hour, which lasted only 3 days and provided a review on the fourth day. This program was aided by cassette, flip charts on diabetic care. The results indicated that after 2 weeks, the level of knowledge and adaptation of diabetic care in the experiment group were significantly higher than the control group.

Chomsamut, K. (1992) studied the effectiveness of a health education program through patients with social support from relatives on diabetic patient's behavior to control diabetes in elderly diabetic patients with more than 5 years at Chulalongkorn Hospital. The subjects were divided into 2 groups. There were 38 subjects in the experimental group. There were 39 in the control group. The experimental group received social support from relatives, who had received group education by the investigator in a clinical setting 1 time, received 1 mail per 2 weeks for 6 times and self-care instruction 1 time per 2 weeks or 3 times. While the control group received social support from relatives who had routine health education. The results indicated that after entering the program the self-care ability, knowledge, and attitude to diabetic control in the experiment group was increased than before entering the program and than that of the control group.

However, the purposes of some educational programs in this phase were to enhance self-confidence in self-care behavior. The self-efficacy theory was used in the study. It is based on a concept of social learning theory of Albert Bandura which believes that people learn from their past events and experiences. This learning is from any evidence as an experience that affects the persons' behavior and influences confidence to make decisions in the future. This change in person behavior has a relationship with

confidence in self-efficacy (Bandura, 1977a: 58-59). Research studies in diabetic patients used self-efficacy as conceptual framework in various methods as follows:

Chanthamolee, S. (1992) studied the new approach to a health education program on self-care behavior in 168 NIDDM patients. The experimental group consisted of 80 patients and 88 patients were in a comparison group. This new approach emphasized the importance of self-care behavior, which included knowledge, confidence in self-care abilities, practice related to diet control, taking oral medication, exercise and complying with appointments. The self-efficacy theory using social support with significant others was modified as a conceptual framework in this program. The intervention was a three hours teaching program consisting of a group discussion about self-care behavior, watching videotape about diabetes mellitus and making a commitment to change their behavior. After 3 months, the health education program significantly contributed to higher achievement in the treatment group in terms of changes in knowledge, self-care efficacy and practice. In addition, it was found that knowledge, self-efficacy and practice were accounted for by the health education program of variances at 47, 62, and 80 percent, respectively. The finding proved very relevant to improving self-care of diabetic patients. The program focused on the enhancement of self-confidence, involvement of significant others, and participation in problem solving.

Loachot, C. (1994) studied the effectiveness of the health education program on self-care behavior with modification of self-efficacy theory and group counseling among NIDDM patients at Photharam Hospital, Rachaburi Province. The experimental group had 56 subjects which were divided in subgroups was composed of 8-10 subjects in each

group. The control group had 60 subjects. The experimental group received group education 3 times for 2 hours at 2 weeks intervals in a clinical setting and used slides and documents. While the comparison group had not received the program. The result showed that after the education program, the experimental group gained a significantly higher level of the mean score on knowledge, the self-efficacy and the practice than before experimentation and than those of the comparison group at a significantly level ($p < .001$). However, the fasting blood sugars of both group were not statistically significant different.

Dumrongwanch, S. (1994) studied the effectiveness of health education program on level of blood sugar control among diabetes mellitus patients at Charoenkrung Pracharak Hospital in Bangkok. This program applied group process with modification of self-efficacy theory and health belief model. The experimental group comprised of 50 patients while the comparison group had 48. The experimental group received the health education program by group process for 1 hour and 30 minutes, 3 times at 1 month intervals while the comparison group received a regular health education program. The result showed that the experimental group gained a significantly higher level of self-efficacy and practices than before experimentation and more than those of the comparison group. The fasting blood sugar decreased at the end of the program and was significantly lower than those in the comparison group. This indicated that the strategies of a health education program by using group process for patients could improve behavior change and self-efficacy, leading to blood sugar level control.

Naovarat, S. (1998) studied the effect of application of self-efficacy theory with significant others for improving behaviors among non-insulin dependent diabetes mellitus

patients about diet control, exercise and taking medicine. The experimental group comprised of 40 patients while the comparison group had 39. The results reveal that after the experiment, knowledge, perceived self-efficacy and practice in the experimental group had increased significantly than prior to the experiment and than the comparison group. The HbA1c of the patients in the experimental group was significantly lower than prior to the experiment and than that of the comparison group.

At the same time, the educative-supportive intervention research moved the program from hospital base to community base. The diabetic patients received home visits by the investigator. For example, Poomiwisate, A (1994) examined self-care knowledge and practice of diabetic patients before and after home visits in 15 NIDDM patients from the Diabetic Clinic at Lamphum Hospital. The study was a one group pretest-posttest design. All subjects received individual home visits, 1 time for 2 weeks with 4 contacts. The results showed that self-care knowledge and self-care practice scores after the home visits were statistically significant better than those scores before the home visit. The blood glucose level after the home visits decreased significantly ($p < .01$). Some of the sample had self-care problems regarding diet control and appropriate exercises.

Theawnnongiw, K. (1994) studied the effect of home health care on self-care of diabetic patients in Khonkean municipal area of Khonkean Province. Forty diabetic patients were randomly selected and assigned into two groups. Each group consisted of 20 patients. The experimental group received home health care until the patients could care for themselves. The result showed that after 3 month, the patients who received home

health care service pursued self-care better than those who received regular service at the Out Patient Department.

Even though diabetic education program which base on nursing theories, cognitive learning theories as well as group process seem to be effective. But some investigators critiqued of the more action role of health care profession and wanted the patients to take more actions role so that self-care behaviors would be sustained. Thus, the studies shifted to focus on increasing patients' participation. Participation action research was used to develop the model for self-care agency development among diabetic patients as follows:

Keeratiyutawong, P. (1994) conducted the participatory action research to develop the model of promoting self-care among 30 diabetic patients at Provincial Hospital. The self-care promotion program aimed to promoting patient's self-care agency both by individual and group meetings once a month for four months. Video presentation was used. The result indicated that after entering the program, the patient's level of HbA1c decreased significantly, whereas perceived self-care ability and satisfaction with care increased significantly as compared to levels before entering the program.

Phonploy, W. (1996) employed the action research method to develop self-care ability to control blood sugar in 13 non-insulin dependent diabetes mellitus patients. The important strategy was personal follow-up for 5-6 months after participating in this study. The study had 3 complementary parts: 1) preparation in the areas of knowledge, skills and mindfulness of nurses, patients and patients' families; 2) eleven strategies for behavior modification with four important strategies: good interpersonal relationships, goal setting

in HbA1c level, continuous reflecting of practical outcome, and continuous follow-up and counseling and; 3) implementing the 4 important strategies. This included continuous follow-up and counseling, continuous reflecting of practical outcomes, having self-esteem, and continuous psychological support from patients' families. The results indicated that diabetic patients changed their perceptions of the disease to acceptance and a willingness to help other diabetic patients. HbA1c levels change from fair (8.1-10%) to good (6.5-8.0%) and very good (4.4-6.4%).

Tantayotai, V. (1997) used action research to develop self-care agency in 28 insulin dependent diabetic patients for 8 months. The results indicated that therapeutic relationship and interaction between nurse and patient is the core component in enhancing patient' self-care agency. After entering the program, the patients perceived significantly higher self-care agency in diet control and usage of insulin. Their HbA1c level decreased significantly at the 4th month as compared to the first month of entering into the program. The patients also had a significant increase in the sense of well being after entering the intervention program.

Ratnapitak, U. (1997) studied the effect of self-care supportive system on diabetic control in 23 NIDDM patients at Siriraj Hospital. The study was one group pretest- posttest design. Self-care supportive system methods was provided by the investigator and composed of individual interview. Nurses built relationships with 2 contacts, and helped patients to identify problems by finding the solution by group discussion. This was done in clinical setting 1 time per month with 4 contacts. The results indicated that after entering the program the patients' level of knowledge and self-care

behavior increased significantly and HbA1c levels decreased significantly as compared to before entering into the program.

These results indicated that participation action research methods could improve knowledge and disease control among diabetic patients. It yielded the practice model, which reflected the patient's effort to perform self-care, and helping methods as provided by the nursing investigators. In a meta-analysis by Hanucharurnkul, S. et al., (2000: 18) it was found that the core helping methods in participation action research were 1) managing symptoms, 2) coordinating health care, 3) providing counseling to patients and families, both by telephone and personal interaction, 4) providing information regarding type of treatment and its outcome, 5) involving families in patient care, 6) reinforcing continuing treatment and self-care, and 7) mobilizing resources to assist patients and families. However, it was found that some investigators used an educative-supportive nursing system and provided various methods in helping diabetic patients as proposes in Orem's self-care theory.

Plodnaimuang, A. (1999) studied the effectiveness of an educative-supportive program in 42 uncontrolled diabetes patients at Sappasithiprasong Hospital, Ubon Rachathani Province. This program provided information on diabetic knowledge and self-care management through lecture, discussion, practice, videotapes recording and pamphlets for one day in 2 large groups and was followed by small group meetings once a month, for 3 months. The result indicated that total patients' mean scores on perceived self-care efficacy and each dimension, and the mean score on disease control were significantly higher than the first month ($p < .0001$). Also, the mean score of fasting blood

sugar level decreased significantly in each month ($p < .05$). And after entering program it was found that 17 diabetic patients could decrease type/doses of oral hypoglycemic drug as compared to before entering the program. Results of this study were very effective because it was a comprehensive education in self-management.

Most of results from the review of the literature indicated that various strategies are able to promote disease control. The goals of patient educational programs are to optimize the quality, costs and outcomes of health care. There are providing patients and their families with the information they need to actively participate in their care, make informed choices about their health behaviors, and engage in self-care with confidence and competence (Donaldson, et al., 2000). However, it was found that some investigators concluded studies about diabetic patients in Thailand as follows:

Menetthip, S. (1997) analyzed the characteristics and the research results of nursing research as related to diabetes patient in Thailand from 1977 to 1996. Sources of research projects were from Master' thesis, Doctoral dissertations, and research publications journal from nursing and medicines. The results of the study showed that most of research (63%) conducted by Master' thesis and Doctoral dissertations were from Mahidol University. The majority of research projects were quantitative studies at Diabetic Clinics. The three majorities of variables were nursing intervention, health behavior and diabetic control. Most nursing interventions for diabetes patients involved as education program to improve self-care ability. The results also showed that health behavior and disease control correlated with demographic data of the sample.

Hanucharunkul, S. et al. (2000) described 10 years of self-care research (during 1988 to 1999) in Thailand. The results on diabetic patients showed that most of the studies in diabetic patients were based on Orem's general theory. The research method included descriptive, experimental, qualitative, and participatory action research. The results showed that most of the effectiveness of self-care promotion intervention produced moderate effect size on glucoregulation (0.61) and large effect on disease control (1.27), self-care agency (1.66), and knowledge (1.80). The results from participatory action research and qualitative studies provided the deep understanding of self-care from the patient's perspectives (emic). It is evident that diabetic patients used their efforts in self-care agency development. The process of self-care agency development from lower to higher stages with the patient's accumulation of knowledge, trial and error experience, and self-care abilities. The process reflects the struggle of the patients to care for themselves and to live normally.

Following this study of Likiratcharoen, S. (2001) reviewed 57 research studies related to educative-support intervention for diabetic patients in Thailand from the beginning in year 1977 through year 1999 to determine the status of knowledge and synthesize research finding using meta-analysis technique. The finding showed that the educative-support intervention research for diabetic patients from the past to present has increased. The majority of these were from Mahidol University (68.89%). Most of the studies (91.23%) were quantitative research involving experimental and quasi-experimental research design that dictated manipulation or treatment variables. The conceptualize knowledge from nursing theory and other sciences developed the

effective program, most of these used Orem's nursing theory (77.78%), coordinated with health care teams especially physicians for encouragement of self-care practice, and selected the effective instruction media. The intervention method was predominantly the group approach (42.11%). The setting of instruction was mostly at out-patient clinics (73.68%). The results of effective educative-support intervention research also supported previous meta-analysis by Hanucharumkul, S et al. (2000). This result indicated that the educative-support intervention research improved the metabolic control, self-care ability, patient knowledge, and beliefs and attitudes toward illness. It produced the weighted mean effect size = 0.60, 1.65, 1.52, 1.54, respectively. The influencing of methodological and substantive characteristic to outcome (metabolic control, self-care ability, patient knowledge, and beliefs and attitudes toward illness) included in-patient ($r= 0.38, p<0.01$), multimedia used ($r=0.32, p<0.05$), the unspecific status of disease ($r=-0.34, p<0.05$), out-patient clinic intervention ($r=-0.31, p<0.05$), and group instruction ($r=-0.28, p<0.05$). Mean score on effect size of metabolic control in uncontrolled diabetic patients was significantly higher than in the unspecific status of disease. Frequency of intervention significantly correlated with the effect size of metabolic control ($r=0.34, p<0.05$).

