THE FEASIBILITY OF USING SELF-CARE PACKAGES TO INCREASE KNOWLEDGE AND IMPROVE SELF-CARE BEHAVIOR OF PERSONS WITH DIABETES MELLITUS

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THE FEASIBILITY OF USING SELF-CARE PACKAGES TO INCREASE KNOWLEDGE AND IMPROVE SELF-CARE BEHAVIOR OF PERSONS WITH DIABETES MELLITUS

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ABSTRACT

This pre-experimental research, one-group pretest- posttest design tested the feasibility of using self-care packages to increase knowledge and improve self- care behavior of persons with type 2 diabetes. Random sampling was used to select 80 persons with diabetes from the Outpatient Department, Nongbua Hospital, Nakhon Sawan Province. Self-care packages containing information about diabetes and self-care behavior were distributed to participants by CD-ROM and booklets, for 8 small groups meeting consisted of 8-11 persons per group. These self-care packages were followed by individual reminders to read the booklets and encourage participants to continue self-care behavior every week, for six weeks. Diabetic knowledge and self-care behavior were assessed before and after using the self-care packages, for eight weeks. The data were analyzed using descriptive statistics and Paired t-test.

The findings revealed that after using the self-care packages persons with diabetes had their knowledge on diabetes and self-care behavior significantly increased ($p < .0001$). Also, the persons with diabetes had the mean score of the quality of self-care packages in each items at good level. Furthermore, it was found that all persons with diabetes had read all booklets averaging twice.

This study indicated that the self-care packages could be used with persons with type 2 diabetes because it positively increased knowledge and improved self-care behavior. However, health care providers may combine it with other strategies such as telephone to help effort patients to maintain their self-care.

KEY WORDS: BOOKLETS / CD-ROM / DIABETES MELLITUS / KNOWLEDGE / SELF-CARE

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ความเป็นไปได้ในการใช้สื่อส่งเสริมการดูแลตนเองเพื่อเพิ่มความรู้และปรับปรุงพฤติกรรมการดูแลตนเองในผู้เป็นเบาหวาน (THE FEASIBILITY OF USING SELF-CARE PACKAGES TO INCREASE KNOWLEDGE AND IMPROVE SELF-CARE BEHAVIOR OF PERSONS WITH DIABETES MELLITUS)

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บทคัดย่อ

การศึกษาครั้งนี้เป็นการวิจัยก่อนทดลอง มีวัตถุประสงค์เพื่อทดสอบความเป็นไปได้ในการใช้สื่อส่งเสริมการดูแลตนเองเพื่อเพิ่มความรู้และปรับปรุงพฤติกรรมการดูแลตนเองในผู้เป็นเบาหวาน กลุ่มตัวอย่างคือผู้เป็นเบาหวานประเภทที่ 2 ซึ่งมารับบริการที่แผนกผู้ป่วยนอก โรงพยาบาลหนองบัว จังหวัดนครสวรรค์ คัดเลือกโดยการสุ่มแบบง่าย จำนวน 80 คน รูปแบบการใช้สื่อส่งเสริมการดูแลตนเองแบ่งออกเป็น การประชุมกลุ่ม 1 ครั้ง โดยจัดกลุ่มตัวอย่างเป็น 8 กลุ่มย่อย กลุ่มละ 8-11 คน เพื่อชมวีดีทัศน์วันละ 1 กลุ่ม หลังจากชมวีดีทัศน์รับหนังสือคู่มือกลับไปอ่านทบทวนที่บ้าน และนัดกลุ่มตัวอย่างมาพบอีกครั้งในสัปดาห์ที่ 8 ระหว่างที่ผู้เป็นเบาหวานอยู่บ้านในสัปดาห์ที่ 2 - 7 ผู้วิจัยจะส่งไปรษณียบัตรเพื่อกระตุ้นและสนับสนุนให้กำลังใจในการอ่านหนังสือคู่มือสัปดาห์ละครั้ง ประเมินความรู้และพฤติกรรมการดูแลตนเองของผู้เป็นเบาหวาน 2 ครั้งก่อนและหลังการใช้สื่อส่งเสริมการดูแลตนเอง วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและ Paired t-test

ผลการวิเคราะห์ข้อมูล พบว่า หลังจากการใช้สื่อส่งเสริมการดูแลตนเอง ผู้เป็นเบาหวานมีความรู้เกี่ยวกับโรคเบาหวานและมีพฤติกรรมการดูแลตนเองเพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ ($p < .0001$) ผู้เป็นเบาหวานมีคะแนนเฉลี่ยของความคิดเห็นต่อสื่อส่งเสริมการดูแลตนเองทุกข้อคำถามอยู่ในระดับดี นอกจากนี้พบว่าผู้เป็นเบาหวานทุกคนอ่านหนังสือคู่มือครบทุกเล่ม โดยเฉลี่ยอ่านคนละ 2 รอบ

จากการวิจัยในครั้งนี้ชี้ให้เห็นว่า สื่อส่งเสริมการดูแลตนเองมีความเป็นไปได้ในการนำไปใช้ในการส่งเสริมการดูแลตนเองในผู้เป็นเบาหวาน การติดตามสนับสนุนและให้กำลังใจด้วยวิธีต่างๆ โดยพยาบาลเป็นสิ่งจำเป็นเพื่อกระตุ้นและส่งเสริมให้ผู้เป็นเบาหวาน มีการดูแลตนเองได้อย่างถูกต้องและต่อเนื่อง

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CHAPTER I
INTRODUCTION

Background and Significance of the Study

Diabetes mellitus is a significant health problem in the world. The World Health Organization (WHO) has estimated that every year there will be approximately eight millions new persons with diabetes. (Leslie, Joel, Julia, and Neal, 2001). The total number of persons with diabetes around the world in the year 2000 was approximately 150 million. It will be more than double in the year 2025 (World Health Organization, 1997 cited by Katarina, Esther, Grace, and John, 2003) and will be increasing to 370 million in the year 2030 (World Health Organization, 2003).

The prevalence of diabetes is also increase among Thai people. It is found that 6% of them have diabetes (Himathongkam, 2002). The results from surveys in 1998-2001 showed that the number of persons with diabetes would rise from 97,564 to 151,115. The World Health Organization had estimated that the number of Thai people with diabetes will be increasing from 1,923,000 in the year 2025 to 2,912,626 in the year 2030 (Chuprapawan, 2000; World Health Organization, 2003).

The situation in Nakhon Sawan Province the number of persons with diabetes was increasing from 3,350 in the year 2001 to 5,359 in the year 2004 (Nakhon Sawan Provincial Public Health Office, 2004). The morbidity and mortality rate of diabetes mellitus was also increasing as shown in Table 1.

Table 1 Morbidity and Mortality Rate of Diabetes Mellitus Each Year in Nakhon Sawan Province

Year	Number	Morbidity Rate / 100,000	Mortality Rate/ 100,000
2001	3,350	297.66	6.04
2002	4,382	388.24	12.58
2003	4,898	432.68	13.52
2004	5,359	475.08	14.26

Source: Nakhon Sawan Public Health Provincial Record

Nongbua Hospital is a community hospital with 60 beds with Diabetic Clinic services three days a week, Wednesday, Thursday, and Friday. From the Diabetic Clinic record, it was found that the numbers of persons with diabetes are increasing each year. The incidence rate in 2002, 2003, and 2004 was increasing from 719, 783, and 817, respectively.

At present, despite rapid progress in medicine, new technology, and various strategies to help the persons with diabetes for control their disease, it has found that there are only 3 % of persons with diabetes mellitus could control their blood glucose at normal levels (blood glucose at normal level is lower than 126 milligram/ deciliter). If they can not control their blood glucose at normal levels, they will have complications. The complications of type 2 diabetes categorized as acute and chronic complications. Acute complications include hyperglycemia and hyperosmolar nonketotic coma. Chronic complications categorized as microvascular and macrovascular problems which affect almost all organs. The chronic hyperglycemia of diabetes mellitus is associated with long term damage, dysfunction, and failure of various organs including retinopathy, nephropathy, neuropathy, and automatic neuropathy causing gastrointestinal, genitourinary and cardiovascular symptoms and sexual dysfunction. Diabetes carries an increased risk for heart attack, stroke, and complications related to poor circulation (The American Diabetes Association, 2000). In the year 1995, a survey in Center Hospital revealed that 50% of persons with

diabetes were unable to control their blood glucose levels, causing hypertension 38.4%, ischemic hearth disease 2.8%, and paralysis 3.7% (Chuprapawan, 2000).

