

**A SELF-MANAGEMENT PROGRAM FOR IMPROVING
KNOWLEDGE, SELF-CARE ACTIVITIES, QUALITY OF LIFE,
AND GLYCOSYLATED HbA1c IN THAIS WITH TYPE 2
DIABETES MELLITUS**

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PAWANA KEERATIYUTAWONG

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY (NURSING)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY**

2005

ISBN 974-04-6504-8

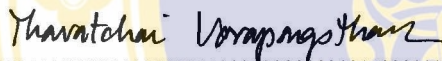
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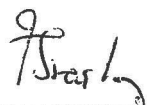
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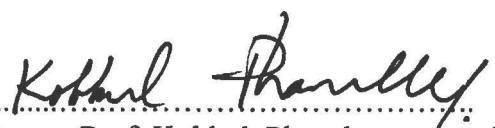
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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Doctor of Philosophy (Nursing)

on

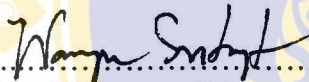
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ACKNOWLEDGEMENT

I would like to express my gratitude to Dr.Somchit Hanucharunkul, chair of my dissertation committee, for her thoughtful guidance, comprehensive suggestion, and invaluable support throughout the dissertation process. I deeply appreciate her dedication to strengthening academic competency of her doctoral students. I am very thankful to Dr.Gail Melkus, my co-advisor at Yale School of Nursing for her guidance and support. Moreover, she gave me a great opportunity by asking me to joining her research team on a type 2 diabetes project for black American women from August 2002 to August 2003. I would like to express my sincere thanks to Dr.Orasa Panpakdee, Dr.Saipin Gasemkitvatana, and Dr.Wanapa Sritanyarat for her valuable suggestions and Dr.Thavatchai Vorapongsathorn for his intellectual guidance in data analysis and interpretation.

I express my gratitude to the director and diabetes health care team at the community hospital where I implemented my project. They were very kind and helpful. Special thanks go to all subjects in the study for sharing their experience of diabetes self-management and their enthusiastic participation. My dissertation would not have been possible without these people.

I wish to express my indebtedness to: my respected parents, aunt, and parents in law for their unconditional love and their immeasurable support; my husband for his kindness and for taking good care of me; and my three cousins for their love and cheerfulness. Also, I really appreciate my classmates for their friendship, love, and invaluable learning experiences.

Finally, special thanks go to the Commission of Higher Education, Ministry of Education for giving me the financial support throughout my study program, and also the administration of Burapha University for giving me full time study leave. In addition, I would like to thank the Thai Health Promotion Foundation for supporting my research grant.

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ABSTRACT

Diabetes is a severe health problem in Thailand and patient self-management is a key to successful treatment. Self-management helps patients to control their disease, prevent complications, and enhance quality of life. The purpose of this study, then, was to test the effect of a new self-management program on knowledge, self-care activities, quality of life, and glycosylated HbA_{1c} (GHb) in patients with type 2 diabetes mellitus. Orem's self-care theory and cognitive behavioral therapy provided the theoretical framework of this study.

Eighty-one subjects with type 2 diabetes at a community hospital in Thailand were randomly assigned to either the self-management or the control group. Both groups received five videotapes, a set of written diabetes materials, and the usual diabetes education program. They also received follow-up phone calls at three and five months. However, the self-management group also attended five sessions which focused on improving cognitive processes and skills in diabetes care. Several combined methods such as teaching, support, discussion, exercise assignments, and skill training were used in each session. Data were collected at pre-intervention, three, and six months analyzed by repeated measures ANOVA and repeated measures ANCOVA.

The results indicated that the subjects in the self-management group had higher mean scores of knowledge, self-care activities, and quality of life than the control group at three and six months. The mean GHb levels in the self-management group were lower than in the control group at three and six months but the differences were not statistically significant. However, the GHb results showed clinical significance. The percentage GHb decrease and average GHb change in the self-management group were higher than in the control group.

The study findings show the effectiveness of this diabetes self-management program for improving both physiological and psychological outcomes. Therefore, implementing this program at community hospitals is recommended.

KEY WORDS: SELF-MANAGEMENT/ SELF-CARE ACTIVITIES/ QUALITY OF LIFE/ GLYCOSYLATED HbA_{1c}/ TYPE 2 DIABETES

154 P. ISBN: 974-04-6504-8

ประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้
กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม (A SELF-MANAGEMENT
PROGRAM FOR IMPROVING KNOWLEDGE, SELF-CARE ACTIVITIES, QUALITY OF
LIFE, AND GLYCOSYLATED HbA1c IN THAIS WITH TYPE 2 DIABETES MELLITUS)

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บทคัดย่อ

โรคเบาหวานเป็นปัญหาสุขภาพที่สำคัญของประเทศไทย การส่งเสริมให้ผู้เป็นเบาหวานจัดการดูแลตนเองจะเป็นประโยชน์ในการควบคุมโรค ป้องกันภาวะแทรกซ้อน และส่งเสริมคุณภาพชีวิตที่ดี การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม กรอบแนวคิดของการศึกษานี้ใช้ทฤษฎีการดูแลตนเองของโอเรมและการปรับแนวคิดและพฤติกรรม

กลุ่มตัวอย่างเป็นผู้เป็นเบาหวานชนิดที่ 2 จำนวน 81 ราย จากโรงพยาบาลชุมชนแห่งหนึ่งในประเทศไทย ถูกสุ่มเข้ากลุ่มการจัดการดูแลตนเองสำหรับผู้เป็นเบาหวาน หรือกลุ่มควบคุม ทั้งสองกลุ่มได้คู่มือ 5 เรื่อง ได้รับชุดความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน และได้ความรู้เรื่องโรคเบาหวานจากเจ้าหน้าที่สุขภาพ รวมทั้งได้รับการติดตามทางโทรศัพท์ในเดือนที่ 3 และ 5 ผู้เป็นเบาหวานกลุ่มการจัดการดูแลตนเองฯ ได้เข้าร่วมกลุ่มเรียนรู้เรื่องการจัดการดูแลตนเอง จำนวน 5 เรื่อง เนื้อหาเน้นการเพิ่มสมรรถนะของผู้เป็นเบาหวานด้านกระบวนการคิดและการฝึกทักษะในการจัดการดูแลตนเอง โดยประกอบด้วยวิธีการที่หลากหลาย เช่น สอน สนับสนุน อภิปราย ทำกิจกรรม และการฝึกทักษะ การเก็บรวบรวมข้อมูลจะเก็บก่อนเริ่มโปรแกรม และเมื่อครบ 3 เดือน และ 6 เดือน วิเคราะห์ข้อมูลด้วยสถิติการวิเคราะห์ความแปรปรวนแบบวัดซ้ำและความแปรปรวนร่วมแบบวัดซ้ำ

ผลการศึกษาพบว่ากลุ่มการจัดการดูแลตนเองฯ มีระดับความรู้ กิจกรรมการดูแลตนเอง และคุณภาพชีวิต ดีกว่ากลุ่มควบคุมทั้ง 3 เดือน และ 6 เดือน ถึงแม้ว่าค่าน้ำตาลสะสมในกลุ่มการจัดการดูแลตนเองฯ ต่ำกว่ากลุ่มควบคุมอย่างไม่มีนัยสำคัญทางสถิติ แต่กลุ่มการจัดการดูแลตนเองฯ มีจำนวนผู้เป็นเบาหวานที่มีค่าน้ำตาลสะสมลดลง และมีค่าเฉลี่ยการเปลี่ยนแปลงของระดับน้ำตาลสะสมดีกว่ากลุ่มควบคุม

ผลการศึกษาแสดงให้เห็นถึงประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองสำหรับผู้เป็นเบาหวาน จึงควรนำโปรแกรมนี้ไปสู่การปฏิบัติแก่ผู้เป็นเบาหวาน ในระดับโรงพยาบาลชุมชนต่อไป

154 หน้า ISBN 974-04-6504-8

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CHAPTER I

INTRODUCTION

Background and Significance of the Study

Diabetes mellitus is a major health problem, which affects people around the world. The World Health Organization (WHO) projected that the number of persons with diabetes is estimated to increase by 122% from 135 million in 1995 to 300 million in 2025. Moreover, a 170% rise in individuals with diabetes from 84 million to 228 million will occur in developing countries as compared to a 42% increase from 51 million to 72 million in developed countries, between 1995 and 2025. (King, Aubert, & Herman, 1998). Diabetes mellitus is also an important health problem in Thailand. With the development of Thailand from an agricultural economy to an industrial economy during the previous decade, major problematic changes in lifestyle have occurred such as unhealthy diet, lack of exercise, stressful lives, and obesity. A survey of the health status of Thai adults between 1996 to 1997, using fasting plasma glucose level (FPG) ≥ 126 mg/dl to diagnosed diabetes, found a prevalence rate of 4.4% (Chuprapawan, 2000). Lastly, the International Collaborative Study of Cardiovascular Disease in Asia (InterASIA) conducted a survey of 5,105 individuals aged ≥ 35 years, with and without diabetes, in Thailand during the year 2000. The subjects of this study were screened for diagnosed diabetes using FPG ≥ 126 mg/dl or a previous history of diabetes. Additionally, the impaired fasting glucose (IFG) level, IFG 110 -125 mg/dl, was recorded. The results illustrated that prevalence of diabetes in Thai adults was 4.8% previous diagnosed and 4.8% newly diagnosed. Furthermore, persons who had a high risk of diabetes as diagnosed by IFG had high prevalence 5.4% (Aekplakorn et al., 2003). The prevalence of diabetes is higher in urban areas than rural areas (Chuprapawan, 2000; Aekplakorn et al., 2003). The estimated number of Thai adults aged ≥ 35 years with diabetes was 2.4 ± 0.2 million based on the year 2000 Thai population census (Aekplakorn et al., 2003). Unfortunately, a survey of the health status of Thai adults found that only 3% of patients with diabetes could control their disease (Chuprapawan, 2000).

Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia due to alteration in insulin secretion, action, or both. People with diabetes are at higher risk of microvascular and macrovascular complications such as renal failure, lower-extremity amputation, blindness, stroke, and cardiovascular disease. Diabetes and its complications are a significant cause of morbidity and mortality compared with populations without diabetes in all countries (Hanis et al., 1993; Gu, Cowie, & Harris, 1998; Morgan, Currie, & Peters, 2000; Rajala, Pajunpaa, Koskela, & Keinanen-Kiukaanniemi, 2000; Brown, Scott, & Moir, 2001; Roper, Bilous, Kelly, Unwin, & Connolly, 2002; Asia Pacific Cohort Studies Collaboration, 2003). The death rates of persons with diabetes in Thailand were 11.4, 12.2 and 13.2 per 100,000 of population in the years 1999 to 2001, respectively (Bureau of Health Policy and Plan, 2003). Furthermore, diabetes mellitus and its complications contribute to massive economic costs. The total economic burden of diabetes and its chronic complications in Canada for 1998 was estimated between \$4.76 and \$5.23 billion (Dawson, Gomes, Gerstein, Blanchard, & Kahler, 2002). A huge amount of direct medical and indirect expenditures in the U.S. were attributable to diabetes in 2002. It was estimated at \$132 billion (American Diabetes Association [ADA], 2003). In Thailand, the direct cost of diabetes care for elderly people is approximately 2.4 million baht per annual (Keeratiyutawong, 2003). Diabetes often greatly impacts not only an individual's life but also on the overall economic situation of the country.

The major goals in taking care of patients with diabetes are to maintain blood glucose levels to near normal as possible, prevent acute and chronic complications, and optimize quality of life. Therefore, patients with diabetes require an educational training program to control the disease and its complications. The United Kingdom Prospective Diabetes Study's results supported the relationship between exposure to glycemia and vascular complication in patients with type 2 diabetes. The results have shown that each 1% reduction in glycosylated haemoglobin A1c (GHb) was associated with reductions in risk of 21% for deaths related to diabetes, 14% for myocardial infarction, and 37% for microvascular complications (Stratton et al., 2000). These results are consistent with a previous study by the Diabetes Control and Complications Trial Research Group (DCCT) (1993). Patients with type 1 diabetes who received intensive therapy effectively reduced the risk of retinopathy by 76% and

delayed the onset and slowed the progression of diabetic retinopathy by 54%, nephropathy by 39%, and neuropathy by 60% compared with conventional therapy (DCCT, 1993). These findings confirmed that reduction of hyperglycaemia in patients with diabetes can reduce serious complications, save cost expenditure involving other diseases, and enhance life expectancy.

Diabetes education training has evolved from primarily didactic interventions focusing on the acquisition of knowledge and information as evident in the 1970s to 1980s in Western countries (Bloomgarden et al., 1987; Raz, Soskolne, & Stein, 1988). The same evolution occurred in Thailand where primary diabetes education training started by improving diabetes knowledge of the patients.

The results of some studies indicated that improvement of diabetes knowledge was not associated with blood glucose level and self-care practice over a period of time (Tantayotai, 1982; Siritharungsri, 1983; Siripakarn, 1990; Poomidandin, 1991; Brown, 1992). Consequently, diabetes education was shifted from didactic presentation to interventions involving patient empowerment, with participation and collaboration (Keeratiyutawong, 1994; Phonploy, 1996; Tantayotai, 1997; Hanucharunkul, Achananupap, Plodnaimuang, & Pramokul, 2001; Keeratiyutawong, Hanucharunkul, Boonchaay, Phumleng, & Muangkae, 2005).

A qualitative review of diabetes self-management education concluded that behavior change strategies were much more effective than didactic methods. Self-management education is the process of providing patients with the knowledge and skills needed to perform self-care, manage crises, and make lifestyle changes required to successfully manage this disease. The goal of the process is to enable the patient to become the most knowledgeable and the most active participant in his or her diabetes care. The term self-management education emphasizes the need for people with diabetes to manage their diabetes on a day-to-day basis (Clement, 1995). Current evidence supports the theory that self-management education decreases GHb by approximately 0.76% at immediate follow-up, by 0.26% at 1-3 months of follow-up, and by 0.26% at > 4 months of follow-up (Norris, Lau, Smith, Schmid, & Engelgau, 2002).

Recently, Siripitayakunkit, Hanucharunkul, & Melkus (2005) integrative reviewed 63 studies of diabetes intervention in Thailand from 1977 to 2002. The

results showed that diabetes intervention program focused on information cognitive training 23.8%, information and skill training 66.66%, and none of coping skill training including changing negative thinking or using relaxation techniques. Methodological weakness was found in the reviews. There were unclear of target population, sample selection and dosage of intervention to be given on study reviews. Homogeneity of sample in age, gender, duration of disease, type of diabetes, and health status were limited; therefore, it is hard to draw a conclusion from the intervention effect. Purposive or convenience sample were used. Also, small number of sample and no comparison group were done. Outcome measure was obtained in short time, no follow-up and reinforcement activities after completing the program. The most outcome measure were self-care behaviors and GHb was measured only 20.6%. Quality of life was less intention in those study reviews.

Previous some diabetes education programs had unclear protocols and lacked a manual for conducting the intervention. Some studies had complicated protocols which needed a deep understanding of the theory to perform intervention and were unpractical for nurses in a real situation (Keeratiyutawong, 1994; Phonploy, 1996; Tantayotai, 1997). Although diabetes educational program claimed to add skills training 66.66% in the program, they were still spend time more on obtaining diabetes knowledge than on skills training. In addition, it was unclear about the dosage of intervention. No any study focused on cognitive skill involving problem solving ability, cognitive restructuring from negative thinking to positive thinking, and social skill training. Knowledge improvement is necessary but not sufficient for producing improved diabetes self-management practices. Diabetes self-management skills need to be developed as well as the cognitive abilities. Moreover, cognitive skills are necessary for patients to adjust their life in daily situational changes.

Also in the previous studies, methodological weaknesses included single group designs, non-random assignment, and short term evaluation (Padgett, Mumford, Hynes, & Carter, 1988; Norris, Engelgau, & Narayan, 2001; Siripitayakunkit et al., 2005). To fill this gap of knowledge, the purpose of this study was to test a self-management program that designed to improve cognitive and skill abilities in patients with type 2 diabetes by improving diabetes knowledge, self-care activities, quality of life, and GHb using a randomized controlled trial design. Comparisons between the

randomized the self-management group and the control group were done at 3 and 6 months.

Research Questions

What is the effect of self-management program on diabetes knowledge, self-care activities, quality of life, and GHb level after completing the program?

Do mean diabetes knowledge, self-care activities, quality of life, and GHb level change over time?

Is there an interaction effect between the self-management program and time on diabetes knowledge, self-care activities, quality of life, and GHb level?

Hypotheses

1. The subjects who are randomized to the self-management group have higher mean diabetes knowledge, self-care activities and quality of life, and lower mean GHb level than the subjects who are randomized to the control group.
2. There are significant differences in mean diabetes knowledge, self-care activities, quality of life and GHb level, across the three time periods in at least one pair.
3. There are significant differences in mean diabetes knowledge, self-care activities, quality of life and GHb level on interaction of Group and time.

Assumptions

Patients with type 2 diabetes have the ability to improve their diabetes self-management of dietary control, exercise, self-monitoring, foot care, and medication-taking by receiving the appropriate educational strategies.

Theoretical Framework

The theoretical framework of this study is based on Orem's self-care theory (1995) and cognitive behavioral therapy. Orem's self-care theory included a theory of self-care, the concept of therapeutic self-care demand, and a theory of nursing system (see Figure 1.1).

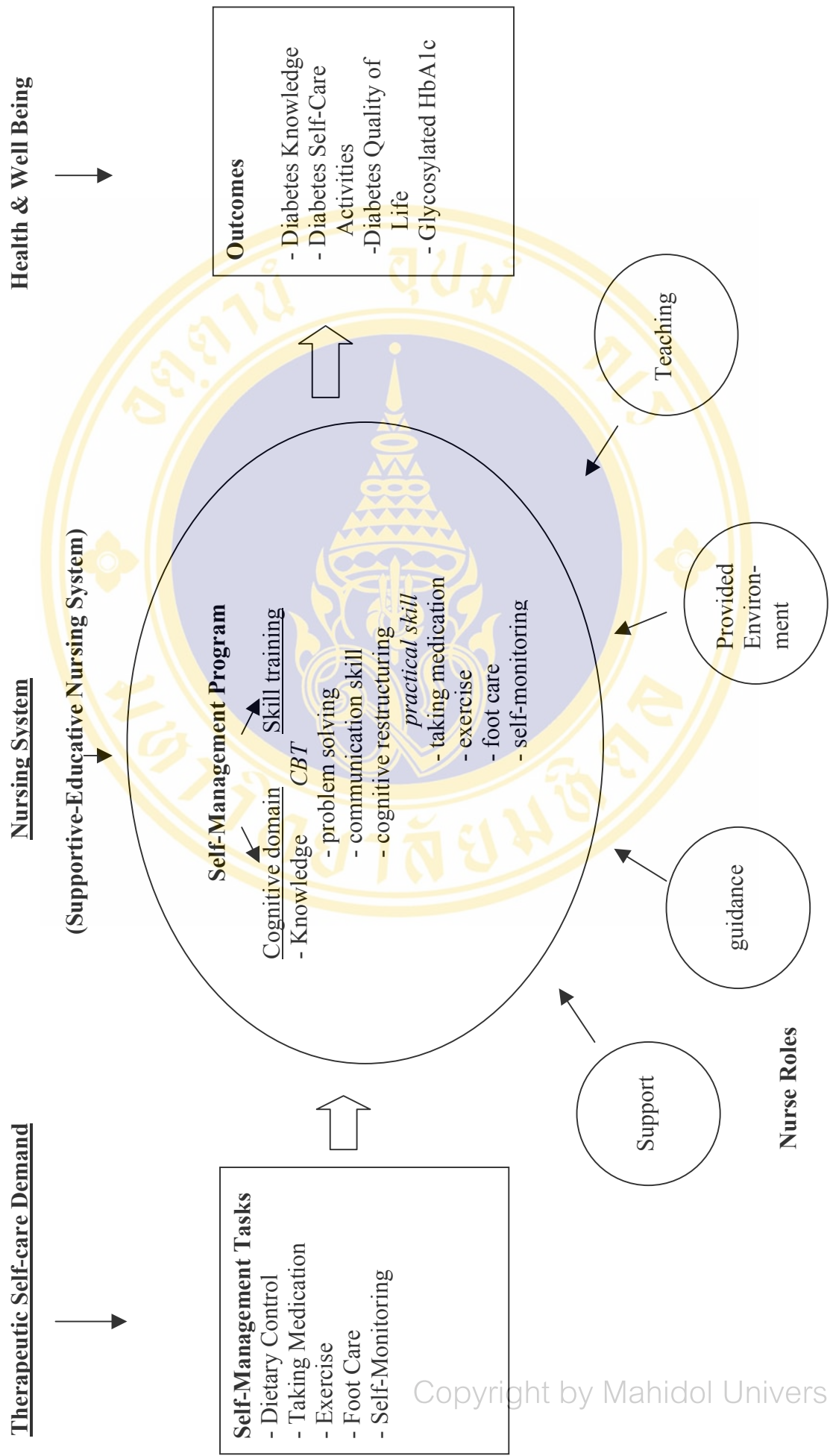


Figure 1.1 A Model of the Diabetes Self-Management Program

Self-care is a learning process where individuals initiate and deliberately perform activities for maintaining their life, health, and well-being. Self-care must be performed continuously thorough an individual's life span and take into account on individuals environmental situation, for example, stage of growth and development, state of health, specific features of health or developmental states, environmental factors, and levels of energy expenditure. (Orem, Taylor, & Renpenning, 2001).

Individuals who take deliberate action have goals and intentions, and consciously to perform their self-care. Engagement in self-care involves performance of operations to estimate what can and should be done, to decide what will be done, and to produce care. There are two phases of action. Phase one includes estimative and transitional operations, this proceeds to reflective understanding and judgment about the situation. This phase plans for what will or will not be done and give a design for doing it. Phase two consists of production and evaluation. The plan from phase one transfers into action to achieve the goals and an evaluative process is done (Orem et al., 2001).

Orem (1995) proposed the concept of therapeutic self-care demand, consisting of three types of self-care requisites: a universal self-care requisite, developmental self-care requisite, and a health deviation self-care requisite. The universal self-care requisite and developmental self-care requisite are regulatory of human functioning and development during all stages of the life cycle. The health-deviation self-care requisite is associated with changes in human structure, in physical functioning, or in behavior and habits of daily living which have adversely affected the health and well-being of the individual. Understanding these types of self-care requisites requires a foundation of knowledge in medical science and medical technology (Orem et al., 2001). Moreover, the structure of knowledge in the formulation and expression of self-care requisites require a thoughtful structuring of facts, concepts, and theories from different sciences and fields of knowledge in articulation with a valid model of deliberate action (Denyes, Orem, & SozWiss, 2001). The patients who were diagnosed with diabetes had a health-deviation from a normal person, affected by pathology of the disease. The goals of diabetes care are aimed to keep blood glucose level at a normal or near normal level and preventing long-term diabetes complications. To achieve these goals a set of therapeutic self-care demands, which consist of diet,

exercise, self-monitoring, foot care, and medication-taking must be met. Nurses have roles in helping patients to meet their self-care demands.

Orem proposes the concept of a nursing system that describes what would be a good organization of the action of nurses and patients whenever there are conditions such as (1) the patient has physiologic or psychologic limitations hindering controlled movement and needed for the accomplishment of required self-care, (2) the patient has a self-care requisite to limit energy expenditures because of health state, and (3) the patient lacks knowledge or skill or is not psychologically ready to perform self-care actions. These conditions are related to three types of nursing system respectively: (1) wholly compensatory nursing systems, (2) partly compensatory nursing systems, and (3) supportive-educative nursing systems. The supportive-educative nursing system is relevant for patient with diabetes in the chronic phase of the disease. Valid helping techniques in these situations include a combination of support, guidance, provision of a developmental environment, and teaching particular knowledge and skills (Orem et al., 2001).

Nurses implement diabetes self-management programs based on a supportive-educative nursing system to help patients in learning, managing their diabetes care tasks, and encouraging behavior change. This self-management program is the only system in which a patient's requirements for help are confined to decision making, behavior control, and acquiring knowledge and self-management skills. This type of nursing system requires facilitating interpersonal conditions and nurse-patient interactions (Orem et al., 2001).

Self-management refers to the individual's ability to manage the symptoms, treatment, physical and psychosocial consequences and lifestyle changes inherent in living with a chronic condition (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002). Self-management is based on a participant model which emphasizes the importance of the client's responsibility (Kanfer & Gaelick-Buys, 1991). The patients should initiate better self-care and nurses should help them to do so. Rehm & Rokke (1988), who are psychologists, defined self-management as tactics and procedures of control over cognitive and behavioral processes. The self-management process involves cognitive decision making, practicing specific skills, actions, and evaluations (Tobin, Reynolds, Holroyd, & Creer, 1986). Self-management emphasizes techniques

of action that produce care and which are part of self-care. Therefore, self-management is one component of self-care. Self-management techniques such as self-monitoring, problem solving, skill training and acquisition, feedback and self evaluation, contract and goal setting, or modification of environment serve the function of facilitating change.

The term self-management within cognitive behavioral therapy refers to (1) certain natural processes by which individuals direct and control their own behavior and (2) specific methods within cognitive behavioral approaches to therapy (Rehm & Rokke, 1988). Cognitive behavioral therapy has the assumption that behavior and emotions are in constant interaction with the cognitive process. Ellis (1989) stated that thinking, feeling and acting are in constant interaction. Irrational belief or negative thought about diabetes care lead to dysfunctional overt behaviors and emotional responses such as frustration, anger, or depression which can affect the quality of life of patients. Patients with diabetes require cognitive behavioral techniques to help them modifying their negative thinking about diabetes care in daily life and enhance rational thinking to maintain their care. The aims of cognitive behavioral therapy are to help the client accept the necessity for change and to develop clear objectives for treatment (Kanfer & Grimm, 1980), model and learn to analyze problems and work toward their resolution, and help the client practice more effective cognitive and interpersonal actions. The techniques of cognitive behavioral therapy comprise problem solving, stress management, and social skills training.

The self-management program in this study consisted of two major parts: cognitive improvement and skill training. The first part consisted of problem solving ability, changing negative belief about diabetes care to positive belief, and diabetes knowledge improvement. The nurse provided diabetes knowledge which was a necessary factor for patients to make an informed decision on action. Diabetes knowledge consisted of knowledge on (1) the pathology of diabetes mellitus, (2) dietary control, (3) diabetes medication, (4) foot care and self-monitoring, and (5) exercise. Furthermore, the nurse trained diabetes patients to take action by skill training. There were five skill training components: (1) cognitive restructuring and goal setting skills, (2) communication skills, (3) problem solving skills, (4) foot care, and self-monitoring skills, and (5) exercise skills. The first three skills were based on

cognitive behavioral techniques which help patients deal with a wide variety of problems in daily life regarding diabetes care. The others were practical skills to improve patients' abilities to transform knowledge into practice.

Based on the supportive educative nursing system, nurses use a combination of helping techniques; teaching, support, guidance, and providing a suitable environment, using the circumstances of a good relationship between nurse and patient.

Teaching Nurses teach patients with type 2 diabetes mellitus about diabetes knowledge and particular skills. These knowledge and skills concern: (1) pathology of diabetes mellitus, cognitive restructuring and goal setting skills; (2) dietary control and communication skills; (3) diabetes medication and problem solving skills; (4) foot care and self-monitoring; and (5) exercise.

Support Nurses support patients with type 2 diabetes mellitus both physically and psychosocially to help them control and direct self-care action. The nurse's words of encouragement and assurance provide psychological support to patients to learn new skills, make a decision, and maintain their self-care. Tangible supports such as educational multimedia are available.

Guiding There are a variety of self-care practices to choose from a daily life. The patients should make a good choice for themselves. Nurses guide patients to or suggest an appropriate selection of self-care practices.

Provided environment Nurses provide a developmental environment that motivates the patients to learn and achieve their diabetes care goals. Physical and psychosocial environmental conditions are considered. A good relationship between nurses and the patients including trust, respect, and caring is created to encourage the learning process of the patients.

The goal of self-care is maintaining life, health, and well-being (Orem et al., 2001). The program provided diabetes knowledge and cognitive and skills training for improving a patient's abilities to estimate the situations, make decisions, and take actions. Moreover, cognitive behavioral modification enhanced the skills needed to overcome obstacles related to diabetes self-care in daily life and reduce negative thinking leading to emotional distress caused by diabetes care. These skills help patients to sustain self-care behaviors in the long run. The diabetes self-management program in this study purposed to impact both the physical and psychological health of

the patients. Therefore, diabetes knowledge, self-care activities, quality of life and GHb level, were the measured outcomes of this study.

Scope of the Study

The purpose of this study was to determine the effect of a self-management program on diabetes knowledge, self-care activities, quality of life and GHb level in patients with type 2 diabetes mellitus, in patient at an out patient diabetes clinic of a community hospital in the East of Thailand. The subjects who participated in this program were type 2 diabetes mellitus, had a fasting blood sugar level higher than 130 mg/dl recorded at two least consecutive times over the last 6 months before entering the program, and be taking oral medications.

Definition of Terms

Diabetes self-management program refers to the educational program for patients with type 2 diabetes mellitus. The program was developed to improve the cognitive process, and skill abilities in patients with type 2 diabetes mellitus to take care of themselves. The self-management program includes five sessions. Each session consists of (1) a pathology of diabetes mellitus, cognitive restructuring and goal setting skills; (2) dietary control and communication skills; (3) diabetes medication, and problem solving skills; (4) foot care and self-monitoring; and (5) exercise. The patients in this program learn to direct and control their own behavior in both their cognitive domain and skills training.

Diabetes self-care activities (DSCA) refers to the activities that patients with diabetes perform to control their disease and prevent complications. DSCA were measured by the Summary of Diabetes Self-Care Activities Measure (SDSCA) developed by Toobert & Glasgow (2000) and it was modified by the researcher. DSCA measures self-care activities regarding diabetes care during the past seven days in five aspects of the diabetes regimen: diet, exercise, self-monitoring, foot care, and medication-taking.

Glycosylated haemoglobin A1c (GHb) is the best maker of glycemic control. GHb can assess level of glucose over the previous 6-8 weeks (Cooper, Mulluis, & Stewart, 1991). The goal of GHb level is less than or equal to 7% (ADA, 2004). Blood

samples were tested at the laboratory of Chonburi R.I.A. using turbidimetric inhibition immunoassay method.

Diabetes quality of life (DQOL) is defined as the patients' satisfaction with life and diabetes treatment, patients' concerning the burden of particular treatments, treatment impact and the impact of diabetes on social life. The Diabetes Quality of Life Measure developed by Jacobson & DCCT (2001) was used. Two separate components are addressed by the measure: satisfaction with treatment (15 items) and impact of treatment (20 items). Responses to questions are made with a five-point Likert scale.

Diabetes Knowledge is a cognitive measure of recognition and understanding about diabetes mellitus. It was measured by Tantayotai (1982). Some items were modified by the researcher. The 35 items self-administered multiple choice questionnaire consists of questions on general knowledge about diabetes mellitus (10 items), diabetes food (8 items), drugs (6 items), exercise (5 items), hygiene and foot care (6 items).

CHAPTER II

LITERATURE REVIEW

Literature is reviewed in four areas. The first is the pathology of type 2 diabetes mellitus, the second, diabetes self-management tasks, the third, diabetes educational programs, and the forth, outcome measures of diabetes self-management program.

The Pathology of Type 2 Diabetes Mellitus

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia caused by insufficient of insulin production and/or inability to properly use the insulin of the body. Not only is carbohydrate metabolism impaired but fat, and protein metabolism also develop abnormalities, in diabetes mellitus. The pathophysiology of type 2 diabetes mellitus is characterized by peripheral insulin resistance, impaired regulation of hepatic glucose production, and declining β -cell function, eventually leading to β -cell failure (Mahler & Adler, 1999). The destruction of the β -cells of the pancreas causes insulin deficiency and abnormalities. Moreover, all major target tissues such as skeletal muscle, liver, kidney, and adipose tissue of patients with type 2 diabetes are found to have insulin resistance (Matthael, Stumvoll, Kellerer, & Haring, 2000). Impairment of insulin secretion and insulin resistance frequently coexist in the same patient.