Factors influencing effect size of patient knowledge were uncontrolled diabetic patients ($r=0.40, p<0.05$), unspecific status of disease ($r=-0.38, p<0.05$), out-patient clinic interventions ($r=-0.55, p<0.01$), in-patient clinic interventions ($r=0.72, p<0.01$), individual instruction ($r=0.44, p<0.05$), and group instruction ($r=-0.46, p<0.05$). The factor most influencing effect size on patient beliefs and attitudes toward illness knowledge were uncontrolled diabetic patient ($r=0.62, p<0.05$), unspecific status of disease ($r=-0.62,$

$p < 0.05$), adult subject ($r = 0.66$, $p < 0.05$), multimedia used ($r = 0.55$, $p < 0.05$). This study provided a deviation of research on diabetic patients. In addition most of the studies were carried out in university/ central or provincial hospitals, Thus studies in community hospitals are needed.

Summary

From review of the literature, it was found that diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Patients with type 2 diabetes need to perform self-care activities to adjustably meet their self-care demand to control blood sugar at the normal level. Health care providers used many methods to help them. For this reason, this investigator interested in studying the effectiveness of an educative-supportive program on perceived self-care efficacy and diabetic control in uncontrolled type 2 diabetes patients.

CHAPER III

METHODOLOGY

This is pre-experimental research. A one group pre-post test design was used to study the effectiveness of an educative-supportive program on perceived self-care efficacy, and disease control in uncontrolled patients with type 2 diabetes. In this chapter, the method including population and sample, sample size, setting, research instrument, data collection procedures, the protection of human rights, and statistic analysis are presented.

Population and sample

The population of this study was diabetic patients in the Outpatient Department, Sombepjaboromrachimad Nathawee Hospital. The patients were selected by using a purposive sampling method based on the following inclusion criteria:

1. Uncontrolled type 2 diabetes being treated with oral medication and had a fasting blood sugar (FBS) higher than 140 mg% for at least 3 times consecutively before entering the program.
2. Being 40 years old or over, both male and female.
3. Alert, good hearing, understand Thai language, and able to count numbers.
4. Willing to participate in this study.

The exclusion criteria were as follows:

1. Type 1 diabetic patients.
2. Diabetic patients with pregnancy or having severe complications including paralysis or amputation, cataracts causing visual abnormality, myocardial infarction and renal disease. These criteria were considered by history, interview and observation by the investigator combined with medical diagnosis.

Sample size

The sample size of this study was calculation based on the criterion that when the number of the population is at the level of hundred, the sample size should be 25% of the population (Petnoi Singchangchai, et al., 1989: 155). The researcher surveyed the number of all patients who had uncontrolled diabetes and attended the Diabetic Clinic at Sombejpraboromrachininad Nathawee Hospital during 4 months before the project started. There were 156 patients. Therefore, the sample size was 39 patients in this study. However, 46 patients were selected for this. Forty-two completed the study, one was excluded because of pregnancy and 3 subjects missed the small group meetings because the first one had fever, the second one was taking hormones for menopause syndrome and the third one had to take care of a hospitalized family member.

Setting

Data collection took place at the Diabetic Clinic at Sombejpraboromrachininad Nathawee Hospital, Songkhla Province.

Characteristics of Nathawee District

Nathawee is one of 16 Ampurs at Songkhla Province in the southern part of Thailand. It is 57 kilometers from Songkhla. It is about 747 square kilometers and there are many mountains near the border of Malaysia. Cars are the major transportation to other provinces and motorcycles or buses are used within the Ampurs. The buses run until 12.00 am. The climate consists of 2 seasons: rainy season (June-January), and hot season (February-May). People are involved in agriculture such as farmers, rubber tapping, and orchards (Durain, Rambutan, Long-kong, Pineapple, Mangosteen). Most of the people are Buddhists (73.57%), and Islam (26.37%), with only 0.06% are Christians.

Sombejpraboromrachininad Nathawee Hospital

It is a community hospital with 60 beds under the Ministry of Public Health, which was developed from the primary health service to a community hospital in 1971. The service is primary care in nature, but it also provides service for those who were referred from other institutions, such as the Health Center Post and community hospital. For patients who have problems beyond its' capability, they will be referred to the hospital. The majority of the services provided are medical problems. However, surgical problems are increasing because there is one physician who specialized in surgery. One of the top ten diseases in the Outpatient Department is diabetes and the number is rising.

Characteristics of the services provided at the Diabetic Clinic

The service of the Diabetic Clinic is at the Outpatient Department on Tuesday mornings. The providers are 1 physician, 1 registered nurse (RN), 1 technician nurse (TN), laboratory technician, pharmacist, and a secretarial officer.

The nature of the service

1. Steps of providing service

The clinic starts at 7.00 am to 12.00 am. to provide services to the diabetic patients. The patients give their identification card and a booklet on self-monitoring at the Outpatient Department and they receive their priority number by clerk. Then, they would go to the laboratory for FBS drawing before having breakfast (service free from this hospital). After that their body weight and fasting blood sugar were recorded into the Out Patient Medical record by a registered nurse at the diabetic clinic which is located near the laboratory. The physician uses this data when they prescribe treatment, medication, and the follow-up appointment of the patients. There is only one physician from the Outpatient Department to provide services to 37-62 patients each day and each physician spends 2-3 minutes for each patient during visits. Finally, the nurses give a booklet on FBS self-monitoring and indicate the date for the next follow up. Then the patient would go to receive the medication from the pharmacology department.

2. Health education

The patients get information related to self-care management from the routine of health education, which is provided by a physician and a nurse. The physician spends a short time to advice the patient who has complications or the blood sugar is too high. The nurse provides health education as individual counseling according to the time available. It was found that teaching is not effective because patients were in large groups and they did not have a private room. Thus, the patients were interrupted by the surrounding environment. The health education activities were provided by the nurse to all

patients who were waiting to meet the physician. Various media such as video, and pamphlets are used. At the same time, the nurse could not always teach according to the plan because they are too busy with their routine work and have to assist the physician. So patients may not have enough information for developing self-care for themselves.

INSTRUMENT

The instruments of this study consist of 2 parts: instrument for data collection and intervention program.

1. Instrument for data collection consisted of Demographic Data Questionnaire, Perceived Self-care Efficacy Measurement of Diabetic Patient, and Disease Control Assessment Form as follows:

1.1 Demographic Data Questionnaire was used to record the patient profile: hospital number, address, age, gender, number of family members, marital status, religion, education level, occupation, family income per month, medical expenses, duration of follow up, resources of health information, duration of the illness with diabetes mellitus, person who was first diagnosed with diabetes mellitus, treatment after diagnosis, other chronic health problems, perceived diabetic control and causes of uncontrolled.

1.2 Perceived Self-care Efficacy Measurement of Diabetic Patient was developed by Valla Tantayotai (1993) based on the Orem's self-care theory. It consisted of 44 items to measure self-confidence in the ability to act successfully. These 44 items represented self-care action to meet self-care requisites for the diabetic patients. The self-care action was grouped into 5 dimensions: dietary control (11 items), medication management (3 items), self-monitoring and prevention of hypo-hyperglycemia (6 items),

exercise (2 items), hygiene and foot care (7 items), others such as stress management, establishing a relationship with others and seeking support (16 items). The measurement is 10 points on likert scale from 0 to 100, in which each interval of scale represents a score of 10. A score of 0 means the subjects did not have self-confidence to perform the self-care action at all and a score of 100 means that the subjects have extreme self-confidence to perform the self-care action. Higher scores indicated higher levels of perceived self-care efficacy.

Content validity was evaluated by 6 experts including 2 physicians and 4 nurses. After the questionnaire was revised according to experts' recommendations, the instrument was sent back to experts for the second round to ensure the most accurate content. The contents of the instrument were finally accepted by experts. This instrument has already been used in previous diabetic researches. The internal reliability was measured by Cronbach's alpha and the report showed that Cronbach's alpha ranged from 0.87-0.96 (Rattanaporn Siriwachaiyaporn, 1993; Pawana Keeratiyutawong, 1994; Valla Tantayotai, 1997; Apiradee Plodnaimaung, 1999). In this study, the reliability with 42 subjects before and after entering the program with Cronbach's alpha ranged from 0.94 to 0.96.

1.3 Diabetic Control Assessment Form was developed by Apiradee Plodnaimuang (1999). Four experts; 3 physicians and 1 nurse evaluated the content validity of this instrument. These criteria of diabetic control have been used in previous diabetic studies. It consisted of fasting blood sugar (FBS), body mass index (BMI) as follows:

1. **Fasting blood sugar** was modified based on criteria purposed by Alberti & Gries (1988 cited by Vitaya Seidama, editor. 1998: 416) and European NIDDM policy Group, 1993 cited by Chatchalit Ratarasan (1999: 19). The levels of control were divided into 3 levels: good, fair, and poor (Table 5).

Table 5. Score of diabetic control divide by fasting blood sugar.

Fasting blood sugar (mg%)	Level of disease	Score
	Control	
80-120	Good	2
121-140	Fair	1
<80 or >140	Poor	0

2. **Body mass index (BMI)** used criteria of Wannee Nithiyant (1992: 3) specifically proposed for Thai people. The levels of diabetic control according to BMI were also divided into 3 levels: good, fair, and poor. Body mass index (BMI) was calculated by dividing weight in kilograms (kg) by height in meters squared (m^2)(Table 6).

Table 6. Score of diabetic control divide by body mass index (BMI).

BMI (kg/m^2)		Level of disease Control	Score
Male	Female		
20.0-25.0	19.0-24.0	Good	2
25.1-27.0 or 18.0-19.9	24.1-26.0 or 17.0-18.9	Fair	1
>27.0 or <18.0	>26.0 or <17	Poor	0

Diabetic control was assessed from a combination of scores on ability to control their FBS and BMI. The sum of the scores was 0-4. The score indicating the level of control was as follows:

The score value 3-4, Diabetic control is good

The score value 2, Diabetic control is fair

The score value <2, Diabetic control is poor

The Intervention Program included:

1. An Educative-Supportive Program for Diabetic Patients. This was a program developed by Apiradee Plodnaimuang (1999) and modified by this researcher. The program included the significance, objective, activity, evaluation and advantage of the program. This program was divided into 2 phases: the first phase was a workshop which consisted of providing information on diabetic knowledge and skill development related to exercise and diabetic diet example. The second phases included small group discussions to exchange experiences in their self-care and individual counseling face to face or by phone.

2. Media consisted of Videotape and Hand book

2.1 Videotape was developed by the Center of Community Health, the Faculty of Medicine, Ramathibodi Hospital. This videotape consisted of 4 topics; quality of life of diabetic patients, diet for diabetic patients, exercise, and foot care.

2.2 Handbooks about self-care for a person with diabetes were developed by Buntana Phumleng, Wariya Boonchaui, and Watchara Muangkae. There are based on diabetic knowledge from research, text books, and 11 pamphlets about self-care for diabetes mellitus which were produced by a research group from The Center of Community Health the Faculty of Medicine, Ramathibodi Hospital. Questions raised by diabetic patients from a study by Apiradee Plodnaimung (1999) were answered and

included as interesting questions from diabetic patients. This handbook comprises of 7 topics, which included:

- No.1 Knowledge about diabetes mellitus.
- No.2 Complications of diabetic patient.
- No.3 Oral hyperglycemic agents in a diabetic patient.
- No.4 Dietary control for the diabetic patient.
- No.5 Effective exercises for the diabetic patient.
- No.6 Foot care for diabetic patient.
- No.7 Interesting questions from diabetic patients.

The content validity was evaluated by 4 experts including 2 physicians and 2 nurses. It was revised according to the experts' suggestions.

3. Anthropometric measurements: which included height and body weight, were measured while the subject was wearing light clothing without shoes. The investigator checked the accuracy of the scale zero before weighing each time and used the same scale throughout the study.

4. Glucometer: this study used the Advantage II glucometer and Advantage II test strip that was produced by Roche Diagnostics to measure fasting blood sugar. The glucometer slide is 86x21x6.3 mm, 60 gms., and uses a sensor system that can detect blood glucose between 10-600 mg/dl or 0.56-33.3 mmol/L. Each test used 40 seconds and was able to test all specimens from capillary whole blood, venous whole blood and arterial blood. The accuracy was checked before each use.

Advantage II test strips used Glucose Dehydrogenase enzyme principle which is not affected by varying degrees of oxygen concentrations found in different blood types and it can detect blood glucose between 10-600 mg/dl. The accuracy was checked every time of opening a new package by using Advantage II test strip solution.

5. The camera and film was used during the workshop and group meetings.

6. Tape recorder and tape cassettes were used to record content of interaction among the subjects and the investigator in small group and individual meetings.

DATA COLLECTION

The procedure for data collection and intervention was divided into 2 stages:

1. Preparation stage

1.1 The investigator submitted the letter asking for permission from the Faculty of the Graduate Studies to the Director of Somdetphaboromarajineenath Nathawee Hospital.

1.2 The investigator asked for co-operation from the chief nurse, the head nurse in the Outpatient Department, the physicians, the nurse in the Diabetic Clinic, the technician in laboratory unit and the dietitian.

1.3 Two research assistants were trained for data collection including criteria for the sample selection, demographic data collection, and perceived self-efficacy questionnaire.