The above complications affect the value and self-image of persons with diabetes. They feel lack of independence, self-confidence and self-esteem; especially the younger that has physical effect will be suffered more than elder (Marcus, Wing, and Gaure, 1992). Not only the persons with diabetes but also their family will suffer both physically and mentally. They have to pay a lot of money in dealing with the disease. From the study of Rattanaphitak (1992) it was found that the persons with diabetes and their families had to pay 5,582 baht/year/person. The study of Provincial Hospital Division in the year 1997 was found that diabetes patients with complications had to be admitted in hospital about 1 to 3 times/person/month and paying average 1,670.09 baht on admission. The expenses of persons with diabetes in Thailand are 4-5 % of direct treatment or about 12,500 million baht/year (Chuprapawan, 2000). This clearly indicates that diabetes mellitus and its complications can cause tremendous harms in persons with diabetes, their families, and society at large.

Most complications are preventable with self-care behavior by maintaining normal blood glucose levels. The goal of treatment is to control the blood glucose at a normal level or close to normal level. It can prevent, decrease, or slow down the onset of complications (Nithiyanant, 1987; The Diabetes Control and Complications Trial Research Group, 1993; Himathongkum, 2002). The United Kingdom Prospective Diabetes Study (UKPDS) of persons with type 2 diabetes mellitus showed that the improvement of blood glucose control decreased the HbA1c and lead to a 35 % reduction in the risk of microvascular complications (The American Diabetes Association, 2000). Persons with diabetes need to take good care of themselves when it comes to eating, exercising, taking medicine, taking care of their health in general, and self- monitoring. This requires continuous and effective care on part of them. In addition, persons with diabetes need to be truly knowledgeable about disease, understand the information and treatment necessary for goal setting, and seek knowledge to choose appropriate activities in adjusting their daily living. Therefore, nurses need to promote patients' self-care ability by involving them in performing self-care as necessary (Hanucharurnkul, 2001).

In Thailand, a number of research projects have been established to develop a nursing intervention to help persons with diabetes take care of themselves and control their blood glucose level such as teaching, recommendations, promotion and creation of the environment which will enhance the knowledge. There were several teaching package consisted of various media such as videos, slides, booklets, pamphlets, posters, and flip charts. The media are very important for delivery of knowledge to persons with diabetes. However, there are some limitations in applying the teaching package in clinical practice. Such interventions are complicate; the difficulties are due to inadequate staffing or less practice for rural community health care setting due to limitation of time, experienced health care provider, and budget. Moreover, many studies used at least two teaching media. Likitratcharoen (2000) studied of supportive-educative intervention research for persons with diabetes in Thailand form 1997 to 1999. From 57 studies, the results found that the most of researches (56.14%) used mixes teaching media, most media (63.13%) used booklets, follow by videos (33.33%) and flip charts (15.79%). A considerable amount of teaching media produced by several experts and educators was available to provide education for persons with diabetes, particularly booklets and teaching package. They have been less widely used in remote area due to problems of accessibility, insufficient time for staff to produce their own teaching media and discontinuity. Furthermore, the content was not covering all aspects of diabetes knowledge. Teaching media includes specific topic such as diabetic foot-care or dietary control. Such teaching package was complicated interventions, requires more time, and need more effort to join the intervention. For example; the study of Tantayutai (1997) studied the development of self-care agency model in insulin dependent persons with diabetes. The knowledge delivery was done through an individual and a group. The teaching as a group was carried out by a doctor in 4 subjects as general knowledge about diabetes, medicines used in treatment of diabetes, monitoring of blood glucose level, and what to do when becoming ill; one subject was taught by a nurse as self-care when becoming the persons with diabetes; one subject was taught by a dietician as dietary control. There was also one assistant nurse for the group arrangement, preparation of a venue and teaching equipments. For individual teaching, it is responsible by a nurse and dietician. The teaching media were pamphlets, food exchange menu and recording book for each person. It was found that

persons with diabetes's perception in self-care ability, dietary control, and insulin injection were statistically significant higher than at the beginning of the research. In this study, a group teaching could not be carried out due to a problem about the time and place. Besides, the samples were not convenient to join the group as they had to attend their family affairs, educations, or works.

It is necessary to create strategies providing interventions within the economic constrains on the health care system and the time restrictions of most health care providers. This research used teaching packages, which was consisted of CD-ROM and booklets. CD-ROM is most popular electronic equipments at present due to many advantages as it can give both vision and sound at the same times. It is easy to operate and can be distributes each time to large number of audiences. The persons with diabetes will receive the experience closet to the actual conditions. But CD-ROM has a limitation in its production cost, and equipments to transmit the information, such as CD-ROM player and television or a computer. The CD-ROM is most used in the offices of public health services. So, the researcher used the booklets to support of this knowledge delivery. Booklets are most popular also as they are easy to understand and can be self-study. They can be brought to study at home and no limit in reading time. Furthermore, the booklets are economical to produce but worthy as they can be re-read any times, helping the persons with diabetes receives a complete knowledge about diabetes. The effectiveness of these self-care packages has not been assessed about the quality to use in persons with diabetes. So, the researcher was interested in the feasibility of using self-care packages, CD-ROM and booklets, to increase knowledge and improve self-care behavior of persons with diabetes mellitus. These self-care packages were not complicated, requires less time, budget and effort because persons with diabetes can study by themselves or with assistance from their caregivers in their home. In addition, the researcher continued follow-up via postcards to the persons with diabetes every week to remind them in reading booklets and encourage them for continuing self-care behavior.

Research Questions

Are self-care packages feasible to use in persons with diabetes to increase knowledge and improve self-care behavior?

Research Objectives

1. To assess the quality of self-care packages which evaluate by the persons with diabetes.
2. To assess the frequency of reading the booklets of the persons with diabetes.
3. To compare the knowledge and self-care behavior of persons with diabetes before and after using self-care packages.

Conceptual Framework

This study was guided by Orem's conceptual model of nursing which included three related theories: theory of self-care, theory of self-care deficit, and theory of nursing system (Orem, et al., 2001).

Self-care is the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being (Orem, et al., 2001). Orem refers to self-care as the deliberate action, which are performed by individual human beings who have intentions and are conscious of their intentions to being about, through their actions, conditions or state of affairs that do not exist at present. There are two phases of action: one is represented as an investigative and estimative phase ending with judgments about situational variables subject to regulation and conditions of actions; the other is represented as proceeding from decisions about ends to be sought and the actions required to use the means to achieve the end, to production action sequence designed to achieve the end sought. The end sought is also called self-care requisites.

Self-care requisites are expressions of the purposes that individuals should have when they engage in self-care. Self-care requisites were consisting of three of self-care requisites; universal self-care requisites, developmental self-care requisites, and health-deviation self-care requisites. Universal self-care requisites are common to all human beings during all stages of the life cycle, adjusted to age, developmental state, and environmental and other factors. They are associated with life processes, with the maintenance of the integrity of human structure and functioning, and with general well-being. Developmental self-care requisites are associated with human growth and developmental processes and with condition and events occurring during

various stages of the life cycle and events that can adversely affect development. Health-deviation self-care requisites are associated with genetic and constitutional defects and human structural and functional deviations and with their effects and with medical diagnostic and treatment measures and their effects (Orem, et al., 2001).

Furthermore, self-care consists of therapeutic self-care demand and self- care agency. When persons' self-care agency is of a value that is not adequate for their performance of actions specified by their therapeutic self-care demands, there is a self-care deficit or the action limitations and they need helping for self-maintenance and self-regulation. A helping method from nursing perspective is a sequential series of actions, which, if performed, will overcome or compensate for the health-associated limitations of persons to engage in actions to regulate their own functioning and development or that of their dependents. These methods are identified as acting for or doing for another, guiding and directing, providing physical or psychological support, providing and maintaining an environment that supports personal development, and teaching (Orem, et al., 2001).

According to Orem's nursing system, which based on individuals' ability to control movement and performance can be divided as follows:

1. Wholly compensatory nursing systems, this system is used when the patients cannot perform self-directed self-care or cannot control own movement.

2. Partly compensatory nursing systems, this system is used when nurses and patients cooperative satisfy the need for self-care.

3. Supportive-educative nursing systems, this system is used when patients able to perform or can and should learn to perform required measures of externally or internally oriented therapeutic self-care but cannot do so without assistance. Helping techniques in these situations include combinations of support, guidance, provision of a developmental environment, and teaching. It is only system in which a patient's requirements for help are confined to decision making, behavior control, and acquiring knowledge and skills.