Diagnostic criteria for diabetes mellitus by the American Diabetes Association (ADA) are uses independently to establish the diagnosis: (1) symptoms of diabetes plus random plasma glucose of 200 mg/dl (11.1 mmol/l) or more, (2) a fasting plasma glucose (FPG) of 126 mg/dl.(7.0 mmol/l) or more on more than one occasion, and (3) a 75 g oral glucose tolerance test (OGTT) with a 2 hour value of 200 mg/dl (11.1 mmol/l) or more. The classic symptoms of diabetes include polyuria, polydipsia, and unexpected weight loss. Susceptibility to certain infections may also accompany chronic hyperglycemia (ADA, 2004).

The chronic hyperglycemia of diabetes is associated with long-term damage dysfunction, and failure of various organs including retinopathy with potential loss of vision; nephropathy with risk of foot ulcer, amputation and Charcot joints; and autonomic neuropathy causing gastrointestinal, and cardiovascular symptoms and sexual dysfunction. Diabetes is an independent risk factor for the development of stroke and coronary heart disease. (Manson et al., 1991; Stamler, Vaccaro, Neaton, & Wentworth, 1993; Stevens, Kothari, Adler, & Stratton, 2001). In patients with type 2 diabetes the risk of diabetes complications is strongly associated with raised blood pressure. Each 10 mmHg decrease in updated mean systolic blood pressure is associated with reductions in risk of 12% for any complication related to diabetes, 15% for deaths related to diabetes, 11% for myocardial infarction, and 13% for microvascular complications. The lowest risk of complications is when systolic blood pressure (SBP) is less than 120 mm Hg (Adler et al., 2000). Every 10 mmHg rise in baseline SBP increases the risk of end stage renal disease or death by 6.7% (Bakris, et al., 2003).

A meta-analysis of 20 studies on nondiabetes subjects performed by Coutinho, Wang, Gerstein, & Yusuf (1999) has demonstrated that in the nondiabetes range of glycemia (< 6.1 mmol/l), increased glucose is already associated with an increased relative risk of cardiovascular events by 33%. Poor metabolic control leads to high serum total triglycerides, low high-density lipoprotein cholesterol, and elevation of blood pressure (Laakso & Lehto, 1998). Furthermore, the emotional and social impact of diabetes and the demand of therapy may cause significant psychosocial dysfunction in patients and their families. With these facts, it is evident diabetes intervention programs should be concerned with other relative risk factors of diabetes such as hypercholesterolemia, and hypertension leading to vascular complications and psychological impact on the patient as well.

Diabetes Self-Management Tasks

Diabetes mellitus is a complex disease. A lot of patients do not cope well with diabetes self-management tasks because controlling diabetes mellitus is related to good day-to-day health habits such as eating, exercising, and self-monitoring throughout patients' lives. Moreover, many factors influence diabetes self-care

behaviors such as pattern of living, perception of the disease, health status and personal factors (Keeratiyutawong, 1994). These factors cause difficulty in maintaining diabetes self-management task over time for each individual. Therefore, nurses should be concerned about these factors. Furthermore, the development of processes for diabetes self-management should be understood for further guiding nursing interventions.

Price (1993) studied the processes of diabetes self-management in 18 adults with type 1 diabetes mellitus using grounded theory. The diabetes self-management model was presented in two phrases. Phrase 1 “getting regulated” referred to a period when patients with diabetes sought a regimen or basic routine that was appropriate for themselves. Phrase 2 “being regulated” was a period to maintain their basic self-management and apply their knowledge or skills to new situations. The patients would achieve success or failure in phrase 2 depending upon four factors. The first factor, personal consideration, comprises perceived cognitive and physical abilities, available resources, general education level, and diabetes education level. The second factor, monitoring, consists of blood testing, body listening, monitoring by others, and monitoring by health care professionals. The third factor, cognitive skills, is the ability to solve problems and evaluation. The last factor, control, means achieving their desired glucose range or becoming aware of self-control in diabetes care.

Sritanyarat (1996) conducted a grounded theory study to explore self-care processes among Thai adults with diabetes. There were four self-care processes comprised of learning about diabetes, trial and error, sacrifice, and going on with life. The first two processes are consistent with phrase 1 of Price’s model and the last two processes are similar to phase 2 of Price’s model. Helping patients with diabetes to achieve diabetes self-management are complex challenges for both health care providers and patients. A self-management process informs health care providers to understand individuals stand point of learning process and to assist patients pass through these processes successfully.

Multiple strategies should be created to help patients learn to manage their disease. The processes of diabetes self-management learning should improve both cognitive and skill practice abilities. Aside from this, positive thinking about diabetes and self-reinforcement is necessary for maintaining diabetes self-care.

The essential goals of diabetes self-management are maintaining near normoglycemia, preventing complications and enhancing quality of life. A person with diabetes must learn five self-management tasks: dietary control, exercise, skin and foot care, self-monitoring, and medication-taking.

Dietary Control

Dietary control is the major problem for patients with diabetes self-management. Factors related to poor diet control from patients' perspective were blood glucose level unrelated to dietary control, feeling bored with diabetes control, getting used to the taste of food, and difficulty in limiting sweet foods (Keeratiyutawong, Thampanichawat, Melkus, Khuwatsamrit, & Youngpradith, 2003). In addition, some patients did not know the appropriate amount of food intake or were inconsistently practicing dietary control (Phonploy, 1996). Some patients had experienced physiological symptoms and emotional distress after they limited their diet (Keeratiyutawong et al., 2003). The problem of dietary control usually occurred because of energy expenditure inconsistency in each day. Nurses should inform patients about food sources and amount of food intake that is appropriate for individual patients. Food list exchange should be taught. Moreover, barriers to dietary control should be discussed and encourage to solve their problems and practice self-motivation to maintain their diet control.

Reduced energy intake and increased energy expenditure are good self-care practices of patient with diabetes. Many people with diabetes also have dyslipidemia and hypertension, making reductions in dietary intake of saturated fat, cholesterol, and sodium desirable. Therefore, the emphasis of nutrition therapy for type 2 diabetes is on lifestyle strategies to reduce glycemia, dyslipidemia, and blood pressure. Persons with diabetes can improve their health through healthy food choices and physical activity as well as consideration of personal and cultural preferences and lifestyle choices of each individual (ADA, 2003; Rezenbek, 2001). Patients with diabetes should control their weight within the normal range. (Willett, Dietz, & Colditz, 1999). The acceptable weight, as defined by a Body Mass Index, (Weight/Height^2) is 18.5 to 23, for Thai adults. Food intake has five major components and patients should learn which components they should take more or less of.

Carbohydrates

The ADA (2003) suggests 50% of the total caloric intake should be from carbohydrate sources. Carbohydrates refer to sugars, starch, and fiber. People with diabetes are encouraged to choose a variety of fiber-containing foods, such as whole grains, fruits, and vegetables, because they provide vitamins, minerals, fiber, and other substances important for good health (Strain, 2001; Vinik & Jenkins, 1988). There is evidence to support that a high-fiber diet significantly improves blood glucose control and reduces plasma cholesterol levels in patients with diabetes compared with a low-fiber diet. In addition, a high-fiber diet does not increase plasma insulin and triglyceride concentrations, despite the higher consumption of carbohydrates (Riccardi & Rivellese, 1991; Anderson & Akanji, 1991).

Fruits and milk have been shown to have lower glycemic responses than most starches (Hollenbeck, Coulston, Donner, Williams, & Reaven, 1985). The sweeteners that have calories from carbohydrate, like fruit juice concentrate, molasses, honey, and corn syrup, have direct effects on blood glucose similar to sucrose and offer no advantage to persons with diabetes (Strain, 2001). Nonnutritive sweeteners are encouraged for people with diabetes to add increased variety to their food choices. No adverse effects from using saccharin, aspartame, acesulfame K and sucralose have been demonstrated in humans for many years over a wide range of dosages (ADA, 2003).

Protein

The ADA (2003) suggests 10 to 20% of total caloric intake be from protein sources. Protein refers to meats, fish, beans, and egg. Recent research has focused on the type of protein and its effect on the kidney. Diet using soy protein has been shown to reduce hyperfiltration of the kidneys in individual with diabetes (Strain, 2001). For preventing kidney disease, vegetable protein such as beans and legumes is recommended as a substitute for animal protein (Strain, 2001; Friesen, 2002).

Fat

The amount of fat that should be consume in the diet has been liberalized to 30% of the total calories (ADA, 2003). The primary dietary fat goal in persons with diabetes is to limit saturated fat and dietary cholesterol intake. Less than

10% of energy intake should be derived from saturated fats. Sources of saturated fat are animal fats, meats, butter fat, coconut oil, and palm oil (Friesen, 2002). The recommended cholesterol intake is less than 300 mg/day for patients with normal plasma cholesterol concentrations. For patients with elevated low-density lipoprotein (LDL ≥ 100 mg/dl), less than 7% of energy intake should be from saturated fat, and cholesterol intake should be restricted to less than 200 mg/day (ADA, 2003). Polyunsaturated fat recommendation is less than 10% of total calories. Sources are corn, safflower, sunflower, soybean, and sesame seed. Monounsaturated fats like olive oil and canola oil, have been shown not to increase the LDL cholesterol and may improve glycemic control, triglyceride and HDL cholesterol levels. A result of meta-analysis of fish oil consumption from clinical trials showed that fish oil has no adverse effects on GHb in diabetes subjects and lower triglyceride levels effectively by almost 30% (Friedberg, Janssen, Heine, & Grobbee, 1998). Omega-3 Fatty acids reduce serum lipids and lipoproteins, impair platelet aggregation, increase cell membrane fluidity, and lower blood pressure in humans (Malasanos & Stacpoole, 1991). Omega 3 fatty acids from fish and other seafoods are recommended three times per week. (Strain, 2001).

Sodium

Several meta-analyses and reviews have documented the relationship between sodium intake and blood pressure. The mean effect of a moderate sodium restriction is reported to be a reduction of 5 mmHg for systolic and 2 mmHg for diastolic blood pressure in hypertensive subjects and a reduction of 3 mmHg for systolic and 1 mmHg for diastolic blood pressure in normotensive subjects. The goal should be to reduce sodium intake to 2,400 mg or sodium chloride (salt) to 6,000 mg/day (ADA, 2003).

Alcohol

It is noted that alcohol is not metabolized to glucose and can inhibit gluconeogenesis. Alcohol can have both hypoglycemic and hyperglycemic effects in people with diabetes. Alcohol slightly enhances the meal-induced insulin secretion resulting in lower blood glucose concentrations the next morning. Moderate alcohol intake taken with a meal has been shown to have little or no effect on postprandial glycemic excursions (Koivisto, Tulokas, Toivonen, Haapa, & Pelkonen, 1993; Bell,

1996). The evidence-based nutrition principles (2002) recommended no more than two drinks per day for men and no more than one drink per day for women. One drink, or alcoholic beverage, is commonly defined as 360 ml of beer, 150 ml of wine, or 45 ml of distilled spirits, each of which contains 15 g of alcohol. If alcohol is not consumed with food and the patient is taking medication to lower blood glucose, hypoglycemia may occur. Alcohol, if taken, should be taken with food. The use of alcohol is also contraindicated with certain medications, particularly metformin which is frequently prescribed for type 2 diabetes, since alcohol can increase the effects of metformin on lactate metabolism which increases the risk of lactic acidosis (Strain, 2001).

Exercise

Lack of physical exercise and obesity are major contributory factors to insulin resistance. It has been demonstrated that insulin sensitivity could be improved by exercise independently from weight reduction and changes in body composition (Matthael, Stumvoll, Kellerer, & Haring, 2000). The potential benefits of regular physical activity in patients with diabetes include improvements in insulin sensitivity and glycemic control, reduction in cardiovascular risk, improvements in blood pressure, lipid profile and weight loss. Individuals undergoing long term physical training regimens with an exercise frequency of three or more sessions per week have improved insulin stimulated muscle glucose uptake, glucose tolerance, and decreased insulin level (Schneider, Amorosa, Khachadurian, & Ruderman, 1984; Reitman, Vasquez, Dimes, & Nauglesparan, 1984; Dela et al., 1995). Gregg, Gerzoff, Caspersen, Williamson, & Narayan (2003) studied the relationship of walking to mortality among U.S. adults with diabetes. The results indicated that persons with diabetes who walked at least 2 hour/week had a 39% lower all-cause mortality rate and a 34% lower cardiovascular disease mortality rate. The mortality rates were lowest for persons who walked 3 to 4 hour/week and for those who reported that their walking involved moderate increases in heart and breathing rates.

A careful medical history and physical examination should focus on the symptoms and signs of disease affecting the heart and blood vessels, eyes, kidneys, feet, and nervous system before increasing usual patterns of physical activity or an exercise program (ADA, 2003). Aerobic physical activity should be recommended; for example, walking, jogging, swimming, dancing and cycling, and other endurance

activities, depending on individual preference. Individuals must be taught to monitor closely for blisters and other potential damage to their feet, both before and after physical activity. Proper hydration is also essential, as dehydration can affect blood glucose levels and heart function adversely. Adequate hydration prior to physical activity is recommended, i.e. 500 ml of fluid consumed 2 hour before physical activity. During physical activity, fluid should be taken early and frequently in an amount sufficient to compensate for losses in sweat reflected in body weight loss (ADA, 2003).

A standard recommendation for patients with diabetes is that physical activity includes a proper warm-up and cool-down period. A warm-up should consist of 5 to 10 min of aerobic activity at a low-intensity level. The warm-up session is to prepare the skeletal muscles, heart, and lungs for a progressive increase in exercise intensity. After the activity session, a cool-down of 5 to 10 min should be structured similar to the warm-up. This will help gradually reduce the heart rate down to the pre-exercise level and reduce the risk of post exercise hypotension and arrhythmias. It is recommended for patients with diabetes to engage in aerobic exercise roughly every other day or 3 to 5 days each week (ADA, 2003; Schneider & Bhambri, 2002).

For patients who can not exercise for any reason increasing energy expenditure whenever they have chance is recommended, example of increasing physical activities are walking to the market, going up and down stairs, cleaning the house, and gardening.

Skin and Foot Care

Persons with diabetes are more prone to attack from staphylococci, beta-hemolytic streptococci, and fungi. One of the commonest infections observed in women with diabetes is candidiasis. Candidiasis may also appear in the vaginal, ancillary areas, and under the breast if they are pendulous. Treatment of candidiasis includes the use of topical powders, vaginal suppositories, and oral medication. The best treatment is the control of blood glucose levels and daily hygiene care (Guthrie & Guthrie, 2002).

Naruwat (1990) found 71% percent of patients with diabetes had foot problems related to diabetes. Furthermore, most patients took care of their feet incorrectly. Patients with diabetes are afraid of foot amputation; therefore, they usually

are concerned about their foot care (Keeratiyutawong, 1994; Tantayotai, 1997). Early recognition and management of independent risk factors for ulcers and amputations can prevent or delay the onset of adverse outcomes. The ADA recommends the use of the 10-gram Semmes Weinstein monofilament for the early identification of patients with diabetes at risk of foot ulceration (ADA, 2004). People with diabetes should wash their feet daily. Because the temperature receptors in the lower extremities of a person with diabetes may be impaired, water should always be tested with the wrist or elbow or by another family member. A soft towel should be applied gently to dry the feet, and it is especially important to dry well between the toes. If dryness is noted, lanolin or baby oil can be rubbed gently into the skin. Immediately after washing is the best time to cut toenails or to care for corns or calluses, because the water has softened them. Toenails should be cut along the top of the toe, without digging into the corners and without cutting below the end of the toe. A person with diabetes should carefully inspect their feet daily; this should include the tops and the soles of the feet, the heels, and the areas between the toes. If the patient cannot see well under their feet, a small mirror can help them to see clearly. If the patients cannot do these themselves, another person in the family should make the inspection (Guthrie & Guthrie, 2002). The feet should be protected at all times from cuts, bruises, introduction of foreign objects, and fractures. Clean socks and properly fitting shoes should be worn every day and changed frequently. Even a curled thread in a sock can cause an irritation if unnoticed.

Even a minor injury to or a change in the feet, such as a small reddened area, should be checked by a health professional. Many serious complications can be avoided if slowly healing wounds or other problem areas are reported early, before they develop into ulcerations. The use of alcohol is not recommended as all harsh antiseptics and chemicals should be avoided. For instance, iodine, Merthiolate or Mercurochrome should not be used on the feet. Home remedies for cuts and scratches can be extremely dangerous. If in doubt, the patient should consult a medical team (Guthrie & Guthrie, 2002).

Self-Monitoring

Self-monitoring skills for detecting hyperglycemic or hypoglycemic symptoms are important skills for patients with diabetes. Hyperglycemia and hypoglycemia can cause numerous physical symptoms in patient with diabetes

mellitus. A patient should learn how to observe his or her physiological responses to glucose change and learn how to interpret those symptoms as well as how to cope when those symptoms and other symptoms related to diabetes complications occur such as foot ulcer, and fungal infection. Furthermore, food intake awareness, and increased physical activities should be encouraged through self motivation. Keeratiyutawong et al. (2003) reported that patients with type 2 diabetes tended to rely on their subjective feeling of physical symptoms and their direct experiences of self-care rather than believe suggestions from health care providers. However, a problem arises when symptoms are not easily recognized or are interpreted inaccurately.

Self-monitoring or self-evaluation is an important skill for patients with diabetes despite regular reliable blood examination. O' Connell et al. (1984) examined the use of symptoms as indicators of perceived blood glucose level in 38 outpatients. The results demonstrated that 32 of the 38 patients used symptoms as signals of blood glucose level and they took actions after the signals presented themselves. A significant relationship was found between GHb and whether subjects took action to reduce symptoms of high blood glucose. In 1990, O' Connell, Hamera, Schorfheide, & Guthrie studied the relationship of blood glucose level to symptoms and symptom beliefs, again, in 51 patients with type 2 diabetes. The results showed that blood glucose level correlated with at least one symptom. Furthermore, metabolic control was positively related with symptom beliefs concerning low blood glucose. Symptom awareness is beneficial for assessing self health status and encouraging patients to take self-care action.

Therefore, self-monitoring is a necessary skill of patients with diabetes for evaluation of their health status at anytime. Patients with diabetes should learn to monitor themselves everyday regarding food intake, symptoms of hyperglycemia or hypoglycemia, and check their body's skin.

Medication-Taking

The problems of drug administration usually occurred in patients with diabetes. Most patients with diabetes do not take medicines following the prescription for many reasons (Keeratiyutawong, 1994; Phonploy, 1996). Because patients must take medications everyday, they occasionally miss their medication. Moreover, the individuals may have many medicines to take because of having other comorbidity

diseases; thus, they sometimes forget or feel too bored to take their medication (Keeratiyutawong et al., 2003). Another reason for failure to take prescribed medication is that Thai patients often take traditional medicines such as herbs instead. Others take both the traditional medicine and the prescription drugs (Keeratiyutawong, 1994; Sritanyarat, 1996; Phonploy, 1996; Tantayotai, 1997). Egede, Ye, Zheng, & Silverstein (2002) studied the prevalence and pattern of complementary and alternative medicine (CAM) in the U.S. individuals with diabetes. They found that more than one a half times as many individuals with diabetes use CAM as individuals without diabetes.

Patients with diabetes should learn about the action of drugs, how to take medications, and the side effects of their medications. Moreover, nurses should explore patients' problems about medication taking and solve those problems with patients.

Diabetes Educational Programs

This section reviewed the evolution and empirical evidence of diabetes educational researches both in the West and Thailand. Cognitive behavioral therapy was explained and diabetes educational programs based on this theory were presented. Finally, evidence supporting telephone follow-up of diabetes educational programs was reviewed.

Diabetes Educational Researches

Diabetes education has moved from a compliance-base approach to an empowerment approach. Traditional diabetes education focused on patient adherence to the treatment recommendations of health-care professionals. Patients with diabetes played a passive role while the health-care provider was an expert who could make a decision regarding diabetes treatment for the patients (Anderson & Funnell, 1993). Under this philosophy, the primary diabetes educational program used a didactic method focusing on the acquisition of knowledge and compliance to the regimen (Bloomgarden et al., 1987; Raz et al., 1988). Evaluation of the program emphasized knowledge, metabolic control and patient adherence.

Bloomgarden et al. (1987) conducted 9 diabetes education sessions for 127 patients in an experimental and control group. Knowledge improvement and metabolic control were compared. They found that diabetes knowledge in the experimental group improved without improved metabolic control when compared with the control group. The same results occurred in primary diabetes research in Thailand which found that diabetes knowledge had no relationship with glycemic levels. (Tantayotai, 1982; Siripakarn, 1990; Poomidandin, 1991). Clearly, evidence supports the ideal that didactic diabetes education successfully improves diabetes knowledge but fails to improve lifestyle change and glycemic control.

Padgett et al. (1988) reported a meta-analysis of 93 studies conducted between 1976 and 1986. The studies on the effects of educational and psychosocial intervention were retrieved. All intervention types (didactic education, enhanced education, diet instruction, exercise instruction, self-monitoring instruction, behavior modification, counseling, and relaxation) had mild to moderate positive effects which decreased between the 6 months and 12 months follow-up. The mean effect size of didactic and enhanced education was respectively 0.36 - 0.60 for glycemic control, 0.55 - 0.81 for knowledge, and 0.16 - 0.52 for compliance to self-care. The results reported that the educational and psychosocial intervention were an effective diabetes educational program. Padgett and colleagues suggested that future research should design a more rigorous methodology, perform long term evaluation, and assess cost benefits of the program.

Brown (1992) reported a meta-analysis of 73 published and unpublished diabetes education studies. The selected high quality studies showed a large effect size for knowledge (0.82), and skill performance (0.85). The mean effect sizes for GHb, psychological outcome, and weight loss were 0.40, 0.35 and 0.26 respectively. The results indicated that patient education appeared to be more effective in younger patients, particularly regarding knowledge outcome. Furthermore, GHb improved between 1 and 6 months post-intervention but decreased to the 1 month levels after 6 months. A meta-analysis by Padgett et al. (1988) and Brown (1992) analyzed diabetes educational programs before 1900, which focused on compliance models and didactic education. The results showed effective knowledge improvement and mixed results on glycemic control over a short time.

Diabetes education has gradually changed to take empowerment approach. This approach focuses on patient center care, encourages active participation in self-care, and uses a collaborative approach between the health care provider and patient. Health care providers facilitate informed choices by patients making a decision on their diabetes care. Glasgow & Osteen (1992) suggested that diabetes education must move beyond knowledge improvement and metabolic control to focus on patient-centered perspectives, self-efficacy, self-management, and empowerment. Clement's review of diabetes self-management education also concluded that behavior change strategies should be incorporated into diabetes education to promote lifestyle change. Moreover, diabetes education was most effective when combined with health-care provider interaction, medication adjustment and reinforcement of educational messages (Clement, 1995). Whittemore (2000) added a recommendation on her integrative literature review that diabetes education should provide culturally relevant information in the program.

Mazzuca et al. (1986) studied the effect of a systematic education program for diabetes patients on patient knowledge, skills, self-care behaviors, and relevant physiologic outcomes. Type 2 diabetes patients were randomly assigned to experimental groups (N = 263) and they were offered up to seven modules of patient education. Each module contained didactic instruction (lecture, discussion, audio-visual presentation), skill exercises (demonstration, practice, feedback), and behavioral modification techniques (goal setting, contracting, regular follow-up). The control group received instruction about diabetes as routine education. The results indicated that post-intervention assessment 11-14 months after instruction showed only rare differences between experimental and control patients in diabetes knowledge. However, the mean scores of self-care skills and compliance post-intervention of the experimental group were significantly different compared with the control group. Experimental group patients had significantly greater reductions in fasting blood glucose ($p < .05$) and GHb ($p < .05$) as compared with control subjects. Patient education also had similar effects on body weight, blood pressure, and serum creatinine. This finding illustrated the benefit of multiple approaches; didactic instruction, skill training, and behavioral modification in diabetes educational programs.

Anderson et al. (1995) conducted an empowerment program over 6 weeks in a randomized design, wait-listed control group trial. The intervention group, combining goal setting, problem solving, coping skills, and self-motivation, showed significant improvement in self-efficacy, a decrease in negative diabetes attitude, and reduction in glycosylated haemoglobin compared with the control group. This study showed the effectiveness of a diabetes educational program which combined multiple strategies to enhance a patient's self-care.

Campbell, Redman, Moffitt, & Sanson-Fisher (1996) conducted a randomized trial of patients with non-insulin-dependent diabetes allocated to one of four programs: a minimal instruction program (n = 59), an education program of individual visits (n = 57), an education program incorporating a group education course (n = 66), and a behavioral program, CBT (n = 59). The results showed that individual and group education programs had higher attrition rates than behavioral and minimal programs. There were no differences between the groups over three time periods when looking at total cholesterol, HDL cholesterol, systolic blood pressure, or proportion of patients consulting an ophthalmologist. The behavioral program produced a greater reduction in diastolic blood pressure over 12 months than the education programs and a greater reduction in the cholesterol risk ratio over 3 months than the other programs. The behavioral program patients were more likely to have visited a podiatrist after 6 months and reported higher satisfaction. The finding shows that integrated behavioral modification in a diabetes education program would maintain behavior change more than a usual education program.

Gagliardino & Etchegoyen (2001) implemented an educational model for 446 type 2 diabetes patients in 10 Latin American countries. The model promoted healthy lifestyle habits and patient empowerment, and included four weekly sessions: (1) teaching general knowledge of diabetes and self-monitoring; (2) discussing the disease process, the effect of obesity and weight reduction; (3) discussing foot care and physical activities; and (4) explaining the basic rule of "sick day" and the meaning of laboratory testing. GHb, body weight, blood pressure, cholesterol, and triglyceride were improved significantly after one year. Moreover, the annual cost of treatment decreased 62% for diabetes and reduced medical prescription in comorbidity disease. This study was a large multi-center study which illustrated good physiology outcomes

and cost benefit of diabetes education based on an empowerment approach.

Keers et al. (2004) implemented a Multidisciplinary Intensive Education Program (MIEP) in 51 sub-optimal glycemic type 2 diabetes patients. The MIEP, based on an empowerment approach, consisted of a 12 day group-session and individual counseling. The program integrated learning and practice and was conducted over four phases: (1) receiving information from team member, (2) group discussing or practicing, (3) setting goals and planning practice at home, and (4) evaluating. The results indicated that both GHb and knowledge improved significantly compared with baseline. The study showed the effectiveness of integrating learning and practicing in a diabetes educational program.

Pibernik-Okanovic et al. (2004) conducted 6 weekly small empowerment-based psychosocial intervention group sessions for type 2 diabetes subjects. The participants, 73 patients in an intervention group and 35 patients in a control group, had poor glycemic control and were aged up to 60 years old. The program consisted of goal setting, problem solving, coping with diabetes, coping with daily stress, seeking social support, and staying motivation. The results showed improvement in glycemic control and quality of life at 3 and 6 months compared with the control group who received standard care. The average decrease of GHb at 6 months showed a clinical significance of 0.60% from baseline. Not only physiological outcome but also psychological outcome displayed improvement in the empowerment-based psychosocial intervention in this study.

Melkus et al. (2004) conducted a pilot feasibility testing of a culturally competent intervention consisting of education and care for black women with type 2 diabetes mellitus using a one group, pretest posttest quasi-experimental design. Twenty-five black women with type 2 diabetes attended the 6 week diabetes intervention program which was designed in a culturally sensitive manner. The program focused on problem solving, counterconditioning, stimulus control, and decision-making for goal attainment. The results showed that glycemic control and weight were improved and diabetes-related emotional distress decreased from baseline to 3 months. There were low attrition rates and high satisfaction with the intervention as evidenced by program attendance and kept appointments. This intervention study concerned women in a specific cultural context: they were black women with type 2

diabetes. This concerned with cultural sensitivity increased the effectiveness of the program. Therefore, culturally sensitive intervention should be emphasized when developing intervention program for patients with diabetes.

Trento et al. (2001) conducted a randomized controlled clinical trial of a group educational program which was compared with an individual educational program for patients with diabetes. The group program received four sessions of diabetes education while the control group received individual education sessions. The group program had significantly improved knowledge, quality of life, cholesterol level, and metabolic control compared with the control group. Moreover, physicians spent less time on the patients in the group than on the individuals in the control group. This study shows the benefits of group intervention for improving diabetes outcomes and feasibility for time saving in a clinical practice.

The benefits of individual versus group education are on going debate in diabetes education. Wilson (1997) critically reviewed these two approaches, individual versus group education. Evidence supports the conclusion that both individual and group education can improve patient outcomes. However, there is some evidence that group education is more effective in improving patient self-management, disease status, and cost effectiveness. Small group programs which compose active group members, can exchange their knowledge, beliefs, and experiences among other group members who have similar health problems (Maldonato, Bloise, Ceci, Fraticelli, & Fallucca, 1995). Moreover, social support is enhanced and group members learn to solve their common self-management problems together.

Corey & Corey (1992) mentions that too small a group size, i.e. fewer than five adult members, limits interaction among members. On the other hand, a large group size, more than sixteen has trouble establishing group cohesion. The desirable size for a group depends on many factors such as the age of members, type of group, problem to be explored, and experience of the leader. An ideal of group size is around eight people, giving everyone a choice to be involved and interact.

These studies illustrate that shifting from a medical oriented approach to patient oriented approach is an effective strategy for improving both the physiology and psychology of living with diabetes. Multiple strategies in diabetes educational programs such as teaching, discussing, goal setting, problem solving, coping strategies, maintaining self motivation, and practicing some skills were used for enhancing patients' knowledge and modifying unhealthy lifestyles. Additionally, Glasgow et al. (1999) suggested that incorporating the patient as an active participant and using patient-oriented collaborative goal setting is a key to an effective diabetes self-management program.

A diabetes self-management program should emphasis an interactive approach between health care provider and participant. Patients' self-management should be encouraged and facilitated. The patients should make their own decisions in taking care of themselves while the health care provider supports them with useful information about diabetes care. The program should encourage active participation, and use a variety strategies which improve the behavioral, physiological and psychological outcome of patents rather than be content oriented. In addition, group education (where there is an appropriate group size) is effective for learning and saves time and money. Moreover culturally sensitivity intervention should be emphasized when developing a diabetes intervention program.

Recently, Norris et al. (2001) reviewed a total of 72 studies of published randomized controlled trials to evaluate the effectiveness of self-management training in type 2 diabetes published between 1980 and 1999. They found that there is evidence to support the effectiveness, particularly in the short term of self-management training in type 2 diabetes. Collaborative diabetes education is more effective than didactic education. They suggest that a diabetes self-management program should be designed as practical and feasible in a variety settings and behavior modification should be incorporated in the program. The outcomes of a self-management program should reflect a more holistic view of patient function. Physiological outcome, behavioral change, and quality of life should be an indicator of a program's effectiveness in future research, both in short and long-term outcomes. Furthermore, a high methodological quality in every study should be emphasized.

In Thailand, a didactic teaching of patients with diabetes was studied in primary diabetes educational research (Tantayotai, 1982; Siritharungsri, 1983; Poomidandin, 1991; Loachot, 1994; Naovarat, 1998). The programs had plane instructions, using multimedia such as slides, posters, and videotapes. All studies were of a quasi-experimental research design and selected subjects by purposive sampling. All studies had a significant knowledge improvement after completing the program but glycemic control showed mixed results. Consequently, diabetes educational programs were integrated other strategies such as counseling, group discussion, and self-help groups (Shuglin, 1991; Dumrongwanich, 1994; Lertprapai, 1996; Suwannaruk, 1999). Results of previous studies show that knowledge has no relation with glycemic control.

Diabetes education gradually shifted from the didactic method to collaborative approach. Multiple strategies were involved in programs enhancing patients' ability to take care of themselves. Collaborative approaches focus on patient center care and how to integrate diabetes care into daily life. Keeratiyutawong (1994) conducted a participatory action research to develop a self-care promoting model among 30 patients at a provincial hospital. The self-care promotion program aimed to promote a patient's self-care agency both by individual and group meetings once a month for four months. The results indicated that after entering the program, the patient's level of GHb decreased significantly, whereas perceived self-care ability and satisfaction with care increased significantly as compared to levels before entering the program. Qualitative data in this study gave more understanding of factors influencing self-care behaviors. Those factors were pattern of living, perception of the disease, length of diagnosis, health state, personal habit, family system, sociocultural orientation, and health care system. In addition, the process of self-care agency development required time, energy, effort, motivation, self-discovering of appropriate actions, and reinforcement from significant person or health care provider. However, this study lacked of a control group and the intervention program was extremely flexible making it difficult to implement in a real situation.