2. Study stage was divided into 2 phases: selection of the sample and implementation of the program.

Phase 1. Selection of the sample

1. The researcher collected data at the Diabetic Clinic, Outpatient Department every Tuesday at 7.30-12.00 pm. One day before data collection, the researcher surveyed the Outpatient Medical records card (OPD card) of the diabetic patients who would come for follow-up. The subjects were selected based on the inclusion criteria and labels in the Outpatient Medical records card.

2. On the data collection day, the researcher selected the patients who had a fasting blood sugar higher than 140 mg%. These patients must also meet the inclusion criteria in the study. The objectives and procedures of the study were described by the researcher according to the rules of the human rights protection of the subjects (see Appendix A). When the subjects agreed to participate in the study, the following questionnaires were administered in the following order; demographic data questionnaires would be obtained from the subjects, followed by perceived self-care efficacy questionnaire, which were obtained by 2 research assistants. Four patients answered the questionnaires by themselves because they could read effectively including understanding Thai language, and able to count the numbers. 38 patients were interviewed by the researcher and research assistants because they were unable to read or could not read clearly. The duration of the interview was about 30-40 minutes for each patient.

After the investigator made an appointment with each subject to attend the workshop on the date of their own convenience. The appointment day was not the same as the follow up day, but the small group meetings were provided on the day of follow up. At the beginning of this study, 65 subjects had qualifications according to inclusion

criteria, however 7 subjects refused to participate in the study; two subjects were excluded because of injection insulin after meeting with physician and 5 subjects thought it was not convenient to participate, therefore the total number of subjects was 58. The researcher made an appointment with the first 28 subjects in the first week to attend in the program. The other 30 subjects were given an appointment in the fourth and fifth week of the program with 15 members in each group. Data about body weight, height and fasting blood sugar were recorded in the Diabetic Control Assessment Form.

Phase 2. Implementation of the program

The program consisted of one workshop and 3 small group meetings. Subjects would attend the workshop first and then meet in a small group for 3 months at the time of follow up. The workshop provided information on diabetic knowledge and self-care management through lecture, discussion, videotapes recording, handbook, and a demonstration at a large meeting room, at Sombejpraboromarachininad Hospital. This workshop also provided the establishment of a relationship among group members through various activities such as group discussion, practicing skills, having lunch and snacks together within 6 hours of the program (9.00 am. - 3.00 pm.). This workshop was offered 3 times for 3 groups:

The first group was on March 1, 2001 (The first week of the program) with 11 people.

The second group was on March 22, 2001 (The 4th week of the program) with 24 people.

The third group was on March 29, 2001 (The 5th week of the program) with 11 people.

Thus, the total number of subjects was 46 (the number of subjects who attended all meetings throughout the period of study was 42) and 15 additional people

from their family members. However, 12 subjects could not meet in the workshop because of 1 subject has fever, 2 subjects were meeting community leaders, 3 subjects had loss the date of the appointment, and 6 subjects had an unknown reason.

Weeks 2 to 17 after entering of the program. The small group meeting was organized when each subject came to follow up at the diabetic clinic. Each group consisted of 8-10 people meeting once a month for 3 months. Each meeting would be in the morning lasting for 1 hour (9.00-10.00 am) and before the patients saw the physician. This group meeting provided the opportunity for the patients to discuss their beliefs, experiences, change of self-care behavior, obstacles in self-care practice, explored why some helping methods could not be used and the way to apply knowledge in their daily life. Then the investigator together with the patients would meet and mutually set goals and strategies to achieve the goal. Individual counseling was used when the patients had individual problems and did not want to disclose their problems in the group. The investigator provided an environment to promote trust to make the patient feel free to share their feeling so the investigator also gave counseling to patients face to face or by phone.

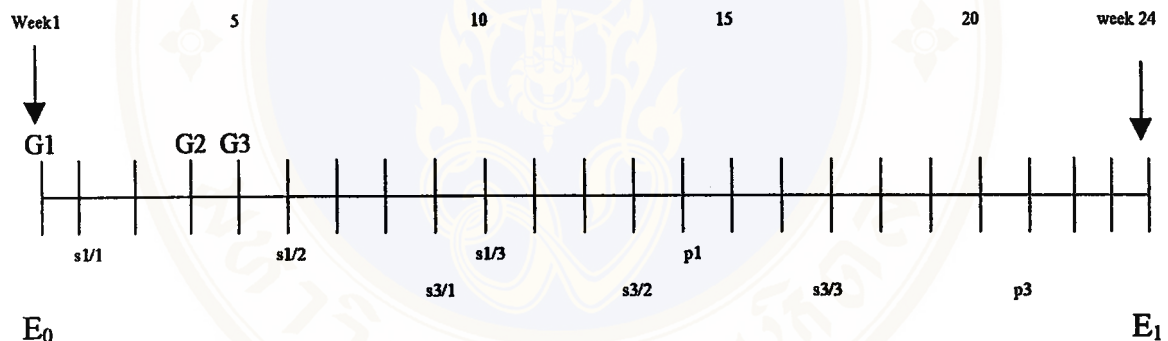
Subjects, who experienced difficulties in blood glucose control, in performing self-care practice or who needed specific advice (e.g. high fasting blood sugar, difficulties in dietary control, obesity, low body weight in relation body mass index) would receive individual consultation. In each meeting the investigator measured their fasting blood sugar, body weight, and recorded these in a self-monitoring booklet of the patients.

Weeks 14-22 after entering the program. During this period, the investigator prepared all the questionnaires for data analysis such as: the scores on perceived self-care

efficacy, the level of fasting blood sugar and body mass index before entering the program and month 1, 2, 3, and 4 after entering the program, to present to the patients in the last meeting.

Weeks 24 after entering the program. The program was completed during this week (August 15, 2001). For closing the program, the conference was held for all the patients who participated all through the program. Four subjects represented each group who were successful in controlling their diabetes mellitus and they presented their experiences in self-care on the topic “An interesting self-care experience”.

In conclusion, the program implementation is shown in Figure 5.



E_0 = Starting of the program

E_1 = Ending of the program

G = The workshop of each group

S = The small group meeting

P = Program evaluation

Figure 2: Program implementation

DATA ANALYSIS

Data was compiled and analyzed by the computer program, SPSS/PC⁺ version 8 /for window. The details will be presented in Chapter 4.

CHAPTER IV

RESULTS

The purpose of this pre-experiment research was to test the effectiveness of an educative-supportive program on perceived self-care efficacy and diabetic control in uncontrolled type 2 diabetic patients. The results of this study are presented as follows:

Demographic characteristics of the sample

Forty-six eligible subjects participated at the beginning of the program. However 4 subjects were excluded because they missed the small group meetings and loss of follow up, with one patient being pregnant which didn't meet the inclusion criteria. Forty-two subjects were included in the data analysis.

Demographic data

The total sample who completed the study consisted of 42 patients with type 2 diabetes. The sample comprised of 32 females (76.2%) and 10 males (23.8%), ranging in age from 40 to 81 years ($M=60.45$, $SD=10.09$). A large group of the sample (78.6%) had primary education. The majority of the subjects were married (71.4%). In this region most subjects were Buddhists (78%) and most of them (88.1%) lived in Nathawee district. Their occupations were mostly agriculture (42.9%) and housework (35.7%). Their family

income was mostly 1,001-5,000 bath per month (61.9%). The family members ranged from 1 to 10 with mean of 4 people per family (Table 7).

Table 7. Number and Percentage of demographic characteristics of the samples (n=42).

Characteristics	Number	Percentage
Gender		
Female	32	76.2
Male	10	23.8
Age (year)		
40-49	6	14.3
50-59	11	26.2
60-69	17	40.5
70-79	7	16.6
>80	1	2.4
Range 40-81, Mean 60.45, SD 10.09		
Marital status		
Single	2	4.8
Married	30	71.4
Divorce/widow	10	23.8
Family member (person)		
1-5	29	69.1
6-10	13	30.9
Range 1-10, Mean 3.83, SD 2.48		
Address		
Nathawee district	37	88.1
Other district	5	11.9
Region		
Buddha	33	78.6
Islam	8	19.0
Christian	1	2.4
Occupation		
Agriculture	18	42.9
House work	15	35.7
Commerce	6	14.3
Employee	2	4.8
Government officer	1	2.4



Table 7. Number and Percentage of demographic characteristics of the samples (n=42)
(cont).

Characteristics	Number	Percentage
Education level		
No formal education	5	11.9
Primary school	33	78.6
Secondary school	2	4.8
High school	0	0
Diploma	1	2.4
Bachelor Degree	1	2.4
Family income per month		
< 1,000	10	23.8
1,001 – 5,000	26	61.9
5,001-10,000	4	9.5
>10,001	2	4.8

Data related to disease and treatment

Most of the subjects have type 2 diabetes with an average of 5.75 years of duration, ranging from 3 months to 30 years (Table 8). All subjects were followed up every 4 weeks, and the majority of the subjects' medical expenses were paid by social welfare (97.6%). Most resources of information regarding their diabetes and self-care practice came from doctors (85.7%) and nurses (78.6%). Most of the patients knew their diagnosis from the physician and all subjects were on treatment after diagnosis immediately (100%). Approximately, 40% of the patients had other chronic health problems such as hypertension, numbness, and chronic urinary tract infection (UTI). About 31% used herbs combined with oral hypoglycemic agents (Table 8).

Table 8. Number and Percentage of the characteristics of the disease and treatment of the samples (n=42).

Characteristics	Number	Percentage
Duration of DM diagnosis(year)		
0-2	8	19.0
3-5	11	26.2
6-8	15	35.7
9-11	6	14.3
>11	2	4.8
Range 0.3-30.0, Mean 5.8, SD 4.9		
Medical expenses		
Social welfare	24	57.1
Reimbursement	9	21.4
Health card	8	19.1
Self pay	1	2.4
Resources of health information*		
Physician	36	85.7
Nurse	33	78.6
Mass media	15	35.7
Other patient	5	11.9
Health care volunteer	2	4.8
Health center staff	2	4.8
Family	1	2.4
First person suspected diabetes		
Physician	37	88.0
Nurse	2	4.8
Health center staff	1	2.4
Patient themselves	1	2.4
Family	1	2.4
Treatment after diagnosis		
Immediately	42	100.0
Alternative treatment		
No	29	69.0
Yes	13	31.0
Others chronic health problem		
No	25	59.5
Yes	17	40.5
-Hypertension	13	76.4
-Numbness	2	11.8
-Chronic UTI	2	11.8

* Each patient may have received information from more than one source.

Perceived disease control

Before entering the program, 18 patients perceived that they could control their disease by using signs and symptoms; were able to work, and not hospitalized from diabetes. Fifteen participants in this study perceived that they could not control their disease due to being unable to control their diet (76.5%), other causes (11.8%) such as inadequate knowledge, lack of sleep, and unable to manage medication (5.9%). Each patient perceived that there were many causes that prevented them from controlling their disease. However, 21.4% of patients did not know whether their disease could be controlled or not (Table 9).

Table 9. Number and Percentage of perceived causes of uncontrolled disease of the samples (n=42).

Characteristics	Number	Percentage
Perceived control disease	18	42.9
Perceived unknown control disease	9	21.4
Perceived uncontrolled disease*	15	35.7
Dietary control	13	76.5
Exercise	0	0
Medication management	1	5.9
Stress and anxiety	1	5.9
Other**	2	11.8

* Each patients may have perceived more than one cause

** Other: Inadequate knowledge, lack of sleep

The results of hypothesis testing

Hypothesis 1 stated that “ after entering the program, patients’ mean scores of the total and each dimension on perceived self- care efficacy would be higher than before entering the program”.

The total score on perceived self- care efficacy before entering the program ranged from 1450 to 3900. After entering the program, it ranged from 2370 to 4400 (actual score ranged from 0 to 4400). In comparison, the investigator adjusted the total scores on each dimension from 0 to 100. The mean score total dimension and each dimension after entering the program were higher than before entering the program (Figure 3).

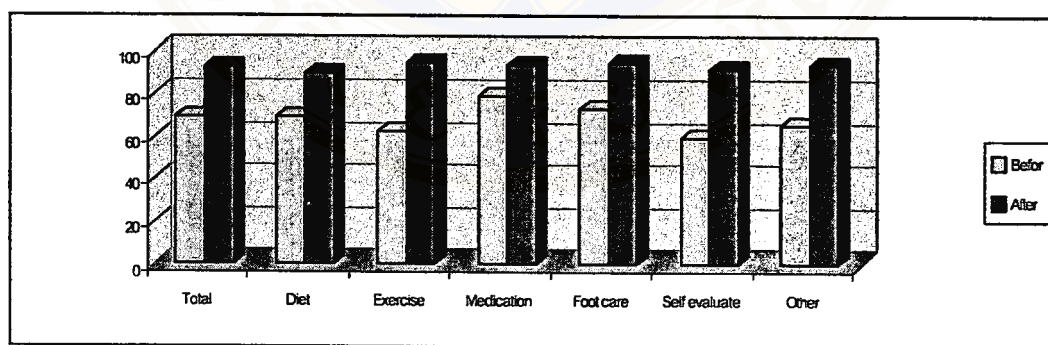


Figure 3: Mean of total and in each dimension of perceived self-efficacy scores before and after entering program of the sample (n=42).