The concept of a supportive-educative nursing system is used in the study. The subjects were the persons with type 2 diabetes mellitus who were able to perform self-care. Therefore, supportive-educative nursing system by using helping methods was selected to be used in this study. Nurses should be a resource for persons with

type 2 diabetes mellitus and should use effective instruction media for their learning to increase knowledge and improve self- care behavior of persons with type 2 diabetic mellitus.

The researcher applied the supportive-educative nursing system by providing information through the CD-ROM titled “Guideline of self-care behavior for persons with diabetes”. This CD-ROM has the manual in details that health personnel at all level can follow (See Appendix K). Each part of the CD-ROM takes about 9 to 20 minutes with illustrations of actual events; beautiful colors, making it attractive and better perceived. It is the media that can promote knowledge up to 88 % of contact senses; as can be perceived by ears and eyes (Sigkabantit, 1989). But as there is a limitation of its use as it can be used by a person having a CD-ROM player and television or computer only and can not make a review at home. Therefore, the researcher has provided the booklets titled “Knowledge of self-care for persons with diabetes” in support of this education. These booklets cover all aspects of diabetes, having easy language, beautiful colors, and each topic in each number thus making it easy to read and reviewed whenever required. The more they read the more they will understand. Their family members can also read and creating mutual assistance among them. Moreoer, the researcher will send postcards to persons with diabetes every week to stimulate them in reading booklets and encourage them for continuing self-care behavior. The concepts used in the research are shown in Figure 1.

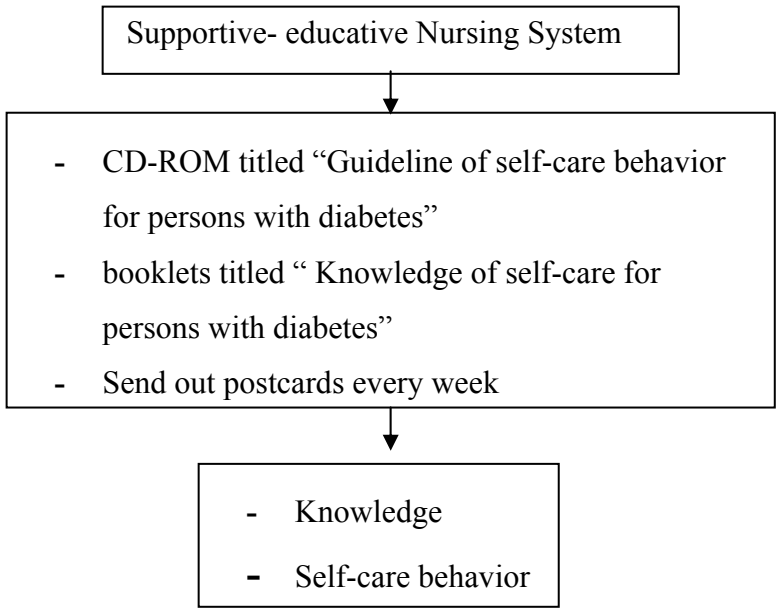

Figure 1 Conceptual Framework

Scope of the Study

This research involves the feasibility of using self-care packages to increase knowledge and improve self-care behavior of persons with diabetes mellitus at Diabetic Clinic, Nongbua Hospital, Nongbua District, Nakhon Sawan Province.

Definition of Terms

Feasibility refers to the ability to use in actual practice. The feasibility to use self-care packages (CD-ROM and booklets) in actual practice, in this study is considered as follows:

1. After using self-care packages, the mean score of diabetes knowledge must increase, measure by the diabetes knowledge questionnaires of persons with diabetes.

2. After using self-care packages, the mean score of self-care behavior must increase, measure the summary of diabetes self-care activity.

3. The mean score of the quality of self-care packages in each item is at good or very good level, measure by the questionnaire on CD-ROM quality and the questionnaire on booklets quality.

4. From the record of reading the booklets, persons with diabetes must have read all numbers of booklets, measure by the questionnaire on reading the booklets.

Self-care packages refers to the educational materials full of information so that the sender and the receiver can directly communicate with each other according to the objective; a medium for transferring knowledge and self-care experience to the recipient to change the life style accordingly. The self-care packages used in this research consists of CD-ROM and booklets.

CD-ROM: Compact Disc Read-Only Memory. A compact disc (or CD) is an optical disc used to store digital data, originally developed for storing digital audio. CD-ROMs are particularly well-suited to information that requires large storage capacity. This includes large software applications that support color, graphics, sound, and especially video. In this study, CD-ROM entitled "Guideline of self-care behavior for persons with diabetes" was developed in year 2004 by Hanucharurnkul, and colleagues covering five main parts as follows; knowledge about diabetes mellitus; living with diabetes normally; guideline for healthy eating; exercises and diabetes mellitus; and foot care for the persons with diabetes mellitus.

Booklets entitled "Knowledge of self-care for persons with diabetes" is a small book, 15 mm. wide × 21 mm. long, in ten numbers, each 12 to 20 pages thick. It was developed in year 2004 by Hanucharurnkul, and colleagues. These booklets contain the content on diabetes and self-care behavior for persons with diabetes and their families.

Diabetes knowledge refers to the ability of persons with diabetes to remember, understand in the matter concerning dietary control, exercise, taking medicines, general health care and foot care, and self-monitoring, measure by the diabetes knowledge questionnaires of persons with diabetes developed by Kiratiyuttawong (2005).

Self-care behavior refers to the activities that persons with diabetes perform for controlling their disease and preventing complications, measured by the summary of diabetes self-care activity score developed by Kiratiyuttawong (2005).

Benefit of the Research

1. Persons with diabetes and their families will get knowledge from the self-care packages of equal standard where they can continuously study by themselves.

2. Health care providers at all levels; particularly health center, community hospitals, and general hospitals can use the self-care packages in helping the persons with diabetes' behavior and their families. These people will understand of diabetes, self-care, and mutual assistance.

CHAPTER II
LITERATURE REVIEW

This study is designed to test the feasibility of using self-care packages to increase knowledge and improve self- care behavior of persons with type 2 diabetes mellitus. Literature review was organized in to three parts as follows:

1. Pathology of type 2 diabetes mellitus and its effects
2. Therapeutic self-care demands in persons with diabetes
3. Diabetic education for the persons with diabetes

The Pathology of Type 2 Diabetes Mellitus and Its Effects

Diabetes mellitus is a group of metabolic disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eye, kidneys, nerves, heart, and blood vessels (Arlene, Polaski, and SuZanne, 1996; Parveen and Michael, 1998; Joan and Derek, 1996; The expert committee on the diagnosis and classification of diabetes mellitus, 2003). Diabetic risk was reported to be associated with obesity – defined as an increase in body mass index (weight in kilograms divided by the square of height in meters) and, in particular, with increased central adiposity (fat in the belly). Other risk factors for diabetes mellitus in the Asian population, including genetic factors, are not well characterized and certainly deserve more attention.

The previous, the World Health Organization (WHO) used to divide diabetes mellitus into five distinct types (insulin-dependent diabetes mellitus: IDDM, non-insulin-dependent diabetes mellitus: NIDDM, gestational diabetes mellitus: GDM, malnutrition related diabetes mellitus: MRDM, and other types). The different clinical presentations are genetic and environmental etiologic factors of the five types permitted discrimination among them. All five types were characterized by either fasting hyperglycemia or elevated levels of plasma glucose during an oral glucose

tolerance test (OGTT). The current, the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus had been recommended to classified types of diabetes mellitus based on treatment rather than etiology; therefore, it had been lately recommended consequent type 1 diabetes, type 2 diabetes, other specific types, and gestational diabetes mellitus (The American Diabetes Association, 2003a; The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus, 2003).

Type 1 diabetes is an insulin-dependent diabetes that occurs in about 5% to 10% of those with diabetes. Considered an autoimmune disease, it occurs equally among males and females and usually affects children and young adults, but it can occur at any age. Persons with type 1 diabetes must have daily insulin injections to survive because their body stops producing insulin.

Type 2 diabetes is a non-insulin-dependent diabetes and accounts for 90% to 95% of persons with diabetes and usually occurs in adults over 40 who are overweight and have a family history of diabetes. The specific etiologies of this form of diabetes are not known, autoimmune destruction of beta- cells does not occur, and patients do not have any of the other cause of diabetes listed above or below. This form of diabetes frequently goes diagnosed for many years because the hyperglycemia develops gradually and at earlier stage is often not severe enough for the patient to notice any of the classic symptoms of diabetes. Diagnostic criteria for diabetes mellitus by American Diabetes Association (ADA) used independently to establish the diagnosis as 1) Symptoms of diabetes and casual plasma glucose level of 200 mg/dl or greater (11.1 mmol/l), casual is defined as any time of day without regard to time since last meal. The symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss. 2) A fasting plasma glucose (FPG) level of 126 mg/dl or greater (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 hours. 3) 2-hour Plasma Glucose level of 200 mg/dl or greater (11.1 mmol/l) during an Oral Glucose Tolerance Test (OGTT). In type 2 diabetes is often related to being overweight. The early stage of type 2 diabetes may be managed by eating healthy foods and getting regular exercise. Sometimes oral medication and even insulin may be needed as the diabetes progresses (The American Diabetes Association, 2001).