Hanucharunkul et al. (2001) developed an educative-supportive program by using the results of participatory action research. This one-day program provided information on diabetes knowledge and self-care management through a lecture,

discussion, practice, videotape recording, and pamphlets and was followed by small group meetings once a month, for 3 months. The results indicated that total patients' mean score on perceived self-care efficacy in each dimension, and the mean score on disease control were significantly higher at the end than in the first month. Also mean score of FPG level decreased significantly each month. Boonchaay (2001), Phumleng (2002), and Muangkhae (2002) replicated the study of Hanucharunkul et al. (2001) in the central, the south, and the north of Thailand respectively. The findings were consistent with the findings of Hanucharunkul et al. (2001). However, those studies did not have a control group, most of the time was spent in a didactic method and they used FPG as an indicator of outcome, which may include an error concerning glycemic control interpretation.

Likiratcharoen (2000) analyzed 57 studies of supportive-educative nursing systems in diabetes education programs in Thailand. The results indicated that the average effect size for metabolic control was medium (0.60) whereas other outcomes yielded a large effect size (1.65 for self-care ability, 1.52 for patient knowledge, and 1.61 for beliefs and attitudes toward the illness). However, most of the previous studies lacked a control group and randomization in research design and therefore it is difficult to draw a conclusion about the effectiveness of the intervention programs. Moreover, most studies spent more program time on diabetes knowledge more than cognitive and practical skills. A proportion of cognitive improvement and skill training in self-management program should be concerned. Moreover, the strategies for sustaining behavioral changes were not mentioned clearly in the conceptual basis of the program intervention. A theory that promotes a behavioral change should be integrated into a diabetes educational program.

Cognitive Behavioral Therapy (CBT)

Cognitive behavioral therapy (CBT) suggests techniques to promote behavioral change such as problem solving skills, communication skill and cognitive restructuring. These skills will help patients to connect their knowledge to practice in a variety of situations in daily life and enhance internal motivation to maintain their self-management behavior in the future. Therefore, a self-management program for diabetes patients which incorporates a supportive educative nursing system and cognitive behavioral therapy may be effective in helping patients change and maintain

self-management in daily life and have a good quality of life.

Cognitive behavioral therapy postulates that an individual performs behavior according to their beliefs about oneself which are formed on the basis of personal experiences (Beck, 1976). Throughout human lives various incidents serve to strengthen or weaken some of these beliefs. Negative beliefs of people affect negative feelings (hopelessness, depression, anxiety) and unwanted behaviors. Changing negative beliefs of people can lead to performance of positive behavior. Therefore, people's thoughts influence their intention to engage in self-management activities. White (2000) mentioned that CBT is applicable for patients with chronic medical problems because it focuses on the patients' interpretation and meaning of events. Negative beliefs and attitudes towards diabetes are likely to be common in patient with suboptimal glycemic control. Altering these negative beliefs could help to improve a patient's emotional well-being and adherence behaviors, leading to a subsequent improvement of metabolic control. Promoting patients to develop positive beliefs, using CBT, can help patients manage more effectively diabetes care. The techniques of CBT include problem-solving, cognitive restructuring and communication skills.

Rubin, Peyrot, & Saudek (1993) used a cognitive-behavioral psycho-educational 5 day group intervention in 165 adults with diabetes mellitus. Cognitive restructuring was used to change each patient's beliefs and attitudes regarding diabetes self-management. Problem solving strategies for living with diabetes were taught. The results showed that anxiety, self-esteem, diabetes-specific knowledge, and self-efficacy were improved at 6 months and 12 months follow-up. Depression scores were improved at the 6 month, but not the 12 month, follow-up. This program showed the benefits of integrating a cognitive-behavioral approach to change and maintain self-care and emotional well-being.

Lustman, Griffith, Freedland, Kissel, & Clouse (1998) tested the efficacy of CBT for depression in patients with diabetes. Ten weeks of individual diabetes education plus a CBT, randomized controlled trial, were conducted with the experimental group. The control group received only diabetes education. The results found a significant reduction of depressive symptoms and an improvement in glycemic control in the experimental group compared with the control group. This study illustrates the effectiveness of a combination of CBT and supportive diabetes

education in decreasing depression and improving glycemic control.

Snoek et al. (2001) conducted a pilot study of 4 weeks cognitive behavioral group training (CBGT) with a suboptimal glycaemic control of 24 type 1 diabetes patients. Four sessions were implemented: (1) the way cognitions affect emotions and behavior, (2) stress and metabolic control, (3) diabetes complications and the future, and (4) diabetes and social relationships. The program was delivered in small groups ($n = 6-8$), by a team of a diabetes nurse specialists and a psychologist. The results showed the feasibility and effectiveness of the program. The mean GHb dropped by 0.8% at 6 months from baseline, while emotional well-being was improved. The CBGT program helped patients overcome negative beliefs towards diabetes and improve their self-care behaviors.

Ellis et al. (2004) conducted a meta-analysis of 21 randomized controlled trials of diabetes patient education published between 1990 and 2000. The results reported that the net GHb change was 0.29, 0.47, and 0.33 at 12, 24, and 52 weeks, respectively. Meta-regression revealed that interventions with included a face-to-face delivery, cognitive reframing, teaching method, and exercise content were more likely to improve glycemic control. This study showed the advantage of diabetes educational program combining several activities and focusing on cognitive restructuring.

In summary, CBT is an intervention technique that may help diabetes patients to develop a more positive attitude towards their diabetes and improve their self-management behaviors.

Telephone Follow-Up

Diabetes care may cause a feeling of burnout in a patient because it requires the patient to keep track of self-care all through their life. The majority of problems of diabetes self-care concern the difficulty of ensuring long-term maintenance of behavior change. Glasgow et al. (2001) suggested successful diabetes management programs should provide consistent follow-up procedures in the program. Evidence supports the idea that telephone consultations reduce cost and missed appointments, and increase frequency of contact and satisfaction in patients with mode of communication (Car & Sheikh, 2003). In addition, telephone support has been found to be beneficial in improving of adherence to drug treatment and self-care in patient with type 2 diabetes mellitus.

Estey, Tan, & Mann (1990) tested the hypothesis that follow-up intervention by telephone calls and home visits affects compliance in patients with type 2 diabetes mellitus. Sixty patients were randomly assigned to two groups: a control group, which received the standard protocol (three day educational program and a review session one month after the program); and an intervention group, which received the standard protocol as well as a series of four telephone calls and one home visit by a registered nurse over a 3 month period. Results showed that self-monitoring blood glucose practice was significantly better for the intervention group. There were no significant differences of GHb values and weight changes between the two groups after study. The results showed follow-up intervention by telephone calls and home visits can enhance patient compliance to certain aspects of a prescribed diabetes management plan.

Tu, McDaniel, & Gay (1993) conducted a post-educational follow-up intervention in 27 hospitalized elderly patients with diabetes who had completed an inpatient education program. Follow-up telephone calls, 10 to 15 minute telephone sessions, were conducted weekly for four weeks. Each telephone call consisted of assessing the patient's self-care knowledge and self-care activities. No significant difference was observed in diabetes self-care knowledge and GHb values. A significant difference was achieved in reduction of self-care behavioral deficits ($p < .05-.01$). This study concluded that post-educational follow-up is necessary for enhancing self-care adherence and ensuring safe practice of home care for elderly patients with diabetes.

McBride & Rimer (1999) reviewed 74 telephone delivered interventions (TDIs); for example, to promote smoking cessation, telephone contact following hospital discharge in chronic patients, and to promote good health. Thirty-nine studies used TDIs as the main intervention component and 58 studies used one as part of the program. The reviews showed the benefits of telephone call in relapse prevention of chronic illness, improvement of adherence to diets, maintenance of cholesterol reduction, and sustaining exercise.

Telephone follow-up is a strategy for following self-management practices of patients at home. Nurses can help patients to solve their problem and give advise about diabetes care. Moreover, patients can consult nurses about their health

problems or self-management problems at a low cost. This strategy may enhance patient's motivation and maintain their self-management.

Outcome Measures of Diabetes Self-Management Program

Diabetes mellitus impacts the physiology of the patient in the short term and gradually impacts long term complications. Moreover, psychological problems such as emotional distress, and depression may occur due to burden of daily diabetes self-management. Self-management programs should be designed to improve both physiological and psychological outcomes. Glasgow & Osteen (1992) criticized the outcome of previous diabetes educational research by pointing out that program evaluations have focused too narrowly on assessing knowledge and GHb outcomes, to the exclusion of other important variables. They recommend quality of life and patient functioning outcomes be measured and have used more standardized and objective measures of diabetes management behaviors. Anderson & Funnell (1993) recommended an outcome evaluation of diabetes education including knowledge, attitudes, self-care practices, psychosocial adaptation, and some metabolic indices such as blood glucose control and weight. To reflect the changing emphasis and conceptual basis of diabetes self-management programs, the outcome evaluation of this program focused on diabetes knowledge, self-care activities, quality of life, and GHb.

Diabetes Knowledge

Diabetes knowledge regarding diabetes pathology, and diabetes self-management enhances a patient to understand his/her disease situation and leads to good self-management. Knowledge improvement is a cognitive process that helps people to develop a better self-management and make informed decisions. Loycharoen (2005) found a moderate relationship between diabetes knowledge and self-care activities ($r = .41$, $p < .05$) in her study using a self-care package to increase knowledge and improve self-care behavior of persons with type 2 diabetes. Although knowledge improvement is not significantly related with glycemic control, it is considered important and necessary for diabetes self-management. Diabetes knowledge evaluated in this study was through a self-administered multiple choice questionnaire which included five components, totaling 40 items used for type 1 and 2

diabetes, developed by Tantayotai (1982). The questions related to insulin injection were removed leaving a total of five components with 35 items: general knowledge about diabetes mellitus, diabetes food, drugs, exercise, and hygiene and foot care.

Diabetes Self-Care Activities (DSCA)

Evidence supports that patients with diabetes who adhere to self-care practices have good metabolic control, lower emotional distress, and good quality of life when compared with patients who do not adhere (Glasgow et al., 2001). Patients with diabetes should be responsible for their self-management regarding diet, exercise, self-monitoring, foot care, and medication-taking. Improvement of those diabetes self-management areas in each session will produce better metabolic control, and prevent long term complications. Therefore, improvement of self-care activities is an important outcome reflecting a successful diabetes self-management program. The Summary of Diabetes Self-Care Activities (SDSCA) developed by Toobert & Glasgow (2001) was used to measure diabetes self-care activities. The questions also ask about diabetes self-care activities during the previous seven days.

Diabetes Quality of Life

Quality of life (QOL) has been recognized as an important health outcome. The World Health Organization (1995) defined QOL as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. The characteristics of the QOL are subjective, multi-dimensional nature including physical, psychological, social, and spiritual, and address individuals' perceptions of both positive and negative dimensions (WHO, 1995). The pathology of diabetes mellitus disrupts human functioning and long term care for diabetes affects a person's life-satisfaction. The demands of diabetes self-care and diabetes treatment can have a significant impact on many aspects of quality of life: work, interpersonal relationships, social functioning, and physical and emotional well-being. The specificity of diabetes quality of life questionnaires has an advantage over more general measures of quality of life. The Diabetes Quality of Life Measure (DQOL) was developed in the early 1980s for use in the Diabetes Control and Complication Trial (DCCT, 1993). DQOL purposely allowed for a broader application to patients with type 1 and type 2 diabetes. It is conceptualized as measuring the patient's personal experience about the burden of

particular treatments, satisfaction with life and diabetes treatment, and the impact of diabetes on their social life. Four separate areas are addressed by the measure: satisfaction with treatment, impact of treatment, worry about the future effects of diabetes, and worry about social/vocational issues. The last two components, worry about the future effects of diabetes, and worry about social/vocational issues are designed for use with adolescents so they are less relevant for adults who are settled in their lives. DQOL measured in the present study included only components related to satisfaction with treatment and impact of treatment. The items illustrate the satisfaction and impact of treatment on physical ability, interpersonal relationships, social function and emotion, and well being of patients.

Glycosylated Haemoglobin A1c (GHb)

The best indicator of diabetes control is glycosylated haemoglobin (GHb). Glycosylated haemoglobin, referred to as glycated haemoglobin, glycohaemoglobin, or haemoglobin A1c (HbA1c), is a term for stable minor haemoglobin components formed slowly and nonenzymatically from haemoglobin and glucose. Red blood cells infiltrated with glucose have a life span of 120 days; therefore, GHb level represents glycemic control in the former 120 days (Pi-Sunyer, 2002). GHb often reports as HbA1c and most accurately reflects a mean glycemia over the preceding 2 to 3 months. American Diabetes Association (2004) suggests measuring GHb approximately every 3 months to determine the status of glucose control in patients with diabetes.

Summary

A patient with type 2 diabetes mellitus should learn to control their disease and prevent long term complications with dietary control, exercise, self-monitoring, foot care, and medication-taking. Diabetes education programs should shift from a didactic method, in order to increase patients' participation, and encourage patients' self-control and behavior change. A theory that promotes a behavioral change should be involved in a self-management program. A diabetes self-management program, based on Orem's self care theory and cognitive behavioral therapy, designed for improving cognitive and skill abilities may help patients change their behaviors and maintain self-care practices over time. In addition, there is evidence to support the idea that

small group interventions and telephone follow- ups are effective strategies for self-management programs, which are cost effective. Finally, the research findings from meta-analyses suggest emphasis on a rigorous research design in a diabetes self-management program.

In addition, cognitive behavioral therapy suggests techniques to promote behavioral change such as problem solving skills, communication skills and cognitive restructuring. These skills will help patients connect their knowledge to practice in a variety of situations in daily life and enhance internal motivation to maintain their self-management behavior in the future. Therefore, a self-management program for diabetes patients which incorporates a supportive-educative nursing system and cognitive behavioral therapy may be effective in helping patients change and maintain self-management in daily life and also maintain a good quality of life.

CHAPTER III

METHODOLOGY

This chapter explains the research designs and method that were used in the present study. It includes a description of the research design, research setting, sample, sample size, instrumentations, protection of right of human subjects, pilot study, procedures, data management, and data analysis.

Research Design

The design of this study was a randomized controlled trial (RCT) design. This design is the most powerful method for testing hypotheses of cause and effect relationships between independent and dependent variables (Polit & Hungler, 1999). The treatment was a diabetes self-management program. The outcomes measured diabetes knowledge, diabetes self-care activities (DSCA), diabetes quality of life (DQOL), and glycosylated haemoglobin A1c (GHb).

Research Setting

The study was conducted at a community hospital in the eastern part of Thailand, approximately 80 kilometers from the capital, Bangkok. This community hospital was selected as a setting for this study because (1) the policy of the Public Health Ministry is to improve the potential of community hospitals to take care of patients with chronic diseases such as diabetes mellitus, hypertension, and heart disease under the Universal Health Care Coverage Scheme; therefore, health education for patients with chronic illness has been established at out patient clinics, (2) this hospital has a diabetes education service for routine care, (3) this area could be easily accessed.

This community hospital located about 30 kilometers from the provincial tertiary hospital. It provides a diabetes clinic on Thursdays. Diabetes education at this hospital is run by a diabetes health care team including nurses, a pharmacologist, a nutritionist, and a physiotherapist. Around two members of this team rotate to give

diabetes education while patients are waiting for laboratory results between 9 and 10 a.m. at the clinic every Thursday. Patients with diabetes are taught about diabetes care through a lecture using a microphone in front of the clinic.

Sample

The patients who participated in this study all met the following inclusion criteria:

1. type 2 diabetes which had been diagnosed less than or equal to 10 years
2. treated only with oral medications
3. had had a fasting blood sugar level higher than 130 mg% at least two consecutive times before entering the program
4. aged between 21 - 60 years
5. able to read Thai

Exclusion criteria

1. receiving insulin therapy
2. had diabetes-related complications such as end stage renal disease, heart failure, lower extremity amputation, or other serious illness

Sample Size

The sample size in this study is based on the effect size from meta-analysis of educative-supportive intervention research for patients with diabetes in Thailand (Likiratcharoen, 2000). It was found that the average effect size of metabolic control was medium ($d = 0.60$) whereas other outcomes yielded a larger effect size for self-care, patient knowledge, and beliefs and attitudes toward the illness. The sample size of this study was adequate when based on a power level of 0.8, an alpha of 0.05, an effect size of medium level ($f = d/2 = 0.3$) and degree of freedom equal 2 ($k-2$, k = number of dependent variables). Sample size should be at least 36 subjects per group (self-management and control group) (Cohen, 1988, p.384).

Previous studies with a 3 months follow-up, in Thailand, found an 8.69% attrition rate. This study followed the patients longer than previous studies and therefore, the attrition rate might have been higher. Therefore, this study recruited 44 subjects per group which assumed an attrition rate of 15%.

Instrumentations

There were two types of instrumentation. The first type was the Manual of the Type 2 Diabetes Self-Management Program. The second was the set of data collection instruments.

The Manual of the Type 2 Diabetes Self-Management Program

The Manual of the Type 2 Diabetes Self-Management Program was developed using the concept of therapeutic self-care demand, a theory of nursing system which was elaborated in Orem's self-care theory (1995) and cognitive behavioral therapy to improve the cognitive processes, and skill abilities in practicing diabetes self-management. Five hours were allocated for cognitive improvement and skill training was five hours. The program outline is shown as follows:

- Week 1 What is diabetes? The pathology of diabetes mellitus
Cognitive restructuring and goal setting skills
- Week 2 Dietary control
Communication skills
- Week 3 Diabetes medication
Problem solving skills
- Week 4 Foot care and self-monitoring
Self-monitoring skills: how to take care of your feet, how to monitor hyperglycemia or hypoglycemia
- Week 5 Exercise
How to deal with relapse

The manual included the goals of each session, materials, content, strategies, detailed guidelines for patient training, handouts, and exercise assignments. The supportive-educative nursing system included a combination of support, guidance, provision of a developmental environment, and teaching particular knowledge and skills were helping methods in the program. Also, presentation, discussion and skills training were the methods used for each session with an emphasis on problem solving, goal setting, cognitive restructuring, and reinforcement. Active participation was encouraged and group discussion was facilitated. Handouts and exercise assignments which were appropriate in each session were distributed. In addition, a set of written diabetes material was distributed to the subjects, and five videotapes about diabetes

self-care developed by Hanucharunkul et al. (2004) were incorporated into the study. The set of written diabetes material consisted of ten booklets dealing with the following topics: (1) diabetes prevention, (2) what diabetes is, (3) diabetes and complications control, (4) diabetes food, (5) diabetes medications, (6) exercise, (7) diabetes self-monitoring, (8) foot care, (9) sick day management, and (10) questions about diabetes. The content of the five videotapes were (1) what diabetes is, (2) living with diabetes with a good quality of life, (3) diabetes food, (4) exercise, and (5) foot care.

The manual was reviewed by three experts for content validity. The first expert was a specialist diabetes nurse. The second expert was a nursing instructor who had had experience taking care of patients with chronic diseases. The third expert was a physician who was an expert in diabetes care. The manual was revised according to the three experts' recommendations (see the Manual, Appendix A).

Instruments for Data Collection

Four questionnaire instruments and one blood examination were used to measure the outcome of this study. They were the Personal Information Sheet, the Diabetes Knowledge Scales, the Summary of Diabetes Self-Care Activities Measure (SDSCA), the Diabetes Quality of Life Measure (DQOL), and Glycosylated Haemoglobin A1c (GHb).

The Personal Information Sheet

The Personal Information Sheet is used to obtain the demographic characteristic of the subjects such as age, sex, marital status, education, religious, duration of disease (see Appendix B).

The Diabetes Knowledge Scales

The Diabetes Knowledge scales is a cognitive measure of recognition and understanding about diabetes mellitus. The original version developed by Tantayotai (1982) consisted of five components, forty items: component 1, general knowledge about diabetes mellitus; component 2, diabetes food; component 3, drugs; component 4, exercise; and component 5, hygiene and foot care. A patient with type 1 diabetes answers 39 items, and a patient with type 2 answers 33 items.

In this study, the researcher revised the multiple choice answers in component 1, item 2, which asks about the normal level of fasting plasma glucose.

The new answer was updated to take into account more recent knowledge on diabetes. The researcher added one question in component 1 and one question in component 3 to cover more information on diabetes care. Those questions were “What is patient with diabetes self-monitoring?” and “What should you do when you forget to take medicine?”.

Finally, there were five components with 35 items for patients with type 2 diabetes who took pills. These components were (1) general knowledge about diabetes mellitus, 1-10 items; (2) diabetes food, 11-18 items; (3) drugs, 19-24 items; (4) exercise, 25-29 items; and (5) hygiene and foot care, 30-35 items (see Appendix C). Each item is assigned a score of one for a correct answer and zero for an incorrect answer. The total score is calculated by adding the scores for each of the 35 items. Higher scores indicated better diabetes knowledge.

Psychometric Properties of the Diabetes Knowledge Scales

The original version of Tantayotai (1982), content validity was evaluated by one physician and three nurse instructors who specialized in diabetes care. The reliability measured by the Kuder-Richardson (KR-20) formula, was .76 and .80 for type 1 and type 2 diabetes mellitus, respectively.

The K-R 20 reliability coefficient was .81 for thirty subjects who met the same criteria as patients in the self-management group. Discrimination between patients who got high scores and patients who got low scores was assessed for significant difference. The results showed that this instrument has a good discrimination index. In this study, K-R 20 for diabetes knowledge was .82, .84, and .82 at baseline, 3, and 6 months, respectively.

The Summary of Diabetes Self-Care Activities Measure (SDSCA)

The SDSCA is a brief self-report questionnaire about diabetes self-management. The original version of the SDSCA developed by Toobert & Glasgow (2001) assessed 5 components of the diabetes regimen: general diet, specific diet, exercise, medication-taking, and blood sugar testing. Toobert, Hampson, & Glasgow (2000) revised this instrument by including items on foot care and smoking. In this study the questions on smoking were removed to personal data because the previous studies had found it very rare that Thai patients with type 2 diabetes smoked.

The SDSCA was translated into the Thai language and back-translated by a bilingual expert at the Language Center, Burapha University. The original version and translated version were evaluated by a native English-speaker. The translated version was modified following the expert's recommendations. The original version and Thai version were evaluated for equivalence, connotation, denotation and suitability of the language for Thai context by two bilingual doctoral nurses and one linguist expert. Two components, general and specific diet, were revised for ease of understanding in the context of Thai culture. In addition, the component on blood sugar testing was modified to a self-monitoring component because this study did not deal with glucose monitoring at home. The first original questions on blood sugar testing component was "On how many of the last seven days did you test our blood sugar?". It was changed to "On how many of the last seven days did you evaluate yourself concerning diet, your symptoms of hyperglycemia or hypoglycemia, and your hygiene care?". The second original question was "On how many of the last seven days did you test your blood sugar the number of times recommended by your health care provider?". It was changed to "On how many of the last seven days did you evaluate yourself concerning diet, your symptoms of hyperglycemia or hypoglycemia, and your hygiene care compared with the number of times recommended by your health care provider?".

Finally, the SDSCA included 5 components: diet, 1-7 items; exercise, 8-9 items; self-monitoring, 10-12 items; foot care, 13-17 items; and medication-taking, 18-19 items. The last Thai version was revised by three experts, two nurses and one physician, in diabetes care. Then it was revised according to the experts' suggestions (see Appendix D).

Scores were calculated by the total number of days in each item, reversing item 2 to 4 and 7 ($0 = 7, 1 = 6, 2 = 5, 3 = 4, 4 = 3, 5 = 2, 6 = 1, 7 = 0$). The score assessed each component separately and combined scores across components. The total score was 133 points. A higher score indicated greater diabetes self-care activities.

Psychometric Properties of the SDSCA

The validity of SDSCA was assessed by a diverse group of experts. The panel of experts rated the importance of these items using a consensus-seeking

Delphi procedure (Toobert & Glasgow, 2001). There is evidence supporting the correlations of the SDSCA with other criterion measures such as self-monitoring, and behavior inventories. This means that the SDSCA has a high validity. In addition the validity of diet and exercise components were compared with other methods of self-reporting such as food record or exercise record. The results showed the validity of the SDSCA measure (Tolbert & Glasgow, 2001, pp. 363 - 367).

Seven different studies involving a total of 1,988 people with diabetes have tested the validity and reliability of this instrument (Toobert & Glasgow, 2001). The average inter-item correlation score within components was high (mean (r) = .47), with the exception of specific diet. Test-retest correlations were moderated across the studies; it measured between pre- and post intervention; therefore, behavior changes at post test could have been effected by the intervention.

In this study, the instrument was tested for reliability with thirty Thai subjects who met the same criteria as subjects in the self-management group. Inter-item correlations were used to assess relationships among items because the various SDSCA components had different numbers of items and some components had a small number of items. The average inter-item correlation scores within components was high (mean (r) = .43, SD = 0.21). The two weeks test – retest reliability of SDSCA was .89.

The Diabetes Quality of Life Measure (DQOL)

The DQOL was used in the DCCT to evaluate the relative burden of intensive therapy as compared to conventional therapy. The scale covers a range of issues directly relevant to satisfaction with life and diabetes treatment, treatment impact and the impact of diabetes on social life. DQOL includes two components: (1) treatment satisfaction, 15 items; and (2) treatment impact, 20 items. The scale is a 5-point Likert scale. Satisfaction is rated from 5 (very satisfied) to 1 (very dissatisfied). Impact scales are rated from 5 (no impact) to 1 (always affected) reversing item 8 and 16. Therefore, a positive quality of life is equivalent to a higher score. The raw scale score is translated into a 100 point scale where 0 represents the lowest possible quality of life, and 100 represents the highest possible quality of life. The patient's raw score minus the lowest possible score on each scale is divided by the possible score range and multiplied by 100. The formula can be written as follows (Jacobson & DCCT,

2001):

$$\text{Transformed scale} = \frac{[(\text{Raw score} - \text{Lowest possible score})]}{\text{Raw score range}} \times 100$$

Wording of one question on treatment impact component was changed. Item 3 was changed from “low blood sugar” to “high blood sugar” because patients with type 2 diabetes mellitus usually have hyperglycemic symptoms rather than hypoglycemic symptoms. The question “How often do you have low blood sugar?” was changed to “How often do you have high blood sugar?”.

Additionally, one question asks about side effects of insulin therapy but the subjects in this study were not using insulin therapy; therefore, the researcher changed the question “How often do you hide from others the fact that you are having an insulin reaction?” to “How often do you hide from others the fact that you have a high blood sugar level?”.

Psychometric Properties of DQOL

Jacobson & DCCT (2001) examined the construct validity of DQOL by investigating the relationship between DQOL and Medical Outcome Survey (SF-36). A moderate relationship of satisfaction and impact items were found ($r = .32 - .42$) between these two instruments. In addition, the strongest relationship was found with the functional health status scales of the Medical Outcome Survey (Jacobson & DCCT, 2001). DQOL was also related to other three measures, Symptom Checklist 90-R, The Bradburn Affect Balance Scale, and the Psychosocial Adjustment to Illness Scale. These relationships addressed content relevant to quality of life in patients with diabetes.

Cronbach’s alpha coefficient from the initial study by the DCCT research group conducted in type 1 diabetes mellitus was .88 and .77 for treatment satisfaction and treatment impact components, respectively. The total Cronbach’s alpha coefficient was .92 (DCCT, 1993). The levels of internal consistency of the scales and of the total score were similar to the study by Jacobson et al. (2001). Cronbach’s alpha coefficient in type 1 diabetes mellitus in treatment satisfaction and treatment impact components were .83, and .87 and in a type 2 populations were .87, and .78, respectively. Total Cronbach’s alpha coefficient was .83 and .70 for type 1 and type 2 populations, respectively.

The DQOL was translated to Thai language. The process of translation was the same as that used for the SDSCA measure (see Appendix E). Internal consistency of the two components and total score were investigated in thirty patients with type 2 diabetes mellitus. Cronbach's alpha coefficient is .77 and .86 in treatment satisfaction and treatment impact components, respectively, and the total Cronbach's alpha is .87. In this study, Cronbach's alpha coefficient was .78, .82, and .78 of treatment satisfaction and .83, .77, and .71 of treatment impact at baseline, 3, and 6 months, respectively. Total Cronbach's alpha coefficient was .85, .84, and .83 at baseline, 3, and 6 months, respectively.

Glycosylated Haemoglobin A1c (GHb)

GHb levels were assessed by technicians at Chonburi R.I.A. where there is a quality control of the standardization of blood testing by an external quality control organization. Blood was collected by the technician of the setting hospital and Chonburi R.I.A. picked up blood samples on the date of collection and reported to the researcher.

The Turbidimetric inhibition immunoassay method was used in this study. GHb was used to assess blood glucose level during the previous 6 to 8 weeks interval (Cooper et al., 1991). The test had a specificity of GHb and had sensitivity 0.2%. The normal GHb set by the American Diabetes Association is less than 6% and the goal of a good GHb level is less than 7% (ADA, 2004).

Protection of Right of Human Subjects

The study proposal was submitted to the Human Subjects Committee, Mahidol University, for approval prior to data collection (see Appendix F). The permission letter for data collection from the Faculty of Graduate Study was sent to the chairperson of the community hospital which collected the data. The potential subjects who met the study criteria were informed of the purpose, procedure, benefits, and risks of the study. The benefits of participation were that the subjects would learn about diabetes self-management which they could use to take care of themselves. The subjects were informed that the process of data collection would take around one hour and would involve answering three questionnaires and drawing blood for examination at three time points. They could refuse to answer any specific question which made

them feel uncomfortable. There were no known major risks to subjects in this study, only the discomfort of having blood drawn at the baseline and throughout the study follow-up period. The subjects were assured that they could terminate their participation at any time. They were also assured that their willingness to participate in the study had no implications for the health care services that they would receive. Their decision to discontinue participating in the study would not affect their relationship with health care providers or their access to any services available at the hospital (see Appendix G).

All extra costs that the subjects incurred in the study, such as extra blood examinations, transportation, and time lost from work were compensated.

Confidentiality of data collection was ensured both during data collection and after collection.

Pilot Study

There were two major objectives for the pilot study. Firstly, the interventionist and research assistant were trained to implement the self-management program in order to maximize experimental variance. Secondly, the Manual of the Type 2 Diabetes Self-Management Program was tested for its instruction.

Training Researcher

A researcher with experience of taking care of diabetes patients conducted the intervention. The researcher was attended a diabetes self-management programs as a visiting scholar at the Yale School of Nursing and had experienced in conducting participatory action research in promoting self-care for patients with type 2 diabetes.

The research assistants were trained to collect the questionnaires and help the researcher facilitate the self-management program.

After approval was given by the Human Subjects Committee, Mahidol University, and consent was obtained from the chairperson of a community hospital which was not a setting of this study, the pilot study on the self-management program was conducted. Eight to ten subjects who met the criteria of the study were recruited to participate in the self-management program following the Manual of the type 2 Diabetes Self-Management Program. The manual was tested for clarity and

comprehensibility in its instructions for the program. Also, the researcher and research assistant were trained to gain more experience relevant to the study.

Procedures

This section explained the procedures of random assignment the subjects to groups and procedures in the intervention and control groups.

Random Assignment

The researcher or a research assistant approached the patients who met the study criteria at the diabetes clinic. Potential subjects were informed of the study purpose and procedures and asked to sign an informed consent form. After consenting to the program, they were randomly assigned to either a self-management or a control group using a sealed envelope technique. In this technique notes assigning random subjects to either the self-management or control groups are placed in a sealed enveloped. The subjects are asked to take an envelope and are then assigned to the group that their enveloped dictates. Then, the subjects in both the self-management and control groups were given an appointment at the clinic to complete the questionnaires and have a blood examination.