The perceived self-care efficacy scores had a normal distribution when tested by One-sample Kolmogorov-Siminop of Fit tests ($p > .05$). Paired t-test showed that after the program, the patient's mean scores on the total and each dimension on perceived self-care efficacy were significantly higher than before entering the program (all $p < .0001$). This result supported hypothesis 1 (Table 10).

Table 10. Comparison of the mean scores on the total and each dimension of perceived self-care efficacy before and after entering the program of the sample : (n=42).

Perceived self-care efficacy	Before		After		t-value
	M	SD	M	SD	
Total	69.16	13.09	92.83	5.76	11.63*
Each dimension					
Dietary control	69.18	13.15	90.30	7.43	9.76*
Exercise	62.97	16.11	94.68	6.38	5.70*
Medication management	79.44	24.52	94.17	7.23	8.80*
Hygiene and foot care	73.44	16.48	94.32	6.23	9.04*
Self evaluation and prevention of hypo-hyperglycemia	59.76	23.62	91.63	7.34	8.38*
Other**	65.77	15.29	93.44	6.32	12.06*

* $p < .0001$

**Other means stress management, establishing of relationships, and seeking information

Hypothesis 2 stated that “ the mean fasting blood sugar when entering the program and in each month through the end of the program would be lower than before entering the program”.

The mean of patients fasting blood sugar when entering the program and in each month through the end of the program were decreased (Figure 4).

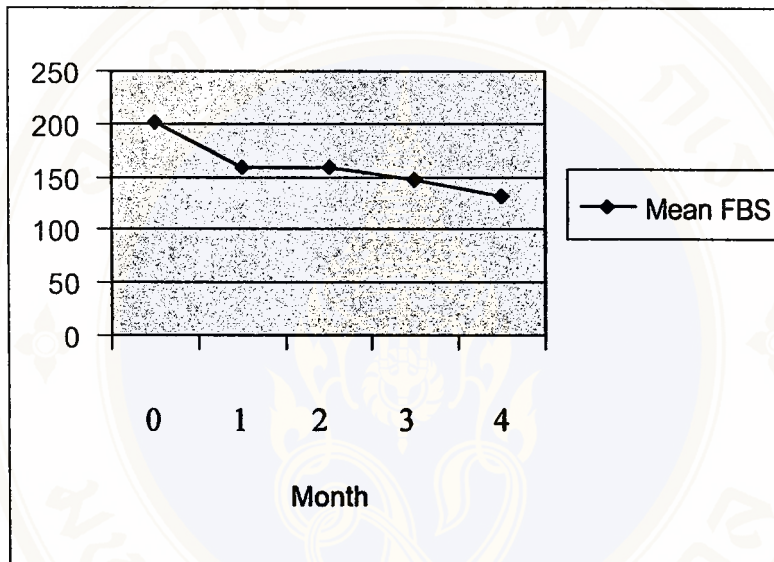


Figure 4: Mean of fasting blood sugar before entering the program and through to the end of the program of the sample (n=42).

In a comparison the mean of fasting blood sugars, they were significantly lower in the first month after entering the program. One-way Repeated Measure Anova showed that mean score on fasting blood sugars when entering the program and in each month through the end of the program were significantly different. $F(4,41) = 19.86$, $P < .0001$. However, Least Significant Difference (LSD) was used to compare these means. It was found that the mean of fasting blood sugars after entering the program and at

months 1-4 were significantly lower than before entering the program (p<.0001) (Table11). These results supported hypothesis 2.

Table 11. Comparison of the means of fasting blood sugar level in each month with One-way Repeated Measure Anova of the sample (n=42).

Source of Variance	Df	SS	MS	F	P-value
Between patients	41	82833.22	2020.32		
Between patients	4	113114.70	28278.67	19.87	.000
Errors	164	233435.70	1423.38		
Total	209	117493.62	562.17		

Range, Mean (M), Standard deviation (SD) and comparison with Least Significant Difference (LSD)

Month	Range	M	SD	Month				
				0	1	2	3	4
0	143-302	202.36	33.35	-				
1	75-266	159.45	45.42	****	-			
2	86-262	159.29	43.81	****	*	-		
3	44-252	147.95	38.15	****	*	*	-	
4	47-215	132.55	34.12	****	***	***	**	-

*ns(P>. 05), **P<. 05, ***P<. 001, ****P<. 0001

When the disease control was analyzed by using the fasting blood sugar as criteria, it was found that before entering the program all patients were in poor control, but after entering the program 9 to 15 patients improved their disease control to fair and good, respectively (Table12).

Table 12. Number and Percentage of samples in each level of diabetic control according to fasting blood sugar criteria (n=42).

FBS	Number (Percentage)		
	Poor (Score=0)	Fair (Score=1)	Good (Score=2)
Before entering the program	42(100%)	0	0
Month 1	25(59.5%)	9(21.4%)	8(19.1%)
Month 2	28(66.7%)	5(11.9%)	9(21.4%)
Month 3	25(59.5%)	9(21.4%)	8(19.1%)
After entering the program	18(42.9%)	9(21.4%)	15(35.7%)

Body Mass Index

In addition, when comparing the change of BMI based on Wannee Nithiyant (1992: 3) for Thai people which was divided into 3 levels; good, fair, and poor. It was found that 38.1% of patients had a good level of BMI before entering the program but after entering the program this level increased to 42.9%. The number of patients who were in the poor level of diabetic control were the same both before and after entering the program. Two patients changed to good control (Figure 5 and Table 13).

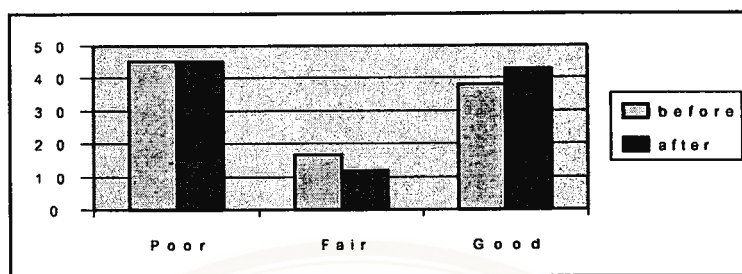


Figure 5: Percentage of patients in each level of diabetic before and after entering the program (n=42).

Table 13. Number and Percentage of samples in each level of diabetic control according to body mass index (BMI) criteria (n=42).

BMI	Number(Percentage)		
	Poor (Score=0)	Fair (Score=1)	Good (Score=2)
Before entering the program	19(45.2%)	7(16.7%)	16(38.1%)
After entering the program	19(45.2%)	5(11.9%)	18(42.9%)

In terms of changes in body weight after entering the program, it was found that after entering the program, 31 patients decreased their body weight as compare to before entering the program (Table 14). It decreased from 0.5 to 5 kilograms (mean 2.7 kilograms).

Table 14. Number and Percentage of samples in each level of diabetic control according to body mass index (BMI) criteria which changed their body weight after entering the program (n=42).

BW	Number (Percentage)		
	Poor	Fair	Good
Decrease	14 (45.1%)	6 (19.4%)	11(35.5%)
Same	1(50%)	0	1(50%)
Increase	4(44.4%)	1(11.1%)	4(44.4%)

Hypothesis 3 stated that “ after entering the program, the patient’s mean scores on diabetic control would be higher than before entering the program”.

Diabetic control was determined by the sum of scores of fasting blood sugar and BMI, before and after entering the program. It ranged from 0-2, and 0-4, respectively. The mean scores on diabetic control before and after entering program were .83 and 1.83, respectively. Wilcoxon signed ranks test showed that the patient’s mean scores on diabetic control were significantly higher than before entering the program ($p < .0001$) (Table 15). These results supported hypothesis 3.

Table 15. Comparison of the mean scores of diabetic control before and after entering the program of the sample by Wilcoxon signed ranks test (n=42).

Diabetic control	N	Mean Rank	Sum of rank	Z
Negative Rank	2	6.50	13.00	
Positive Rank	25	14.60	365.00	-4.319*
Ties	15			

*p< .0001

When diabetic control was divided into 3 levels; good, fair, and poor, it was found that 10 patients (23.8%) changed into good control (Table 16).

Table 16. Number and Percentage of the samples on diabetic control level before and after entering the program (n=42).

Disease control	Number (Percentage)		
	Poor (Score<2)	Fair (Score=2)	Good (Score=3-4)
Before entering the program	28(66.7)	14(33.3)	0
After entering the program	14(33.3)	18(42.9)	10(23.8)

For medication use, this study found that most patients used the same medications, both type and dose, and their fasting blood sugar levels decreased. There are 2 patients whose drug dosage could decrease with also a decrease in FBS in the fourth month (Table 17). However, this study found that through out the program, 15 of 42 patients had changed type/does medication but only 4 patients could decrease it through the end of the program.

Table 17. Number and Percentage of the samples who had changed dose/type of oral hypoglycemic agents according to changes in FBS level each month after entering the program as compared to before entering the program (n=42).

Drug (Type/dose)*	FBS	Through program			
		Month 1	Through 2month	Through 3month	Through 4month
		Number (Percentage)	Number (Percentage)	Number (Percentage)	Number (Percentage)
Same	Decrease	N =32 27(84.4)	n =35 18(51.5)	n =42 28(66.7)	n =40 28(70)
	Same	-	-	-	2(5)
	Increase	5(5.6)	17(48.5)	14(33.3)	10(25)
Decrease	Decrease	n =3 2(66.7)	n =3 1(33.3)	n =0 -	n =2 1(50)
	Same	-	-	-	-
	Increase	1(33.3)	2(66.7)	-	1(50)
Increase	Decrease	n =6 3(50)	n =4 2(50)	n =0 -	n =0 -
	Same	-	-	-	-
	Increase	3(50)	2(50)	-	-

*Compare before entering the program

In conclusion, all of the hypotheses were supported. The intervention program seem to effective on improving perceived self-care efficacy and disease control in uncontrolled type 2 diabetic patients.

CHAPTER V

DISCUSSION

This research aims to test the effectiveness of an educative-supportive program on perceived self-care efficacy and disease control in uncontrolled type 2 diabetic patients. The discussion of the research results is presented as follows:

1. Characteristics of the sample
2. The effectiveness of an educative-supportive program

1. Characteristics of the sample

The sample consisted of 42 adults with type 2 diabetes. Most of the subjects were female (76.2%) and the age ranged from 41-81 years with the mean of 60.45 years. These findings are consistent with previous studies in that there were more female subjects than male subjects (Keeratiyutawong, P. 1994; Phonploy, W. 1996; Ratanapitak, U. 1997; Tantayotai, V. 1997; Plodnaimaung, A. 1999). Likewise, WHO (2001) reported that the prevalence rate of diabetes type 2 in females doubles more than males and the rate increases in over the 40 years age group. The majority of the subjects were married (71.8%) because most of them were middle aged. The educational background of the subjects was mainly primary school (78.6%) and this was consistent with previous studies (Thongsawatwong, Y. 1990; Sanuan, U. 1999; Cennoy, N. 1999; Plodnaimoang, A. 1999). However, this study found that 11.9% of the subjects had no formal education. It might be explained that, most of the people who live in rural areas can not further their

education, because they need to work for a living. In addition, all subjects worked in agriculture (42.9%) and the majority of the families' income were only 1,001-5,000 baht per month (61.9%). This reflects the economical status of Thailand and an inadequate policy in human resource development.

The majority of the patients were diagnosed diabetes for more than 5 years ($M = 5.75$, $SD = 4.92$), and they were first diagnosed by a doctor (88.0%). A few patients suspected their diabetes by other health providers such as nurses (4.8%), and health center staff (2.4%), when they received service in a mobile clinic. Thus community screening for diabetes is useful and cost-effective. It may reduce the complications of type 2 diabetes because 50% of diabetics go undiagnosed (ADA, 2000: S20; Phaibul Suriyavongphaisal, 1996: 1). Whereas 2.4 % of patients could make first suspected diabetes mellitus by themselves or by a family member, they came to the hospital for confirmation of diagnosis and for treatment. All of them received treatment immediately. Sixty nine percent of the patients used only oral antihyperglycemic agents and 31% used traditional medicine (herbs or plant) in addition such as *Bo-ra-pet*, *Bi-cha-ploo*, *Kra-thom*, *Ya-tai-bi*, *Ya-tha-va-da*, *Lancquered mushroom tablet*, *pot medicine* (the mixtures of various medicinal plants). This reflected the important role of complementary therapy in Thai culture.

The most common resources of self-care information were from physicians (85.7%), and nurses (78.6%). This result is similar with previous studies (Siriwatchaiporn, R. 1984; Rajata Rajatanavin, et al., 1987; Plodnaimaug, A. 1999) which found that most of the diabetic patients received information from health care providers. However, the

subjects received information from other resources such as mass media (35.7%) and other patients (11.9%). Thus, supplying health information mass media is a useful method in disseminates self-care knowledge.

As to other chronic illnesses, 39.5% of the patients had diabetes with other chronic disease. The majority of them were hypertension (76.4%). It is a common disease that is presented at the time of diagnosis with type 2 diabetes. And it was found in one in three people with diabetes, which is more than people without diabetes does 1.5-2 times (ADA, 2000b: S70; Pongamorn Bunnag, 2000: 17).