The complications of type 2 diabetes categorized as acute and chronic complications. Acute complications include hyperglycemia and hyperosmolar

nonketotic coma. Chronic complications categorized as microvascular and macrovascular problems which affect almost all organs. The chronic hyperglycemia of diabetes mellitus is associated with long term damage, dysfunction, and failure of various organs including retinopathy with potential loss of vision was found in 21 % of persons with type 2 diabetes; nephropathy leading to renal failure; neuropathy is more likely to affect person with diabetes for a long time or whose glucose control is poor. Persons with diabetes are far more likely to have a foot or leg amputated than other people; and automatic neuropathy causing gastrointestinal, genitourinary and cardiovascular symptoms and sexual dysfunction. Diabetes carries an increased risk for heart attack, stroke, and complications related to poor circulation (The American Diabetes Association, 2003g).

Most complications are preventable with self-care behavior is maintaining near normal blood glucose levels. This is important goal of diabetic treatment. Persons with diabetes have to knowledge about diabetes and self-care practice to make decisions and to operate self-care behavior. The United Kingdom Prospective Diabetes Study (UKPDS) studied persons with type 2 diabetes mellitus showed that improved blood glucose control in every percentage point decreased the HbA1c and lead to 35 % reduction in the risk of microvascular complications (The American Diabetes Association, 2003f).

Therapeutic Self-Care Demands in Persons with Diabetes

Therapeutic self-care demands in persons with diabetes included dietary control, exercise, medication management, hygienic and foot care, and self monitoring. Each is discussed as follows:

Dietary Control

Maintaining a healthy diet is important for everyone, but it is especially important for persons with diabetes. The immediate treatment aim for diabetes is to control hyperglycemia, ultimate aim is allow the person to lead as normal a life as possible, in good health, and for most persons with diabetes to achieve a weight as a close as possible to the ideal. The overall aims of dietary control are summarized as abolish the primary symptoms of diabetes, achieve and maintain an agreed target body

weight, maintain blood glucose and lipids at as near normal levels as possible, minimize the risk of hypoglycemia in those treated with oral hypoglycemic agents or with insulin, and minimize the long-term macrovascular and microvascular complications of diabetes (Joan and Derek, 1996). Nutrition recommendations and principles for persons with diabetes are as follows:

Calories Requirement

Dietary control is an essential component to prevent complications of persons with diabetes (The American Diabetes Association, 2003c). Because many persons with type 2 diabetes are overweight and insulin resistant, medical nutrition therapy should emphasize lifestyle changes that result in reduced energy intake and increased energy expenditure through physical activity. Persons with diabetes can improve their health through healthy food choices and physical activity as well as consideration of personal, cultural preferences, and lifestyle of each individual.

Calculation of energy intake is applying from Wichayanrattana, Wannasang, and Nithiyanan, (1984); Chantaraprasert, (1996) consists of 3 steps are as follows:

1. Determine nutritional status, obesity, normal and underweight by using formula:

$$\text{Body Mass Index (BMI)} = \frac{\text{Body weight (kg)}}{\text{Height (m)}^2}$$

Interpret result as follow: BMI range from 20 to 25 in male or 19 to 24 in female is normal weight (18.5 to 23 kg /m^2 is normal weight for Thai adult), BMI less than 20 in male or less than 19 in female is underweight, and BMI more than 25 in male or more than 24 in female is overweight.

2. Identify physical activity level which persons perform to select item of energy intake from Table 2.

Table 2 Recommendation of Energy Intake for Adults with Diabetes Mellitus

Nutrition status	BMI (For Thai adult)	Physical activity		
		Sedentary	Moderate	Active
		Energy intake kcal/kg/day		
Overweight	> 23	20 - 25	30	35
Normal weight	18.5 - 23	30	35	40
Underweight	< 18.5	35	40	45 - 50

3. Multiple energy intakes per day equal to body weight by selected item of energy. For example, female 65 kg with overweight has active physical activity, so calories intake requirement is 35 (cal/kg) x 65 (kg) = 2,275 Kcal/day.

Examples of activity are as follows:

- Sedentary physical activity is cleaning house.
- Moderate physical activity is iron cloth and engage in orchard gardening.
- Active physical activity is labor and farmer.

Guidelines for Food Components in Diabetes Diet

Carbohydrates

Carbohydrates give energy and are a good back-up supply of energy. The American Diabetes Association (2003c) suggests that persons with diabetes eat around 40-45% of our calories as carbohydrate. Carbohydrates refer to sugar, starches, and fiber. Foods high in fiber are healthy. Fiber comes from plants and may help to lower blood glucose and blood-fat levels. Foods high in fiber include: cooked beans and peas, whole-grains bread, fruits, and vegetables. Healthy choices are dried beans, peas, and lentils; whole grain breads, cereals, and fruits and vegetables. Persons with diabetes are encouraged to choose a variety of fiber containing foods. Riccardi and Rivellese (1991) studied the effects of dietary fiber and carbohydrate on glucose and lipoprotein metabolism in persons with diabetes. The result is evidence support that high- fiber and carbohydrate diet significantly improves blood glucose control and reduces plasma cholesterol levels in persons with diabetes compared with a low- fiber

and carbohydrate diet. In addition, high- fiber and carbohydrate diet does not increase plasma insulin and triglyceride concentrations, despite the higher consumption of carbohydrates.

Protein

Persons with diabetes have no less or more need for protein than the general public. The American Diabetes Association nutrition guidelines suggest eating between 10 and 20% of the total caloric intake from protein sources (The American Diabetes Association, 2003c). It can derive from both animal and vegetable source. High protein intake can increase the glomerular filtration rate and workload of the kidney, and the progression of renal disease is delayed early protein restriction. Results of small studied in humans with diabetic nephropathy have shown that a prescribed protein-restricted diet of 0.6 grams per kilogram per day retards the rate of fall of glomerular filtration rate modestly (The American Diabetes Association, 2003f). At this point in time, the general consensus is to prescribe a protein intake of approximately the adult the Recommended Daily Allowance (RDA) of 0.8 grams per kilogram of body weight (The American Diabetes Association, 2003c; Wylie-Rosett, 1988).

Fat

The American Diabetes Association nutrition guidelines suggest eating about 30% of the total calories. One of the most important diabetes nutrition guidelines is to hold saturated fat to less than 10% of calories. Because saturated fat raises blood cholesterol. High blood cholesterol is a risk factor for heart disease. Persons with diabetes have more frequent heart disease. Limiting saturated fat could lower risk for this diabetes complication. Also, some person with abnormal blood lipids (fat) and a high triglyceride might benefit from increasing the amount of monounsaturated fats they eat. The recommended cholesterol intake is kept it to 300 mg or less each day. Some foods high in cholesterol are egg yolks and organ meats (liver or kidney) (The American Diabetes Association, 2003c).

Sodium

Sodium does not affect blood glucose levels. However, many people eat much more sodium than they need, it does affect blood pressure level. Several meta-analysis and reviews have documented the relationship between sodium intake and

blood pressure. The mean effect of a moderate sodium restriction is report to be a reduction of 5 mmHg for systolic and 2 mmHg for diastolic blood pressure in hypertension subjects and a reduction of 3 mmHg for systolic and 1 mmHg for diastolic blood pressure in normotensive subjects. Adults should aim for less than 2400 mg per day. If persons have high blood pressure, it may be helpful to eat less (The American Diabetes Association, 2003c).

Alcohol

The UKPDS study in diabetes identified that persons get fewer complications from diabetes the lower their blood pressure (http://www. alcoholconcern.org.uk/). Furthermore, Bell (1996) found that alcohol can have both hypoglycemic and hyperglycemic effect in persons with diabetes. Alcohol slightly enhanced the meal-induced insulin secretion resulting in lower blood glucose concentrations next morning. The American Diabetes Association (2003c) suggests that 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 12 oz of beer, 5 oz of wine, or 1.5 oz of distilled spirits, each of which contains 15 gram of alcohol.