Procedures in the Intervention Group

1. After the subjects were assigned to the self-management group and complete data collection was done at baseline, the subjects were assigned to four smaller groups of nine to thirteen subjects so they could participate in the self-management program at different times. Session 1 was held on Saturday and Sunday 17-18 of July and 11-12 of September, 2004 from 9.00 to 11.00 a.m. Sessions 2 to 5 were conducted in the following week, two hrs per session. Multiple intervention groups were run and at times conducted simultaneously. The self-management group was given time in a private room in the hospital for learning diabetes self-management. A set of written diabetes material, a notebook and a pencil were distributed to each subject at the beginnings of the first session. The objectives of each session, materials, strategies, questions for guiding a discussion, content, handout assignments, activities, skills training, and time for each activities were explained in the Manual of the Type 2 Diabetes Self-Management Program (see the Manual).

When the next session began, the researcher reviewed the content of the last session for ten minutes and asked the subjects about their diabetes care problems at home or she answered questions that the participants raised. Ten minutes break for refreshment was taken after the program ran for one hour in every session. Also, lunch was arranged for the subjects so that they could learn how to eat appropriate food. The self-management program in each session was shown as follow.

Session 1: What is diabetes? The pathology of diabetes mellitus - one hour

1. The researcher and research assistant gave name tags to the subjects. The researcher, research assistant, and the subjects introduced themselves.
2. The researcher explained the objectives of the program, schedule of each session, time and place to participate in the group, and telephone numbers for contact.
3. A set of written diabetes material, a notebook, a pencil, and handouts and exercise assignments for session one were distributed to the subjects.
4. Knowledge about diabetes, which is what diabetes is, the pathology, causes, symptoms, diabetes complications, and the goals of diabetes care were explained and discussed. In addition, exercise assignments which were appropriate to the content of the session were done.
5. After discussion and exercise assignments were finished, the subjects watched a videotape entitled “What diabetes is”.

Cognitive restructuring and goal setting skills - one hour

1. The relationships among thinking, feeling, and behaviour were explained and discussed.
2. Exercise assignments about changing negative thinking to positive thinking were done.
3. The subjects identified their social roles following an exercise assignment and were encouraged to arrange time for their self-management.
4. The diabetes care goals assignment was done.

Session 2: Dietary control - one hour

1. Appropriate weight and energy for every subject were explained and discussed. The subjects calculated their ideal body weight and energy consumption.
2. Dietary control for patients with diabetes and food lists exchange were taught and discussed using the diabetes food model.
3. Nutrition fact labelling was taught and practiced.
4. The problems of dietary control were discussed in order to find the solution.
5. The subjects watched a videotape entitled “Diabetes Food”.

Communication skills - one hour

1. Exercise assignments about communication problems were done. The subjects identified the problems of communication in everyday life and discussed these problems together.
2. Good communication skills and listening skills were discussed and practiced following the exercise assignments.

Session 3: Diabetes medication - one hour

1. Diabetes drug actions and side effects were explained. Problems about medication-taking and how to solve these problems were discussed.
2. The subjects did exercise assignments to identify their problems about medication and to have practice in talking about their problems within the group.
3. The subjects watched a videotape entitled “Living with Diabetes with a Good Quality of Life”.

Problem solving skills - one hour

1. The problem solving process was explained and discussed.
2. The subjects identified their problems following an exercise assignment and they discussed how to solve those problems within the group.

Session 4: Foot care and self-monitoring - one hour

1. The problems about foot care and how to take care of feet were explained and discussed.
2. The symptoms of hyperglycemia, hypoglycemia, and how to correct those symptoms were discussed.
3. Self-monitoring of food intake, symptoms of hyperglycemia or hypoglycemia, and checking their body's skin were taught and the subjects were encouraged to monitor themselves everyday.
4. The subjects watched a videotape entitled "Foot Care".

Foot care and self-monitoring skills - one hour

1. The researcher examined each subject's feet and advised them how to take care of their feet such as by cutting nails, and wearing appropriate shoes or socks.
2. The researcher demonstrated how to clean feet, cut nails, inspect the feet, dress ulcers and exercise the feet. Then, the subjects practiced foot care and foot exercise together.
3. An exercise assignment about self-monitoring was done and then discussed.

Session 5: Exercise and how to deal with relapse - one hour

1. The benefits of exercise, how to exercise, and the problems of exercise were discussed.
2. The energy expenditures of a variety of physical activities such as walking, gardening, and house work were explained and the subjects were encouraged to increase their physical activities.
3. An assignment about exercise planning of each subject was done.
4. An assignment about how to prevent relapse from self-management was done and discussed. The subjects were encouraged to remind themselves to get back on the track of self-management as soon as possible.
5. The subjects watched a videotape entitled "exercise".

Exercise Training – one hour

The research assistant demonstrated how to exercise to the subjects. Then, the subjects practiced together.

2. After the subjects had completed the five sessions of the self-management program, a follow-up by telephone call was held at two points, 3 and 5 months. The telephone call consisted of a discussion about the subject's diabetes self-management and the problems of self-management practices. The researcher gave support and reinforcement to the participants to maintain their self-management.

3. Appointments were made with the subjects in the self-management group to complete three questionnaires and to have a blood for GHb on Saturday or Sunday at 3 and 6 months.

4. The cost of the GHb test was covered. The subjects in the self-management group received compensation for travelling expenses to intervention visits and time lost from work, 150 Baht, per session. Snacks and water were available for the self-management group during a break.

Procedures in the Control Group

1. The subjects who were assigned to the control group received a set of written materials on the date of data collection at baseline.

2. The physician made appointments with the subjects between one month and three months after data collection at baseline. The time of the appointments depended on health status of the subjects. On the day of the physician's visit, the subjects attended diabetes education at a diabetes clinic between 9 and 10 a.m. and watched five videotapes about diabetes care (one or two videotapes per visit), conducted by the diabetes health care team of the hospital.

3. The subjects in the control group completed questionnaires and blood examinations at the beginning of the program, the third, and the sixth month. Contact was kept with the control group by telephone calls at three points (1, 3 and 5 months) to remind them of dates of appointments and to report the laboratory results.

4. The subjects in the control group were given appointments to visit the diabetes clinic on different dates to the intervention group to prevent subject contamination.

5. The cost of GHb was compensated. Traveling expenses (50-100 baht) were paid for some subjects who came for data collection on a different date than their appointment with the physician.

Data Management

Data from three questionnaires and from laboratory result were entered into SPSS version 10.5 worksheet. The assigned study number for each subject was used for data entry to ensure the anonymity of subjects. Data was double checked to identify errors. Data cleaning strategies such as frequency, minimum and maximum values were used to identify coding error or entry error. Statistical analysis of the data was performed using SPSS version 10.5.

Data Analysis

Descriptive statistics were used to describe the demographic characteristics of the subjects and dependent variables.

Independent t test or Mann-Whitney U test was used to compare the demographic characteristics of the subjects and dependent variables between the self-management and control groups.

A repeated measures analysis of variance was used to test the hypotheses. If the overall F was shown significant difference, post-hoc analysis was used to find differences between pairs of scores. In addition, repeated measures ANCOVA was used to test the hypotheses regarding glycosylated haemoglobin A1c because nonequivalent of this variable between the self-management and control groups was found at baseline.

CHAPTER IV

RESULTS

This chapter presents the results of this study. The first section describes the characteristics of the sample. Comparison of characteristics of the self-management and control groups are presented. The second section presents the assumption testing of a repeated measures analysis of variance (repeated measures ANOVA) and a repeated measures analysis of covariance (repeated measures ANCOVA). The third section proposes findings congruent with the hypotheses. The last section presented the effect size of this study.

Characteristics of the Sample

One hundred and twelve type 2 diabetes mellitus patients who met the criteria were approached to participate in the study, and 90 subjects agreed to join the study. Only 22 potential subjects (19.64%) refused participation. Mann-Whitney U test was calculated for comparing the characteristics between the subjects who enrolled and did not enroll in the study. There was no significant difference in age, sex, marital status, religion, and educational level between those who agreed to participate and those who refused (see Appendix H).

Of the subjects, 45 were in the self-management group and 45 were in the control group. Nine subjects (10%) dropped from the study: five subjects (11.11%) from the self-management group, and four subjects (8.88%) from the control group. The reasons for withdrawal were moving to another province, busy with their work or their life, and working on a ship. Significant differences were not found on demographic data and all dependent variables between the subjects who maintained participation and subjects who withdrew (see Appendix H and I). Finally, 81 subjects, 40 in the self-management group and 41 in the control group were further analyzed.

Comparison of the means of the characteristics in the self-management and control groups were done using independent *t* test on a ratio scale of age, duration of illness and family member variables. No significant difference was found in the means

of these three variables from the self-management and the control group ($p > .05$) (see Table 4.1). For nominal and ordinal scales of characteristic variables, Mann-Whitney U test was performed. The characteristics of the self-management and control groups were not significantly different in gender, marital status, education, religion, career, income, payment, smoking, or drinking ($p > .05$)(see Table 4.1).

Of the 81 subjects, approximately 74% of them were female and most were married. The major religion reported was Buddhism (97.5%). The subjects' age ranged from 27-60 years ($M = 49.65$, $SD = 6.41$). The average duration of diabetes mellitus was 3.83 years ($SD = 2.83$). Most of the subjects (72.8%) graduated from primary school. Fifty three percent of the subjects had an income less than 5000 Baht per month. The mean number of family members was four persons per family. Most subjects did not smoke and drink. Approximately eighty three percent of the subjects had health insurance. The highest percentage of health insurance was paid by the Universal Health Care Coverage Scheme. Only 17.3% of the subjects self paid for health care cost. Approximately 74% had other diseases beside type 2 diabetes mellitus. The detail characteristics of the subjects are shown in Table 4.1

Table 4.1 Demographic Characteristics of the Self-Management and Control Groups

Item	Total		Self-management		Control		Mann-Whitney U	
	N	% (81)	n	% (40)	n	% (41)	Z	$p > .05$
Gender							-.691	.490
Female	60	(74.1)	31	(77.5)	29	(70.7)		
Male	21	(25.9)	9	(22.5)	12	(29.3)		
Marital Status							-1.109	.267
Single	5	(6.2)	2	(5.0)	3	(7.3)		
Marry	56	(69.1)	26	(65.0)	30	(73.2)		
Widow/Divorce/ Separate	20	(24.7)	12	(30.0)	8	(19.5)		

Table 4.1 Demographic Characteristics of the Self-Management and Control Groups
(Continued)

Item	Total		Self-management Group		Control Group		Mann-Whitney U	
	N	% (81)	n	% (40)	n	% (41)	Z	p > .05
Education							-.370	.712
No study	2	(2.5)	-		2	(4.9)		
Primary school	59	(72.8)	30	(75)	29	(70.7)		
Secondary school	15	(18.5)	8	(20)	7	(17.1)		
Diploma	3	(3.7)	1	(2.5)	2	(4.9)		
Bachelor	2	(2.5)	1	(2.5)	1	(2.4)		
Religion							-.035	.972
Buddhist	79	(97.5)	39	(97.5)	40	(97.6)		
Christian	1	(1.2)	-		1	(2.4)		
Muslim	1	(1.2)	1	(2.5)	-			
Career							-.447	.655
Laborers	31	(38.3)	16	(40)	15	(36.6)		
Trades persons	23	(28.4)	9	(22.5)	14	(34.1)		
Agriculture	1	(1.2)	-		1	(2.4)		
House worker	21	(25.9)	11	(27.5)	10	(24.4)		
Other	5	(6.2)	4	(10)	1	(2.4)		
Income							-1.158	.247
≤ 5000	43	(53.1)	18	(45)	25	(61)		
5001 – 10,000	25	(30.9)	16	(40)	9	(22.0)		
10,001 – 20,000	7	(8.6)	2	(5)	5	(12.2)		
20,000 – 30, 000	5	(6.2)	3	(7.5)	2	(4.9)		
≥ 30,000	1	(1.2)	1	(2.5)	-			

Table 4.1 Demographic Characteristics of the Self-Management and Control Groups
(Continued)

Item	Total N % (81)	Self-management Group n % (40)		Control Group n % (41)		Mann-Whitney U Z p > .05	
Payment						-.166	.868
Government services	12 (14.8)	8 (20)		4 (9.8)			
Self paid	14 (17.3)	4 (10)		10 (24.4)			
Universal Health Care Coverage Scheme	52 (64.2)	26 (65)		26 (63.4)			
Social security	3 (3.7)	2 (5)		1 (2.4)			
Smoking						-.427	.669
No	74 (91.4)	36 (90)		38 (92.7)			
Smoke	7 (8.6)	4 (10)		3 (7.3)			
Drinking						-.279	.781
No	70 (86.4)	35 (87.5)		35 (85.4)			
drink	11 (13.6)	5 (12.5)		6 (14.6)			
Comorbidity Disease	60 (74.1)	34 (85.0)		26 (63.4)			
Hypertension	25 (30.9)	13 (46.4)		12 (46.2)			
Hyperlipidemia	14 (17.3)	8 (23.1)		6 (23.1)			
Hypertension & hyperlipidemia	21 (25.9)	13 (46.1)		8 (30.8)			

Table 4.1 Demographic Characteristics of the Self-Management and Control Groups
(Continued)

Item	Total	Self-management		Control	Independent <i>t</i> test	
		Group		Group	<i>t</i>	<i>p</i>
	N % (81)	n % (40)	n % (41)			
Age					.339	.736
Mean (year)	49.65	49.90	49.41			
SD	6.41	6.65	6.25			
Max (year)	60.00	60.00	59.00			
Min (year)	27.00	27.00	34.00			
Duration of Illness					-.039	.969
Mean (year)	3.83	3.82	3.84			
SD	2.83	2.95	2.75			
Max (year)	10.00	10.00	10.00			
Min (month)	1.00	1.00	2.00			
Family Member					1.368	.176
Mean (person)	4.51	4.83	4.12			
SD	2.07	2.40	1.68			
Max (person)	13.00	13.00	8.00			
Min (person)	1.00	1.00	1.00			

* Significance at $p < .05$ **Preliminary Analysis**

The mean scores of dependent variables in the self-management and control groups were compared with *t* test. The results show that beside GHb levels the mean scores of knowledge, diabetes self-care activities (DSCA), and diabetes quality of life (DQOL) had no significant difference at baseline (see Table 4.2). Therefore, repeated measures ANOVA were used to test the hypotheses of those variables. In spite of the significant difference in mean GHb levels at baseline, the levels may influence the outcomes measured at 3 and 6 months of comparisons. Thus, the repeated measures

analysis of covariance (repeated measures ANCOVA) was performed to reduce the error variance in the outcome measure. The power of the test was, therefore increased (Munro, 2001, p. 187). The GHb levels at baseline were controlled for covariate testing. Descriptive statistics of all dependent variables were measured 3 times (baseline, 3 months, and 6 months) and are presented in Appendix J.

Table 4.2 Comparison of Dependent Variables' Mean Score with Independent *t* test at Baseline

Dependent Variables	n	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Knowledge					
Self-management group	40	21.50	5.32	.319	.751
Control group	41	21.10	6.01		
DSCA					
Self-management group	40	88.33	19.09	-.060	.953
Control group	41	88.56	16.54		
DQOL					
Self-management group	40	71.27	10.48	.667	.507
Control group	41	69.79	9.44		
GHb					
Self-management group	40	8.93	2.38	2.217	.029*
Control group	41	7.90	1.77		

* Significance at $p < .05$

Assumption Testing of Repeated Measures ANOVA

The assumptions for the repeated measures ANOVA were tested before further analysis. The following assumptions were examined to ensure the validity of statistical calculations.

1. Normality distribution of dependent variables was tested. All but two dependent variables, knowledge and DQOL, were accepted as a normal distribution. The skewness and kurtosis values of each dependent variable were close

to zero except the DSCA and GHb. Skewness and Kurtosis value of DSCA in the control group was -1.099 and 2.514, respectively. It showed a small negative skew and a large positive kurtosis. Fisher's measure of skewness and kurtosis was calculated by dividing the skewness or kurtosis value by the standard error for skewness or kurtosis, $(-1.099/.396 = -2.978, 2.514/.724 = 3.472)$, respectively (Duffy & Jacobsen, 2001, p. 44). Values above +1.96 or below -1.96 are significant at the .05 level. It indicates that this distribution is significantly skewed and kurtosis. One outlier of DSCA score was removed from the data of the control group. After the outlier removed, skewness (-0.40) and kurtosis (0.415) values were accepted. Fisher's measure of skewness $(-0.40/.374)$ was -1.069 and Fisher's measure of kurtosis $(0.415/0.733)$ was 0.566. The distribution of DSCA is now closely normal (see Appendix K).

GHb variable in the self-management group had a positive skewness (1.519) and kurtosis (3.380); therefore, transformation of GHb variable by $\ln(x)$ was performed. Skewness (0.704) and kurtosis (0.594) values after transformation were accepted. In addition, the Shapiro-Wilks statistic of all dependent variables showed no significance, indicating that the normality is assumed. No dependent variables violated an assumption of normal distribution (see Appendix K).

2. Homogeneity of variance is required. Box's test of equality of covariance matrices presented the p values of .229, .508, .429 of DSCA, DQOL, and GHb, respectively, indicated no significant difference. They indicated equal levels across the between-subject factor of variance-covariance matrices. For the knowledge variable, Box's test showed significance at p value .001 but did not show significance in Mauchly's test of sphericity and Levene's test of equality of error variances. This means that homogeneity of variance did not violate the assumption. All dependent variables were accepted as having homogeneity of variance.

3. Compound symmetry was tested. Knowledge ($p = .690$), DQOL ($p = .055$) and transformed GHb ($p = .99$), except DSCA ($p = .022$), variables had no significance on Mauchly's test of sphericity. The assumption of compound symmetry had been met; therefore, the univariate results were reported. Because Mauchly's test of sphericity of DSCA was significant, it violated the assumption of compound symmetry; therefore univariate results with an epsilon correction were reported. However, the "Test of Within-Subject Effects" table of this variable showed the

overall significance of the F test on the corrected univariate results whether or not epsilon correction was used.

In spite of GHb levels between the self-management and control groups significantly difference at the beginning of the program, repeated measures ANCOVA were conducted. There are three additional assumptions for repeated measures ANCOVA that were met.

1. Covariate, GHb levels, is a continuous variable. This assumption was met.

2. The covariate and the dependent variable must show a linear relationship. GHb levels at baseline had a linear relationship with the dependent variables. The GHb levels at baseline had a correlation with GHb at 3 months .44 ($p < .01$) and 6 months 0.36 ($p < .01$) calculated by the Pearson product-moment correlation. A relationship higher than .30 is the most effective test (Munro, 2001, p. 189).

3. The test of interaction between an independent variable and covariate were conducted before carrying out the repeated measures ANCOVA. The results indicated that there was no interaction between the independent variable, GROUP, and the covariate, GHb ($p = .892$). Thus, the assumption was not violated.

Hypotheses Testing

The results answer the three hypotheses.

1. The subjects who are randomized to the self-management group have higher mean diabetes knowledge, self-care activities and quality of life, and lower mean GHb level than the subjects who are randomized to the control group.

2. There are significant differences in mean diabetes knowledge, self-care activities, quality of life and GHb level, across the three time periods in at least one pair.

3. There are significant differences in mean diabetes knowledge, self-care activities, quality of life and GHb level on interaction of Group and time.

Results

The mean score of knowledge in the self-management group was significantly higher than the control group. The mean was 25.19 for the self-management group and 22.16 for the control group, out of a total score of 35. There were significant differences in knowledge mean scores in at least one pair of the three time points. Pairwise comparisons show significant difference between baseline and 3 months ($p < .05$), and baseline and 6 months ($p < .05$). There was no significance difference in the mean knowledge score between 3 and 6 months ($p = .507$) (see Table 4.8). Interaction effect between group and time had significant difference ($p < .01$) (see Table 4.3). Independent t test showed significant difference between the self-management and control groups at 3 ($t = 3.70, p < .05$) and 6 months ($t = 4.11, p < .05$) (see Appendix L).

Table 4.3 Repeated Measures ANOVA of Knowledge

Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between subjects	5883.984	80			
Group	557.311	1	557.311	8.265	.005*
Within group (error)	5326.673	79	67.426		
Within subjects	2097.969	162			
Time	690.224	2	345.112	45.604	.000*
Group x time	212.067	2	106.034	14.012	.000*
Time x within group (error)	1195.678	158	7.568		
Total	7981.953	242			

* Significance at $p < .05$

The self-management group's knowledge mean score increased at 3 months and increased slightly at 6 months and was significantly higher than the control group. The control group increased slightly from baseline both at 3 and 6 months (see Figure 4.1).

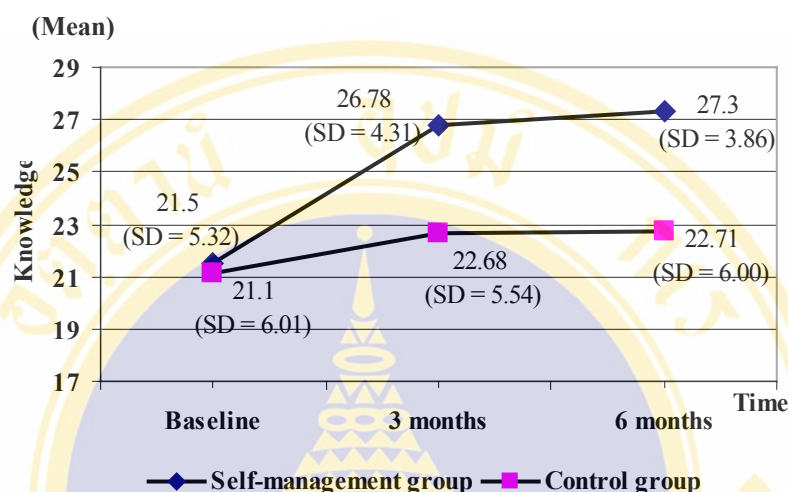


Figure 4.1 Comparison of the Mean Knowledge Scores over Time

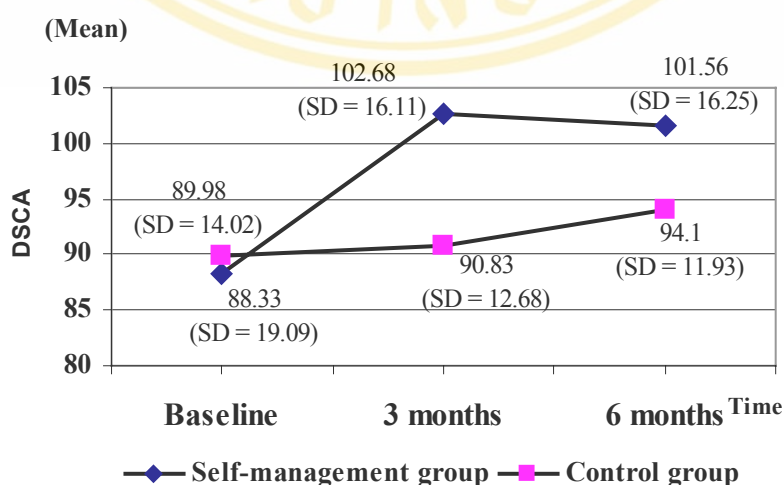
The mean score of diabetes self-care activities (DSCA) of the self-management group was higher than the control group and they differed significantly ($p < .05$). The mean was 97.53 for the self-management group and 91.63 for the control group. DSCA score had significant difference two pairs of three time points. Pairwise comparisons show significance between baseline and 3 months ($p < .05$), and baseline and 6 months ($p < .05$). There was no significant difference in the means of DSCA scores between 3 and 6 months ($p = .475$) (see Table 4.8). In addition, there was significant interaction between group and time in relation to DSCA score ($p < .05$) (see Table 4.4). The mean score of DSCA of the self-management group was significantly higher than the control group at 3 and 6 months, $t = 3.83$ ($p < .05$), $t = 2.57$ ($p < .05$), respectively (see Appendix L).

Table 4.4 Repeated Measures ANOVA of DSCA

Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between subjects	13707.054	79			
Group	694.235	1	694.235	4.161	.045*
Within group (error)	13012.819	78	166.831		
Within subjects	20545.333	160			
Time	3584.408	2	1792.204	18.561	.000*
Group x time	1897.708	2	948.854	9.827	.000*
Time x within group (error)	15063.217	156	96.559		
Total	34252.387	239			

* Significance at $p < .05$

The mean DSCA score of the self-management group increased more than the control group, to 102.68 and 101.56 at 3 and 6 months, out of a total score of 133, respectively. For 6 months, the mean DSCA score decreased slightly from the 3 month. DSCA mean score of the control group increased slightly overall (see Figure 4.2)

**Figure 4.2** Comparison of the Mean DSCA Score over Time

The mean score of diabetes quality of life (DQOL) ($M = 75.27$) of the self-management group was significantly higher than the control group ($M = 70.28$) ($p < .05$). At a different time point, DQOL levels had significant difference between baseline and 3 months ($p < .05$), and baseline and 6 months ($p < .05$) but they did not differ significantly between 3 and 6 months ($p = .552$) (see Table 4.8). Interaction between group and time had significant effect in DQOL levels ($p < .05$) (see Table 4.5). Significant difference of mean DQOL score was found between the self-management and control groups at 3 ($t = 4.16$, $p < .05$) and 6 months ($t = 2.57$, $p < .05$) (see Appendix L).

Table 4.5 Repeated Measures ANOVA of DQOL

Source of Variation	SS	df	MS	F	p
Between subjects	16833.371	80			
Group	1511.912	1	1511.912	7.796	.007*
Within group (error)	15321.459	79	193.943		
Within subjects	6280.554	162			
Time	620.400	2	310.200	9.535	.000*
Group x time	519.720	2	259.860	7.987	.000*
Time x within group (error)	5140.434	158	32.534		
Total	23113.925	242			

* Significance at $p < .05$

The subjects perceived the highest quality of life at 3 months, in the self-management group. For 6 months, the mean DQOL score decreased slightly from the 3 month score to 76.09 but it was still higher than the baseline. DQOL's mean scores of the control group were lower than the self-management group overall. The quality of life scores for the subjects in the control group increased very little at both 3 and 6 months (see Figure 4.3)

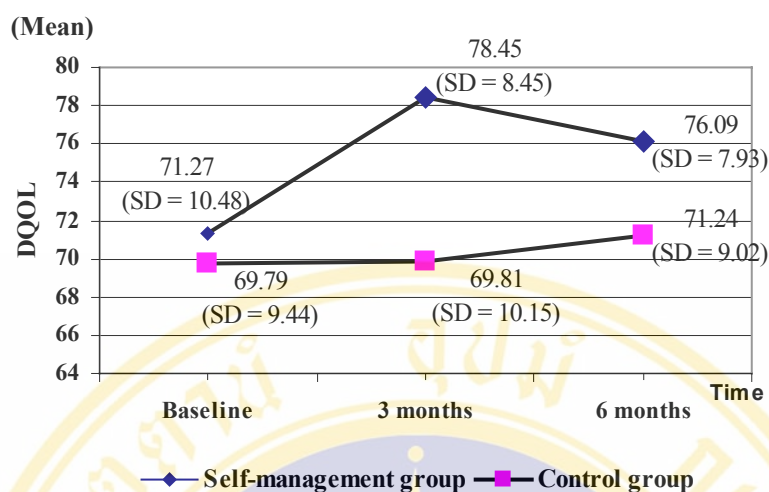


Figure 4.3 Comparison of the Mean DQOL Scores over Time

Regarding glycosylated Haemoglobin A1c (GHb) levels, the self-management group lowered their GHb levels overall. In the first 3 months, the self-management group reported a good change in GHb, unfortunately this was short lived and an increase occurred between 3 and 6 months. The control group had a consistent increase over the 6 months (see Figure 4.4).

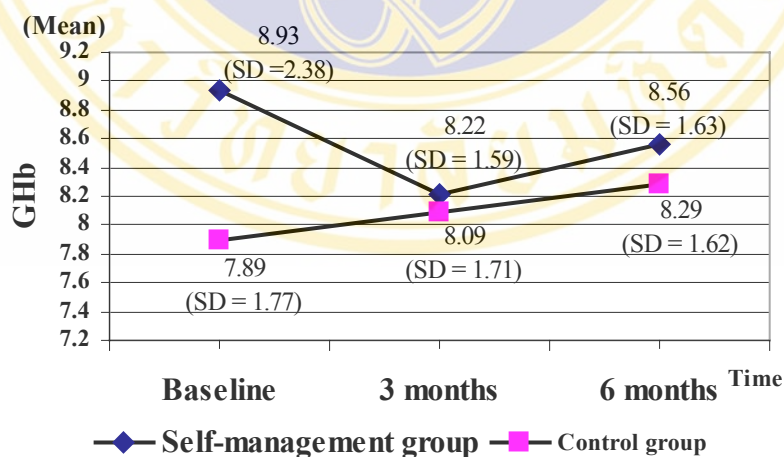


Figure 4.4 Comparison of the Mean GHb Levels over Time

After controlling for GHb levels at baseline, the mean levels of GHb at 3 months and 6 months of the self-management group were lower than the control group but they did not differ significantly ($p = .756$) (see Table 4.6 and Figure 4.5). The

mean was 8.22 for the self-management group and 8.34 for the control group. Also, significant difference was not found between the self-management and control groups at 3 and 6 months. In addition, interaction effect between group and time were not found to have significant difference ($p > .05$) (see Table 4.6).

Table 4.6 Repeated Measures ANCOVA of Transformed GHb

Source of Variation	SS	df	MS	F	p
Between subjects	1.926	79			
Group	.002	1	.002	.097	.756
Within group (error)	1.924	78	.024		
Within subjects	1.076	80			
Time	.018	1	.018	1.387	.242
Group x time	.004	1	.004	.362	.549
Time x within group (error)	1.054	78	.013		
Total	3.002	159			

* Significance at $p < .05$

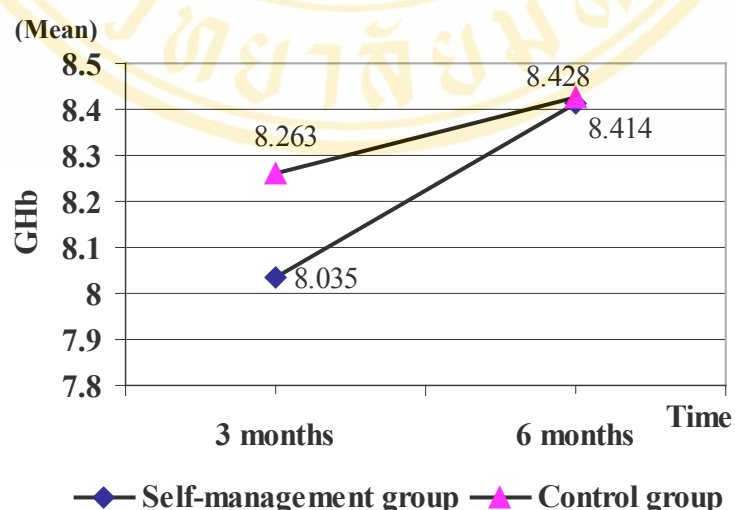


Figure 4.5 Comparison of the Mean GHb Levels over Time after Controlling for GHb at Baseline

GHb level change showed that 55% and 42.4% of the self-management group decreased GHb levels after 3 and 6 months, respectively. The number of subjects who had good changes of GHb level was higher in the self-management group than in the control group at 3 and 6 months. Decreases in the self-management group were significant, GHb levels dropped by more than 2 to 17.5% at 3 months and to 15% at 6 months. The mean GHb level decrease in the self-management group was 2.04 ($SD = 2.13$) at 3 months and 2.1 ($SD = 2.16$) at 6 months and in the control group was 1.32 ($SD = 1.1$) at 3 months and 1.85 ($SD = 1.47$) at 6 months. Moreover, the maximum decrease of GHb in the self-management was 8 at 3 months and 7.6 at 6 months while in the control group the decrease was 3.4 at 3 months and 5 at 6 months. In contrast, the number of subjects in the control group who had increased GHb levels at 3 and 6 months was higher than in the self-management group. On average, the mean GHb change in the self-management group was 0.71 ($SD = 2.28$) at 3 months and 0.37 ($SD = 2.17$) at 6 months. The control group had an average mean GHb change of -0.19 ($SD = 1.72$) at 3 months and -0.40 ($SD = 2.12$) at 6 months (see Table 4.7).