In this study, 42.9% of the patients perceived that they could control their disease before entering the program, because they were on regular medication, ate no sweets, and sometimes did exercise. One man aged 67 years said *"I think medication could cure my disease. When the doctor gave less medication I think it is not enough for the disease. I am upset, so I avoid to meet him."* Whereas those patients who perceived that their disease was uncontrolled they would point to the reason of being unable to control their diet (76.5%) (Table 10). This finding was consistent with previous studies (Keeratiyutawong, P. 1994; Plonplod, W. 1996; Plodnaimaung, A. 1999). Other factors found as barriers of self-care practice were occupation, habit, social and culture, and other illnesses. The findings are also consistent with Anderson (1995: 413) who found that diabetic patients had difficulty in managing their dietary routines and most did not meet pre-established blood testing criteria.

However, this study found that 21.4% of the patients did not know about their disease control. Some patients believe that diabetes is a communicative disease. The first

woman said, *"I separated laundry because I want to prevent spreading the disease to my family.* The second woman said *"I know that when the parent has diabetes the child will have diabetes too. I don't want to tell another person because I'm afraid if they know that I have diabetes, my daughter will not be able to get married."* This finding reflects that the patients have inadequate knowledge to manage their own self-care. Glasgow, et al.(2001) found that many individuals with type 2 diabetes never received any patient education. Of even greater concern is that those who are older, lower socioeconomic status and low educational level, are the minority group that is less likely to have received diabetic education. The patients' knowledge is not enough to manage their own self-care. Thus, it is essential to understand the individual believes, motives, and demands of these patients (Chan & Molassiotis, 1999: 437). Whitehead (2001: 822-828) suggested that the clients' beliefs may not always be based on the weight of objective evidence. They can also be based on inaccurate personal estimation. Thus, nurses must develop competency to help diabetic patients who need complex interventions tailored to their individual needs (Temminck, et al., 2000: 1449).

The effectiveness of an educative-supportive program

The effectiveness of the program was evaluated in term of changes on perceived self-care efficacy of the total and each dimension and disease control of the participants after entering the program.

Perceived self-care efficacy

The results of this study indicated that after entering the program, the patients' mean scores on perceived self-care efficacy were significantly higher than before entering the program ($p < .0001$) (Table 10). This results reflect that integrating the strategies based on Orem's conceptual framework by using an educative-supportive nursing system which includes workshop and skill training, group discussion, and individual counseling would develop confidence in successful practice of self-care ability in the type 2 diabetic patients. These findings may be explained that the understanding of self-care is deliberate action and goal oriented and many factors that influence self-care action guide the nurses to promote self-care in the patients effectively and continuously. The activities were providing information and self-care management with various methods promotes patients' learning and increases their competence in self-care. The aid of videotape instruction as a role model was to increase patient knowledge, self-care practice, and self-efficacy. It was useful in educating people with literacy skills or those with visual impairment (Krouse, 2001: 755). Skill training in workshop about some self-care action such as foot care and food selection were helpful. It was intended to present a clear mental image of how the skill is performed. Practices are needed for learners to develop motor skills therefore the teaching must incorporate time for patients to practice (Redman, 1993 cited by Likitratcharoen, S. 2001: 85).

The group discussion on solutions to the problems encountered with practices helped patients to apply knowledge to self-care practice, and exchanging their experiences, sharing opinions and feelings helped them understand their problems clearly.

Osgood, et al. (1957 cited by Wikbled, et al., 1990: 1089) stated that patients who had diabetes a longtime are the real experts because they have experienced daily life problems. Thus, all of these were source of self-efficacy from vicarious experiences (Bandura, 1977).

Individual information and education empowers the patients to perform their self-care actions. For example, one woman said *"I never control my diet. I was anxious that I do not have enough energy to work. I just take medicine but irregularly. I must work hard in rubber tapping because I want money for my son's education. After he finishes, I think I will take care of myself."* However, this service demands more time and increases institutional expense. These activities helped the patients understand their problems, their roles and responsibilities that needed to be done and how to be done. After the patients tried these practices they learned the good results of the practices which reinforced their self-confidence and lead to the higher level of perceived self-efficacy. William, et al. (1998 cited by Glasgow, et al., 2001: 125) stated that the patients who understood and were supported by their providers are more likely to have high level of self-confidence and to succeed in behavior change.

The result showed that before entering the program, patient's mean score of perceived self-care was in the middle levels (Table 10). This might be explained that patients have some motive in self-care but they have not enough knowledge. The result of this showed that they could not control their disease before entering the program. When they received knowledge and learned about action for self-care, they need time to think in order to know that it is appropriate and useful for them before they take action. For

example, the first diabetes woman said *“My daughter has diabetes too. I worried the other children would get diabetes too. When I knew I could prevent it by eating and exercise, I feel good...I want to role model to control my disease. Father (husband) helps to remind me to take medication and he finished reading your paper (hand book) before me...Now, my family doesn't eat food cooked with coconut but we eat Kang-som (yellow sour curry), Kang-leang (mixed vegetables with spices), Nam-prik (hot chilly cooked with shrimps and fresh vegetables). I ate a little rice, only 2 spoons per time. At the beginning I don't feel full, so I ate vegetables instead.”*

The second woman said *“ My son has diabetes for 1 year. He is a stubborn boy and doesn't take medication. He said that every person would die. I think I must take care of myself very well.*

The finding was consistent with previous studies by Keratiyutawong, P. (1994); Tantayotai, V (1997); Plodnaimuang, A. (1999) in that an educative-supportive program significantly increases the diabetic patient's mean score of the total dimensions on perceived self-care efficacy after entering the program. Thus nursing intervention needs should combine knowledge and motivation strategies for self-care activities.

The results of each dimension on perceived self-care efficacy of the subjects after entering the program revealed that the mean score of dietary control, exercise, medication management, self evaluation and prevention of hypo-hyperglycemia, hygiene care and foot care, and others such as stress management, establishment of the relationship, seeking information and assistance, and follow-up dimension were

significantly higher than before entering the program ($p < .0001$) (Table 10). The example of each dimension is presented as follows:

Dietary control: This finding should be the effect of the activity organized, which included informing the patients with detailed information of diet consumption control by the researcher. The researcher brought fresh food for the participants to learn about proper nutrition in the 5 major groups according to the recommendation of Thai Diet Therapy Association. For example the amount of rice was 2 spoons, an average amount of sticky rice, corn, pineapple, and cashew nuts. When participants saw it, they said *“I ate more than one hundred times that much because I ate 1 kilogram of cashew nuts in one day.” “I ate 1 pineapple each time. I don’t know it leads to high blood sugar because it is sour.” “When I take corn from my garden it tastes sweet so I ate all of it (1 pot has more than 10 pieces).” “I think I ate very much because I ate 1 piece of fried chicken with sticky rice (more than 5 times average) every evening. I ate dinner normal daily.”*

In addition, group discussion was used in group meeting once a month through 3 months. The patients who had blood sugar decreased to exchange experience with other members. One woman said *“At present, I am an expert to test food because I ate every thing I want the same as before entering the program. But I eat only little amounts. I still eat durian. I can’t stop it because I have been eating it a long time, more than 50 years. After I eat it, I must do an activities such as gardening and eat a decreased amount of rice that day.”*

These activities would help them gain more knowledge and self-care practice regarding dietary control. This would increase their perceived self-care efficacy.

Exercise: Before entering the program some patients did not know that exercise could control their blood sugar. Thus knowing about the benefit and how to exercise might lead the patients to practice it regularly. For example, the first man aged 81 years said “ *I saw an older woman walking on TV (video), so I am walking and moving my legs and arms every morning when it is still fresh outdoors.* ”

The second man aged 67 years said “*Now, I exercise daily by climbing a tree to get my betel nuts.*”

Member: “Are you afraid to fall and that it will lead to other problems?”

The third woman aged 72 years said “*After I make merit in the morning, I walk to the district office. Sometimes I walk with another diabetic patients*

Therefore after entering the program the subjects felt more competent than before entering the program.

Medication management: Before entering the program some patients did not take their antihyperglycemia medications regularly. Most of them were unable to take it because they forgot it. In group process, they were finding methods to take it regularly and sharing experiences together such as they said “*I divided the medicine and put one piece of it in the handbag.*” “*I leave the medicine on the refrigerator because when I drink water I can see it.*” “*I divided the tablets for each day and put them in a little glass and I leave it on the TV.*”

The group discussion helped the patients who were using a wrong method of medication with a high level of blood sugar and suggested them to take it appropriately. For example, one man had diabetes for 3 months before entering the program who had increased blood sugar this month.

Members: "How are you taking medication?"

Patient: "This month, I took every type of medication after a meal. I want to help the doctor to research about this drug."

Members: "You don't have to tested it because I tested every method already, such as taking it with my meals; taking it when it is convenient, but the diabetes (blood sugar) was not decreased."

Thus, the educative supportive program helped the patients realize the importance of taking medication regularly with correct method.

This findings was consistent with a previous study of Naovarate, S. (1998) who found that applying self-efficacy theory could improved diet control, exercise, and taking medicine in NIDDM patients at Sawanpracharuk Hospital, Nakonsawan Province. The result indicated that the mean scores on perceived self-efficacy and practice of the patients, after entering the program were significantly higher than before entering the program in the experiment group and higher than the comparison group.

Self-evaluation and prevention of hypo-hyperglycemia: The mean scores of this dimension after entering the program was significantly higher as compared to before and after entering the program (M= 59.72, and 91.63, respectively). Most of the subjects did not know about the signs and symptoms of hyper-hypoglycemia and some subjects

never experienced it. One subjects who had hypoglycemia before entering the program said that *"The doctor tell me that if I have excessive sweat and hungriness with palpitation, I should eat sweets or toffee. I ate one Durian, after that I eat it frequently because I felt hypoglycemia and I have its in my garden. So my blood sugar is always more than 200 mg"*. The activities helped the patients to understand and learn how to monitor hypo-hyperglycemia conditions and management. Thus the patients felt more confidence in their self-efficacy. This study found that 15 patients had hypoglycemia during entering the program. They managed hypoglycemia with food (rice), toffee and coco syrup (Ovaltine).

This is consistent with studied by Navicharern, R. (1999) who found that after collaborated symptom management between patients and nurse, 42.5% of patients with non-insulin dependent diabetes mellitus perceived hypoglycemia symptoms and 30% perceived hyperglycemia symptoms. Patients reacted to hypoglycemia with food and glucose syrup while no action with hyperglycemia.

Hygiene care and foot care: The researcher demonstrated the procedure in foot care to the patients, which included selection of appropriate footwear, nail care, foot exercise and cleaning. This cleaning of their feet is in accordance with the practice of body cleaning in those patients who were Islam. The patients who had appropriated foot wear. They suggested the resource for the other patients. The patients who work in wet area (sell food) were to wear boots (plastic shoos) when they wash dishes.

Stress management: Most of the subjects were relaxing when talking to their neighbors, praying, listening to radio, watching TV, and exercising. Some subject

received individual counseling from the researcher. The researcher taught and demonstrated relaxation techniques to them and paid home visits. For example, one woman aged 54 years who lived with her son said *"I didn't work for 2 years after my husband died. I help my son to take care of my niece and nephew. At present they go to school. So I'm having more time to rest. At night, I can't sleep and I worry about my life."* The researcher taught relaxation techniques and exercise. In the second month the patient has menopause syndrome. The physician suggested taking hormone replacement. She hasn't got money but she had a health card. Then the researcher suggested consulting with the physician at the hospital for referral. Later the researcher went to the home and saw her son and daughter-in-law. She stated that her mother doesn't eat vegetables. I don't have time to prepare food because I must sell som-tum and barbecued chicken. The result of problem solving, the patient will prepare papaya and chicken and the daughter-in-law will go to the market for fresh food. The patient will cook appropriate food for herself and the other person. After that she looked good and she said *"I'm happy."*

Disease control

Disease control is composed of fasting blood sugar and body mass index. Also the changes in fasting blood sugar in each month were recorded.

The results showed that after entering the program, the patients' mean scores on disease control were significantly higher than before entering the program (Table15). Before entering the program most of the patients (66.7%) had poor disease control (disease control score divided into 3 levels; good, fair, poor) (Table16). It may be

explained that before entering the program the patients with uncontrolled type 2 diabetes inadequately performed self-care management. Thus, when the patients received an educative-supportive program using a participative learning in self-care, their self-care management improved and subsequently increased their disease control as evidenced by the reduction of blood glucose levels and body mass index. For example, one woman who had changed disease controlled from 0 to 4 scores after entering the program said *“I think this program gives more knowledge because I don’t know how to manage diabetes. I bring it to take care of myself every day. At the beginning, I will make more effort but when I saw other patients loss of legs. I’m feel afraid because I don’t want the same as the other person. One morning, I had excessive sweat and palpitation, then I ate one toffee and rested. It resolved. Now I think I can control the diabetes and my body weight loss was 4 kilograms after entering the program. I feel very happy.”*

This indicated that the methods of helping them from an educative- supportive program increased the patients’ knowledge and how to apply it to perform self-care actions, which perceived self-care efficacy links knowledge to practice. Hanucharunkul, S. (1997: 124) stated that perceived self-care efficacy will effect self-care behavior and effort to practice continuously.