Exercise

Exercise is also known as physical activity and includes anything that gets them moving, such as walking, dancing, or working in the yard. Exercise is an essential component of persons with diabetes (The American Diabetes Association, 2003d). Furthermore, person's lack of exercise and obesity are major contributory factors to insulin resistance. It is an important part of everyone's lifestyle, but it is especially significant for persons with diabetes. When their physically fit, they have the strength, flexibility, and endurance needed for their daily activities. Being physically active helps they feel better physically and mentally. Furthermore, physical activity can lower their blood glucose (sugar), blood pressure, and cholesterol. It also reduces their risk for heart disease and stroke, relieves stress, and strengthens their heart, muscles, and bones. In addition, regular activity helps insulin work better, improves blood circulation, and keeps joints flexible. A standard recommendation for persons with diabetes is that physical activity includes a proper warm-up and cool-down period. A warm-up should consist of 5 to 10 minutes of aerobic activity at a

low-intensity level. After short warm-up, muscles should be gently stretched for another 5 to10 minutes. Following the activity session, a cool down should be structured similarly to the warm-up. The cool down should last about 5 to 10 minutes and gradually bring the heart rate down to its pre-exercise level. 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 persons with diabetes are as exercise at least three to four times per week (The American Diabetes Association, 2003d).

Medication Management

The goal of diabetes therapy is to prevent or delay the onset of chronic complications without precipitation acute complications and achieving a near-normal blood glucose level. Pharmacotherapy for diabetes can be divided in oral hypoglycemic therapy and insulin therapy (The American Diabetes Association, 2003b) and combination therapy (http://www.more.com/more/story.jhtml).

Oral Hypoglycemic Therapy, oral hyperglycemic agents can be divided into 3 groups; Insulin secretagogues, insulin sensitize, and alpha-glucosidase inhabitation.

Insulin Secretagogues, this group are used to lower blood glucose levels by stimulate the release of insulin from pancreatic and enhance the number of sensitivity and receptor sites on the cell for interaction with insulin. This group can be divided into categories; sulphonylureas and non-sulphonylurea. Sulphonylureas, such as Glucotrol and Micronase, are commonly prescribed medications for diabetes treatment. Sulfonylureas work by helping body make insulin. They can be used alone or with other medications. They have few side effects, but cannot be used by people allergic to sulfa medications. Sulphonlureas agents have benefit when fasting glucose levels greater than 250 mg/dl because beta-cell functions tends to deteriorate with time, limiting the effectiveness of the drugs. Non-sulphonylureas include Gligenclamide, Gliclaside, and Glipiside. They have short duration of action, and less side effects. These drugs are not used with persons who have developed an impairment of kidney function.

Insulin sensitizes, these drugs decrease insulin resistance and decrease insulin sensitization. Drug in this group include Bigaunide (Metformin, Glucophage)

and Thiazolidnedione. Bigaunide help the body use insulin more effectively. It is often used by persons who are overweight, since it also helps with weight control. It can be taken alone or with another medication, but it may cause side effects, which include nausea or diarrhea. Biguanides block the liver's release of glucose and reduce its resistance to insulin. Thus they lower blood sugar levels without stimulating insulin secretion. Typically, Metformin, which comes in a pill form, is taken two or three times a day with meals, although a longer-acting formula may be taken once or twice a day (Evans and Krenta, 1999). Thiozolidinediones (TZDs) is to make cells more sensitive to insulin, but it was recently withdrawn from the market after it was determined it causes liver toxicity. The other medications in this class are considered safe and effective.

lpha-glucosidase Inhabitation, such as Precose and Glyset, work by slowing down the absorption of sugar in their digestive tract. They are often used in combination with another diabetes treatment medication, such as a sulfonylurea. This type of medication can cause stomach or bowel problems in some persons. These side effects, which are due to fermentation of unabsorbed carbohydrate in the small intestine, can be minimized by slowly titrating the dose of either agent. These drugs are not recommended for use in persons with malabsorption, inflammatory bowel disease, or intestinal obstruction (Koda-Kimble and Carlisle, 2001).

Insulin treatment

Persons with type 2diabetes make insulin, but their bodies do not respond well to it. Some persons with type 2 diabetes need diabetes pills or insulin shots to help their bodies use glucose for energy. Insulin cannot be taken as a pill. The insulin would be broken down during digestion just like the protein in food. Insulin must be injected into the fat under skin for it to get into blood (The American Diabetes Association, 2003h). The insulin in a bottle is usable. It has been kept at temperatures between 4 and 25°C, is within its expire date, has properly sealed bung, has been mixed contaminated, has been mixed gently if a cloudy insulin, and is the right insulin for that person at that injection time (Rowan, 1996).

The place on body where inject insulin affects blood glucose level. Insulin enters the blood at different speeds when injected at different sites. Insulin shots work fastest when given in the abdomen. Insulin arrives in the blood a little more slowly

from the upper arms and even more slowly from the thighs and buttocks. Injecting insulin in the same general area (for example, abdomen) will give the best results from insulin. This is because the insulin will reach the blood with about the same speed with each insulin shot. Do not inject the insulin in exactly the same place each time, but move around the same area. Each mealtime injection of insulin should be given in the same general area for best results. For example, giving before-breakfast insulin injection in the abdomen and before-supper insulin injection in the leg each day give more similar blood glucose results. If injection is near the same place each time, hard lumps or extra fatty deposits may develop. Both of these problems are unsightly and make the insulin action less reliable (The American Diabetes Association, 2003h).

Combination Therapy

Because all the oral medications for diabetes have limited potency, scientists have tried to take advantage of their different mechanisms by using them in various combinations, with or without insulin. Traditionally, clinicians took a one-treatment-at-a-time approach to Type 2 diabetes. If diet and exercise failed, the doctor put the persons with diabetes on a sulfonylurea. Once the maximum dose was reached, a new medication was started, and once medication options were exhausted, insulin injections began. But this approach was only modestly successful. It controls blood sugar in only 25% of them in the near-normal range. A multiple-drug approach fits the new view of diabetes as a complex disease with at least two deficits that can be addressed: insulin resistance and inadequate insulin secretion. The combination approach may use lower doses of drugs, each with different mechanisms. The most common and widely studied oral drug combination is Metformin and a Sulfonylurea. Some diabetes experts are now going a step further, arguing that they should be prescribed medications, and even insulin, in conjunction with a diet and exercise plan as soon as they are diagnosed. The rationale is that insulin-secreting beta cells may be most salvageable early in the course of the disease. So, aggressive therapy may prevent blood sugar levels from worsening. While early combination drug therapy would be expensive, it might be cheaper in the long run than dealing with the complications of the disease. Combination therapy probably increases the risk for hypoglycemia. When they combine drugs, they do not usually cause hypoglycemia with drugs that do, the combination leans toward causing low blood glucose.

Skin and Foot Care

Skin care is several things persons with diabetes can do to head off skin. Persons with high blood glucose levels tend to have dry skin and less ability to fend off harmful bacteria. Both conditions increase the risk of infection. Daily assessment of the feet by the persons with diabetes is the first point of prevention. Early recognition and management of independent risk factor for ulcers and amputations can prevent or delay the onset of adverse outcomes. Persons with diabetes should understand the implications of the loss of protection sensation, the importance of foot monitoring on a daily, the proper care of foot, and the selection of appropriate footwear.

After 20 years of diabetes, half the men and two-thirds of women over 60 years old have no foot pulse. Persons with diabetes are two to four times as likely to experience intermittent claudication as non-diabetes, and four to six times as likely to have an amputation. Up to 50 per cent of persons requiring amputation have diabetes (Rowan, 1996).

All persons with diabetes should have a through annual foot assessment that includes the condition of the skin and nails and the presence of any foot deformities. Skin assessments for persons with diabetes are such as color, temperature, absence of sweating, dry, scaly, fissures, macerations, calluses, bunions, corns, and lesions. Nails assessments for person with diabetes are such as thickening, discoloration, ingrown, mycotic, Split, broken, builds up of debris under nail and deformed. It is particularly important to identify those who have a high risk of developing foot ulcers. High-risk individuals include older persons with diabetes, those with foot deformities such as clawed toes, muscle wasting, charcot's, gait disturbances, absence of fat pad over metatarsals, and hallux deformity (George and Margaret, 1999).

Self Monitoring

Persons with diabetes should become accustomed to monitoring their own health. They should monitor their own general health and well being, symptoms, diabetes control, weight, feet, and eyesight. Monitoring of diabetic control (by urine or blood test) is required to promote health and reduced risk of complications.

Persons with diabetes are important to monitor blood glucose levels carefully to avoid complications (short-term and long-term complications). Persons with diabetes should aim for pre-meal glucose levels between 80 and 126 mg/dl. Blood glucose levels are generally more stable in type 2 diabetes than type 1 diabetes. Experts usually recommended measuring blood levels by urine monitoring and self-monitoring blood glucose (Gail and Judith, 1996).