Table 4.7 The Change in GHb between Baseline and at 3 and 6 Months

GHb Level (%)	Self-management Group				Control Group			
	(n = 40)				(n = 41)			
	Baseline & 3 m		Baseline & 6 m		Baseline & 3 m		Baseline& 6 m	
	n	%	n	%	n	%	n	%
Decrease in GHb								
> 0 – 1	9	22.5	8	20.0	9	21.95	6	14.63
1.1 – 2	6	15.0	3	7.5	4	9.76	4	9.76
> 2	7	17.5	6	15.0	5	12.20	4	9.76
Total	22	55.0	17	42.4	18	43.90	14	34.15
Mean	2.04 (SD = 2.13)		2.1 (SD = 2.16)		1.32 (SD = 1.1)		1.85 (SD = 1.47)	
Max change	8		7.6		3.4		5	
Increase in GHb								
> 0 – 1	8	20.0	15	37.5	9	21.95	8	19.51
1.1 – 2	4	10.0	5	12.5	5	12.20	11	26.83
> 2	2	5.0	2	5.0	7	17.07	7	17.07
Total	14	35.0	22	55.0	21	51.22	26	63.41
Mean	1.18 (SD =1.11)		0.95 (SD =0.96)		1.51 (SD = 0.99)		1.62 (SD = 1.31)	
Max change	4.1		3.8		3.6		5.8	
No Change in GHb	4	10	1	2.5	2	4.88	1	2.44
Total Mean GHb Change (N = 81)								
	0.71 (SD = 2.28)		0.37 (SD = 2.17)		-0.19 (SD = 1.72)		-0.40 (SD = 2.12)	

Table 4.8 Comparison of the Dependent Variables Scores over Time with Pairwise Comparison Analysis

Time		Mean Difference	Standard Error	<i>p</i>
Knowledge				
Baseline	3 months	-3.43	.45	.000*
	6 months	-3.71	.44	.000*
3 months	6 months	-.28	.41	.507
DSCA				
Baseline	3 months	-7.92	1.74	.000*
	6 months	-8.86	1.58	.000*
3 months	6 months	-.94	1.31	.475
DQOL				
Baseline	3 months	-3.60	.91	.000*
	6 months	-3.13	.99	.002*
3 months	6 months	.46	.55	.552
GHb				
3 months	6 months	-.01	.04	.756

* Significance at $p < .05$

Five DSCA components: diet, exercise, self-monitoring, foot care, and medication-taking, were calculated using repeated measures ANOVA. All but two components had a normality distribution. Foot care and medication-taking had a negative skew and a large positive kurtosis (see Appendix K). The subjects received high scores in their foot care ($M = 27.2$ for the self-management group, $M = 29.05$ for the control group, out of a total score of 35) as well as for medication-taking ($M = 12.45$ for the self-management group, $M = 12$ for the control group, out of a total score of 14) at baseline (see Appendix J). These two variables violate the assumption of repeated measures ANOVA; therefore, further statistical analyses were not calculated.

The homogeneity of variance, and compound symmetry of the three DSCA components: diet, exercise, and self-monitoring, were tested. All assumptions of

repeated measures ANOVA for those DSCA components were met. In addition, comparisons of the mean scores of three DSCA components at baseline between the self-management and the control group were conducted using independent *t* test (see Appendix L). There were no significant differences in the mean of all variables between those two groups.

The mean diet score of the self-management group had no significant difference with the control group ($p = .352$). The self-management group ($M = 32.19$) had higher scores than the control group ($M = 31.03$), out of a total score of 49. There were significant differences in diet mean scores between the self-management and control groups at baseline and 3 months and baseline and 6 months. Significant differences were not found between 3 and 6 months (see Table 4.12). An Interaction effect between group and time were not shown ($p > .05$) (see Table 4.9).

Table 4.9 Repeated Measures ANOVA of DSCA on Diet Component

Source of variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between subjects	2476.025	80			
Group	27.204	1	27.204	.878	.352
Within group (error)	2448.821	79	30.998		
Within subjects	3293.382	162			
Time	179.184	2	89.592	4.584	.012*
Group x time	26.328	2	13.164	.674	.511
Time x within group (error)	3087.870	158	19.543		
Total	5769.407	242			

* Significance at $p < .05$

Overall, the diet mean score for the self-management group was higher than the control group. The highest mean score of diet component in the self-management group presented at 3 months. Consequently, the mean diet score decreased slightly at 6

months (see Figure 4.6). The mean diet score in the control group increased slightly at 3 and 6 months.

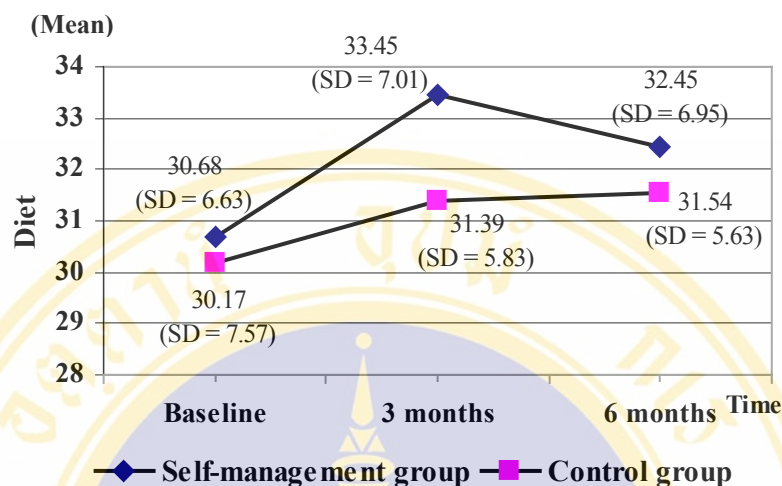


Figure 4.6 Comparison of the Mean Diet Scores over Time

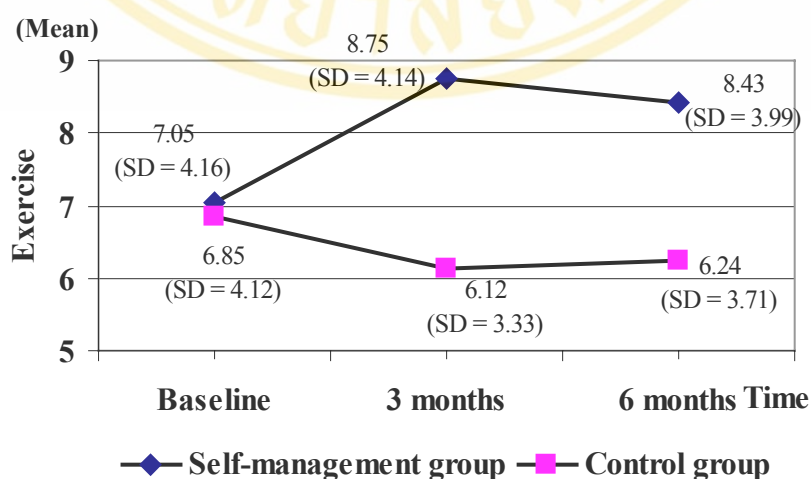
The self-management group had significantly higher DSCA of exercise mean score than the control group ($p < .05$). The mean was 8.08 for the self-management group and 6.41 for the control group, out of a total score of 14. The mean exercise scores had no significant difference over the three time points (see Table 4.10 and 4.12). In addition, interaction effect between group and time in relation to exercise component were found to be significant ($p < .05$) (see Table 4.10). Independent t test showed significant difference of mean exercise scores between the self-management and control groups at 3 ($t = 3.15$, $p < .05$) and 6 months ($t = 2.53$, $p < .05$) (see Appendix L).

Table 4.10 Repeated Measures ANOVA of DSCA on Exercise Component

Source of variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between subjects	909.920	80			
Group	56.365	1	56.365	5.217	.025*
Within group (error)	853.555	79	10.804		
Within subjects	1161.982	162			
Time	10.558	2	5.279	.770	.465
Group x time	67.842	2	33.921	4.946	.008*
Time x within group (error)	1083.582	158	6.858		
Total	2071.902	242			

* Significance at $p < .05$

The mean exercise score increased in the self-management group at 3 months while it decreased in the control group. A decrease slightly of mean exercise score occurred at 6 months in the self-management group. The mean exercise score increased very little at 6 months compared to 3 months in the control group (see Figure 4.7).

**Figure 4.7** Comparison of the Mean Exercise Scores over Time

From a statistical point of view, there was a significant difference in the mean self-monitoring scores between the self-management and control groups ($p < .05$). The mean self-monitoring score of the self-management group ($M = 14.85$) was higher than the control group ($M = 11.47$), out of a total score of 21. Self-monitoring mean scores differed significantly over three time points. Pairwise comparisons indicated significant difference in every paired time point (see Table 4.12). Furthermore, there was significant interaction between group and time in relation to self-monitoring component ($p < .05$) (see Table 4.11). The self-monitoring mean scores between the self-management and control groups differed significantly at 3 and 6 months ($t = 5.46$ ($p < .05$), $t = 4.53$ ($p < .05$), respectively).

Table 4.11 Repeated Measures ANOVA of DSCA on Self-Monitoring Component

Source of variation	SS	df	MS	F	p
Between subjects	1076.858	80			
Group	231.097	1	231.097	21.586	.000*
Within group (error)	845.761	79	10.706		
Within subjects	3620.321	162			
Time	783.983	2	391.992	24.217	.000*
Group x time	278.897	2	139.448	8.615	.000*
Time x within group (error)	2557.441	158	16.186		
Total	4697.179	242			

* Significance at $p < .05$

Overall, both the self-management and control groups increased the mean self-monitoring scores continuously. Self-monitoring mean score in the self-management group increased sharply to 16.55 out of a total score of 21 higher than the control group at 3 months. Then, it increased slightly at 6 months for both of these groups (see Figure 4.8).

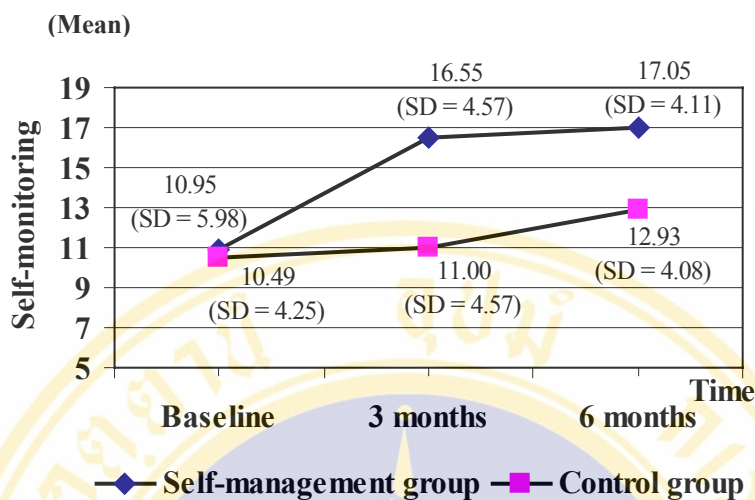


Figure 4.8 Comparison of the Mean Self-Monitoring Scores over Time

Table 4.12 Comparison of the DSCA Components over Time with Pairwise Comparisons Analysis

	Time	Mean Difference	Standard Error	<i>p</i>
Diet				
Baseline	3 months	-1.997	.748	.009*
	6 months	-1.570	.713	.031*
3 months	6 months	.427	.617	.491
Exercise				
Baseline	3 months	-.484	.434	.268
	6 months	.383	.390	.330
3 months	6 months	.102	.409	.805
Self-Monitoring				
Baseline	3 months	-3.056	.659	.000*
	6 months	-4.270	.714	.000*
3 months	6 months	-1.213	.505	.019*

* Significance at $p < .05$

Both the self-management and control groups had high scores of foot care at baseline 27.20 ($SD = 9.85$)/ 29.05 ($SD = 7.92$) out of a total score of 35, respectively. The mean foot care scores increased very little at 3 months to 31.43 ($SD = 5.40$) and 6 months to 31.08 ($SD = 6.35$) in the self-management group. The same increases as in the control group were 29.78 ($SD = 7.14$) at 3 months and 31.54 ($SD = 5.63$) at 6 months. This pattern was similar to the pattern of medication-taking shown by the mean scores in the self-management group. At baseline, the mean medication-taking scores were high 12.45 ($SD = 3.01$) and 12.00 ($SD = 2.84$) out of a total score 14 both in the self-management and control groups, respectively. The mean medication-taking score increased slightly to 12.50 ($SD = 2.95$) at 3 months and 12.58 ($SD = 2.27$) at 6 months in the self-management group. In contrast, the mean medication-taking score in the control group decreased slightly to 11.76 ($SD = 2.49$) at 3 months and 10.78 ($SD = 3.36$) at 6 months (See Appendix J). Independent t test showed that there were no significant differences of mean foot care scores between the self-management and control groups at the three time points. For the medication-taking component, the self-management group had a significance higher mean score than the control group at 6 months (see Appendix L).

After completing the program at 6 months, 17.5% of the subjects in the self-management group decreased medication intake. The subjects in the control group decreased medication intake by 7.3%. Approximately 42% and 44% of the subjects were consistently on the same medication in the self-management and the control groups, respectively. Forty percent of subjects in the self-management group increased medication and nearly 49% of them increased medication in the control group.

Effect Size

The effect size presents the ability to detect an association between a predictor and an outcome variable (Browner, Newman, & Cummings, 1998). The effect size is calculated by the following formula:

$$\text{Effect Size} = \frac{\text{Treatment group mean} - \text{Control group mean}}{\text{Control group standard deviation}}$$

There are three levels of value of effect size: small = 0.2, medium = 0.5, and large = 0.8 (Cohen, 1988). The effect size at 3 and 6 months respectively was medium for knowledge (0.74/0.77), large to medium for DSCA and DQOL (0.94/0.63, 0.85/0.54 respectively), and small for GHb (0.08/0.17). In addition, the effect size was medium to small for diet (0.35/0.16), medium for exercise (0.79/0.59), large for self-monitoring (1.21/1.01), small for foot care (0.23/0.08), and small to medium for medication- taking (0.30/0.54) components at 3 and 6 months, respectively.

Summary

Data analysis in this study used 40 subjects in the self-management group and 41 subjects in the control group. Hypotheses testing were done using repeated measures ANOVA for knowledge, DSCA, and DQOL variables and repeated measures ANCOVA for the GHb variable. All variables met every assumption underlying the statistical testing. The characteristics of the samples in the self-management and control groups were not significantly different at baseline. At 3 and 6 months, diabetes knowledge, DSCA, and DQOL variables were significantly difference. Besides GHb variable, all dependent variables supported the hypotheses. Although, GHb levels were not statistical significantly different between the self-management group and the control group, the mean GHb levels were lower at 3 and 6 months and the level of the decrease of GHb was higher than in the control group.

CHAPTER V

DISCUSSION

This chapter presents a discussion of the research findings. It examines characteristics of the subjects; explores the effects of the self-management program on diabetes knowledge, diabetes self-care activities (DSCA), diabetes quality of life (DQOL), and glycosylated haemoglobin A1c (GHb); discusses the theoretical aspects; and finally, considers methodological issues.

Characteristics of the Subjects

Approximately three quarters of the subjects in this study (74%) were female. Chuprapawan (2000) studied males and females aged between 35 and 44 years with primary school level education and found that type 2 diabetes mellitus was more often found in the females. In 2001, the National Statistical Office (2003) reported that the prevalence of endocrine system disease including diabetes mellitus was 5.6% in females and 3.5% in males. This is consistent with previous studies which also show a higher ratio of females with type 2 diabetes to males (Keeratiyutawong, 1994; Hanucharurnkul et al., 2001; Boonchaay, 2001; Phumleng, 2002; Muangkae, 2002). Type 2 diabetes mellitus was more prevalent in older age groups (ADA, 2004). Therefore, the mean age of subjects chosen for this study was late middle aged ($M = 49.5$, $SD = 6.41$).

Buddhism is the majority religion of Thai people. Thus, most subjects were Buddhist. Approximately 73% of the subjects only had four years elementary education. Education for all Thai people was limited in the past three decades especially in the country. Compulsory education for six years was only introduced 25 years ago by the Elementary Education Act of A.D. 1980. Thus, some persons who were born before 1980 had only four years education or were not receive a formal education (Boonchanaviwat, Saku, & Chaisutthi, 2005). The average age of the subjects in this study was about 50 years and some may have lacked support to finish 6 years of elementary school. Moreover, most subjects lived in the country and came

from low income families. This would have been a further obstacle to higher education. Two subjects in the study had not received formal education but they could read and write. Half of the subjects had low incomes because 26% only did housework and relied on money received from their children for living. Thirty eight percent of the subjects worked as laborers who were paid around 175 Baht per day.

In the wake of the economic crisis of 1997, the Health Care Reform Project in 2001 was launched to reduce health care costs and expenditure, and improve population health status more economically. The Universal Health Care Coverage Scheme was intended to cover the poor and disadvantaged population. Under privileged people pay only 30 Baht for health care services per visit and the government subsidizes other costs to health care services (Health Care Reform, 1997). Despite the poor economic situation of subjects, more than half of the subjects (64.2%) were under the Universal Health Care Coverage Scheme. Most subjects had good health habits about smoking or drinking, and approximately 91% did not smoke and 86% did not drink alcohol. Seventy-four percent of the subjects had hypertension or hyperlipidemia, or both, as comorbidity disease. Diabetes mellitus is a metabolic disorder disease including fat and carbohydrate metabolism impairment; therefore, a high percentage of comorbidity diseases commonly occurred (Mahler & Adler, 1999). Moreover, poor metabolic control causes high blood pressure and hyperlipidemia (Laakso & Lehto, 1997). These characteristics are confirmed by the reports of hospital centers in Thailand in 1995 stated that 50% of patients with diabetes had complications related to diabetes: 38.4% hypertension, 2.8% heart disease, and 3.7% stroke (Chuprapawan, 2000).

Comparison of the characteristics of the subjects who participated in the study and those who refused to participate did not show any significant differences. This ensured that the refusal of some subjects to participate study would not effect the dependent variables. To control extraneous variables as much as possible, randomization was conducted. Equally all possible distinguishing characteristics of the subjects between the self-management and control groups were compared. Statistical analysis showed similar demographic characteristics in the self-management and control groups because eligible subjects were assigned to the groups by randomly.

This method secures comparable group. Possible sources of extraneous variables can be controlled (Polit & Hungler, 1999).

Withdrew from the study might be especially high, if data collecting took a long time. A bias may be more than 20% of the subjects drop out of the study (Polit & Hungler, 1999, p.230). In this study, there was only 10% attrition rate and the subjects who withdrew from the study had reasons which were not to do with dissatisfaction with the program. In addition, participating the program required attendance at the hospital once a week for 5 weeks, with follow-ups at 3 and 6 months. Some subjects had unforeseen situations in their life during the program time period so they could not complete the whole program as they intended. In addition, the subjects who dropped out had similar demographics to the subjects who remained in the study. This means that the subjects who withdrew from the study did not have significant characteristics that would effect the dependent variables.

Effect of the Self-Management Program

The effect of the self-management program on the dependent variables; diabetes knowledge, diabetes self-care activities (DSCA), diabetes quality of life (DQOL), and glycosylated haemoglobin A1c (GHb) is discussed for each variable. In addition, responses of the subjects to the self-management program were presented.

Knowledge

The mean diabetes knowledge of the self-management group was significantly higher than that of the control group at 3 and 6 months. Knowledge mean scores of the self-management group were 21.5 ($SD = 5.32$), 26.78 ($SD = 4.31$), and 27.3 ($SD = 3.86$) while those of the control group were 21.10 ($SD = 6.01$), 22.68 ($SD = 5.54$), 22.71 ($SD = 6.00$), out of a total score of 35, at baseline, 3, and 6 months, respectively. The maximum and minimum scores of the self-management and control groups at 6 months were 34/31 and 17/6, respectively. The mean knowledge score sharply increased at 3 months from baseline and then increased slightly at 6 months but the mean knowledge score of the control group increased very little at 3 and 6 months from baseline. These finding illustrated that the self-management program can improve diabetes knowledge of the subjects at 3 and 6 months compared to the control group. All hypotheses regarding diabetes knowledge were supported.

The subjects in the self-management group learnt diabetes knowledge such as pathology of diabetes, food choices for diabetes, and diabetes care by having several activities such as group discussion, doing assignments, practicing some skills, watching five videotapes, and studying a set of written diabetes materials at home while the subjects in the control group studied a set of written diabetes materials at home, receiving diabetes education and watching five videotapes from the diabetes care team of the hospital at the diabetes clinic. This showed that participation in the self-management group was more effective in improving diabetes knowledge than the usual care. Moreover, the subjects in the self-management group had a chance to discuss and share their experiences about diabetes care with the researcher and other group members. This process helped patients to gain more understanding about diabetes. This finding is consistent with previous studies showing that diabetes educational program improved diabetes knowledge (Tantayotai, 1982; Bloomgarden et al., 1987; Siripakarn, 1990; Poomidandin, 1991; Keers et al., 2004). Moreover, several meta-analyses have reported that diabetes educational programs have had a medium to large effect for knowledge (Brown, 1992; Padgett et al., 1998; Likiratcharoen, 2000).

Diabetes knowledge is an antecedent of an effective self-management production although some studies indicate that knowledge improvement has no relationship with glycemic control (Tantayotai, 1982; Siripakarn, 1990; Poomidandin, 1991). However, diabetes knowledge provides cognitive resources for patients in making observations, interpreting situations more meaningfully of the situations, and providing choices for self-management (Orem et al., 2001, p.273). Diabetes knowledge is necessary for considering the situation before making a decision about self-care action. This process of acquiring knowledge is part of the first phase, estimative and transitional operations, in the phase of Orem's self-care theory. This phase requires knowledge for understanding of the meaning and value of self-care to make rational and reasonable self-care judgments and decisions (Orem et al., 2001, pp. 273-274).

Diabetes Self-Care Activities

The interaction effect of group and time on mean DSCA score was significant. The mean DSCA of the self-management group was significantly higher than the control group at 3 and 6 months. The mean DSCA of the self-management

group increased sharply at 3 months to 102.68 ($SD = 16.11$) from baseline and then decreased very little to 101.56 ($SD = 16.25$) out of a total score of 133, at 6 months. The subjects in the self-management group received both cognitive and skill training regarding diabetes care over 5 weeks. Besides knowledge improvement, problem solving skills, goal setting, communication skills, cognitive restructuring skills, exercise skills, foot care skills, and self-monitoring skills were improved by discussion, activities assignments, and practicing in classes. Moreover, written diabetes material dealing with ten topics was distributed for study at home. After a class of each week, the subjects practiced their self-care at home. When the subjects participated in the self-management group in the following week, they shared their experiences about self-care practices with other members or asked questions that they had in the group. Furthermore, the researcher used a combination of helping techniques; teaching, support, guidance, and providing a suitable environment, using the circumstances of a good relationship between nurse and patient. These supportive-educative strategies created trust and a good relationship between the researcher and the patients. All these methods stimulated the subjects to learn about diabetes care and gave them internal motivation to change their behaviors; therefore the mean DSCA score increased significantly at 3 and 6 months compared with the control group. This finding agrees with a study by Mazzuca (1986) on the effect of a systematic education program for patients with diabetes on self-care behaviors. The result showed that self-care skills and compliance behaviors were significantly different compared with the control group. In addition, the result implied that as in previous studies there was increased higher self-efficacy after completion of the supportive-educative diabetes programs (Hanucharurnkul, 2001; Keeratiyutawong et al., 2005). However, those studied presented only in short term outcome.

The mean DSCA score decreased slightly at 6 months compared with at 3 months. Maintaining diabetes self-care is a problem for patients with diabetes, because it is related to life style change. Moreover, both internal and external factors such as family problems, social or work problems, health status, and personal habits, influence patients' self-care (Keeratiyutawong, 1994; Phonploy, 1996). Therefore, the DSCA decreased at 6 months. Understanding about patients giving up self-care sometimes is an important issue for health care providers. A positive attitude to relapse experiences

should be fostered to encourage patients to self awareness and help patients to identify their problems and get back on track as soon as possible.

The results of five DSCA components: diet, exercise, self-monitoring, foot care, and medication-taking were discussed as follow.

Diet

The subjects in both the self-management and control groups received quite high scores of self-care activity on diet component at baseline, 30.68 and 30.17, respectively, more than half of the total score of 49. Significant differences were not found in diet component between the self-management and control groups over time. However, the mean diet component in the self-management group was higher than the control group overall. This could be explained by the fact that the self-management program introduced the patients to knowledge about the amount of food intake, type of food that was suitable for patients with diabetes, and food list exchange. Moreover, the program enhanced communication skills including techniques to deny food over consumption or to avoid unwanted eating behaviors. Therefore, the mean diet score increased to 33.45 ($SD = 7.01$) at 3 months and was higher than for the control group. However, the mean diet score of the control group also increased to 31.39 ($SD = 5.83$) and 31.54 ($SD = 5.63$) at 3 and 6 months. This might be explained by the fact that after the subjects of the self-management group had completed five sessions of the self-management program, they were more knowledgeable about diet control. They might have evaluated themselves more carefully and more meaningfully; therefore, mean diet scores at 3 and 6 month represented actual self-management actions more effectively than the score at baseline and the score of the control group which might overestimate. Thus, the mean diet score of the self-management group did not differ significantly from the control group.

The results showed that the mean diet score of the self-management group decreased to 32.45 ($SD = 6.95$) at 6 months compared with at 3 months ($M = 33.45$, $SD = 7.01$). The reason for this is that dietary control is the most difficult task when compared with other diabetes self-management tasks: exercise, self-monitoring, foot care, and medication-taking. Eating habits are developed when individuals are young and they become familiar with their eating habits after growing. Modifying eating behaviors and maintaining good eating habits is difficult for older people.

Therefore, good eating behavior may decline overtime. This finding is consistent with previous studies showing that eating habits are an obstacle to dietary control (Maillet, Melkus, & Spollett, 1996; Keeratiyutawong, 1994; Phonploy, 1996). Keeratiyutawong et al. (2003) interviewed eight uncontrolled type 2 diabetes patients concerning self-care experiences. The results revealed that feeling bored with diabetes control and getting used to the taste of food were reasons for poor diet control.

Exercise

The mean exercise component of the self-management group increased significantly compared with the control group at 3 and 6 months. Exercise mean score of the control group decreased overall compared with the baseline. This showed that the subjects in the self-management group increased exercise more than the control group. In the self-management program, there was one discussion session about the relation of exercise and blood glucose control and the benefits of exercise or increased physical activity. This session also provided an example of exercise training. These strategies help patients to realize the benefit of increasing physical activity and encourage patients to exercise at home or increased physical activity anytime. Therefore, exercise mean score increased compared to the control group both at 3 and 6 months. However, the mean exercise score in the self-management group was not maintained at a higher level at 6 months. It decreased slightly when compared with 3 months but it was still higher than the baseline. Type 2 diabetes patients reported a higher frequency of relapse from physical activity. They reported receiving less support, education, and encouragement for physical activity compared to any other aspect of diabetes management (Krug, Haire-Joshu, & Heady, 1991). The major barriers for maintaining exercise of subjects in the self-management group were busyness with their work, problems in their family, and other illness such as common cold and leg pain.

Self-Monitoring

The mean self-monitoring score in the self-management group was significantly higher than in the control group at 3 and 6 months. The self-monitoring session in the self-management group encouraged patients to gain self-awareness about their abnormal symptoms, to be concerned about their diet control and exercise, and to examine their skin for infection. The subjects recorded their self-awareness on

the self-monitoring form or on the paper. Five subjects in the self-management group had their own glucose monitors. The researcher taught the subjects to observe their fasting blood glucose and postprandial glucose and adjust their behaviors depend upon blood glucose level. Moreover, the program taught patients to obtain information and to interpret data more effectively. Therefore, the subjects in the self-management group had higher scores of self-monitoring than the control group. Learning self-monitoring skills is essential for patients with diabetes because management for abnormal symptoms and self-motivation to take care of themselves is required throughout their lives. Price (1993) mentioned that body listening, which is completely subjective and involves specific awareness of how one feels physically should be learnt by patients with diabetes. The subjects of Price's study used body listening from initial stages to the later stage for development of diabetes self-management. Patients with diabetes usually rely on their subjective feeling and physical symptoms and those symptoms are significantly correlated with blood glucose levels (O'Connell et al., 1990; Keeratiyutawong et al., 2003).

Foot Care

The mean foot care scores were high at baseline for the self-management and control groups. The mean scores of the self-management and control groups were 27.20 ($SD = 9.85$) and 29.05 ($SD = 7.92$) out of a total score of 35, respectively. The mean scores increased very little in the self-management and control groups at 3 and 6 months. Because patients with diabetes often fear of foot amputation, they were aware of caring for their feet and preventing foot injuries (Keeratiyutawong et al., 2003). Moreover, foot care is not a difficult skill to learn; therefore, the subjects perceived that they could take care of their feet well. In addition, the study of Mounkum (2004) showed that patients with type 2 diabetes perceived susceptibility to foot ulcer at medium level and perceived severity of foot ulcer at high level. Although the subjects of the self-management and control groups perceived that they took good care of their feet by cleaning or inspecting them everyday, there were three patients who had foot ulcer and did not have good foot care when the researcher examined their feet. The subjects in both groups might overestimated of their foot care score due to limitation of foot component questionnaires in that it only asked superficial questions about foot care. The foot

component questionnaires were more concerned with the quantity of foot care than the quality. Some subjects in both groups complained of foot numbness, and leg pain at night. Some subjects had serious foot ulcers. The patients did not identify these problems through the questionnaires. In foot care session, the subjects in the self-management group were encouraged to be concerned about diabetes foot problems, the relation of foot problems and diabetes control, and practicing foot care in class. Therefore, the subjects in the self-management group still had higher mean scores of foot care at 3 and 6 months. Moreover, the subjects in the self-management group changed their behaviors by wearing shoes which protected their feet, by wearing socks, and inspecting their feet more effectively. One subject in the self-management group had diabetes foot ulcer. She was referred to the physician to receive treatment. At 6 months, this subject had better foot care, and more understanding of how to take care of her feet.

Medication-taking

The medication-taking mean score was also high at baseline and slightly increased at 3 and 6 months in the self-management group. In the control group at 3 and 6 months, the mean score decreased slightly compared with baseline. Most subjects took diabetes medicines following the prescription. This finding is consistent with the study of Keeratiyutawong et al. (2003) reporting that Thai patients with diabetes were well aware that they needed to take medications regularly.

Seventeen point five percent of the subjects in the self-management group decreased their medication intake at 6 months, compared to only 7.3% of the control group. Forty-nine percent of the control group increased their medication intake at 6 months, compared to 40% of the self-management group. This showed the indirect effectiveness of the self-management program. The subjects in the self-management group had several problems about taking medication such as forgetting to take medication, having side effects, time to take their medicine mismatching with their work. Some patients reduced dosages of medication by themselves because they felt that they were taking too much medication or that they had hypoglycemic symptoms. All these problems were discussed and solved in the self-management group. In addition, the researcher encouraged the subjects in the self-management group to talk their problems to the physician on their appointment or write about their

problem and send a letter to the physician. Three subjects in the self-management group were able to stop taking diabetes medications after participating in the program.

Diabetes Quality of Life

The subjects in the self-management group had significantly higher mean DQOL scores than the control group at 3 and 6 month. The mean score in the self-management group increased substantially at 3 months and then decreased slightly at 6 months. In the control group, DQOL mean scores increased very little at 3 and 6 months. This finding is consistent with the study of Pibernik-Okanovic et al. (2004) that quality of life was improved at 3 and 6 months after psychosocial intervention. The self-management program in this study used a combination of helping techniques: teaching, support, guidance, and providing a suitable environment based on the development of a good relationship between nurse and patient. Moreover, the program focused on improving cognitive processes by learning problem solving skills, communication skills, and changing negative thinking to positive thinking. These methods were able to help the subjects in the self-management group to manage their diabetes care and live well with diabetes. In addition, the researcher called the subjects at 3 and 5 months to follow their self-management practices and help them to solve problems or adjust their self-management practices. The subjects also telephoned the researcher if they had any problems to discuss. The subjects usually called to consult with the researcher about their abnormal symptoms and discuss how to manage those problems. Some patients called to consult about other problems such as family problems or other illnesses. These processes of learning helped the subjects to have a positive attitude about diabetes care and increased competence not only in diabetes care management but also in social life management. Therefore, the subjects in the self-management group had a higher mean score of DQOL at 3 and 6 months compared to the baseline and the control group. This means that the subjects in the self-management group had high satisfaction with treatment and had low impact of treatment. They satisfied with their physical ability, interpersonal relationships, social function and emotion, and well being. The characteristics of DQOL measure are almost similar to World Health Organization QOL which concern multi-dimensional quality of life including physical, psychological, social, spiritual, and accept individuals' perceptions of both positive and negative dimensions (WHO, 1995).