Fasting blood sugar

The results of this study showed that after entering the program, the mean of fasting blood sugar of the patients were significantly lower than before entering the program. The means on fasting blood sugar in each month through the end of the program decreased (M= 202.36, 159.45, 159.29, 147.95, 132.55, respectively) (Table11).

This result indicated the effectiveness an educative-supportive program increase self-care ability to control their diabetes.

Result of this study was consistent with previous studies using patients participation programs that had similar interventions in promoting patients' self-care (Keratiyutawong, P. 1994; Ponpoy, V. 1996; Tantayotai, V. 1997; Ratanapitack, U. 1997). The finding contributes to the confirmation of the effectiveness of the program using group process with multiple methods in teaching-learning to enhance self-care abilities in diabetic patients which result in better control of diabetes. This study also was consistent with the finding by Plodnaimaung, A. (1999) who studied the effectiveness of an educative-supportive program in patients with uncontrolled type 2 diabetes at Sappasithiprasong Hospital, Ubon Ratchathani. She found that the mean of fasting blood sugar levels decreased significantly in each month as compared to the prior months.

Body Mass Index

Before entering the program 45.2% of the subjects were poor in disease control according to Body Mass Index criteria (Table13). Obesity is one of the risk of developing type 2 diabetes and found that two-thirds of type 2 diabetic patients are over weight. (ADA, 2000e: S20; Pi-Sunyer, 1991 cited by Clark, et al., 2001). The results of this study showed that the number of patients in poor control level after entering the program did not change (Table 13). It might be explained that the duration of this study was only 4 months and the change in body weight of the subjects requires longer time. Hollander, (1998: 1288) found that weight loss in patient with type 2 diabetes was associated with improved blood sugar control in over 1 year. However, it was found that after entering the program

31 of 42 subjects decreased their body weight range from 0.5-5 kilograms (Table 14). This reflects that they attempt to control their body weight for improve their disease control. For example, One man who lost 5 kilogram of body weight after entering the program said *"I want to decrease my body weight to control diabetes. I can't exercise because my knee joints are hurt from the injury. I control my diet and take medication regularly. Now, my wife could decrease her drug for hypertension."* The finding of this study supported the study by Wing, et al., (1985: 111) who found that weight control program in 53 obese patients with type 2 diabetes were treated by diet only or oral medication was effective. The program included providing information on nutrition, exercise, and diabetes and a variety of behavioral strategies to help patients change their behavior during the initial 16 weeks of treatment, but at 16 months follow-up. The result found that changes in weight were related to improved eating and exercise habits, and moderate weight losses of 4.6-13.6 kg (10-30 pounds) produced significant improvements in blood sugar control. Warren, et al., (1999: 19) also stated that patient with type 2 diabetes had a moderate weight reduction of 10%. These showed that they decreased insulin resistance and improve blood sugar control, dislipidemia, and hypertension.

The analysis of medication revealed that after entering the program, most of the patients with type 2 diabetes used the same type and dose of medication and their fasting blood sugar levels decreased (Table 17). Four subjects had changed throughout the program. The results indicated that activities organized throughout the 16 weeks of this program could enhance regular and continuous self-care practice. This could affect their

physiological status and significantly decrease their blood sugar although decreasing medication.

In conclusion, the educative-supportive program is effective in helping this group of diabetic patients to control their disease and increase perceived self-care efficacy. For fasting blood sugar the effect size is higher than the meta-analysis reported by Hanucharunkul, S. et al., (2000) and Likitrachoen, S. (2001). This intervention was produced large effect size on disease control =1.10, on perceived self-care efficacy = 1.81, and on fasting blood sugar = 2.10. Whereas, Hanucharunkul, S. et al., (2000) and Likitrachoen, S. (2001) reported effect size on fasting blood sugar were 0.61 and 0.60, respectively. The effect size were 0.61 and 0.60, respectively. But it seem lower than studied by Plodnaimuang, A. (1999) which was reported effect size on disease control=1.95, on perceived self-efficacy=1.95 and on fasting blood sugar=1.45. May be explained that it was different basic conditioning factor and characteristics of the sample before entering the program, which influence self-care. (The effect size is a standard deviation unit indicating a difference between experiment and control group performance on an outcome indicator). The effect size is calculated by subtracting the mean of treatment of experimental group from the control group and dividing by the standard deviation of control group (Glass, et al., 1981 cited by Theis & Johnson, 1995: 100-104).

CHAPTER VI

CONCLUSION

The conclusion of this study is presented as follows: summary of the study, recommendations, and limitations of the study.

Summary of the study

This pre-experimental research aimed to study the effectiveness of supportive-educative program on perceived self-care efficacy, and disease control in uncontrolled type 2 diabetic patients at the Outpatient Department of Sombejpraboromrachimad Nathawee Hospital, Songkhla Province. The period of the study was during February to August 2001. The sample included 42 subjects with an age between 40 to 81 years, who were purposively selected for the study according to the following criteria.

1. Uncontrolled type 2 diabetic patients being treated with oral medication and had fasting blood sugar level (FBS) higher than 140 mg% for at least 3 times consecutively before entering the program.
2. Being 40 years old or over, both male and female.
3. Alert, good hearing, understand Thai language, and also able to assess the value of numbers.
4. Willingness to participate in this study.

The exclusion criteria were Type 1 diabetic patients. These diabetic patients included pregnant woman, or having severe complications including paralysis or amputation, cataracts causing visual abnormality, myocardial infarction and renal disease. These criteria were considered by interview the history of illness and observe by the investigator combined with medical diagnosis.

The instruments

The instruments of this study consisted of 2 parts: instrument for data collection and intervention program.

1. Instrument for data collection

1.1 Demographic Data Questionnaire

1.2 Perceived Self-care Efficacy Measurement of diabetic patients was developed by Valla Tantayotai (1993) and based on Orem's self-care theory. It consisted of 44 items to measure self-confidence in the ability to perform self-care actions. These 44 items were grouped into five dimensions: dietary control, medication management, self-monitoring and prevention of hypo-hyperglycemia, exercise, hygiene and foot care, others such as stress management, establish the relationship with others and seeking support. Internal consistency reliability was measured by Cronbach' alpha and ranged between 0.94-0.96.

1.3 Diabetic Control Assessment Form was developed by Apiradee Plodnaimuang (1999). Four experts evaluated the content validity. It consisted of fasting blood sugar (FBS), body mass index (BMI), and details of treatment received.



2. The Intervention Program included:

2.1 An educative supportive program for diabetic patients was used. This was a program developed by Apiradee Plodnaimuang (1999). The program consisted of the significance, objectives, activities, evaluation, budget and advantages of the program. This was a program that provided information on diabetic knowledge via videotape and discussion, skill training and using group process for exchange of experiences in self-care.

2.2 Media utilized in the program included:

1) Videotape was developed by the Center of Community Health, the Faculty of Medicine, Ramathibodi Hospital. The videotape comprised of 4 topics including living with diabetics with good quality of life, diabetic food, exercise and foot care.

2) A set of handbooks about self care for diabetic patients were developed by Buntana Phumleng., Wariya Boonchaay, and Watchara Muangkae. The content consisted of the meaning of diabetes mellitus, signs and symptoms, complications, diet consuming, medication management, exercise, hygiene and foot care. Questions raised by diabetic patients from previous studied were answered and included as “Interesting questions from diabetic patients”.

2.3 Anthropometric measurements were assessed by body weight and height scale.

2.4 Advantage II glucometer and Advantage II test strip which produced by Roche diagnostics were used to measure fasting blood sugar.

2.5 The camera and film. Photograph taking was used during the workshop and group meetings.

2.6 Tape recorder and tape cassettes were used to record content of interaction among the subjects and the investigator in small group and individual meetings.

Data Collection

Data collection consisted of 2 phases: Phase 1 was the selection of the sample. This phase lasted 9 weeks. Phase 2, the implementation phase was divided into 16 weeks for the intervention and 9 weeks for the evaluation. This program consisted of one workshop and small group meetings. Forty six subjects attended the workshop in week 1, 4, or 5. They also meet in small groups once a month at the time of follow up (weeks 2-17). Weeks 14-22 were the periods to evaluate the program (posttest). The investigator prepared all completed questionnaires for data analysis. The program ended in week 24 (August 15, 2001) after entering program. Only 32 subjects attended. Thus, each subject attended one workshop, 3 small group discussions and in some cases received individual consultation and /or home visit. Fasting blood sugar and body weight were measured 5 times, and perceived self-care efficacy questionnaire was answered 2 times, before and after entering the program.

Results

The findings could be summarized into two parts: Characteristics of the sample and results of hypothesis testing.

Part 1. Characteristics of the sample

Demographic data

The sample were 42 patients with type 2 diabetes which was composed of 32 females (76.2%) and 10 male (23.8%), ranging in age from 40 to 81 years ($M=60.45$, $SD=10.09$). The majority were Buddhist (78%), and Islam (19.0%). Most of the subjects (88.1%) lived in Nathawee and completed primary school (78.6%). Most of them earned their living from agriculture (40.5%) with their family income were between 1,001-5,000 baht per month (61.9%). The family members range from 1 to 10 people per family ($M=3.83$, $SD=2.48$).

Data related to diabetes and treatment

Most of the subjects had duration of type 2 diabetes ranging from 3 months to 30 years ($M= 5.75$, $SD=4.92$) and paid for their medical expenses by social welfare (97.6%). Most of the subjects received information of diabetes care management from health care providers such as physicians (85.7%) and nurses (78.6%). All subjects had treatment after diagnosis immediately (100%) and were followed up every 4 weeks. About 31% of them used herbs combined with their drug therapy. Approximately 40% had other chronic health problems such as hypertension (76.4%), numbness and chronic urinary tract infection (UTI) at an equal number (11.8%).

In addition, 18 out of 42 subjects (42.9%) perceived that they could control the disease, 35.7% of the subjects perceived that they could not control their disease due to failure of diet control (76.5%), other causes (11.8%) such as inadequate knowledge, lack of sleep, and unable to obtain medication (5.9%). Each patient perceived that there were

many causes that prevented them from controlling their disease. However, it was found that 21.4% of the subjects did not know how to control their disease.

Part 2 Results of the hypothesis testing.

1. After entering the program, the patients' mean scores of the total and each dimension of perceived self-care efficacy were significantly higher than before entering the program ($p < .0001$).

The mean score on each dimension of perceived self-care efficacy such as dietary control, medication management, exercise, self evaluation and prevention of hypoglycemia, hygiene and foot care and stress management were significantly higher than before entering the program.

2. The mean on fasting blood sugar level decreased significantly each month as compared to before entering the program month ($p < .0001$).

3. The mean scores on diabetic control after entering program was significantly higher than before entering program ($p < .0001$).

Recommendations for practice application

The effectiveness of an educative-supportive program in this study could be applied in similar settings and should be included as one of the guidelines in practice as follows:

1. Educative-supportive program of the diabetic patients should be used to combine the strategies both individual and group education, using multimedia. This should include skill training to enhance self-care behavior of the patients.

2. In an educative-supportive program of the diabetic patients, nurses should coordinate activities with health care teams to maximize the usage of limited resources in primary care settings.

3. Continuity of care for each diabetic patient is necessary so that the primary care provider will know the patients and their family very well and that a trusting relationship can be enhanced. This relationship is the springboard for empowering the patients to care for themselves.

Recommendations for administrator

Administrators should provide resources for educative-supportive programs including a private room for learning and skill training. Media such as videotape, pamphlets, handbook, etc. should be provided. And the most important factor for success in diabetic education is to establish the position for permanent staff in the diabetic clinic.

Recommendations for health care system to reform provide diabetic patient

1. The results indicated that disease control of diabetic patients are very the differently: the first can be control without program, the second can control by workshop and large group discussion, the last group can not control by workshop and small group discussion. This group of patients need to be reevaluated by physician and health care system should provide appropriate method for these groups of diabetic patient.

2. Health care policy should developing audiovisuals aid for self-care in diabetic patients using vary method; pamphlets, video, CD and integrative local health broadcast every day.

Recommendations for further research

1. Further studies on this topic should be carried out with newly diagnosed diabetic patients. Also the duration of the study should be extended to more than one year.

2. Future studies on this topic should include in depth interviews to explore the barriers and factors that influence self-care behavior.

3. Further studies on this topic should be applied in patients with type 1 diabetes, and with type 2 insulin treatment diabetics.

4. This educative-supportive program should be applied in studies of other chronic diseases.

5. Test the effectiveness of only diabetic workshop for 1 day, and follow the subjects for 4-6 months

Limitations of this study

1. The researcher could not control the health information the subjects received from other health care professionals or other sources, which may affect the results of this study.