Urine Monitoring

Glucose, protein (albumin), and ketones can be monitored simple in urine**.** Urine testing is a first step to learning about self-monitoring. Urine testing provides an approximation of the individual's blood glucose levels. An individual's renal threshold determines when blood glucose spills over into urine. For adults with no renal problem, this threshold is proximately 170 to 200 mg, which means the blood glucose level must be least 170 mg before any glucose could be wasted into the urine. The lowest blood glucose value at which glucose spills into the urine is an estimate of the renal threshold. Urine glucose testing is simply to test and low cost but is less reliable than blood glucose testing.

Self-Monitoring of Blood Glucose (SMBG) is an important component of modern therapy for diabetes mellitus. SMBG has been recommended for persons with diabetes and their health care professionals in order to achieve a specific level of glycemic control and to prevent hypoglycemia. The goal of SMBG is to collect detailed information about blood glucose levels at many time points to enable maintenance of a more constant glucose level by more precise regimens. It can be used to aid in the adjustment of a therapeutic regimen in response to blood glucose values and to help individuals adjust their dietary intake, physical activity, and insulin doses to improve glycemic control on a day-to-day basis.

Numerous trials have been carried out to determine the true impact of SMBG on glycemic control. Some, including randomized, controlled trials, have demonstrated the efficacy of SMBG. Among persons with type 1 diabetes, SMBG has been associated with improved health outcomes. Specifically, increasing frequency of SMBG was linearly correlated with reductions in HbA_{1c} among type 1 patients in Scotland. Among patients with type 2 diabetes, a higher frequency of SMBG was associated with better glycemic control among insulin-treated patients who were able

to adjust their regimen. Other studies, however, have suggested that SMBG has not achieved its true potential impact as an aid to improving glycemic control.

SMBG works by having persons with diabetes perform a number of glucose tests each day or each week. The test most commonly involves pricking a finger with a lancet device to obtain a small blood sample, applying a drop of blood onto a reagent strip, and determining the glucose concentration by inserting the strip into a reflectance photometer for an automated reading. Test results are then recorded in a logbook or stored in the glucose meter's electronic memory. Persons with diabetes can be taught to use their SMBG results to correct any deviations out of a desired target range by changing their carbohydrate intake, exercising, or using more or less insulin.

For persons with type 2 diabetes, optimal SMBG frequency varies depending on the pharmaceutical regimen and whether patients are in an adjustment phase or at their target for glycemic control. If a person is on a stable oral regimen with HbA_{1c} concentration within the target range, infrequent SMBG monitoring is appropriate. In such cases, they can use SMBG data as biofeedback at times of increased stress or changes in diet or physical activity. Target of fasting blood sugar control for persons with type 2 diabetes can be divided into 3 levels: good control, fair control, and poor control:

FBS (mg/dl)	**Levels**
80 – 126	Good control
127 - 140	Fair control
< 80 or > 140	Poor control

Once diabetes is diagnosed, it is very important to have regular physical check-ups, at least once a year, so the patient remains symptom-free and to prevent possible complications (http://www.bbc.co.uk/health/conditions/diabetes/living diabetesself. html). These check-ups will include:

1. Blood tests to monitor the level of blood glucose, how well the diabetes has been controlled over the previous two to three months, cholesterol, and kidney function.

2. Blood pressure measurement. Control of hypertension has been proven conclusively to reduce the complications of nephropathy, cerebrovascular disease, and cardiovascular disease. The goal for adults is to decrease blood pressure to below 130/80 mmHg. (The American Diabetes Association, 2003i).

3. Watch cholesterol levels. A high cholesterol level damages the blood vessels and is another risk factor for heart and circulatory diseases. Therefore, it's important that the cholesterol level is not too high, ideally below 200 mg/dl.

4. Eye examination, at least annually. Diabetes can damage the back of the eyes (called retinopathy), but laser treatment can be used to treat this damage when caught early enough.

5. Examination of the feet and nerves.

6. Maintain a healthy diet**.** A healthy diet is essential. This should include regular meals that are low in fat and high in fiber - such as fruit, vegetables and pulses (beans, lentils and peas).

7. Take regular exercise. Walking, swimming, dancing or cycling, for example, will help keep weight at an ideal level and assist in keeping blood sugar levels under control.

8. Avoid smoking and alcohol. Smoking should be completely avoided since it greatly increases the risk of many health problems, including damage to the blood vessels. Drinking on an empty stomach because this can cause hypoglycemia.

Diabetic Education for the Persons with Diabetes

Teaching clients about their health and illness has always been a high-priority responsibility in nurse. Whether community based or hospital based, nurse are the principle health educators of persons with diabetes (Schorfheide, Eaks, Hamera, and Cassmeyer, 1989). Diabetes education is essential in the care of the persons with diabetes and can help improve glycemic control, self-care, and emotional well-being and decrease the cost of care (Norris, Lau, Smith, Schmid, and Engelgau, 2000; Bloomgarden, Karmally, Metzger, Brothers, Nechemias, Bookman, et al., 1987). From literature reviews, it found that numerous researchers have attempted to find proper methods of care for persons with diabetic education. Each method of care consists of various strategic approaches, which are bases on theoretical framework used. Methods

of care that provide education for persons with type 2 diabetes are individual education, group education, participatory action research, and home health care. The diabetic education emphasized on knowledge gain and all of the studies have the same objectives. These objectives are increasing knowledge, encourage self-care behavior, and improve disease control for persons with diabetes to prevent acute and chronic complications. Diabetic education for persons with diabetes is an important factor that will make them enable to do their self care (Chanthamolee, 1992; Lawang, 2001). Further more, it is also an important role of health care providers as the important source of information and the first source of education that enable them to do self-care. Now there is a development and introduction of technological media for teaching. Equipments and new techniques are used in teaching activities to transfer the diabetes knowledge from health care providers to persons with diabetes. Moreover, technological media is change from abstract to tangible matters, making education simpler, convenient, fast, economical and effective enough to change them behavior (Rosheim and Fowles, 1999). Because of media is very important in teaching as it helps educate, develop the capacity and adjust behaviors of persons with diabetes to suit their daily lives. As there many kinds of media, each having different advantage and disadvantage, therefore, the nurse as a teacher should have judgment in selection of the media. If the media is not properly selected the befit obtained will be little and not worth the investment. Therefore, in a selection of a media a careful consideration and planning should be made.

CD-ROM is quite a popular media to assist in education as it provides animated pictures as well as sounds and beautiful colors, making it attractive and better perceived. The education will be perceived through eyes 75 %, ears 13 %, contact 6 %, nose 3%, and taste 3% (Sigkabantid, 1989). Moreover, CD-ROM is easy to use and accesses by a large number of persons with diabetes each time. By using video different detailed procedures can be shown and repeated many time; they will receive complete literature always; they will receive experience closest to the actual practice; making the education more efficient (Antaricanont, 1996; Mailer, Twitty, and Sauve, 1997 cited by Oermann, Marilyn, Webb, and Ashare, 2003).

Booklets means a small document or a printing media specially made for a particular occasion such as the annual report, employee's guidelines, good application guidelines and a guideline for knowledge delivery of a particular disease, size about 4 X 7 inches, can be smaller or bigger than this depending on the design for economy, attraction and convenient handing (Suteetorn, 1992). Furthermore, the booklets can be use as a part of main teaching media; easy and convenient to use. Persons with diabetes can self-learning, no time limit, can be used any time when ready, low investment, economical and worth the investment as it can be read many time by any body, the more reading the more knowledge will gain. They can choose to read the subject of interest as the individual ability could be connection with the original knowledge and experience (Wangyaychim, 1997).

From review of past researches it was found that there had been a study of supportive education for persons with diabetes in different methods. Each method of care consists of various strategic approaches. Most of methods that provide education for persons with type 2 diabetes are teaching. The teaching patterns found are individual and group teachings. All teaching patterns emphasized on knowledge and self-care behavior on increasing knowledge, encourage self-care behavior, and improve disease control for persons with diabetes. In every research were used media in teaching to support and promote the patients learning. So selection of media must be suitable for patient's ability to learn. Factor which should be considered are the patient's eye vision, reading level, and socioeconomic level. Videotapes or CD is specifically designed to provide information and promote active participation in treatment decisions, can be an effective tool for learning (Krouse, 2001).