Glycosylated Haemoglobin A1c

The self-management group had decreased GHb levels at 3 and 6 months compared with baseline. GHb level at 3 month decreased the most and then it increased slightly at 6 months. The control group had increased GHb overall. When GHb at baseline was controlled to be covariant, the mean GHb levels at 3 and 6 months in the self-management group were less than in the control group but they did not differ significantly. The hypotheses on GHb were not supported. Although the mean GHb level in the self-management group increased slightly at 6 months compared with 3 months, it was still less than GHb level at baseline. The control group trended to increase in GHb over time. The self-management program was able to reduce GHb levels effectively at 3 months, but this reduction did not continue at the same rate. This may have been because the subjects may have become more relaxed and, consequentially, less strict in their self-care practices. Keeratiyutawong et al. (2003) explored self-care experiences of Thai patients with type 2 diabetes who were not successfully controlling their blood glucose levels and reported that when these patients believed their blood glucose level was “in control”; they did not follow strictly their self-care regimens. In addition, there are several factors related to blood glucose levels such as the progression of disease in each individual, change in life patterns, interference from other illnesses, and energy expenditure change. The subjects must cope with new situations which they became involved in and balance their self-management with these new situations. These processes require time for management until the subjects can regain of control the situation. The researcher helped subjects pass through this process by giving information and encouraging patients to solve their problems in a proper way. For example, one patient was able to reduce his GHb levels from 10.8 at baseline to 6.3 at 3 months, but the GHb level rose to 9.8 at 6 months. After finishing session five of the self-management program, this patient had hypoglycemic symptoms very often then he took off medications. He learnt many things in the self-management group and practiced very well in the first 3 months. Consequently, the patient felt able to take on more work but he became anxious about business. Then, he paid less attention to his self-care. However, he had experienced success in controlling his blood glucose at 3 months; therefore, he was

able to identify his problems and plan to go back on track in self-care as soon as possible.

The percentage of subjects in the self-management group who had decreased GHb level compared with baseline was 55% and 42.4% at 3 and 6 months, respectively; these were higher percentages than in the control group. Of the 40 in the self-management program, 22 and 17 had decreased GHb levels in the self-management group at 3 and 6 months, respectively; the mean decrease GHb was 2.04 ($SD = 2.13$) at 3 month and 2.1 ($SD = 2.16$) at 6 months compared with baseline. On average, there was a decrease in GHb in the self-management group from baseline to 3 months of 0.71 ($SD = 2.28$) and from baseline to 6 months of 0.37 ($SD = 2.17$). In contrast, on average, there was an increase in GHb levels in the control group from baseline to 3 months of 0.19 ($SD = 1.72$) and from baseline to 6 months of 0.40 ($SD = 2.12$). The data shows that, GHb change in the self-management group had a clinical significance although there were not statistically significant differences of mean GHb levels between the self-management and control groups. The present study showed GHb decreases that are broadly similar to comparable studies. The average GHb decrease in this study (0.71 at 3 months and 0.37 at 6 months) was higher than that in the meta-analysis study of Norris et al. (2002) in which self-management education decreased GHb by approximately 0.26 at 1-3 months of follow-up and by 0.26 at more than 4 months of follow-up. Similar to Norris et al.'s study a meta-analysis by Ellis et al. (2004) showed that GHb change in the intervention group was .294, .486. and .328 at 3, 6, and 13 months. GHb change in the present study was lower than in the comparable study of Pibernik-Okanovic et al. (2004) (average GHb change = 0.60) and the study of Snoek et al. (2001) (average GHb change = 0.8) at 6 months compared with baseline.

Evidence from the United Kingdom Prospective Diabetes Study shows that each 1% reduction in GHb in patients with type 2 diabetes mellitus was associated with reductions in diabetes complications such as myocardial infarction, microvascular complications, and deaths (Stratton et al., 2000). This is a similar result to the Diabetes Control and Complications Trial Research Group (DCCT, 1993) which found that patients with type 1 diabetes who received intensive therapy effectively reduced the risk of diabetes complications (DCCT, 1993).

Of the 41 in the control group, 18 and 14 had decreased GHb levels at 3 and 6 months, respectively; the mean decrease GHb was 1.32 ($SD = 1.1$) at 3 month and 1.85 ($SD = 1.47$) at 6 months compared with baseline. This could be explained by the fact that the subjects in the control group received diabetes education from a diabetes health care team of the community hospital on the date of the physician's visit. In addition, they received a set of written diabetes materials and watched the same five videotapes as the self-management group. The subjects in the control group were told their GHb values and reminded of the date of appointment by a telephone call. These procedures may have encouraged the subjects in the control group to be more concerned about their disease and take care of themselves. However, there was smaller number of subjects of GHb decrease less than the self-management group and on average GHb changes in the control group were not good.

In summary, the self-management program was more effective in improving mean score of diabetes knowledge, self-care activities, and quality of life at 3 and 6 months in patients with type 2 diabetes mellitus compared with the control group. The mean GHb levels in the self-management group were lower than those of the control group at 3 and 6 months but they did not differ significantly. However, the data showed clinical significance in a good GHb change in the self-management group. At 6 months, the mean DSCA and DQOL decreased very little while the mean GHb level increased slightly compared with 3 months. This might be explained by the fact that when the subjects had other problems in their life such as health problems, economic problems or family problems, these factors may have influenced their life satisfaction. Consequently, the motivation to maintain diabetes self-management may be affected. A qualitative data of Keeratiyutawong (1994) study supported the idea that pattern of living, health state, and family system were factors influencing self-care behaviors. In addition, process of self-care agency development in patient with diabetes requires time, energy, effort, motivation, self-discovering of appropriate actions, and reinforcement from significant person and health care provider (Keeratiyutawong, 1994). To explain the relationship from a statistical point of view, there was a significant correlation between DQOL and DSCA ($r = .38, p < .01$). After self-care activities declined, this may have effected GHb levels.

Other possible reason for the decline of outcome score after 3 months is that the strategies to encourage self-motivation of the subjects to maintain their self-care were not intensive enough. The self-management program only gave telephone calls to the subjects at 3 and 5 months. Although the subjects could call the researcher whenever they had any problems to discuss, some subjects may not have called even when they did have problems. Thus, perhaps the researcher received self-management problems from the subjects too late to help patients solve their problem before the date of data collection. This may be why outcome measured at 6 months was not as good as that at 3 months. In general, in the control group the number of subjects with GHb decrease and the amount of GHb decreases were lower than in the self-management group.

The self-management program in this study was designed to improve cognitive process and skill abilities. The program consisted of 5 sessions: (1) the pathology of diabetes mellitus, cognitive restructuring and goal setting skills; (2) dietary control and communication skills; (3) diabetes medication and problem solving skills; (4) foot care and self-monitoring skills; and (5) exercise. All sessions helped the subjects gain more understanding about diabetes mellitus and diabetes care and the subjects learnt to practice self-management both cognitive and practical skills in class. Cognitive skills were taught skills such as problem solving and cognitive restructuring practiced to think positively about diabetes care and manage any problem systematically. Moreover, communication skills provide techniques to deny negative behaviors and to speak positively. Furthermore, practical skills such as foot care and exercise were practiced in class. The self-management program was based on a supportive-educative nursing system comprised of teaching, support, guidance, and providing a suitable environment. In addition, providing telephone calls was beneficial for helping the subjects cope with diabetes and for encouraging internal motivation to take care of themselves. Holistic care for patients with diabetes was an important concern. This self-management program illustrates that the program improved not only physiological well being but also psychological well being. Although mean GHb levels in the self-management group did not differ significantly compared with the control group, the average GHb change had a clinical significance that was a meaningfully in the clinical practices. Maintaining diabetes self-care for longer

periods of time is a challenging issue for nurse practitioner. Intensive strategies for preventing self-management relapse should be explored further.

Responses of the subjects to the Self-Management Program

The subjects in the self-management group showed a positive response to the diabetes self-management program. In general, the subjects were enthusiastic about joining the program as evidenced by the fact that most attended all five sessions of the diabetes self-management program. Most of them had participated in the program regularly and punctually without any telephone reminders since session two. The participants suggested that diabetes self-management program like this should be held for other patients at the diabetes clinic of the hospital. They said that patients at the diabetes clinic may not be interested in joining the group at first when they heard about it. If the patients had a chance to attend the program on the first session, they would know about the benefits that they would get from the program and continue to come. One subject said “I feel relaxed and I can ask the questions that I want answered. The program provides enough time for discussion and has taught me everything about diabetes care.” Every subject in the program said that they were very lucky to join the program, more than other patients who did not have chance to participate in the program. They agreed that it was a good way to share their experiences about diabetes care together. Some subjects shared the diabetes care knowledge which they learnt from the program with their friends or their relatives. The subjects suggested that the program should train participants in ways to teach other people because they felt that it was a difficult task to convince other people to believe what they were saying about diabetes care. After the program finished, the participants wanted to continue meeting together to share their experiences about diabetes care and encourage each other to maintain their diabetes self-management.

These reflections illustrate that all the participants were satisfied with the diabetes self-management program. The program enhanced a process of learning for diabetes self-management and increased their ability to take care of themselves. Moreover, the program provided an environment for sharing knowledge of self-management experiences and group cohesion was established.

Theoretical Aspects

The diabetes self-management program of this study was guided by Orem's (1995) self-care theory which was advantageous. Orem's self-care theory provided a logical and holistic conceptual basis for diabetes self-management program. The theory gives a whole picture of related concepts to provide care for diabetes patients. The theory states that patients have therapeutic self-care demands and requisites which need to be met. To respond to the self-care demands of patients with diabetes, nurses must use professional care to enhance patients' ability in term the diabetes self-management. The goals of Orem's self-care theory are maintenance of life, health, and well-being which reflects the holistic view of human services. The theoretical base of this study provided a clear process for holistic care in the diabetes self-management.

In terms of the supportive-educative nursing system, the nursing must prudently empower patients to take care of themselves. Nurse must use a combination of helping techniques; teaching, support, guidance, and providing a suitable environment which enables patients to learn diabetes self-management while balancing the physiological and psychological well being of person. In addition, cognitive-behavioral therapy was one used in cognitive and skills improvement in the diabetes self-management program. This concept is useful in strengthen a supportive-educative nursing intervention to improve the abilities of patients with diabetes to take care of themselves. Cognitive behavioral therapy provided techniques including problem-solving, cognitive restructuring, and social skills training which are beneficial for living with diabetes. This combination of theories for guiding nursing intervention research is advantageous.

The findings of this study support the contention that a diabetes self-management program based on Orem's self-care theory and cognitive behavioral therapy improves diabetes knowledge, self-care activities, quality of life, and glycosylated haemoglobinA1c in patients with type 2 diabetes mellitus.

Methodological issues

This part discussed the methodological issues related to randomization techniques, instrumentation issues, data analysis procedures, and generalizability of the study findings.

Randomization Techniques

The randomized controlled trial (RCT) is the most rigorous scientific method for evaluating a self-management program. The design in this study is the most powerful method for testing hypotheses of cause and effect relationships between variables. Random assignment to groups used is to secure comparable groups and is the most effective approach to control all possible sources of extraneous variables. The subjects have an equal chance of being assigned to any group. Therefore, the dependent variables are assured of being an effect of the treatment, not of extraneous variables. However, any experiment involving human subjects can not control all extraneous factors such as personality, life problems, pathology of the disease, and severity of illness. Therefore, randomization is no absolute guarantee that the groups will be equal (Cook & Campbell, 1979; Polit & Hungler, 1999).

Although randomization was used to assign the subjects to the self-management and control groups in this study, inequality of the mean GHb levels at baseline between these two groups was found. Thus, a statistical procedure, repeated measured ANCOVA, was used further to control this unbalance variable.

Threat to validity may occur if the subjects behave in a particular manner because they are aware of their participation in a study. Therefore, double-blind experiment should be used, in which neither the subjects nor interventionist know who is in the experimental or control group. However, in nursing intervention research it is not feasible to use double-blind techniques because the nurse researcher must interact with the subjects who participate into the program. Nursing interventions are more difficult to disguise than other treatments such as taking medication and using medical equipment and perhaps it would be undesirable and unethical to attempt to disguise them. Moreover, nursing as a human science focuses on human care and it is a practice discipline regarding human health and illness. However, an equal attention were concerned for the control group by the control group received a set of written diabetes materials, watch five videotapes, attended diabetes education conducted by diabetes health care team, and contacted by telephone.

Instrumentation Issues

Two instruments (The Summary of Diabetes Self-Care Activities Measure (SDSCA) and The Diabetes Quality of Life Measure (DQOL) were translated into Thai. The processes of translation and back-translation were conducted systematically. The first pilot testing of SDSCA with type 2 diabetes patients revealed that the diet component on this instrument was difficult to answer for those Thai patients who had not been well educated. To answer the questions, a person needed to have some basic knowledge about nutrition such as carbohydrates, fat, and healthy food. In addition, Western culture has a different style of eating from Thai culture; for example steak and full-fat dairy products are more common. Therefore, the diet component was revised to make the language ease and it was adjusted to suit Thai food preference. The number of items of this component increased from five items in the original version to seven items in Thai version.

The subjects in the self-management and control group received high scores of foot care ($M = 27.20$, $SD = 9.85$ / $M = 29.05$, $SD = 7.92$), out of a total score of 35) and medication-taking component ($M = 12.45$, $SD = 3.01$ / $M = 12.00$, $SD = 2.84$) out of a total score of 14) at baseline. This created a ceiling effect; there was little room on the scale for improvement. Therefore, sensitivity to score change on these two components were low. Diabetes self-care is a complex task which requires a cognitive process to evaluate the situation and make decisions before performing actions. Measuring self-care activities should not only be concerned with the quantity of action but also on the quality of self-management and the meaning of these actions. The foot and medication-taking components measured only superficial self-care that concerned the quantity rather than the quality of care. The subjects over-estimated the quality of the foot care compliance and their medication compliance. These issues should be further examined and more accurate instrument development.

Data Analysis Procedures

A repeated measures ANOVA was used to analyze the data in this study. This statistical tool is very powerful in controlling some variations of individual differences. Therefore, it increases the power of analyses (Munro, 2001, p. 203; Polit & Hungler, 1999, pp. 221)

Because the mean GHb levels of the self-management and control group showed difference at baseline, statistical control of this variable was performed. In analysis of covariance (ANCOVA), the effect of extraneous variables on the dependent variable was extracted from within variation (Munro, 2001, p. 187; Polit & Hungler, 1999, pp. 226). This procedure reduces the error variance in the outcome measure and increased the power of analysis.

Threats to internal validity from selection bias were examined. The demographic characteristics between the subjects who enrolled and who did not enroll in the study were compared and also those of the subjects who did and did not complete the study.

Generalizability

The design of this study was more concerned about threats to internal validity by the selection of a heterogeneous sample; therefore, generalizability was lessened. In this study, homogeneous samples were obtained by balancing between sufficient controls and real clinical practice situations. Thus, the results of this study are generalizable only to adult patients with type 2 diabetes mellitus at the level of a community hospital. A Community hospital in Thailand is likely to share characteristics such as geographies, size, health care services, characteristics of patients with diabetes, and treatments. However, there are some points to be aware of when implementing this self-management program in other settings. The inclusion criteria were quite restrictive: patients were taking oral medication, they had been diagnosed for less than ten years, they had aged less than or equal sixty years, and they were functionally literate in Thai. This self-management program would have limited application for patients who have limits on their functional ability and patients with serious diabetes related complications.

CHAPTER VI

CONCLUSION

This chapter presents a summary of the study, including the purposes of the study, methodology, data analysis, procedures, and findings. In addition, implications for nursing practice, nursing education, national health policy, and recommendation for future research are presented.

Summary of the Study

This randomized controlled trial (RCT) study aimed to test the effect of a self-management program on diabetes knowledge, diabetes self-care activities (DSCA), diabetes quality of life (DQOL) and glycosylated haemoglobin A1c (GHb) in Thai people with type 2 diabetes mellitus. Testing was carried on both a self-management and a control group out of baseline, 3 and 6 months. Orem's self-care theory and cognitive behavioral therapy were the theoretical frameworks for this study.

Data collection was done at a community hospital in the eastern part of Thailand. The sample were recruited to the study using the following inclusion criteria: having had diabetes for less than 10 years, having been treated only with oral medications, having had a fasting blood sugar level higher than 130 mg% at least 2 consecutive times before entering the program, being between 21 - 60 years of age, and being able to read Thai. In addition, the exclusion criteria were receiving insulin therapy or having had other serious illnesses or complications related to diabetes.

One hundred and twelve subjects were approached for the study but twenty two refused to participate. Ninety subjects were randomly assigned to the self-management or the control group by sealed envelope technique. The attrition rate was low; only 10 % of subjects withdrew. Finally, 40 subjects were left in the self-management group and 41 subjects in the control group. There were no significant differences in demographic characteristics between the subjects who remained in the study and those who refused to participate or withdrew from the studies. This means that the risk of selection bias was low.

The subjects in the self-management program participated in five sessions, two hour per session. Each session consisted of (1) pathology of diabetes mellitus, cognitive restructuring and goal setting skills; (2) dietary control and communication skills; (3) diabetes medication and problem solving skills; (4) foot care and self-monitoring skills; and (5) exercise. Several combination methods including teaching, support, guidance, provision of a developmental environment, discussion and skill training were used for each session. Appropriate handouts and exercise assignments were distributed in each session. In addition, a set of written diabetes materials, and five videotapes about diabetes care were used in the study. A follow-up by telephone call was made at 3 and 5 months. The subjects in the control group attended diabetes education conducted by the health care team of the community hospital, received a set of written diabetes materials and watched five the videotapes, as did the self-management group. Answers to three questionnaires on diabetes knowledge, DSCA, and DQOL, and the results of a blood examination for GHb were obtained at baseline, 3 and 6 months.

The results showed improvement of diabetes knowledge, DSCA, DQOL, and clinically significant improvements although not statistically of GHb levels in the self-management group compared with the control group. The mean scores of diabetes knowledge, DSCA, and DQOL in the self-management were higher than in the control group at 3 and 6 months and the differences were significantly. After GHb levels at baseline were controlled, the mean GHb levels in the self-management group were lower than the control group at 3 and 6 months but they were not significantly different. The percentage of mean decrease in the self-management group was higher than in the control group. The average change in GHb level in the self-management group was 0.71 ($SD = 2.28$) at 3 months and 0.37 ($SD = 2.17$) at 6 months. This was higher than in the control group where the average change were -0.19 ($SD = 1.72$) at 3 months and -0.40 ($SD = 2.12$) at 6 months.

Recommendations and Implications

The findings of this study have implications for nursing practice, nursing education, and national health policy. In addition, recommendations for future research are presented.

Implications for Nursing Practice

The diabetes self-management program should be implemented at the community hospital level in Thailand. The current community hospital diabetes education services were given to the control group; the experimental group received the new self-management program. The results show that the outcomes were better for the experimental groups. This program should be run as part of diabetes educational services. Diabetes education in a community hospital is normally run in the morning on the day of the physician's visit while the patients wait for laboratory results and a lecture given at the clinic. This kind of service may not be effective because the environment is not conducive for learning. It can be noisy, crowded, and interrupted. Also, the patients have different characteristics and they may have different problems of self-care and need different nursing interventions. Diabetes education services should set up a new model and they may provide services on the day when the physician is not present. Currently some hospitals have nurses responsible for diabetes education but some do not. This needs to be rectified; all hospitals should have a nurse responsible for diabetes education and they should be trained in diabetes self-management program. This model may help patients with diabetes learn to manage their disease effectively.

The self-management program responds to the Health Care Reform Project policy which aims to provide quality services to all people equally, responding to people's needs, and encouraging people to participate in taking care of themselves.

Implications for Nursing Education

Curriculum of diabetes self-management should be developed for training advanced nurse practitioners. The curriculum should encompass: the theories which promote self-management and behavioral change, Orem's self-care theory, cognitive behavioral therapy, and the concept of patient empowerment; medical knowledge about diabetes mellitus, pathology of diabetes, diabetes care, diabetes medications; cognitive skills, cognitive restructuring, goal setting, problem solving skills, communication skills; practical skills, foot care, exercise, food management, and self-monitoring skill. Furthermore, diabetes self-management program developed in this study should be a part of this curriculum.

Implications for National Health Policy

Before the economic crisis, health expenditure was extremely high but people received poor quality health care services and it was difficult to access health services for people of lower social and economic status. The health care reform proposes to develop the health care system to provide quality services within the same health expenditure or at a lower cost (Health Care Reform, 1997). The Universal Health Care Coverage Scheme is the major vehicle health financing and health service delivery reform. To decentralize health resources to a community level, primary medical care levels need to be strengthened to provide good quality of care as well as improve the capacity of health care providers.

The results of this study show the effectiveness of the diabetes self-management program at the community level. Given these findings, the national health policy should be concerned with the following points:

1. The Universal Health Care Coverage Scheme should cover activities which promote self-management of persons such as patients with diabetes and other chronic diseases as well as medical treatment. Promoting models of health care delivery which focus on patient self-management of their disease should be emphasized. Patients with diabetes should have more choices to participate in diabetes self-management education. Furthermore, participation in diabetes self-management program should be recommended for all type 2 diabetes patients under the Universal Health Care Coverage Scheme.
2. The ability of nurses to conduct the diabetes self-management program or program for other chronic diseases should be strengthened.
3. Diabetes care networks among provincial hospitals, community hospitals, and health centers of each region should be set up for sharing of resources.
4. Materials which promote diabetes self-management; for example, written diabetes care material, learning materials for conducting diabetes self-management program, and glucose monitor should be provided and distributed widely.

Recommendations for Future Research

1. Most chronic illnesses impact many aspects of an individual's life such as career, social role, family members, health, and quality of life. Moreover, the chronic condition stays with an individual at all times. Therefore, an individual should

learn to manage their chronic illness so that they can maintain their health, and enhance their quality of life. The diabetes self-management program enhances knowledge, self-care activities, and quality of life as well as improving glycemic control. Therefore, the principle of the self-management program may apply to other chronic illnesses such as type 1 diabetes, hypertension, and ischemic heart disease. Self-management programs of these chronic illnesses should be developed and tested the effectiveness.

2. The major problem of diabetes self-management is relapse from self-care over a longer period of time. The results showed that the scores for all dependent variables decreased substantially less in the second 3 months of the program than in the first 3 months. The factors which cause self-management relapse should be explored. Furthermore, strategies to prevent relapse or to maintain diabetes self-management should be studied.

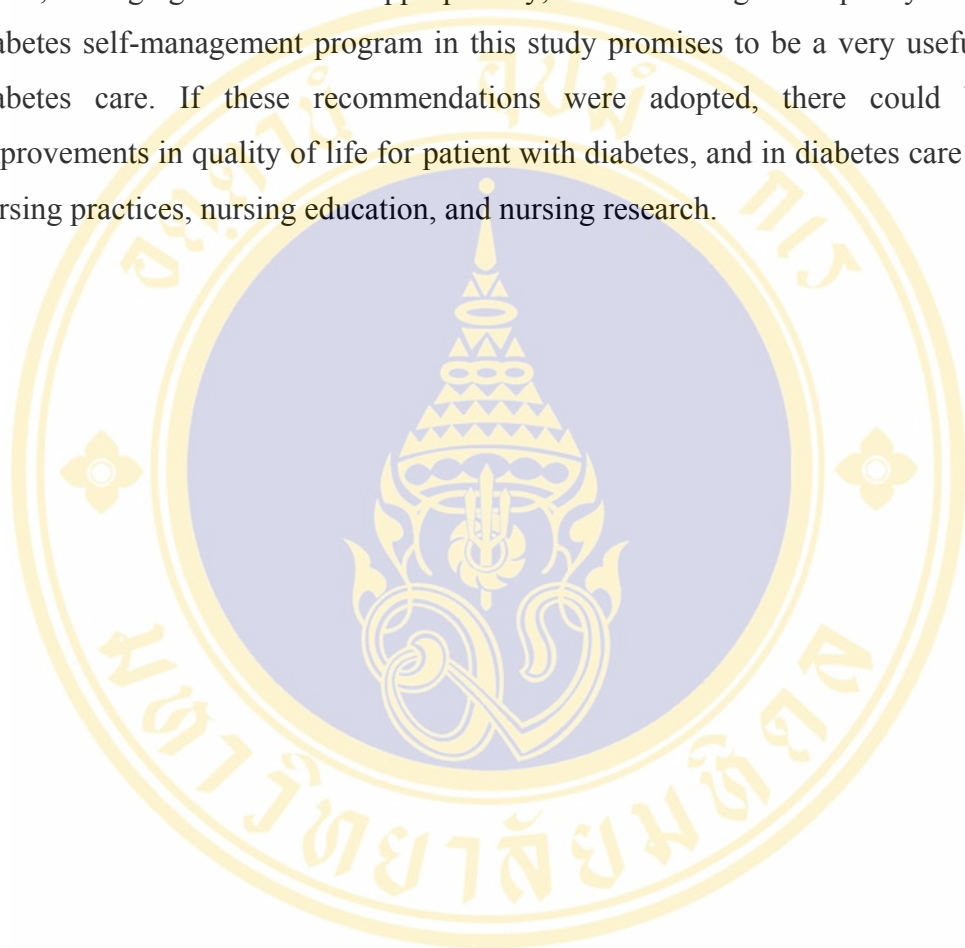
3. Ceiling effects occurred in foot care and the medication-taking components of the DSCA instrument. The foot examination score may have to be considered as only the one part of the foot care component. Qualitative methods of obtaining data on foot care and medication-taking should be further developed for evaluating self-care activities. In addition, other methods for evaluating self-care activities should be examined beside self-report questionnaires.

4. There is little evidence of support for Thai patients with psychological problems stemming from diabetes such as anxiety, depression, or negative attitude about diabetes. Thus, these issues should be further explored.

5. Research about how to implement the diabetes self-management program in community hospitals throughout the entire health care system should be undertaken. In addition, diabetes care network among provincial hospitals, community hospitals, and health centers of each region should be further studied about how to share resources and what a referral system should be.

6. At present, there are various models of diabetes educational programs being conducted in outpatient clinics around the country. The methods, strategies, health care systems, advantage and disadvantage of these models should be explored.

As I said at the beginning of this thesis, type 2 diabetes mellitus is a serious health problem in Thailand. It causes long term damage to various organs and it impacts patients' lives, health, and quality of life as well as their economic situation. Learning diabetes self-management is beneficial for patients in improving their health status, managing their disease appropriately, and enhancing their quality of life. The diabetes self-management program in this study promises to be a very useful tool in diabetes care. If these recommendations were adopted, there could be great improvements in quality of life for patient with diabetes, and in diabetes care services, nursing practices, nursing education, and nursing research.



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Appendix A

The Manual of the Type 2 Diabetes Self-Management Program

บทนำ

คู่มือนี้จัดทำขึ้นสำหรับพยาบาลที่ให้การดูแลผู้ป่วยเป็นเบาหวานชนิดที่ 2 ในการส่งเสริมให้ผู้ป่วยเป็นเบาหวานจัดการดูแลตนเอง เนื้อหาของคู่มือประกอบด้วย 2 ส่วน คือ

ส่วนที่ 1 แนวคิดทฤษฎีที่นำไปสู่การสร้างสาระในโปรแกรมการจัดการดูแลตนเองสำหรับผู้เป็นเบาหวานชนิดที่ 2 และบทบาทของพยาบาลในการดูแลผู้ป่วยกลุ่มนี้

ส่วนที่ 2 เนื้อหาของโปรแกรมการจัดการดูแลตนเองทั้งหมด 5 เรื่อง ผู้เข้าร่วมเป็น เบาหวานชนิดที่ 2 อายุน้อยกว่าหรือเท่ากับ 60 ปี ไม่มีภาวะแทรกซ้อนรุนแรง และสามารถอ่านภาษาไทยได้ เนื้อหาสาระทั้ง 5 ครั้งประกอบด้วย

- | | |
|-------------|---|
| เรื่องที่ 1 | โรคเบาหวานคืออะไร
ทักษะการปรับกระบวนการคิด และการตั้งเป้าหมาย |
| เรื่องที่ 2 | การรับประทานอาหาร
ทักษะการสื่อสาร |
| เรื่องที่ 3 | การรับประทานยาเบาหวาน
ทักษะการแก้ปัญหา |
| เรื่องที่ 4 | การดูแลเท้าและการประเมินตนเอง
ทักษะการดูแลเท้าและการประเมินตนเอง |
| เรื่องที่ 5 | การออกกำลังกาย
ทักษะการออกกำลังกาย และการป้องกันการละเลยการดูแลตนเอง |

แต่ละเรื่องใช้เวลา 2 ชั่วโมง แบ่งเวลาเป็น

15 นาทีแรก อภิปรายร่วมกันถึงการจัดการดูแลตนเองเกี่ยวกับโรคเบาหวาน และปัญหาการจัดการดูแลตนเองที่ผ่านมา

45 นาทีถัดมา สอนและอภิปรายกันถึงเนื้อหาของการจัดการดูแลตนเองเรื่องโรคเบาหวาน

1 ชั่วโมงที่เหลือ ฝึกทักษะ ประกอบด้วย ทักษะด้านกระบวนการคิด และทักษะในการปฏิบัติ

สัปดาห์ที่ 1 โรคเบาหวานคืออะไร

วัตถุประสงค์

1. สร้างสัมพันธภาพภายในกลุ่ม แนะนำตัว บอกวัตถุประสงค์การมาเข้าร่วมกลุ่ม
2. อธิบายความหมายของโรคเบาหวาน และพยาธิสภาพของโรคเบาหวานได้
3. อธิบายสาเหตุและอาการของโรคเบาหวาน
4. อธิบายถึงภาวะแทรกซ้อนของโรคเบาหวาน
5. อธิบายถึงเป้าหมายในการดูแลตนเองเรื่องโรคเบาหวาน
6. อธิบายวิธีการดูแลตนเองเพื่อควบคุมโรคและภาวะแทรกซ้อน

อุปกรณ์

1. สมุดบันทึก ดินสอ ป้ายชื่อ
2. ภาพตับอ่อน เซลล์ไอส์เลต การทำงานของอินซูลิน
3. ภาพอธิบายภาวะ insulin resistance
4. ภาพเส้นเลือดเล็กๆ ทั่วร่างกาย
5. ภาพภาวะแทรกซ้อนของโรคเบาหวาน
6. เอกสาร 1/1 – 6/1
7. วีซีดีเรื่อง มารู้จักเบาหวานกันเถอะ

วิธีการ

1. ชักถามผู้เข้าร่วมกลุ่มตามประเด็นคำถามที่เตรียมไว้ และอภิปรายร่วมกัน
2. อธิบายประเด็นความรู้ต่างๆ โดยใช้สื่อภาพประกอบ แจกเอกสาร หรือยกตัวอย่างประกอบ
3. ทำกิจกรรมตามเอกสารที่เตรียมไว้ให้

เวลา

1

ชั่วโมง

กิจกรรมที่ 1 สร้างสัมพันธภาพภายในกลุ่ม แนะนำตัว บอกวัตถุประสงค์การมาเข้าร่วมกลุ่ม (15 นาที)

สถานที่สำหรับผู้เข้าร่วมโปรแกรมการจัดการดูแลตนเองสำหรับผู้เป็นเบาหวาน ใช้ห้องที่เป็นส่วนตัว บรรยากาศเงียบสงบ ขนาดจุคนได้ประมาณ 10-15 คนในการทำกิจกรรม จัดโต๊ะไว้ตรงกลางสำหรับผู้เข้าร่วมสามารถวางเอกสารและเขียนหนังสือได้ ให้ผู้เข้าร่วมนั่งรอบโต๊ะเป็นรูปสี่เหลี่ยม หรือวงกลม ผู้ดำเนินการนั่งอยู่ตรงกลาง มีกระดาน หรือไวต์บอร์ดสำหรับเขียนหนังสืออยู่ด้านหลัง รวมทั้งมีเครื่องฉายวีซีดี