2. This study used purposive sampling, thus the findings could not be generalized to other groups of population.

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APPENDIX A

INFORM CONSENTED FORM

คำชี้แจงสำหรับผู้ป่วยและการพิทักษ์สิทธิของผู้ป่วยในการเข้าร่วมวิจัย

สวัสดิ์ค๊ะ ดิฉันทนางสาวบุญตนา พุ่มเล่ง เป็นนักศึกษาระดับปริญญาโท คณะแพทยศาสตร์ โรงพยาบาลรามาริบัติ มหาวิทยาลัยมหิดล กำลังศึกษาวิจัยเกี่ยวกับโครงการสนับสนุนและให้ความรู้กับผู้ป่วยเบาหวาน เพื่อช่วยให้ผู้ป่วยเบาหวานควบคุมโรคได้ดีขึ้น

ถ้าคุณ.....เข้าร่วมในการวิจัย ดิฉันทจะให้เอกสารโครงการสนับสนุนและให้ความรู้ 1 ชุด เพื่อให้คุณทราบรายละเอียดของกิจกรรมในโครงการ และขอพบคุณ 5 ครั้ง โดยมีกิจกรรมดังนี้ ก่อนเข้าโครงการและหลังเข้าโครงการครบ 4 เดือน ดิฉันทจะบันทึกผลการตรวจระดับน้ำตาลในเลือดของคุณ และให้คุณตอบแบบบันทึกเกี่ยวกับข้อมูลส่วนบุคคล แบบวัดการรับรู้สมรรถนะในการดูแลตนเอง ชั่งน้ำหนักและวัดส่วนสูง ใช้เวลาประมาณ 20-30 นาที หลังจากนั้นจะนัดคุณเข้าประชุมให้ความรู้ที่ห้องประชุมโรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี เวลา 9.00-15.00 น. ในสัปดาห์ที่ 1, 4 หรือ 5 หลังจากตกลงเข้าร่วมวิจัย การนัดคุณในครั้งต่อไปจำนวน 3 ครั้งห่างกันทุก 1 เดือน จะนัดคุณมาให้ตรงกับวันตรวจตามที่แพทย์นัด เป็นการเข้ากลุ่มย่อยที่ห้องประชุมคอกปีบ เวลา 9.00-10.00 น. ภายในกลุ่มแต่ละครั้งจะมีการแลกเปลี่ยนความรู้ ประสบการณ์ การรับรู้ ความเชื่อเกี่ยวกับโรคเบาหวาน การดูแลตนเองที่ปฏิบัติอยู่ ค้นหาปัญหาที่เกี่ยวกับการดูแลตนเอง และหาแนวทางแก้ไขร่วมกันกับผู้ป่วยเบาหวานท่านอื่นๆ และผู้วิจัย เมื่อสิ้นสุดโครงการ ดิฉันทจะนัดคุณให้เข้ารับฟังการประเมินผลโครงการที่ห้องประชุมโรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี เวลา 8.30-12.00 น.

ดิฉันทจึงขอเชิญคุณเข้าร่วมในการวิจัยในครั้งนี้ ซึ่งคุณมีสิทธิที่จะตอบรับหรือปฏิเสธการเข้าร่วมในการวิจัยได้โดยไม่มีผลต่อการดูแลรักษาที่คุณได้รับอยู่แต่ประการใด และในระหว่างการวิจัยครั้งนี้หากคุณไม่พอใจหรือไม่ต้องการที่จะเข้าร่วมในการวิจัยต่อจนครบตามเวลา คุณก็สามารถบอกเลิกได้โดยจะไม่มีผลต่อการดูแลรักษาเช่นกัน หากคุณมีข้อสงสัยประการใดเกี่ยวกับงานวิจัยในครั้งนี้ดิฉันทยินดีตอบให้คุณเข้าใจ ข้อมูลต่างๆของคุณที่ได้จากการวิจัยครั้งนี้ ดิฉันทจะถือเป็นความลับ โดยจะแสดงให้เห็นผู้อื่นทราบเป็นผลรวมของการวิจัยเท่านั้น

ขอขอบคุณมา ณ โอกาสนี้

บุญตนา พุ่มเล่ง (ผู้วิจัย)

APPENDIX B

DEMOGRAPHIC DATA FORM

แบบบันทึกข้อมูลส่วนบุคคล

HN.....

ผู้ป่วยรายที่

วันที่.....เดือน..... พ.ศ.....

ที่อยู่ที่สามารถติดต่อได้บ้านเลขที่..... หมู่ที่..... ถนน.....

ตำบล.....อำเภอ..... จังหวัด..... รหัสไปรษณีย์.....

หมายเลขโทรศัพท์ (ถ้ามี)..... บุคคลสำคัญในหมู่บ้านที่รู้จักบ้านท่าน.....

สถานที่สำคัญใกล้บ้านที่สังเกตง่าย.....

คำชี้แจง กรุณาตอบแบบบันทึกเกี่ยวกับตัวท่าน โดยเติมคำลงในช่องว่าง หรือทำเครื่องหมาย ✓ หน้า
ข้อความที่ตรงกับตัวท่าน

1. อายุ.....ปี
2. จำนวนสมาชิกในครอบครัว.....คน
3. เพศ
 ชาย หญิง
4. สถานภาพสมรส
 โสด คู่ ม่าย หย่า แยกกันอยู่
-
-
-
20. ในปัจจุบัน ท่านคิดว่าท่านควบคุมโรคเบาหวานได้หรือไม่
 ได้ (ถ้าเลือกข้อนี้ กรุณาตอบข้อ 21 ต่อ)
 ไม่ได้ (ถ้าเลือกข้อนี้ กรุณาตอบข้อ 22 ต่อ)
 ไม่ทราบว่าควบคุมได้หรือไม่

APPENDIX D

AN EDUCATIVE- SUPPORTIVE PROGRAM OF PATIENTS WITH TYPE 2 DIABETES

โครงการสนับสนุนและให้ความรู้สำหรับผู้ป่วยเบาหวาน

1. ชื่อโครงการ

โครงการสนับสนุนและให้ความรู้กับผู้ป่วยเบาหวาน

2. ผู้รับผิดชอบโครงการ

นางสาวบุญคณา พุ่มเกล้า

3. ที่ปรึกษาโครงการ

แพทย์ที่รับผิดชอบในคลินิกเฉพาะโรคเบาหวาน และอาจารย์ที่ปรึกษา

4. ความเป็นมาและความสำคัญของโครงการ

โรคเบาหวานเป็นโรคเรื้อรังที่มีผู้ป่วยเป็นจำนวนมากและปัญหาสุขภาพที่สำคัญของประเทศกำลังพัฒนาทั่วโลก โดยเฉพาะประเทศไทยเป็นปัญหาสุขภาพอยู่ในอันดับสอง และมีผู้เป็นเบาหวานประมาณ 900,000 คนหรือคนไทย 100 คนเป็นเบาหวาน 4 คน แนวโน้มมากขึ้นเมื่ออายุเพิ่มขึ้น โดยเฉพาะอายุ 60 ปีขึ้นไป และคาดว่าในปี พ.ศ. 2568 ประเทศไทยมีผู้ป่วยเบาหวานประมาณ 1,923,000 คนหรือเพิ่มขึ้นจากเดิมเป็น 2 เท่า แม้ว่าในปัจจุบันจะมีความก้าวหน้าด้านวิชาการและเทคโนโลยีต่างๆ เกี่ยวกับการรักษาเบาหวานเป็นอย่างมาก แต่ผู้ป่วยเบาหวานส่วนใหญ่มักไม่สามารถควบคุมระดับน้ำตาลในเลือดได้ และการที่ระดับน้ำตาลในเลือดสูงเป็นเวลานานนั้น จะก่อให้เกิดความผิดปกติของหลอดเลือด เส้นประสาท และระบบภูมิคุ้มกันของร่างกาย ส่งผลให้เกิดโรคต่าง ๆ ที่มีอันตราย เกิดความพิการและเสียชีวิตได้ เช่น โรคไต โรคหัวใจ โรคความดันโลหิตสูง โรคหลอดเลือดในสมองแตกหรือตีบ เป็นต้น ภาวะแทรกซ้อนที่เกิดขึ้นกับผู้ป่วยแต่ละอย่างนั้นเป็นภาวะเรื้อรัง ก่อให้เกิดการสูญเสียค่าใช้จ่ายสูงกว่าบุคคลทั่วไปถึง 127 เท่า นอกจากนี้ยังไม่รวมถึงความสูญเสียรายได้จากการขาดงาน ความพิการ

การตายก่อนถึงวัยอันควรและความสูญเสียอย่างอื่นที่ไม่สามารถวัดได้เช่นความเครียด ความเจ็บปวดของผู้ป่วยและครอบครัว ซึ่งมีผลกระทบต่อคุณภาพชีวิตของผู้ป่วยเป็นอย่างมาก ผู้ป่วยเบาหวานที่สามารถควบคุมระดับน้ำตาลในเลือดได้ จะป้องกัน ลด หรือชะลอการเกิดภาวะแทรกซ้อนดังกล่าวได้ และการที่จะสามารถควบคุมระดับน้ำตาลในเลือดได้ผู้ป่วยจำเป็นต้องดูแลตนเองอย่างสม่ำเสมอ ในเรื่องการควบคุมอาหาร การรับประทานยา การออกกำลังกายและการดูแลสุขภาพทั่วไปและการดูแลเท้า รวมทั้งการจัดการกับความเครียด การที่จะทำได้นั้น ผู้ป่วยต้องมีความรู้ ความเข้าใจเกี่ยวกับโรคเบาหวานเป็นอย่างดี ดังนั้น ผู้ป่วยเบาหวานจึงควรพัฒนาความสามารถในการดูแลตนเอง โดยการแสวงหาความรู้และนำความรู้ไปปฏิบัติ เนื่องจากผู้ป่วยต้องปรับเปลี่ยนแปลงกิจกรรมต่าง ๆ ในชีวิตประจำวัน และต้องเป็นผู้นำแผนการรักษาไปปฏิบัติด้วยตนเอง ขณะเดียวกันบุคลากรในทีมสุขภาพ ก็มีบทบาทสำคัญในการสนับสนุน และส่งเสริมให้ผู้ป่วย รวมทั้งครอบครัวรู้จักแสวงหา และนำความรู้ที่ได้รับไปปฏิบัติได้จริง มีความเหมาะสมและต่อเนื่อง ทั้งนี้เพื่อให้ผู้ป่วย สามารถควบคุมโรค เหนือปัญหาจากความเจ็บป่วย และปฏิบัติกิจกรรมการดำเนินชีวิตได้อย่างปกติสุข

5. วัตถุประสงค์ของโครงการ

- 5.1 เพื่อให้ผู้ป่วยมีความรู้และมีความเชื่อมั่นในการดูแลตนเองเพื่อควบคุมโรคเบาหวาน
- 5.2 เพื่อให้ผู้ป่วยมีภาวะการควบคุมโรคดีขึ้น ได้แก่ มีระดับน้ำตาลในเลือดใกล้เคียงระดับปกติและมีน้ำหนักตัวอยู่ในระดับเกณฑ์ปกติ
- 5.3 เพื่อสร้างเครือข่ายการการติดต่อระหว่างผู้ป่วยเบาหวานด้วยกัน
- 5.4 เพื่อส่งเสริมและสนับสนุนให้ผู้ป่วยมีความชำนาญเกี่ยวกับการปฏิบัติตัวในเรื่องต่าง ๆ และสามารถแนะนำ ตลอดจนถ่ายทอดความรู้ไปสู่ผู้ป่วยรายอื่นได้

6. กลุ่มเป้าหมาย

ผู้ป่วยเบาหวานประเภทที่ 2 ที่ควบคุมโรคไม่ได้ จำนวน 40 คน

7. กิจกรรมในโครงการ การดำเนินการ โครงการสนับสนุนและให้ความรู้ มีกิจกรรมดังนี้

สัปดาห์ที่ 1, 4 และ 5 จัดประชุมให้ความรู้ในผู้ป่วยเบาหวานที่ควบคุมโรคไม่ได้ ของโรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี จังหวัดสงขลา จำนวน 3 กลุ่ม กลุ่มละ 20 คน โดยแต่ละกลุ่มจะเข้าประชุม กลุ่มละ 1 ครั้ง เป็นเวลา 1 วันตามกำหนดการนี้

กำหนดการประชุมให้ความรู้กับผู้ป่วยเบาหวาน

(วัน เดือน ปี)

(09.00 – 15.00 น.)