Many studies investigated the teaching media that can help persons with diabetes improve diabetic knowledge, better control disease, and self-care practice (Lertprapai, 1996; Tantayotai, 1997; Arunneatara, 1998; Boonyeun, 1998; Jaitham, 1998; Baineam, 1998; Plodnaimuang, 1999; Sanaun, 1999; Suwannaruk 1999; Tiatakul, 2001; Masawang, 2001; Phumleng, 2002; Wibunrattanasri, 2002; Muangkae, 2002), each of the research has the following details:

Lertprapai (1996) studied the effectiveness of participation in self-help group on self–care deficit in persons with type 2 diabetes attending community hospital in Samutprakan Province. The comparison group (n = 39) received routine service in

hospital. The experimental group (n = 39) received a self-help group once a month for 3 months. The teaching media was booklets on diabetes knowledge. The result found that after entering the self-help group, self-care deficit and fasting blood sugar mean score of experiment group was statistically lower than before entering the self-help group. But there was no significant change in fasting blood sugar.

Tantayotai (1997) used action research to develop self-care agency in 28 persons with type 2 diabetes mellitus. The knowledge delivery was done through an individual and a group. The teaching as a group was carried out by a doctor in 4 subjects as general knowledge about diabetes, medicines used in treatment of diabetes, monitoring of blood glucose level, and what to do when becoming ill; one subject was taught by a nurse as self-care when becoming the persons with diabetes; one subject was taught by a dietician as dietary control. There was also one assistant nurse for the group arrangement, preparation of a venue and teaching equipments. For individual teaching this is responsible by a nurse and dietician. The teaching media were leaflets, food exchange menu and recording book for each person. The result of this study indicated that therapeutic relationship and interaction between nurse and persons with diabetes is core component in enhancing persons with diabetes' self-care agency. After entering the program, the participants perceived significantly higher self-care agency in diet control and usage of insulin. Their HbA1c level decreased significantly at the 4^{th} months as compared to the first month of entering the program. In this studied a group teaching could not be carried out as there was a problem about the time and place including many persons with diabetes were not convenient to join the group as they had to attend their family affairs, educations, or works.

Arunneatara (1998) studied the effect of group process on knowledge, self-care behavior and diabetic control in persons with type 2 diabetes mellitus. The teaching as a group process for 4 times in week 1, 3, 5, and 7. The teaching media was the videotapes. The result found that after entering the group process, mean score of knowledge, self-care behavior, and diabetic control were statistically higher than before entering the group process. As the appointment times of persons with diabetes to see the physician and participate in group process were not the same, hence making them inconvenient to join the group process.

Boonyeun (1998) studied the effect of home health care on self-care behavior among persons with diabetes at Onkarak Hospital, Nakhonayok Province. The experimental group (n = 20) received individual home health care 3 times for 1 hour each. First time and second time two weeks apart, second and third times four weeks apart. The teaching media was the booklets for persons with type 2 diabetes. The booklets consisted of topics are dietary control, exercise, medication taking, and foot care for persons with diabetes. The result of this study indicated that the experimental group had the score of knowledge and score of self-care behavior higher than those received before home health care. There was no statistically significant difference of fasting blood sugar level between before and after home health care.

Jaitham (1998) studied the effectiveness of goal setting for changing behavior related to blood sugar control among persons with type 2 diabetes mellitus at Yala Hospital. The experimental group (n = 40) received a one-hour individual health education program for 3 months, with 3 stimulating letters, while the comparison group received a regular health education program. The teaching media was the videotapes. The result of this study indicated that after experiment, the participants had significantly higher level of mean score on the knowledge, the perceived out-come expectations and practices about eating and exercise than before experiment and the score were significantly higher than those of the comparison group. Additionally, the HbA1c of the experimental group also decreased significantly.

Baineam (1998) studied the effect of public health nursing activities on persons with type 2 diabetes with an application of Orem's Self-Care Theory, Bandura's Self-Efficacy Theory, group process and home visit. The experimental group (n = 35) received the group process in hospital two times, plus two home visits. The control group received routine service in hospital. The teaching media were the videotapes on exercise (Thai keg), posters on exercise (Thai keg), and self-care hand book. The result of this study indicated that the means of self efficacy score and practice in self care scores of the experiment group were significantly higher after the experiment than before the experiment, and higher than those of the control group ($P < .001$). However, the HbA1c level of the experiment group did not change significantly over the course of the study, nor was it significantly different from that of the control group.

Plodnaimuang (1999) studied the effectiveness of an educative-supportive program to improving perceived self-care and diabetic control in 41 persons with type 2 diabetes. The study was one group pretest-posttest design. This program provided information on diabetes knowledge and self-care management through lecturing, discussion, and practice once a month for 3 months and was followed by small group meetings 3 times for 1 hour each, every two weeks. The teaching media were videotapes and pamphlets. The videotapes consisted of 4 parts are quality of life of persons with diabetes, food for persons with diabetes, diabetes and exercise, and foot care for persons with diabetes. The pamphlets consisted of 7 topics are information persons with diabetes need to know, dangers of diabetes, oral medication for diabetes, principle of food control for persons with diabetes, diabetes and exercise, foot care for persons with diabetes, and questions from persons with diabetes. The result of this study indicated that total participants' mean score on perceived self-care efficacy in each dimension, and mean score on disease control were significantly higher than the first month. Also the mean score of fasting blood sugar level decreases significantly in each month ($P < .001$).

Sanaun (1999) studied the effects of the supportive educative nursing system of self care on persons with type 2 diabetes mellitus at Phiboonmungsahan Hospital, Ubonratchatanee Province. The experimental group ($n = 22$) received the supportive educative nursing system including discussions and exercise demonstrations once a month for 2 month (1.5 hours each time), and home visit once a month for 2 month (1.5 to 2 hours each time). The intervention took place over 8 weeks. The teaching media were posters and booklets. The booklets consisted of topics are self-care for persons with diabetes, observation and prevention of complications, stress management, and seeing the physician as the appointment. The result of this study indicated that the mean score of knowledge and self-care in the experimental group were significantly better than those before the experiment and than those of the control group ($P < .05$). In addition, the mean score of metabolic control in the experimental group was significantly better than those before the experiment ($P < .05$). However, it was found that the knowledge delivery period was too tight and home visit to persons with diabetes each had to travel a long distance as each person living at different villages remote from one another.

Suwannaruk (1999) studied on the application of empowerment on self-care of persons with type 2 diabetes at Sathinpra Hospital, Songkhla Province. They were matched by sex, age, and fasting blood glucose level. Each pair was randomized into an experimental group and comparison group of 30 persons each. The experimental group received training about empowerment for self-care through 1 hour individual counseling followed, at one month intervals, by 2 hours group counseling sessions. The comparison group received 3 sessions of a regular health education program at one month intervals. The teaching media was a booklet on diabetes knowledge and self-care. The results of this study indicated that after the experiment, the experimental group had significantly more knowledge, self-efficacy, practice, and fasting blood glucose control than before entering in the program and than the comparison group ($P < .001$).

Tiatrakul (2001) studied the effectiveness of self-efficacy theory for self-care behavior modification among persons with type 2 diabetes attending Soongnurn Hospital, Nakhon Ratchasima Province. The comparison group (n = 37) received routine service in hospital. The experimental group (n = 39) received a health education 6 times; 3 times in the hospital in week 1, 4, and 8; 3 times in the community in week 2, 6, and 10. The teaching media were pamphlets on diabetes knowledge, videotapes about diabetes and self-care, and slides on complications. The result of this study indicated that after experiment, the experiment group had a significant change in knowledge, self-efficacy, outcome expectation and self-care practice compare to before experiment and the comparison group. But there was no significant change in fasting blood sugar and body mass index.

Masawang (2001) studied the effectiveness of health promotion and education program in improving behavior and glycemic control of persons with menopausal type 2 diabetes attending Jaturapakpiman Hospital, Roi-ed Province. The experimental and comparison group each consisted of 50 persons. The experimental group received the health promotion and education program by group process and had activities 3 times at 1 month intervals while the comparison group received the regular services at hospital. The teaching media was video on diabetes knowledge. The result of this study indicated that the experiment group gained a statistically higher level of knowledge about diabetes mellitus, self-efficacy, outcome expectation, practice in

dietary control, exercise, taking medication, and punctuality on doctor's appointment than before the experiment and had a higher level of knowledge than the comparison group. In addition, the fasting blood sugar decreased at the end of the program and was sisnificantly lower than that of the comparison group.