สร้างสัมพันธภาพกับผู้เข้าร่วม โดยการแนะนำตัว แจกป้ายชื่อสำหรับติดหน้าอก ให้ผู้เข้าร่วมแนะนำตัวเองทีละคน โดยเริ่มจากผู้ดำเนินการ บอกชื่อ อธิบายเกี่ยวกับตัวเองอย่างสั้นๆ ที่ต้องการให้สมาชิกในกลุ่มได้รู้จัก และบอกความตั้งใจที่มาเข้าร่วมในกลุ่มนี้

ผู้ดำเนินการชี้แจงวัตถุประสงค์ของการมาเข้าร่วมกลุ่ม บอกกิจกรรมที่จะทำร่วมกัน 5 ครั้ง บอกวิธีการติดต่อสื่อสารกับผู้ดำเนินการ ให้หมายเลขโทรศัพท์สำหรับติดต่อของผู้ดำเนินการ แนะนำสถานที่ เวลาค้นหา อธิบายให้ผู้เข้าร่วมฟังว่าถ้ามีปัญหาหรืออุปสรรคใดๆ ในขณะที่ยังเข้าร่วมอยู่ในโครงการจัดการดูแลตนเองฯ สามารถปรึกษากับผู้ดำเนินการได้ตลอดเวลา

กิจกรรมที่ 2 อภิปรายตามประเด็นคำถาม 35 นาที

คำถามประกอบการอภิปรายระหว่างผู้ดำเนินการและผู้เข้าร่วมกลุ่ม

1. การที่เราเคลื่อนไหวร่างกาย ทำกิจกรรมต่างๆ ได้ เราใช้พลังงานจากที่ใด
2. น้ำตาลส่วนเกินในร่างกายเกิดได้อย่างไร

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สัปดาห์ที่ 1 ทักษะการปรับกระบวนการคิด และการตั้งเป้าหมาย

วัดอุประสงค์

1. วิเคราะห์วิธีการคิดของตนเองเกี่ยวกับโรคเบาหวาน
2. วิเคราะห์และประเมินวิธีการแก้ปัญหาของตนเองที่ผ่านมา
3. ฝึกการปรับเปลี่ยนวิธีการคิดด้านลบเป็นด้านบวกในการดูแลตนเองเกี่ยวกับโรคเบาหวานและปัญหาอื่น
4. ประเมินการจัดสรรเวลาตามบทบาทต่างๆ ในชีวิตประจำวันของตนเอง
5. ตั้งเป้าหมายในการดูแลตนเองเรื่องโรคเบาหวาน

อุปกรณ์

เอกสารกิจกรรมทักษะ 2/1 – 6/1

เวลา 1 ชั่วโมง

กิจกรรมที่ 1 การปรับกระบวนการคิด (Cognitive restructuring) 25 นาที

เอกสารทักษะ 1/1 กิจกรรมความคิด ความรู้สึก การปฏิบัติ มีความสัมพันธ์กัน (15 นาที)

อธิบายกิจกรรมเอกสารทักษะ 2/1 ให้เวลาผู้เข้าร่วมทำ หลังจากนั้นให้ผู้ช่วยเล่าแลกเปลี่ยนกันในกลุ่ม ผู้ดำเนินการสรุปและชี้ประเด็นให้เห็นถึงความสัมพันธ์ระหว่างความคิด ความรู้สึก และการปฏิบัติ

ผู้ดำเนินการสรุปว่าจากที่อภิปรายกันไปจะเห็นว่า ความคิด ความรู้สึก และการกระทำจะมีความสัมพันธ์กัน ดังนั้นถ้าเราปรับความคิดให้ตรงกับความจริง ปรับให้เป็นความคิดด้านบวก คิดในสิ่งที่จะเป็นผลดีต่อสุขภาพของเรา ความรู้สึกอึดอัด คับข้องใจ วิตกกังวล ไม่สบายใจ ของเราก็จะถูกปรับไปด้วย ซึ่งจะนำไปสู่การปรับพฤติกรรมของเราต่อไป

[illegible]

สัปดาห์ที่ 2 การรับประทานอาหาร

วัตถุประสงค์

1. ประเมินความเหมาะสมของน้ำหนักตนเอง และการใช้พลังงาน
2. เรียนรู้เรื่องการรับประทานอาหาร และการแลกเปลี่ยนอาหาร
3. อธิบายการอ่านฉลากอาหาร

อุปกรณ์

1. ตัวอย่างอาหาร ผัก ผลไม้ ข้าวไม่ขัดสี โมเดลอาหาร น้ำมันพืชไขมันอิ่มตัว และไม่อิ่มตัว
2. ตัวอย่างน้ำตาลเทียม และอาหารที่ใส่น้ำตาลเทียม ได้แก่ equal, เป๊ปซี่ไดเอ็ต, ลูกอม sugar free, ขนม sugar free
3. ตัวอย่าง ขนาดจานอาหาร แก้ว ช้อน แก้วน้ำ
4. ตัวอย่างฉลากอาหาร
5. เอกสาร 1/2 – 8/2
6. วิซีดี เรื่อง อาหารสำหรับผู้เป็นเบาหวาน

เวลา 50 นาที

วิธีการ

1. ซักถามผู้เข้าร่วมกลุ่มตามประเด็นคำถามที่เตรียมไว้ และอภิปรายร่วมกัน
2. อธิบายประเด็นความรู้ต่างๆ โดยใช้สื่อโมเดลอาหาร แจกเอกสาร หรือยกตัวอย่างประกอบ
3. ทำกิจกรรมตามเอกสารที่เตรียมไว้ให้

ให้ผู้เข้าร่วมเล่าถึงประสบการณ์การจัดการดูแลตนเองในสัปดาห์ที่ผ่านมา และสอบถามว่ามีปัญหา หรืออุปสรรคอย่างไร แลกเปลี่ยนกันภายในกลุ่ม (ใช้เวลา 10 นาที)

กิจกรรมที่ 1 อภิปรายตามประเด็นคำถาม (30 นาที)

คำถามประกอบการอภิปรายระหว่างผู้ดำเนินการและผู้เข้าร่วมกลุ่ม

1. ท่านคิดว่าขนาดรูปร่างของท่านเป็นอย่างไร (อ้วน ปกติ หรือ ผอม)
2. ท่านมีการใช้พลังงานในแต่ละวันอยู่ในระดับใด (ใช้แรงงานน้อย ปานกลาง มาก)
3. ท่านคิดว่าอาหารสุขภาพมีลักษณะอย่างไร
4. อาหารกลุ่มคาร์โบไฮเดรตได้แก่อะไรบ้าง
5. อาหารกลุ่มโปรตีนได้แก่อะไรบ้าง
6. อาหารกลุ่มไขมันได้แก่อะไรบ้าง
7. การแลกเปลี่ยนอาหารคืออะไร มีประโยชน์อย่างไร
8. ตามปกติเวลาอยู่บ้านใช้จานรับประทานอาหารขนาดเท่าใดบ้าง
9. ใครเคยอ่านฉลากอาหารบ้าง การอ่านฉลากอาหารให้ประโยชน์กับเราอย่างไร

คำถามข้อที่ 1-2 ท่านคิดว่าขนาดรูปร่างของท่านเป็นอย่างไร (อ้วน ปกติ หรือ ผอม)

ท่านมีการใช้พลังงานในแต่ละวันอยู่ในระดับใด (ใช้แรงงานน้อย ปานกลาง มาก)

การรับประทานอาหารเป็นหัวใจสำคัญของการควบคุมโรคเบาหวาน ผู้เป็นเบาหวานควรควบคุมน้ำหนักให้อยู่ในเกณฑ์ปกติ โดยประเมินจากค่าดัชนีความหนาของร่างกาย (Body Mass Index : BMI) ซึ่งมีวิธีการคำนวณดังนี้

$$\text{ค่าดัชนีความหนาของร่างกาย} = \frac{\text{น้ำหนัก (กิโลกรัม)}}{\text{ความสูง}^2 \text{ (เมตร}^2\text{)}}$$

$$\text{ค่าที่เหมาะสม} = 18.5 - 23 \text{ กิโลกรัมต่อตารางเมตร}$$

(ค่ามากกว่า 23 คือ อ้วน ค่าน้อยกว่า 18.5 คือ ผอม)

การคำนวณพลังงานที่ผู้ป่วยควรได้รับในแต่ละวันต้องประเมินจากค่าดัชนีความหนาของร่างกายผู้ป่วย และแปลผลว่าผู้ป่วยมีภาวะน้ำหนักปกติ น้ำหนักน้อย หรือน้ำหนักมากกว่าปกติ ร่วมกับประเมินลักษณะการใช้แรงงานประจำวันว่ามีการใช้แรงงานอยู่ในระดับแรงงานน้อย แรงงานปานกลาง หรือแรงงานมาก

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สัปดาห์ที่ 2 ทักษะการสื่อสาร

วัตถุประสงค์

1. วิเคราะห์ปัญหาในการสื่อสารในชีวิตประจำวัน และการสื่อสารที่มีประสิทธิภาพเกี่ยวกับโรคเบาหวาน
2. อธิบายหลักการสื่อสารที่ดี
3. อธิบายหลักการฟังที่ดี

เวลา 1 ชั่วโมง

อุปกรณ์

เอกสารกิจกรรมทักษะ 1/2 – 5/2

กิจกรรมที่ 1 อภิปรายปัญหาในการสื่อสาร

ในชีวิตประจำวันเราต้องพบปะผู้คนหลากหลายประเภท ทักษะการสื่อสารที่มีประสิทธิภาพเป็นสิ่งสำคัญ เริ่มจากการสื่อสารภายในครอบครัว ญาติพี่น้อง เพื่อนบ้าน การสื่อสารในการเลี้ยงสัตว์ เช่น งานแต่งงาน งานบวชงานขึ้นบ้านใหม่ เป็นต้น ผู้สื่อสารต้องพยายามสื่อความต้องการของตนเองออกไปให้ผู้รับสารทราบ แต่บางครั้งเกิดปัญหาในการสื่อสารทำให้ผู้ส่งสารไม่ได้รับการตอบสนองตามความต้องการของตนเอง

ปัญหาการสื่อสาร เช่น การไม่กล้าพูดปฏิเสธ ไม่รู้ว่าจะพูดอย่างไร เมื่อไปงานเลี้ยงและเพื่อนชักชวนให้ดื่มเหล้า หรือรับประทานอาหารมากเกินไป วัฒนธรรมการเกรงใจไม่กล้าปฏิเสธเจ้าของงานที่เชิญเราไป ซึ่งอาจทำให้บางครั้งขัดต่อการปฏิบัติตนในเรื่องการควบคุมเบาหวานได้ การสื่อสารในครอบครัวก็อาจพบปัญหาเช่นเดียวกันเช่น ขัดแย้งกับบุตร หรือคนในครอบครัวในเรื่องเกี่ยวกับการดูแลเรื่องโรคเบาหวาน ถ้าพูดสื่อสารไม่ดีอาจทำให้เกิดความขัดแย้งกันได้ ตัวอย่างสถานการณ์ของปัญหาในการสื่อสารที่อาจเกิดขึ้นกับท่าน (เขียนขึ้นกระดาน และสอบถามว่าเกิดกับผู้เข้าร่วมหรือไม่ หรือมีปัญหาอื่นๆที่จะเสนอ)

“เสียใจเมื่อได้ยินคนพูดว่าเป็นเบาหวานไม่ช้าก็ตาย” และไม่รู้จะพูดได้ตอบอย่างไร จึงเก็บมาเสียใจ

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สัปดาห์ที่ 3 การรับประทานยาเบาหวาน

วัตถุประสงค์

1. อธิบายการออกฤทธิ์และผลข้างเคียงของยารักษาโรคเบาหวานที่รับประทานอยู่
2. ทบทวนปัญหาของตนเองเกี่ยวกับการรับประทานยา และหาวิธีแก้ไขที่เหมาะสมกับตนเองได้
3. บอกอาการผิดปกติให้พยาบาลหรือแพทย์ทราบเมื่อไปตรวจตามนัด
4. บอกวิธีการแก้ไขเมื่อลืมรับประทานยาเบาหวาน

อุปกรณ์

1. ตัวอย่างยาเบาหวาน
2. ตัวอย่างวิธีการแก้ไขการลืมรับประทานยา เช่น กล่องใส่ยา ซองยาระบุนวันที่ เป็นต้น
3. เอกสาร 1/3 – 3/3
4. วิดีโอเรื่อง การมีชีวิตร่วมกับเบาหวานอย่างปกติสุข

เวลา 50 นาที

วิธีการ

4. ชักถามผู้เข้าร่วมกลุ่มตามประเด็นคำถามที่เตรียมไว้ และอภิปรายร่วมกัน
5. ทำกิจกรรมตามเอกสารที่เตรียมไว้ให้

ให้ผู้เข้าร่วมเล่าถึงประสบการณ์การจัดการดูแลตนเองในสัปดาห์ที่ผ่านมา และสอบถามว่ามีปัญหา หรืออุปสรรคอย่างไร แลกเปลี่ยนกันภายในกลุ่ม (ใช้เวลา 10 นาที)

กิจกรรมที่ 1 อภิปรายตามประเด็นคำถาม 40 นาที

คำถามประกอบการอภิปรายระหว่างผู้ดำเนินการและผู้เข้าร่วมกลุ่ม

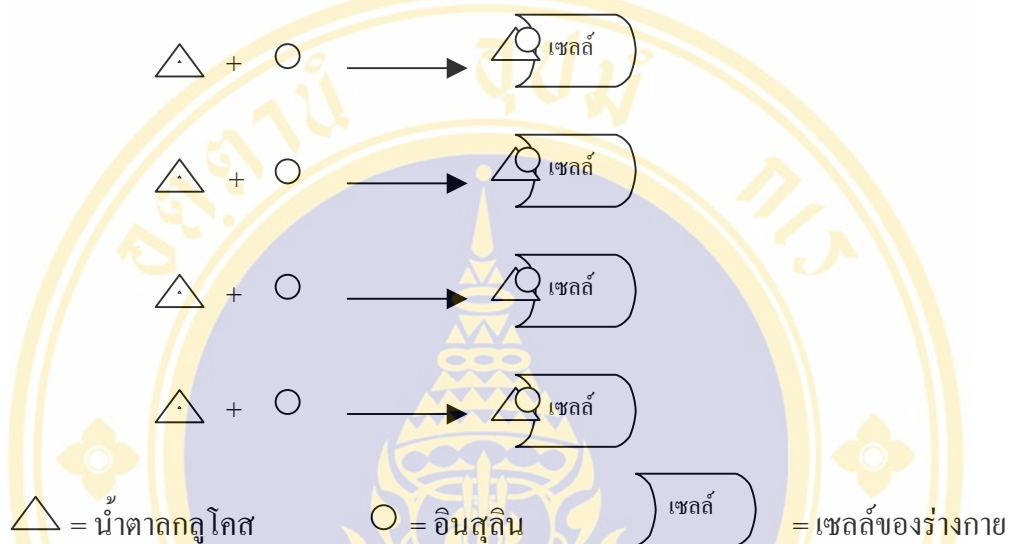
1. สอบถามผู้ป่วยว่ารับประทานยาอะไรอยู่บ้าง
2. ยาที่รับประทานอยู่มีผลต่อร่างกายอย่างไรบ้าง
3. ท่านมีปัญหาในการรับประทานยาบ้างหรือไม่อย่างไร และมีวิธีแก้ไขอย่างไร
4. ท่านมีวิธีการรักษาโรคเบาหวานวิธีอื่นหรือไม่นอกจากกินยาของโรงพยาบาล เช่น กินยาสมุนไพร

การรักษาโรคเบาหวานโดยใช้ยา

คำถามข้อที่ 1 - 2 สอบถามผู้ป่วยว่ารับประทานยาอะไรอยู่บ้าง 10 นาที

ยาที่รับประทานอยู่มีผลต่อร่างกายอย่างไรบ้าง

(แสดงภาพการออกฤทธิ์ของอินซูลิน ประกอบการอธิบาย)



คู่มือสาร 1/3 สรรพคุณของยาเบาหวาน

ยาที่ใช้รักษาผู้เป็นเบาหวานมีทั้งชนิดรับประทานและชนิดฉีด ยาชนิดรับประทานในปัจจุบันได้แก่

1. ยากลุ่มซัลโฟนิลยูเรีย (Sulfonylureas)

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สัปดาห์ที่ 3 ทักษะการแก้ปัญหา (Problem solving skill)

วัตถุประสงค์

6. อธิบายปัญหาคืออะไร
7. อธิบายกระบวนการแก้ปัญหา
8. ฝึกกิจกรรมกระบวนการแก้ปัญหา
9. วิเคราะห์และประเมินวิธีการแก้ปัญหของตนเองที่ผ่านมา

เวลา 1 ชั่วโมง

อุปกรณ์

เอกสารกิจกรรมทักษะ 1/3 – 5/3

กิจกรรมที่ 1 ปัญหาคืออะไร 10 นาที

คู่มือเอกสารทักษะ 1/3 หลัก 7 ประการของกระบวนการแก้ปัญหา

ถามผู้เข้าร่วมว่า ปัญหาคืออะไร มีใครที่เกิดมาแล้วไม่เคยมีปัญหาบ้าง

ให้ผู้เข้าร่วมอภิปรายว่าปัญหาคืออะไร ผู้ดำเนินการสรุปว่าปัญหาคืออะไรจากการอภิปรายของกลุ่ม

ผู้ดำเนินการอธิบาย หลัก 7 ประการของกระบวนการแก้ปัญหา และอภิปรายวิธีการตั้งปัญหาตามตัวอย่างในเอกสาร พิจารณาว่าตั้งปัญหาได้ถูกต้องหรือไม่ ถ้าไม่ถูกต้อง ปัญหาของการตั้งปัญหาอยู่ที่ใด

กิจกรรมที่ 2 การวิเคราะห์ปัญหา 10 นาที

คู่มือเอกสารทักษะ 2/3 และ 3/3 กระบวนการแก้ปัญหา

อธิบายกระบวนการแก้ปัญหาตามเอกสารทักษะ 2/3 และยกตัวอย่างประกอบโดยเขียนขึ้นกระดาน ให้ผู้ปวยยกตัวอย่างปัญหามา 1 ปัญหา ช่วยกันอภิปรายตามกระบวนการแก้ปัญหา

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สัปดาห์ที่ 4 การดูแลเท้า และการประเมินสุขภาพตนเอง

วัตถุประสงค์

1. อธิบายความสัมพันธ์ระหว่างระดับน้ำตาลในเลือดกับปัญหาสุขภาพอนามัยและเท้า
2. อธิบายวิธีการดูแลเท้า
3. อธิบายการดูแลตนเองเมื่อมีภาวะน้ำตาลสูงและต่ำ และในวันที่เจ็บป่วย
4. อธิบายการประเมินสุขภาพของตนเอง

อุปกรณ์

1. อุปกรณ์ตรวจเท้า ได้แก่ โมโนฟิลาเมนต์ กระจก
2. อุปกรณ์ดูแลเท้า ได้แก่ กรรไกรตัดเล็บ กะละมังล้างเท้า ฟาโน่เช็ดเท้า โลชั่น สบู่
3. อุปกรณ์ปฐมพยาบาลเบื้องต้น ได้แก่ ก๊อชทาแผล น้ำยาล้างแผล น้ำยาใส่แผล พลาสเตอร์ไมโครพอร์
4. ตัวอย่างอาหารเพื่อแก้ไขอาการน้ำตาลในเลือดต่ำ
5. เอกสาร 1/4 – 9/4
6. วีซีดีเรื่อง การดูแลเท้าในผู้เป็นเบาหวาน

เวลา 50 นาที

วิธีการ

1. ชักถามผู้เข้าร่วมกลุ่มตามประเด็นคำถามที่เตรียมไว้ และอภิปรายร่วมกัน
2. อธิบายประเด็นความรู้ต่างๆ แจกเอกสาร หรือยกตัวอย่างประกอบ
3. สาธิตการทำความสะอาดเท้า การตัดเล็บ การบริหารเท้า และปฏิบัติร่วมกัน
4. ทำกิจกรรมตามเอกสารที่เตรียมไว้ให้

การจัดสถานที่ จัดเก้าอี้เป็นวงกลม

ให้ผู้เข้าร่วมเล่าถึงประสบการณ์การจัดการดูแลตนเองในสัปดาห์ที่ผ่านมา และสอบถามว่ามีปัญหา หรืออุปสรรคอย่างไร แลกเปลี่ยนกันภายในกลุ่ม (ใช้เวลา 10 นาที)

กิจกรรมที่ 1 อภิปรายตามประเด็นคำถาม (38 นาที)

คำถามประกอบการอภิปรายระหว่างผู้ดำเนินการและผู้เข้าร่วมกลุ่ม

1. ซอกอับของร่างกายได้แก่บริเวณใดบ้าง
2. ท่านใดเคยมีการติดเชื้อในร่างกาย และเกิดบริเวณใด
3. ท่านใดมีอาการเท้าชา หรือมีประสบการณ์เป็นแผลที่เท้าบ้าง
4. ท่านดูแลเท้า และแผลที่เท้าอย่างไรบ้าง
5. ทำไมเราจึงต้องรู้จักสังเกตตนเอง
6. การสังเกตตนเองมีอะไรบ้าง
7. ท่านใดมีประสบการณ์อาการน้ำตาลสูง มีอาการและการแก้ไขอย่างไร
8. ท่านใดมีประสบการณ์อาการน้ำตาลต่ำ มีอาการและการแก้ไขอย่างไร

การรักษาสุขภาพอนามัยของร่างกายและการดูแลเท้า

ตรวจร่างกายผู้ป่วยตามซอกรักแร้ ได้ร่วมนม ตรวจเท้าผู้ป่วย

คำถามข้อที่ 1 -2 ซอกอับของร่างกายได้แก่บริเวณใดบ้าง ท่านใดเคยมีการติดเชื้อในร่างกาย และเกิดบริเวณใด

ผู้เป็นเบาหวานมีโอกาสติดเชื้อโรคได้ง่าย โดยเฉพาะเชื้อราตามซอกอับต่างๆ เนื่องจากพยาธิสภาพของโรคมีผลทำให้เม็ดเลือดขาวทำหน้าที่ต่อต้านเชื้อโรคได้ไม่ดี ผู้เป็นเบาหวานที่มีระดับน้ำตาลในเลือดสูงจะมีโอกาสติดเชื้อโรคได้ง่าย ดังนั้นจึงต้องหมั่นรักษาความสะอาดของร่างกายอย่างทั่วถึง ทำความสะอาดบริเวณรักแร้ ได้ร่วมนม ขาหนีบ อวัยวะสืบพันธุ์ และรักษาบริเวณเหล่านี้ให้แห้งอยู่ เสมอนอกจากนี้ผู้เป็นเบาหวานไม่ควรกลืนยีสสภาวะเนื่องจากมีโอกาสเกิดการติดเชื้อทางเดินปัสสาวะได้มากกว่าคนปกติ

คำถามที่ 3 ท่านใดมีอาการเท้าชา หรือมีประสบการณ์เป็นแผลที่เท้าบ้าง

ผู้เป็นเบาหวานร้อยละ 50 จะประสบปัญหาระบบประสาทส่วนปลายเสื่อมภายใน 25 ปี หลังจากเป็นโรค ทำให้รู้สึกขาบริเวณเท้าและสูญเสียความรู้สึก ก่อให้เกิดบาดแผลได้ง่าย ซึ่งลักษณะของแผลเบาหวานมักจะเป็นแผลเรื้อรัง รักษาหายยาก เนื่องจากมีความเสื่อมของหลอดเลือด

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สัปดาห์ที่ 4 ทักษะการดูแลเท้า และการประเมินตนเอง

วัตถุประสงค์

1. ฝึกปฏิบัติการดูแลเท้า
2. ฝึกบันทึกการประเมินตนเอง

เวลา

1

ชั่วโมง

อุปกรณ์

1. กระจก
2. โมนิฟิลาเมนต์
3. กรรไกรตัดเล็บ
4. กะละมังล้างเท้า
5. ฟ้านุ่มเช็ดเท้า
6. โลชั่น
7. อุปกรณ์ปฐมพยาบาลเบื้องต้น ได้แก่ ก๊อชทำแผล น้ำยาล้างแผล น้ำยาใส่แผล

พลาสติกหรือไมโครพอร์

8. เอกสารทักษะ 1/4 – 2/4

กิจกรรมที่ 1 ฝึกปฏิบัติการดูแลเท้า 45 นาที

เอกสารทักษะ 1/4 การดูแลเท้า

ฝึกปฏิบัติทำความสะอาดเท้า ตรวจเท้า ทำแผล บริหารเท้า

ผู้ดำเนินการ สาธิตการทำความสะอาดเท้า การตัดเล็บเท้า และการทำแผลให้ดู หลังจากนั้นให้ผู้เข้าร่วมลองฝึกปฏิบัติพร้อมกัน

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สัปดาห์ที่ 5 การออกกำลังกาย

วัดอุประสงค์

1. อธิบายความสำคัญของโรคเบาหวานกับการออกกำลังกาย
2. อธิบายหลักการออกกำลังกาย และการเพิ่มการเคลื่อนไหวร่างกายให้มากขึ้น

อุปกรณ์

1. เอกสาร 1/5 – 4/5
2. วิดีทัศน์เรื่อง เบาทวานกับการออกกำลังกาย

เวลา 50 นาที

วิธีการ

1. ชักถามผู้เข้าร่วมกลุ่มตามประเด็นคำถามที่เตรียมไว้ และอภิปรายร่วมกัน
2. ทำกิจกรรมตามเอกสารที่เตรียมไว้ให้

ให้ผู้เข้าร่วมเล่าถึงประสบการณ์การจัดการดูแลตนเองในสัปดาห์ที่ผ่านมา และสอบถามว่า
มีปัญหา หรืออุปสรรคอย่างไร แลกเปลี่ยนกันภายในกลุ่ม (ใช้เวลา 10 นาที)

คำถามประกอบการอภิปรายระหว่างผู้ดำเนินการและผู้เข้าร่วมกลุ่ม 40 นาที

1. การออกกำลังกายมีประโยชน์อย่างไรต่อร่างกายบ้าง
2. ท่านใดที่ออกกำลังกายบ้าง และทำอย่างไร
3. ท่านจะเพิ่มการเคลื่อนไหวร่างกายในแต่ละวันได้ด้วยวิธีใด
4. สาเหตุที่ทำให้ท่านละเลยการปฏิบัติการจัดการดูแลตนเองมีอะไรบ้าง และจะป้องกันอย่างไร

สัปดาห์ที่ 5 ทักษะการออกกำลังกาย

วัตถุประสงค์

1. ฝึกปฏิบัติการออกกำลังกาย

เวลา 1 ชั่วโมง

อุปกรณ์

ไม้พลอง หรือท่อพีวีซี สำหรับออกกำลังกายทำรำไม้พลองแม่บุญมี

ให้ผู้ป่วยสวมเสื้อผ้าที่สะดวกต่อการออกกำลังกายมาเข้าร่วมกลุ่ม

กิจกรรม

คำถาม ก่อนออกกำลังกายท่านควรมีการเตรียมตัวอย่างไร

ถ้าเกิดอาการน้ำตาลในเลือดต่ำระหว่างที่ออกกำลังกาย ท่านจะอย่างไร

สาธิตการออกกำลังกายอย่างง่าย และทำการรำไม้พลองแม่บุญมี

ปฏิบัติการออกกำลังกายร่วมกัน

สรุปกิจกรรมทั้งหมดใน 5 สัปดาห์ที่ผ่านมา สอบถามความคิดเห็น ความรู้สึกของผู้เข้าร่วม
พูดให้กำลังใจผู้เข้าร่วมในการดูแลตนเองต่อไป และรับประทานอาหารกลางวันร่วมกัน

Appendix B

The Personal Information Sheet

แบบบันทึกข้อมูลส่วนบุคคล

เลขที่ เบอร์โทรศัพท์

บ้านเลขที่

.....

คำชี้แจง กรุณาตอบแบบสอบถามเกี่ยวกับตัวท่านโดยทำเครื่องหมาย ✓ หรือเติมคำลงในช่องว่าง หน้าข้อความที่ตรงกับตัวท่าน

1. เพศ
 () ชาย () หญิง
2. อายุ ปี
3. สถานภาพการสมรส
 () โสด () คู่
 () หม้าย/หย่า/แยก
4. นับถือศาสนา
 () พุทธ () คริสต์
 () อิสลาม () อื่นๆ ระบุ
5. อาชีพ
 () รับจ้าง () ค้าขาย
 () เกษตรกร () แม่บ้าน
 () อื่นๆ ระบุ
6. การศึกษา
 () ไม่ได้เรียน () ประถมศึกษา
 () มัธยมศึกษา () ประกาศนียบัตร
 () ปริญญาตรี () สูงกว่าปริญญาตรี
7. รายได้ต่อเดือน
 () น้อยกว่าหรือเท่ากับ 5000 บาท () 5001 – 10000
 () 10001 – 20000 () 20001 – 30000
 () มากกว่า หรือเท่ากับ 30001

8. ค่ารักษาพยาบาล

- | | |
|---|--|
| ☐ เบิกได้ | ☐ ชำระค่ารักษาพยาบาลเอง |
| ☐ โครงการ 30 บาท | ☐ ประกันสังคม |
| ☐ อื่นๆ | |

9. จำนวนบุตร

- | | |
|--------------------------------|--|
| ☐ ไม่มี | ☐ มี จำนวน คน |
|--------------------------------|--|

10. ท่านสูบบุหรี่หรือไม่

- | | |
|---------------------------------|---|
| ☐ ไม่สูบ | ☐ สูบ จำนวน มวน ต่อวัน |
|---------------------------------|---|

11. ท่านดื่มสุราหรือไม่

- | | |
|----------------------------------|---|
| ☐ ไม่ดื่ม | ☐ ดื่ม ปริมาณ ต่อวัน |
|----------------------------------|---|

12. ระยะเวลาที่เป็นเบาหวาน

13. เดินทางมาโรงพยาบาลโดย

14. จำนวนสมาชิกในครอบครัว

Appendix C

The Diabetes Knowledge Scales

แบบทดสอบความรู้เรื่องโรคเบาหวาน

ข้อคำถามต่อไปนี้ มีคำตอบที่ถูกต้องเพียงข้อเดียว โปรดใส่เครื่องหมายวงกลม (O) ส้อมรอบคำตอบที่ท่าน
คิดว่าถูกต้องที่สุด

1. โรคเบาหวานเป็นโรคที่มีลักษณะอย่างไร
 - . มีน้ำตาลในเลือดสูงกว่าปกติ
 - . มีน้ำตาลในเลือดน้อยกว่าปกติ
 - . มีน้ำตาลในเลือดเท่าคนปกติ
 - . ไม่มีน้ำตาลในเลือด
2. ค่าปกติของระดับน้ำตาลในเลือดก่อนอาหารเช้า ควรจะมีค่าเท่าใด
 - . ต่ำกว่า 80 มก. เปอร์เซ็นต์
 - . 80 – 120 มก. เปอร์เซ็นต์
 - . 120 – 140 มก. เปอร์เซ็นต์
 - . มากกว่า 140 มก. เปอร์เซ็นต์
3. เมื่อตรวจไม่พบน้ำตาลในปัสสาวะหมายความว่าอย่างไร
 - . ไม่เป็นเบาหวาน
 - . น้ำตาลในเลือดต่ำกว่าปกติ
 - . น้ำตาลในเลือดอยู่ในระดับปกติ
 - . น้ำตาลในเลือดไม่สูงเกินขีดจำกัดของไต
4. อินซูลินเป็นฮอร์โมนที่สร้างมาจากอวัยวะส่วนใดของร่างกาย
 - ก. กระเพาะ
 - . ตับ
 - . ตับอ่อน
 - . ไต
5.