ณ ห้องประชุม โรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี จังหวัดสงขลา

เวลา	กิจกรรม
09.00 – 09.30 น.	แนะนำและทำความรู้จัก
09.00 – 10.30 น.	สัมพันธกรุ่ม
10.30 – 10.45 น.	พักรับประทานอาหารว่าง
10.45 – 11.40 น.	ชมวีดิทัศน์ 2 เรื่อง ประกอบด้วย <ul style="list-style-type: none"> - คุณภาพชีวิตของผู้ป่วยเบาหวาน - อาหารสำหรับผู้ป่วยเบาหวาน
	ทบทวนสิ่งที่ได้และซักถามข้อสงสัยจากการรับฟังความรู้และการชมวีดิทัศน์ในแต่ละเรื่องและสาริตอาหารตัวอย่าง
12.00 – 13.00 น.	พักรับประทานอาหารกลางวัน (อาหารสำหรับผู้ป่วยเบาหวาน)
13.00 – 13.30 น.	ชมวีดิทัศน์เรื่องการดูแลรักษาเท้าในผู้ป่วยเบาหวานและสาริตการดูแลรักษาเท้า
	ทบทวนสิ่งที่ได้และซักถามข้อสงสัย
13.30 – 14.15 น.	ชมวีดิทัศน์เรื่องเบาหวานกับการออกกำลังกาย และสาริตการออกกำลังกายพร้อมทั้งออกกำลังกายร่วมกัน
	ทบทวนสิ่งที่ได้และซักถามข้อสงสัย
14.15- 14.30 น.	พัก
14.30 – 15.00 น.	สรุปกิจกรรม นัดเข้ากิจกรรมในโครงการครั้งต่อไป และวางแผนกำหนดกิจกรรมร่วมกัน

สัปดาห์ที่ 2- 17 หลังเริ่มโครงการ เป็นช่วงที่ผู้ป่วยมาตรวจตามนัดและมาเข้ากลุ่มครั้งที่ 2, 3 และ 4 ที่คลินิกเฉพาะโรคเบาหวาน โรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี จังหวัดสงขลา ซึ่งผู้ป่วยแต่ละคนจะได้เข้ากลุ่มแลกเปลี่ยนความคิดเห็น และเรียนรู้ซึ่งกันและกันจำนวน 3 ครั้ง โดยเป็นกลุ่มย่อยประมาณ 8 – 10 คน และนัดทุก 1 เดือน ภายในกลุ่มย่อย พยายามเปิดโอกาสให้ผู้ป่วยอภิปรายในประเด็นที่ว่าหลังจากเข้าประชุมแล้ว ได้นำความรู้เรื่องใดไปใช้ มีการเปลี่ยนแปลงการดูแลตนเองในเรื่องใดบ้างและปฏิบัติกิจกรรมต่าง ๆ ได้มากน้อยเพียงใด มีความยากลำบากในการปฏิบัติกิจกรรมการดูแลตนเองในเรื่องใดบ้าง รวมทั้งกระตุ้นให้ผู้ป่วยแลกเปลี่ยนความรู้ การรับรู้ และความเชื่อเกี่ยวกับโรคเบาหวาน การดูแลตนเองที่ผู้ป่วยปฏิบัติอยู่และสิ่งที่ควรปฏิบัติร่วมกัน หากแนวทางในการดูแลตนเองทั้งในเรื่อง การรับประทานอาหาร การรับประทานยา การออกกำลังกาย การดูแลเท้า และการจัดการกับความเครียด รวมทั้งแลกเปลี่ยนประสบการณ์ในการดูแลตนเองร่วมกัน และพยาบาลช่วยสนับสนุนและเสริมความรู้ในสิ่งที่ผู้ป่วยต้องการ โดยการเข้ากลุ่มครั้งที่ 2 มีการตั้งเป้าหมายร่วมกันว่า ผู้ป่วยจะบรรลุวัตถุประสงค์อะไรบ้างในการดูแลตนเองด้านต่าง ๆ การเข้ากลุ่มครั้งที่ 3 และ 4 พยาบาลและผู้ป่วยประเมินผลตามเป้าหมายที่ไว้ รวมทั้งพิจารณาอุปสรรคต่าง ๆ ที่เกิดขึ้น เพื่อนำมาวิเคราะห์สาเหตุและหาแนวทางแก้ไขร่วมกัน และในสัปดาห์ 12 พยาบาลทำการคัดเลือกผู้ป่วยที่มีประสบการณ์การดูแลตนเองเรื่องโรคเบาหวานที่น่าสนใจ เพื่อเข้าอภิปรายกลุ่มร่วมกับพยาบาลวันประเมินโครงการเพื่อให้ผู้ป่วยรายอื่นในกลุ่มได้เกิดการเรียนรู้ การเข้าประชุมและเข้ากลุ่มแต่ละครั้ง จะเปิดโอกาสให้ญาติของผู้ป่วยเข้าร่วมด้วยและขณะเข้ากลุ่มจะให้ผู้ป่วยเป็นผู้เสนอว่าจะพูดคุยในประเด็นใดเพิ่มเติม มีการทบทวนความรู้ในสิ่งที่ผู้ป่วยยังสงสัย ส่วนผู้ป่วยที่มีปัญหาซับซ้อนพยาบาลเปิดโอกาสให้เข้ารับการศึกษาเป็นรายบุคคล รวมทั้งแจ้งสถานที่ที่สามารถติดต่อได้ในระหว่างการดำเนินโครงการ ให้กลุ่มผู้ป่วยได้ทราบ โดยแลกเปลี่ยนเบอร์โทรศัพท์ระหว่างพยาบาลและผู้ป่วย (ในรายที่มีโทรศัพท์) ส่วนในรายที่ไม่มีโทรศัพท์ ถ้ามีเรื่องที่จะต้องสื่อสารกับผู้ป่วยพยาบาลใช้ไปรษณียบัตรเป็นสื่อเพื่อใช้ในการติดต่อสอบถามอาการและปรึกษาปัญหาอื่น ๆ ที่ผู้ป่วยต้องการ

สัปดาห์ที่ 14 – 22 หลังเริ่มโครงการ เป็นช่วงที่ผู้ป่วยมาตรวจตามนัด พยาบาลทำการประเมินผลหลังเข้าโครงการ (เข้ากลุ่มครบ 4 ครั้ง) โดยใช้เครื่องมือที่เตรียมไว้

สัปดาห์ที่ 24 หลังเริ่มโครงการ เป็นสัปดาห์ปิดโครงการ และนัดผู้ป่วยที่เข้าร่วมโครงการทั้งหมด 42 คน
เข้ารับฟังการประเมินโครงการตามกำหนดการดังนี้

กำหนดการประชุมให้ความรู้กับผู้ป่วยเบาหวาน

(วัน เดือน ปี)

(08.30 – 13.00 น.)

ณ ห้องประชุม โรงพยาบาลสมเด็จพระบรมราชินีนาถ ณ อำเภอนาทวี จังหวัดสงขลา

เวลา	กิจกรรม
08.30 – 09.00 น.	พยาบาลแจ้งผลการประเมินการรับรู้สมรรถนะในการดูแลตนเองและ ภาวะการควบคุมโรคให้ผู้ป่วยได้ทราบโดยบันทึกลงในเอกสาร และ ใส่ซองให้ผู้ป่วยแต่ละราย ในรายที่ไม่สามารถมาได้ พยาบาลจะจัด ส่งให้ทางไปรษณีย์
09.00 – 09.30 น.	พยาบาลสรุปกิจกรรมในโครงการสนับสนุนและให้ความรู้
09.30 – 10.00 น.	พยาบาลสัมภาษณ์ตัวอย่างผู้ป่วยที่มีภาวะการควบคุมโรคดีขึ้น
10.00 – 10.15 น.	พักรับประทานอาหารว่าง
10.15 – 11.00 น.	ผู้ป่วยเข้าอภิปรายกลุ่มเรื่อง “ประสบการณ์การดูแลตนเองของ ข้าพเจ้า”
11.00 – 11.30 น.	ผู้ป่วยเข้ารับฟังคำแนะนำและข้อคิดเห็นจากแพทย์ประจำคลินิก เฉพาะโรคเบาหวาน
11.30 – 11.40 น.	ตัวแทนกลุ่มผู้ป่วยเบาหวาน (ชายและหญิง) กล่าวความรู้สึกเกี่ยวกับการ เข้าร่วมโครงการ
11.40 – 12.00 น.	พยาบาลสรุปประโยชน์ที่ได้รับจากโครงการสนับสนุนและให้ความรู้ แพทย์ประจำคลินิกเฉพาะโรคเบาหวานมอบรางวัลสำหรับการปฏิบัติ การดูแลตนเองให้กับผู้ป่วยที่เข้าร่วมโครงการ
12.00 – 13.00 น.	พักรับประทานอาหารกลางวัน

8. การประเมินโครงการ

ประเมินหลังเข้าโครงการ คือสัปดาห์ที่ 17 – 20 โดยใช้เครื่องมือที่เตรียมไว้ ได้แก่ แบบวัดการรับรู้สมรรถนะในการดูแลตนเองของผู้ป่วยเบาหวาน และแบบประเมินภาวะการควบคุมโรคเบาหวาน

9. งบประมาณโครงการ

ค่าม้วน วีดีโอเทป	2	ม้วน	200 บาท
ค่าฟิล์ม	3	ม้วน	300 บาท
ค่าซองจดหมาย	50	ซอง	50 บาท
ค่าเพิ่มใส่เอกสาร	50	เพิ่ม	500 บาท
ค่าปากกามึกแห้ง	50	ด้าม	150 บาท
ค่ากระดาษ A4 100 แกรม 4 รีมๆละ 180 บาท			720 บาท
ค่าหมึกสี 3 กล่อง			4,500 บาท
ค่าหมึกดำ 2 กล่อง			2,600 บาท
ค่าถ่ายเอกสารเอกสาร โครงการสนับสนุนและให้ความรู้ ผู้ป่วยเบาหวาน			150 บาท
ค่าของขวัญวิทยากร			400 บาท
ค่าของรางวัลผู้ป่วย			1,000 บาท
ค่าอาหารและเครื่องดื่ม			4,000 บาท
		รวม	14,570 บาท

10. ประโยชน์ที่คาดว่าจะได้รับ

- 10.1 ผู้ป่วยเบาหวานมีภาวะการควบคุมโรคที่ดีขึ้น และเชื่อมั่นในความสามารถของตนเองมากขึ้น ในการที่จะกระทำการดูแลตนเองในเรื่องต่าง ๆ ได้สำเร็จ
- 10.2 เกิดการพัฒนาที่ยั่งยืนในผู้ป่วยเบาหวาน โดย ผู้ป่วยสามารถที่จะเป็นผู้ที่มีความชำนาญเกี่ยวกับการปฏิบัติตัวในเรื่องต่าง ๆ ตลอดจนสามารถแนะนำและถ่ายทอดความรู้ไปสู่ผู้ป่วยรายอื่นได้
- 10.3 เกิดการสนับสนุน ส่งเสริมให้มีการปฏิบัติตัวในเรื่องต่าง ๆ ที่ถูกต้องและเหมาะสมภายใน กลุ่มผู้ป่วยเบาหวาน

APPENDIX E
DISEASE CONTROL ASSESSMENT FORM

แบบบันทึกข้อมูล ภาวะการควบคุมโรค

ผู้ป่วยรายที่.....เพศ () ชาย () หญิง ชื่อ.....นามสกุล..... HN.....

1. ภาวะการควบคุมโรคเบาหวาน

รายการประเมินภาวะการควบคุมโรค	คะแนน	ก่อนเข้าโครงการ		ขณะเข้าโครงการ			หลังเข้าโครงการ	
		ค่าที่วัดได้	คะแนน	เดือนที่ 1	เดือนที่ 2	เดือนที่ 3	ค่าที่วัดได้	คะแนน
1. ระดับน้ำตาลในเลือดก่อนอาหารเช้า 80-120 mg% 121-140 mg% น้อยกว่า 80 หรือมากกว่า 140 mg%	2 1 0							
2. ดัชนีความหนาของร่างกาย กก/ม ² BMI 20-25.0 กก/ม ² ในชาย BMI 19-24.0 กก/ม ² ในหญิง BMI 25.1-27.0 หรือ 18-19.9 กก/ม ² ในชาย BMI 24.1-26.0 หรือ 17-18.9 กก/ม ² ในหญิง BMI มากกว่า 27.0 หรือน้อยกว่า 18 กก/ม ² ในชาย BMI มากกว่า 26.0 หรือน้อยกว่า 17 กก/ม ² ในหญิง	2 1 0							
รวมคะแนน	0-4							

2. การรักษายที่ได้รับ (ชนิดและขนาดยา)

ก่อนเข้าโครงการ.....ขณะเข้าโครงการ เดือนที่ 1.....เดือนที่ 2.....เดือนที่ 3.....หลังเข้าโครงการ.....

APPENDIX F

LIST OF EXPERTS

List of expert was evaluated the content validity of the hand books about self-care management in patients with type 2 diabetes.

1. Professor Thep Himathongkam

M.D. FACT

Thaptarin General Hospital

2. Associate Professor Boonsong Ongphiphadanakul

M.D. Fellow in endocrinology (University of Massachusetts)

Faculty of Medicine, Ramathibodi Hospital, Mahidol University

3. Boonchan Wongsunoppharat

M.N.S.

Intermediate Care Unit, Faculty of Medicine, Ramathibodi Hospital, Mahidol University

4. Assistance Professor Pawana Keeratiyutwong

M.N.S.

Faculty of Nursing, Burapha University

BIOGRAPHY



NAME	Miss Buntana Phumleng
DATE OF BIRTH	6 July 1970
PLACE OF BIRTH	Songkhla, Thailand
INSTITUTIONS ATTENDED	Songkhla Nursing college, Diploma in Nursing Science, 1989-1993 Mahidol University, Master of Nursing (Adult Nursing), 1999-2002
POSITION & OFFICE	1993-Present Registered Nurse 5 Division of Operation Unit, Department of Nursing Sombejpraboromrachininad Nathawee Hospital, Songkhla Province Tel. 047-341701-2