Appendix D

The Summary of Diabetes Self-Care Activities Measure (SDSCA)

แบบวัดกิจกรรมการดูแลตนเองในผู้เป็นเบาหวาน

ข้อคำถามต่อไปนี้ถามท่านเกี่ยวกับกิจกรรมการดูแลตนเองในช่วง 7 วันที่ผ่านมา ถ้าในช่วง 7 วันที่ผ่านมาท่านเจ็บป่วย ให้นึกย้อนหลังไปอีก 7 วัน ก่อนช่วงที่ท่านเจ็บป่วย กรุณาใส่เครื่องหมายวงกลม (O) ลงในหมายเลขที่ตรงกับจำนวนวันที่ท่านดูแลตนเอง

การรับประทานอาหาร

1. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารในปริมาณที่เหมาะสมกับผู้เป็นเบาหวาน และเหมาะกับการใช้แรงงานประจำวันของท่านกี่วัน

0 1 2 3 4 5 6 7

2. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารจิบระหว่างมื้อ กี่วัน

0 1 2 3 4 5 6 7

3. ในช่วง 7 วันที่ผ่านมาท่านกินอาหารที่มีน้ำตาลมาก เช่น น้ำหวาน หวานเย็น ผลไม้รสหวานจัด เช่น ทุเรียน มะม่วง ลำไย ลิ้นจี่ ละมุด โดยไม่คำนึงถึงปริมาณที่กินได้ กี่วัน

0 1 2 3 4 5 6 7

4. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารไขมันสูง เช่น หมูสามชั้น ขาหมู หนังเป็ด หนังไก่ กะทิ อาหารทอดต่างๆ ไข่แดง หอยนางรม ปลาหมึก กี่วัน

0 1 2 3 4 5 6 7

5. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารตรงเวลารอบ 3 มื้อ กี่วัน

0 1 2 3 4 5 6 7

6. ในช่วง 7 วันที่ผ่านมา ท่านใช้หลักการแลกเปลี่ยนอาหารในการกินอาหาร ได้กี่วัน (การแลกเปลี่ยนอาหาร เช่น กินข้าวโพด 1 ฝัก แทนการกินข้าว 2 ทัพพี กินข้าวเหนียว 1 ปั้นเท่าไข่ไก่ แทนการกินข้าว 1 ทัพพี เป็นต้น)

0 1 2 3 4 5 6 7

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Appendix E

The Diabetes Quality of Life Measure (DQOL)

แบบวัดคุณภาพชีวิตในผู้เป็นเบาหวาน

กรุณาคำถามข้อความต่อไปนี้เป็นอย่างดีพิจารณา ข้อคำถามเหล่านี้ไม่มีคำตอบถูกหรือผิด โปรดใส่เครื่องหมาย

✓ ลงในช่องที่ตรงกับระดับความรู้สึกพึงพอใจ หรือไม่พึงพอใจ กับชีวิตของท่านมากที่สุด

ข้อความ	ระดับความพึงพอใจ				
	พึงพอใจ มาก	พึงพอใจ ปานกลาง	เฉย ๆ	ไม่พึงพอใจ ปานกลาง	ไม่พึงพอใจ มาก
1. ท่านพึงพอใจกับเวลาที่ท่านใช้ในการจัดการเรื่องโรคเบาหวานในระดับใด					
2. ท่านพึงพอใจกับเวลาที่ท่านใช้ในการมาพบแพทย์เพื่อตรวจตามนัดในระดับใด					
3. ท่านพึงพอใจกับเวลาที่ท่านใช้ในการประเมินตนเองในระดับใด (ประเมินการรับประทานอาหาร อาการน้ำตาลในเลือดสูง ตรวจร่างกายตามซอกอับ)					
4. ท่านพึงพอใจกับการรักษาที่ท่านได้รับอยู่ในปัจจุบันในระดับใด					
5. ท่านพึงพอใจกับความยืดหยุ่นที่ท่านมีในการเลือกรับประทานอาหารในระดับใด					
6. ท่านพึงพอใจกับภาระจากโรคเบาหวานที่มีผลกระทบต่อครอบครัวของท่านในระดับใด					
7. ท่านพึงพอใจกับความรู้เรื่องโรคเบาหวานที่ท่านมีอยู่ในระดับใด					
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NO. 45/2004

Appendix F

Human Subjects Approval Document

**Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to
Human Experimentation
Mahidol University, Bangkok**

Title of Project: **A Self Management Program for Improving Diabetes Knowledge, Self - Care Activities, Quality of Life and Glycosylate HbA1C, among Thai Persons with Type 2 Diabetes Mellitus**

Principle Investigator: **Miss Pawana Keeratiyutawong**

Name of Institution: **Faculty of Medicine Ramathibodi Hospital**

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: 
(Professor Dr. Srisin Khusmith)

Signature of Head of Institute: 
(Professor Dr. Pornchai Matangkasombut)

Date of Approval: 18 MAY 2004

Appendix G

Cover Letter (Thai Version)

คำอธิบายแก่ผู้ยินยอมเข้าร่วมในการศึกษา (กลุ่มการจัดการตนเองดูแลตนเอง)

ชื่อผู้วิจัย กาวนา กิริยัตวศ์ เป็นนักศึกษาปริญญาเอก สาขาการพยาบาล

โครงการร่วมคณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี และคณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

หัวข้อการวิจัย ประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อ

ระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซี)

วัตถุประสงค์และวิธีการศึกษา เพื่อศึกษาถึงประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซี) เมื่อท่านเข้าร่วมในการศึกษานี้ท่านจะได้เข้ากลุ่มการจัดการดูแลตนเองสำหรับผู้เป็นเบาหวานชนิดที่ 2 ในกลุ่มการจัดการดูแลตนเองฯ จะมีผู้เป็นเบาหวานท่านอื่นเข้าร่วมด้วย กลุ่มละประมาณ 9 – 13 คน ท่านจะได้รับการสอนความรู้ และฝึกทักษะการจัดการดูแลตนเอง เกี่ยวกับเรื่องโรคเบาหวานในหัวข้อ โรคเบาหวานคืออะไร การจัดการเรื่องอาหาร การรับประทานยา การออกกำลังกาย การดูแลเท้า และการประเมินสุขภาพตนเอง รวมจำนวน 5 สัปดาห์ สัปดาห์ละ 1 ครั้ง ครั้งละ 2 ชั่วโมง โดยวันและเวลาในการทำกิจกรรมขึ้นอยู่กับตารางร่วมกันระหว่างท่านและดิฉัน ว่าท่านสะดวกวัน และเวลาใด นอกจากนี้ท่านจะได้รับการติดต่อจากดิฉันทางโทรศัพท์ จำนวน 2 ครั้ง ครั้งละประมาณ 10-15 นาที ในเดือนที่ 3 และ 5 นับจากวันที่เริ่มเข้ากลุ่มเป็นครั้งแรก โดยเมื่อดิฉันโทรศัพท์ไปหาท่าน ดิฉันจะสอบถามท่านก่อนว่าท่านสะดวกจะพูดคุยในเวลานั้นๆหรือไม่ ถ้าท่านไม่สะดวก ดิฉันจะนัดหมายเวลาที่ท่านสะดวกในการพูดคุย ระหว่างพูดคุยทางโทรศัพท์ท่านสามารถไม่พูดในประเด็นที่ท่านไม่สะดวกใจ และสามารถบอกเลิกการสนทนาได้ทุกเมื่อโดยไม่กระทบต่อการรักษา หรือกิจกรรมอื่นๆที่ท่านควรได้รับ การพูดคุยทางโทรศัพท์จะสอบถามเกี่ยวกับการจัดการดูแลตนเองของท่าน รวมทั้งปัญหาในการจัดการดูแลตนเองที่ท่านอาจประสบ เพื่อหาแนวทางปรับการจัดการดูแลตนเองที่เหมาะสมร่วมกัน

ท่านจะได้รับการตรวจค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซี) และตอบแบบสอบถามจำนวน 4 ฉบับ คือ แบบบันทึกข้อมูลส่วนบุคคล แบบทดสอบความรู้เรื่องโรคเบาหวาน แบบวัดกิจกรรมการดูแลตนเอง และแบบวัดคุณภาพชีวิตในผู้เป็นเบาหวาน จำนวน 3 ครั้ง คือ ก่อนเข้าร่วมโครงการ เดือนที่ 3 และ 6 หลังเข้าร่วมโครงการ โดยท่านไม่เสียค่าใช้จ่ายใดๆทั้งสิ้น และในวันที่ท่านมาเข้ากลุ่มการจัดการดูแลตนเองฯ นอกเหนือจากการมาตรวจตามแพทย์นัด ท่านจะได้รับค่าเดินทาง และค่าเสียเวลาการทำงาน จำนวน 150 บาท ต่อครั้ง

ประโยชน์ที่คาดว่าจะเกิดขึ้นจากการศึกษา การศึกษานี้จะช่วยส่งเสริมการดูแลตนเองของท่านเกี่ยวกับโรคเบาหวาน เพื่อประโยชน์ในการควบคุมโรคและป้องกันภาวะแทรกซ้อนของโรคเบาหวานที่อาจเกิดขึ้นในอนาคต และเป็นแนวทาง ในการจัดบริการส่งเสริมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ให้มีประสิทธิภาพต่อไป

เหตุผลที่เชิญชวนท่านเข้าร่วมในการศึกษา เนื่องจากท่านมีคุณสมบัติตรงกับกลุ่มผู้ป่วยที่ต้องการศึกษา คือ เป็นโรคเบาหวานชนิดที่ 2 ที่รักษาด้วยยาชนิดรับประทาน เป็นเบาหวานมานานน้อยกว่า 10 ปี มีอายุน้อยกว่าหรือเท่ากับ 60 ปี และมีการควบคุมระดับน้ำตาลในเลือดมากกว่า 130 มก.เปอร์เซ็นต์ หรือมีการควบคุมระดับน้ำตาลในเลือดไม่คงที่

ความเสี่ยงหรือความไม่สบายที่อาจเกิดขึ้น การศึกษานี้ไม่ก่อให้เกิดอันตราย หรือความเสียหายใดๆแก่ท่าน เป็นเพียงการตอบแบบสอบถาม และมาเข้ากลุ่มเรียนรู้การจัดการดูแลตนเอง แต่ท่านอาจต้องเสียเวลาในการมาเข้ากลุ่มการจัดการดูแลตนเอง และถูกเจาะเลือด ซึ่งการเจาะเลือดจะเจาะพร้อมกับการตรวจระดับน้ำตาลในเลือดตามปกติที่ต้องเจาะอยู่แล้ว แต่ผลการศึกษาจะเป็นประโยชน์ในการดูแลผู้เป็นเบาหวานชนิดที่ 2 ในการส่งเสริมการจัดการดูแลตนเองต่อไป

การรักษาความลับ ข้อมูลที่ได้จากแบบสอบถาม ผลการตรวจทางห้องปฏิบัติการ และการเข้ากลุ่มการจัดการดูแลตนเอง จะเก็บเป็นความลับ ไม่เปิดเผยชื่อจริงของท่าน และการนำเสนอผลการศึกษาจะนำเสนอเป็นภาพรวม ไม่ระบุชื่อของท่านในรายงานใดๆ

สิทธิในการเข้าร่วมหรือถอนตัวจากการศึกษา การตัดสินใจเข้าร่วมหรือไม่เข้าร่วมในการศึกษากครั้งนี้จะไม่มีผลกระทบต่อการรักษา และการบริการที่ท่านได้รับอยู่ตามปกติ และเมื่อท่านเข้าร่วมในการศึกษาแล้ว ท่านสามารถที่จะยกเลิกการเข้าร่วมในระหว่างที่ดำเนินการศึกษาอยู่ได้ตลอดเวลา โดยไม่มีผลกระทบใดๆต่อท่าน ถ้าท่านมีข้อสงสัยใดๆในระหว่างดำเนินการศึกษา ท่านสามารถสอบถามคืนได้ตลอดเวลา

ที่อยู่สำหรับติดต่อดิฉัน ผศ. ปาวนา กิริติยวงศ์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา ต.แสนสุข อ.เมือง จ.ชลบุรี 20000 หมายเลขโทรศัพท์ 038-745273 หรือ 06-5491853

ที่อยู่สำหรับติดต่ออาจารย์ที่ปรึกษา ศ.ดร. สมจิต หนูเจริญกุล ภาควิชาพยาบาลศาสตร์ โรงเรียนพยาบาลรามาธิบดี คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี ถ.พระราม 6 พญาไท กรุงเทพฯ 10400 หมายเลขโทรศัพท์ 02-2012013

ใบยินยอมเข้าร่วมในการศึกษา (กลุ่มการจัดการดูแลตนเอง)

การวิจัยเรื่อง ประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม(ฮีโมโกลบินเอวันซี)

วันที่ให้คำยินยอม วัน เดือน พ.ศ.....

ก่อนที่จะลงนามในใบยินยอมให้ทำการศึกษานี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการศึกษา วิธีการศึกษา ประโยชน์ที่จะเกิดขึ้นจากการศึกษา และผลกระทบที่อาจเกิดขึ้นกับข้าพเจ้า อย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบัง ซ่อนเร้น จนข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในการศึกษานี้เมื่อใดก็ได้ และเข้าร่วมการศึกษานี้โดยสมัครใจ และการบอกเลิกการเข้าร่วมการศึกษานี้ จะไม่มีผลต่อการรักษาหรือการบริการที่ข้าพเจ้าพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะเกี่ยวกับข้าพเจ้าเป็นความลับและจะเปิดเผยได้เฉพาะในรูปที่สรุปเป็นภาพรวมเท่านั้น โดยไม่ระบุชื่อของข้าพเจ้า การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความสมัครใจ

ลงนาม ผู้ยินยอม

ลงนาม พยาน

ลงนาม พยาน

คำอธิบายแก่ผู้ยินยอมเข้าร่วมในการศึกษา (กลุ่มควบคุม)

ชื่อผู้วิจัย ภาวนา กิระติยวงศ์ เป็นนักศึกษาปริญญาเอก สาขาการพยาบาล

โครงการร่วมคณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี และคณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

หัวข้อการวิจัย ประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อ

ระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซ์)

วัตถุประสงค์และวิธีการศึกษา เพื่อศึกษาถึงประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซ์) เมื่อท่านเข้าร่วมในการศึกษาครั้งนี้ท่านจะได้รับ “ชุดความรู้สำหรับผู้เป็นเบาหวาน 1 ชุด ซึ่งประกอบด้วยเล่มย่อยจำนวน 10 เล่ม” โดยชุดความรู้นี้มีเนื้อหาเกี่ยวกับโรคเบาหวาน การดูแลตนเองในด้านอาหาร การออกกำลังกาย การดูแลเท้า การรับประทานยา และการประเมินตนเอง และเมื่อท่านมารับการตรวจตามแพทย์นัดตามปกติ ท่านจะได้รับความรู้เกี่ยวกับการดูแลตนเองเรื่องโรคเบาหวานโดยพยาบาลที่ดูแลคลินิกโรคเบาหวานในระหว่างเวลา 9-10 น. ซึ่งเป็นบริการของคลินิกโรคเบาหวานตามปกติ พร้อมทั้งชมวีซีดีเกี่ยวกับโรคเบาหวานที่พยาบาลประจำคลินิกจัดให้ นอกจากนี้ ท่าน จะได้รับการติดต่อจากคณินทางโทรศัพท์จำนวน 3 ครั้ง ครั้งละประมาณ 10-15 นาที ในเดือนที่ 1, 3, และ 5 นับจากวันที่ยินยอมเข้าร่วมในการศึกษา โดยเมื่อคณินทางโทรศัพท์ไปหาท่าน คณินจะสอบถามท่านก่อนว่าท่านสะดวกจะพูดคุยในเวลานั้นๆหรือไม่ ถ้าท่านไม่สะดวก คณินจะนัดหมายเวลาที่ท่านสะดวกในการพูดคุย ระหว่างพูดคุยทางโทรศัพท์ท่านสามารถไม่พูดในประเด็นที่ท่านไม่สะดวกใจ และสามารถบอกเลิกการสนทนาได้ทุกเมื่อโดยไม่กระทบต่อการรักษา หรือกิจกรรมอื่นๆที่ท่านควรได้รับ การพูดคุยทางโทรศัพท์ คณินจะบอกผลการตรวจทางห้องปฏิบัติการ และเตือนเรื่องการมาตรวจตามนัด

ท่านจะได้รับการตรวจค่าน้ำตาลสะสม (ฮีโมโกลบินเอวันซ์) และตอบแบบสอบถามจำนวน 4 ฉบับ คือ แบบบันทึกข้อมูลส่วนบุคคล แบบทดสอบความรู้เรื่องโรคเบาหวาน แบบวัดกิจกรรมการดูแลตนเอง และแบบวัดคุณภาพชีวิตในผู้เป็นเบาหวาน จำนวน 3 ครั้ง คือ ก่อนเข้าร่วมโครงการ เดือนที่ 3 และ 6 หลังเข้าร่วมโครงการ โดยท่านไม่เสียค่าใช้จ่ายใดๆทั้งสิ้น

ประโยชน์ที่คาดว่าจะเกิดขึ้นจากการศึกษา การศึกษานี้จะช่วยส่งเสริมการดูแลตนเองของท่านเกี่ยวกับโรคเบาหวาน เพื่อประโยชน์ในการควบคุมโรคและป้องกันภาวะแทรกซ้อนของโรคเบาหวานที่อาจเกิดขึ้นในอนาคต และเป็นแนวทางในการจัดบริการส่งเสริมการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ให้มีประสิทธิภาพต่อไป

เหตุผลที่เชิญชวนท่านเข้าร่วมในการศึกษา เนื่องจากท่านมีคุณสมบัติตรงกับกลุ่มผู้ป่วยที่ต้องการศึกษาคือเป็นโรคเบาหวานชนิดที่ 2 รักษาด้วยยาชนิดรับประทาน เป็นเบาหวานมานาน้อยกว่า 10 ปี มีอายุน้อยกว่า 60 ปี และมีการควบคุมระดับน้ำตาลในเลือดมากกว่า 130 มก.เปอร์เซ็นต์ หรือมีการควบคุมระดับน้ำตาลในเลือดไม่คงที่

ความเสี่ยงหรือความไม่สบายที่อาจเกิดขึ้น การศึกษานี้ไม่ก่อให้เกิดอันตราย หรือความเสียหายใดๆแก่ท่าน นอกจาก ท่านอาจต้องเสียเวลาบ้างในการตอบแบบสอบถาม และการถูกเจาะเลือด ซึ่งการเจาะเลือดจะเจ็บพร้อมกับ การตรวจระดับน้ำตาลในเลือดตามปกติที่ท่านต้องเจาะอยู่แล้ว แต่ผลการศึกษาจะเป็นประโยชน์ในการดูแลผู้เป็นเบาหวานชนิดที่ 2 ในการส่งเสริมการจัดการดูแลตนเองต่อไป

การรักษาความลับ ข้อมูลที่ได้จากแบบสอบถาม ผลการตรวจทางห้องปฏิบัติการ และการเข้ากลุ่มการจัดการดูแลตนเองฯ จะเก็บเป็นความลับ ไม่เปิดเผยชื่อจริงของท่าน และการนำเสนอผลการศึกษานำเสนอเป็นภาพรวม ไม่ระบุชื่อของท่านในรายงานใดๆ

สิทธิในการเข้าร่วมหรือถอนตัวจากการศึกษา การตัดสินใจเข้าร่วมหรือไม่เข้าร่วมในการศึกษารั้งนี้จะไม่มีผลกระทบ ต่อการรักษา และการบริการที่ท่านได้รับอยู่ตามปกติ และเมื่อท่านเข้าร่วมในการศึกษาแล้ว ท่านสามารถที่จะยกเลิกการเข้าร่วมในระหว่างที่ดำเนินการศึกษาอยู่ได้ตลอดเวลา โดยไม่มีผลกระทบใดๆต่อท่าน ถ้าท่านมีข้อสงสัยใดๆในระหว่างดำเนินการศึกษา ท่านสามารถสอบถามดิฉันได้ตลอดเวลา

ที่อยู่สำหรับติดต่อดิฉัน ผศ. ภาวนา กิริติยวงศ์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา
ต.แสนสุข อ.เมือง จ.ชลบุรี 20000 หมายเลขโทรศัพท์ 038-745273 หรือ 06-5491853

ที่อยู่สำหรับติดต่ออาจารย์ที่ปรึกษา ศ.ดร.สมจิต หนูเจริญกุล ภาควิชาพยาบาลศาสตร์ โรงเรียนพยาบาลรามาธิบดี
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หมายเลขโทรศัพท์ 02-2012013

ใบยินยอมเข้าร่วมในการศึกษา (กลุ่มควบคุม)

การวิจัยเรื่อง ประสิทธิภาพของโปรแกรมการจัดการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ต่อระดับความรู้ กิจกรรมการดูแลตนเอง คุณภาพชีวิต และค่าน้ำตาลสะสม(ฮีโมโกลบินเอวันซี)

วันที่ให้คำยินยอม วันที่ เดือน พ.ศ.

ก่อนที่จะลงนามในใบยินยอมให้ทำการศึกษา ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการศึกษา วิธีการศึกษา ประโยชน์ที่จะเกิดขึ้นจากการศึกษา และผลกระทบที่อาจเกิดขึ้นกับข้าพเจ้า อย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบัง ซ่อนเร้น จนข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในการศึกษานี้เมื่อใดก็ได้ และเข้าร่วมการศึกษานี้โดยสมัครใจ และการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลต่อการรักษาหรือการบริการที่ข้าพเจ้าพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะเกี่ยวกับข้าพเจ้าเป็นความลับและจะเปิดเผยได้เฉพาะในรูปที่สรุปเป็นภาพรวมเท่านั้น โดยไม่ระบุชื่อของข้าพเจ้า การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความสมัครใจ

ลงนาม ผู้ยินยอม

ลงนาม พยาน

ลงนาม พยาน

Appendix H

Comparison of Demographic Data between the Subjects who Maintained Participation and who Dropped Out with Mann-Whitney U test and Independent *t* test

Demographic Data	Agreed & refused to participated (N = 81, 22)			Self-management group & Dropped out (n = 40, 5)			Control group & Dropped out (n = 41, 4)		
	Mann-Whitney U	Z	<i>p</i> > .05	Mann-Whitney U	Z	<i>p</i> > .05	Mann-Whitney U	Z	<i>p</i> > .05
Sex	781.50	-1.203	.229	82.50	-.849	.396	58.00	-1.249	.212
Marital status	809.5	-.834	.404	94.00	-.263	.793	54.00	-1.408	.159
Religion	869.00	-.741	.459	97.50	-.354	.724	80.00	-.312	.755
Education	742.50	-1.644	.100	87.00	-.609	.543	66.00	-.822	.411
Occupation	-	-	-	62.50	-1.44	.150	57.50	-1.035	.301
Income	-	-	-	69.00	-1.207	.227	50.00	-1.501	.133
Payment	-	-	-	97.00	-.125	.900	72.00	-.464	.643
Smoking	-	-	-	90.00	-.663	.507	76.00	-.554	.580
Drinking	-	-	-	72.50	-1.582	.114	73.5	-.540	.589
Age (<i>t</i> test)	<i>t</i> = .493 <i>p</i> = .623			<i>t</i> = 1.117, <i>p</i> = .270			<i>t</i> = .728, <i>p</i> = .471		

Appendix I

Comparison of the Mean Dependent Variables between the Subjects who Maintained Participation and who Dropped Out with Independent *t* test

Dependent Variables	n	M	SD	<i>t</i>	<i>p</i> > .05
Knowledge					
Self-management group	40	21.50	5.32	.358	.722
Withdrew subjects	5	20.60	5.18		
DSCA					
Self-management group	40	88.33	19.09	-1.150	.271
Withdrew subjects	5	93.40	7.20		
DQOL					
Self-management group	40	71.27	10.48	-.477	.636
Withdrew subjects	5	73.57	6.62		
GHb					
Self-management group	40	8.93	2.38	.347	.730
Withdrew subjects	5	8.54	1.87		
Knowledge					
Control group	41	21.10	6.01	.067	.951
Withdrew subjects	4	20.75	10.24		
DSCA					
Control group	41	88.56	16.54	.862	.393
Withdrew subjects	4	81.25	10.47		
DQOL					
Control group	41	69.79	9.44	.381	.705
Withdrew subjects	4	67.86	12.44		
GHb					
Control group	41	7.89	1.77	-.091	.928
Withdrew subjects	4	7.98	0.99		

Appendix J

Descriptive Statistics the Mean Dependent Variables of the Self-Management and Control Groups at 3 Time Points

Variables	n	Baseline			3 months			6 months		
		Mean (SD)	Max	Min	Mean (SD)	Max	Min	Mean (SD)	Max	Min
Knowledge										
Self-management group	40	21.5 (5.32)	29.00	7.00	26.78 (4.31)	33.00	16.00	27.3 (3.86)	34.00	17.00
Control group	41	21.10 (6.01)	31.00	7.00	22.68 (5.54)	31	8	22.71 (6.00)	31	6.00
DSCA										
Self-management group	40	88.33 (19.09)	126.00	42.00	102.68 (16.11)	128.00	59.00	101.56(16.25)	128.00	61.00
Control group	41	88.56 (16.54)	113.00	32.00	90.05 (13.47)	120	52	93.02 (13.64)	116	50.00
Foot care										
Self-management group	40	27.20 (9.85)	35	0	31.43 (5.40)	35	11	31.08 (6.35)	35	13
Control group	41	29.05 (7.92)	35	2	29.78 (7.14)	35	8	31.54 (5.63)	35	7
Medication-taking										
Self-management group	40	12.45 (3.01)	14	2	12.50 (2.95)	14	0	12.58 (2.27)	14	7
Control group	41	12.00 (2.84)	14	0	11.76 (2.49)	14	5	10.78 (3.36)	14	0

Descriptive Statistics of Dependent Variables of the Self-Management and Control Groups at 3 Time Points
(Continued)

Variables	n	Baseline			3 months			6 months		
		Mean (SD)	Max	Min	Mean (SD)	Max	Min	Mean (SD)	Max	Min
DQOL										
Self-management group	40	71.27(10.48)	93.60	48.60	78.45 (8.45)	93.60	54.30	76.09 (7.93)	88.60	57.90
Control group	41	69.79 (9.44)	89.30	53.60	69.81 (10.15)	90.0	49.7	71.24 (9.02)	86.4	49.30
GHB										
Self-management group	40	8.93 (2.38)	17.6	5.9	8.22 (1.59)	13.8	5.7	8.56 (1.63)	12.7	6.1
Control group	41	7.89 (1.77)	12.00	5.30	8.09 (1.71)	14.3	5.1	8.29 (1.62)	12.6	5.60

Appendix K

Distribution of Dependent Variables of the Self-Management and Control Groups

Dependent Variables	Mean	Median	Mode	Skewness	Kurtosis	Shapiro-Wilk (<i>p</i>)	Skewness/Std.Error	Kurtosis/Std.Error
Self-management group (n = 40)								
Knowledge	21.50	23.00	23.0	-.743	.103	.036	-1.980	.140
DSCA	88.33	91.00	126.0	-.320	-.316	.568	-.855	-.431
Diet	30.68	31.50	42.0	-.617	.122	.066	-1.649	.166
Exercise	7.05	7.00	14.0	.136	-.745	.045	.363	-1.016
Self-monitoring	10.95	11.00	21.0	-.027	-.764	.251	-.072	-1.042
Foot care	27.20	31.00	35.0	-1.334	.785	.010	-3.566*	1.070
Medication-taking	12.45	14.00	14.0	-2.430	5.927	.010	-6.497*	8.085*
DQOL	71.27	70.00	67.1	-.143	-.016	.535	-.382	-0.021
GHb	8.93	8.25	6.6	1.519	3.380	.01	4.060*	4.600*
Transform GHb	2.16	2.11	2.1	.704	.594	.272	1.880	.810
Control group (n = 41)								
Knowledge	21.10	22.00	22.0	-.663	-.001	.093	-1.790	-.001
DSCA (n = 41)	88.56	89.00	113.0	-1.099	2.514	.010	-2.978*	3.472*

Distribution of Dependent Variables of the Self-management and Control groups (Continued)

Dependent Variable	Mean	Median	Mode	Skewness	Kurtosis	Shapiro-Wilk (<i>p</i>)	Skewness/Std.Error	Kurtosis/Std.Error
DSCA (n = 40)	89.98	89.00	113.0	-.40	.415	.266	-1.069	.566
Diet	30.17	30.00	49.0	.241	.179	.581	.653	.247
Exercise	6.85	6.00	14.0	.468	-.779	.010	1.268	-1.075
Self-monitoring	10.49	12.00	19.0	-.211	-.880	.031	-.571	-1.215
Foot care	29.05	32.00	35.0	-1.581	2.315	.010	-4.284 *	3.197*
Medication-taking	12.00	13.00	14.0	-2.237	6.943	.010	-6.062 *	9.589*
DQOL	69.79	70.00	74.3	.199	-.707	.319	.590	-.970
GHb	7.33	7.60	6.6	.629	-.317	.039	1.704	-.437
Transform GHb	2.04	2.03	2.1	.227	-.692	.287	.610	-.955

*Skewness/Std error values above +1.96 or below -1.96 are significant at the .05 level, *p* value < .05, not normal distribution

**Skewness/Std error values above +2.58 or below -2.58 are significant at the .001 level, *p* value < .01 not normal distribution
p value > .05 or *p* value > .01, normal distribution

Appendix L

Comparison the Mean Dependent Variables at 3 Time Points with Independent *t*-test

Variables	n	Baseline			3 months			6 months		
		Mean (SD)	<i>t</i>	<i>p</i>	Mean (SD)	<i>t</i>	<i>p</i>	Mean (SD)	<i>t</i>	<i>p</i>
Knowledge										
Self-management group	40	21.5 (5.32)	.32	.751	26.78 (4.31)	3.70	.000*	27.3 (3.86)	4.08	.000*
Control group	41	21.09 (6.01)			22.68 (5.54)			22.71 (6.00)		
DSCA										
Self-management group	40	88.33 (19.09)	-.06	.953	102.68 (16.11)	3.83	.000*	101.56(16.25)	2.57	.012*
Control group	41	88.56 (16.54)			90.05 (13.47)			93.02 (13.64)		
Diet										
Self-management group	40	30.68 (6.63)	.319	.751	33.45 (7.01)	1.44	.154	32.45 (6.95)	.651	.517
Control group	41	30.17 (7.57)			31.39 (5.83)			31.54 (5.63)		
Exercise										
Self-management group	40	7.05 (4.16)	.213	.832	8.75 (4.14)	3.15	.002*	8.43 (3.99)	2.53	.013*
Control group	41	6.85 (4.14)			6.12 (3.33)			6.24 (3.71)		

* Significant at $p < .05$

Comparison of the Mean Dependent Variables at 3 Time Points with Independent *t*-test (Continued)

Variables	n	Baseline			3 months			6 months		
		Mean (SD)	<i>t</i>	<i>p</i>	Mean (SD)	<i>t</i>	<i>p</i>	Mean (SD)	<i>t</i>	<i>p</i>
Self monitoring subscale										
Self-management group	40	10.95 (5.98)	.40	.689	16.55 (4.57)	5.46	.000*	17.05 (4.11)	4.53	.000*
Control group	41	10.49 (4.25)			11.00 (4.57)			12.93 (4.08)		
Foot care										
Self-management group	40	27.20 (9.85)	-.93	.354	31.43 (5.40)	1.17	.247	31.08 (6.35)	-.35	.730
Control group	41	29.05 (7.92)			29.78 (7.14)			31.54 (5.63)		
Medication-taking										
Self-management group	40	12.45 (3.01)	.69	.491	12.50 (2.95)	1.23	.223	12.58 (2.27)	2.82	.006*
Control group	41	12.00 (2.84)			11.76 (2.49)			10.78 (3.36)		
DQOL										
Self-management group	40	71.27(10.48)	.67	.507	78.45 (8.45)	4.16	.000*	76.09 (7.93)	2.57	.012*
Control group	41	69.79 (9.44)			69.81 (10.15)			71.24 (9.02)		
GHb										
Self-management group	40	8.95 (2.38)	2.22	.029*	8.22 (1.59)	.360	.720	8.56 (1.63)	.747	.458
Control group	41	7.89 (1.77)			8.09 (1.71)			8.29 (1.62)		

* Significant at $p < .05$

Appendix M

Lists of Experts for Back-Translation and Assessment Cultural Appropriate of the Instruments

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