Phumleng (2002) studied the effectiveness of an educative-supportive program on improving perceived self-care and diabetic control in 42 persons with type 2 diabetes: a case study of a rural hospital in the South. The study was one group pretest-posttest design. This program consisted of one workshop for teaching, sharing experiences, and skill training for one day in 3 large groups of 11, 24, and 11 persons; small group discussion consisted of 8-10 persons per group meeting once a month for 3 months; and individual counseling for them according to their needs. The teaching media were videotapes, booklets and pamphlets. The videotapes consisted of 4 parts are quality of life of persons with diabetes, food for persons with diabetes, diabetes and exercise, and foot care for persons with diabetes. The booklets consisted of 7 topics are information persons with diabetes need to know, dangers of diabetes, oral medication for diabetes, principle of food control for persons with diabetes, diabetes and exercise, foot care for persons with diabetes, and questions from persons with diabetes. The pamphlets consisted of 11 topics are information persons with diabetes need to know, dangers of diabetes, oral medication for diabetes, hypoglycemia, urine self-test, principle of food control for persons with diabetes, foods for overweight, foods for underweight, foods for normal weight, exercise, foot care. The result of this study indicated that total participants' mean score on perceived self-care efficacy in each dimension, and mean score on disease control were significantly higher than the first month. Also the mean score of fasting blood sugar level decreases significantly in each month ($P < .001$). There was 3 participants were missing from the experiment.

Wibunrattanasri (2002) studied development of the self-help guidelines for meal planning using carbohydrate counting for diabetes care. The study was one group pretest-posttest design. The participants (n = 32) received the guidelines with one session of introduction. The self-help guidelines are 14.5× 21.5 cm in size and have 20 pages with Angsana UPC font, for the main topics used size18 and general content used size 16. The self-help guidelines consisted of diabetes knowledge, what will happen to you if blood glucose level is higher than normal, how to control blood

glucose?, what are the foods for persons with diabetes?, how do you know that you are just enough eating?, and carbohydrate counting with sample of carbohydrate count recording. There was an introduction before distribution of the self-help guidelines. After one week an appointment to see the participants was made to assess the efficacy of the self-help guidelines. It was found that there were only 26 participants that had read the self-help guidelines. In the assessment of the self-help guidelines it was found its general feature as a whole is good, but some food menus and drinks were missing for carbohydrate unit count.

Muangkae (2002) studied the effectiveness of an educative-supportive program on improving perceived self-care and diabetic control in 42 persons with type 2 diabetes: a case study of a rural hospital in the North. The study was one group pretest-posttest design. This program consisted of one workshop for teaching, sharing experiences, and skill training for one day in 3 large groups of 27, 24, and 14 persons; small group discussion consisted of 8-10 persons per group meeting once a month for 3 months; and individual counseling for them according to their needs. The teaching media were videotapes and booklets. The videotapes consisted of 4 parts on quality of life of persons with diabetes, food for persons with diabetes, diabetes and exercise, and foot care for persons with diabetes. The booklets consisted of 7 topics on information persons with diabetes need to know, dangers of diabetes, oral medication for diabetes, principle of food control for persons with diabetes, diabetes and exercise, foot care for persons with diabetes, and questions from persons with diabetes. After entering the program, the mean scores of total and of each dimension of perceived self-care efficacy, and mean score on disease control were significantly higher than in prior entering the program ($P < .001$). Also the mean score of fasting blood sugar level in each month after entering the program were significantly lower than those before entering the program ($P < .001$). There were 7 participants missing from the experiment.

In the other countries, it was found that there are media such as booklets, flip charts, video, computer, CD-ROM, games, and telephone. The researchers had assessed of the efficiency in using the media also. The above media have different efficiencies such as Skeleton, 1973 (cited by Prapasanon, 1993) who studied the use of media to teach 40 persons with diabetes by using flip charts with the content on

diabetes knowledge and self-care. The control group (n = 20) received routine service in the hospital. The experimental group (n = 20) received health education plus home visit to assess the knowledge and self-care behavior by using a questionnaire. The result of this study indicated that after experiment, the experiment group had a significant change in knowledge, self-care behavior compare to before experiment and the comparison group.

Brown, Duchin, and Villagomez (1992) studied the diabetes education in a Mexican-American population: pilot testing of a research-based. A diabetes education videotape was designed and pilot tested in a sample of 30 Spanish-speaking Hispanic diabetic adults in a rural Texas-Mexican border community. The videotape provided an overview of diabetes, with emphasis on the concept of blood glucose; relationships between food, medications, exercise, and blood glucose levels; and blood glucose monitoring. Outcomes of videotape effectiveness were based on a 20-item knowledge test and interview data to assess acceptability of videotapes as a learning tool. Comparison of the knowledge test scores of the experimental group (those who viewed the tape before taking the knowledge test) with the control group (those who took the test before viewing the tape) produced a positive, moderate effect size of 0.61. Interviews with subjects indicated enthusiastic acceptance of the videotape as a means of transmitting diabetes information.

Glasgow, Toobert, and Hampson (1996) studied the effects of a brief office-based intervention to facilitate diabetes dietary self-management. There is a pressing need for brief practical interventions that address diabetes management. Using a randomized design, and evaluated a medical office-based intervention focused on behavioral issues relevant to dietary self-management. There were 206 adult persons with diabetes randomized to usual care or brief intervention, which consisted of touch screen computer-assisted assessment to provide immediate feedback on key barriers to dietary self-management, and goal setting and problem-solving counseling for patients. Follow-up components to the single session intervention included phone calls and interactive video or videotape instruction as needed. Multivariate analyses of covariance revealed that the brief intervention produced greater improvements than usual care on a number of measures of dietary behavior (e.g., fewer calories from saturated fat, fewer high-fat eating habits and behaviors) at the 3-month follow-up.

There were also significant differences favoring intervention on changes in serum cholesterol levels and patient satisfaction but not on glycosylated hemoglobin. The intervention effects were relatively robust across a variety of patient characteristics, the two participating physicians, and intervention staff members. If the long-term results are equally positive and generalize to other settings, this intervention could provide a prototype for a feasible cost-effective way to integrate patient views and behavioral management into office-based care for diabetes.

Ledda, Walker, and Basch (1997) studied the development and formative evaluation of a foot self-care program for African Americans with diabetes. The purpose of this project was to develop, formatively evaluate, and pilot test a self-care, take-home program for the prevention of foot problems in African Americans with diabetes. The program included a brief, one-on-one orientation session and a take-home foot self-care packet. Through telephone follow-up subjects reported the following: good to excellent overall rating of the program, favorable reactions to the patient instruction booklet, an overwhelming positive response to the large hand mirror, and a positive effect on their daily foot-care practices. The Afrocentricity of the patient education materials was preferred by younger subjects; older subjects found this approach too restrictive.

Oermann, Webb, and Ashare (2003) studied the outcomes of videotape instruction in clinic waiting area**.** The purpose of this study was to examine the effectiveness of general health-promotion teaching for patients in the waiting room of a clinic, using focused videotape instruction. An experimental design was used. Subjects were patients (N = 215) in the waiting rooms of clinics in a university medical center in the Midwest. Patients were randomly assigned to two groups: focused videotape instruction in the clinic (n = 106) and control (no instruction in the clinic waiting area) (n = 109). The outcome measures included patient learning about a health education topic and patient satisfaction with overall care, explanations by the provider, and education received during the clinic visit. There was a significant gain in knowledge for patients who viewed the videotape in the waiting room ($p < .0001$), and they were more satisfied with their education compared with the control group ($p < .0001$). This study supports focused video instruction as an effective and efficient teaching intervention for disseminating health information in the waiting area.

Eaden, Abrams, Shears and Mayberry (2002) studied the efficacy of a video and information leaflet versus information leaflet alone on patient knowledge about surveillance and cancer risk in ulcerative colitis. Patients (n = 124) were recruited into a randomized controlled trial conducted from the gastroenterology outpatient departments of two Leicester hospitals. Participants completed a questionnaire prior to receiving the leaflet or viewing the video, immediately afterward, and 1 month later. One hundred fifteen questionnaires were returned (response rate = 93%). Both videos and leaflets increased knowledge with mean percentage improvements in scores of 71% and 49%, respectively. However, the difference between the two interventions was not statistically significant. After 1 month, knowledge levels decreased in both groups to 55% (video plus leaflet) and 36% (leaflet alone). Conclusions of this study were leaflets and videos have an important role in reinforcing information provided by clinicians. However, there appears to be no immediate or prolonged advantage of a video over and above that of a simple information leaflet. The cost implications of producing a video, such as extra staff time, need to be weighed against the minor benefit that this medium has to offer.

Krouse (2001) studied the video modeling to educate patients**.** The purpose of this integrative literature review was to examine the concept of video modeling and its applications in clinical practice. Based on criteria for inclusion, 18 research studies involving video modeling were reviewed and three major uses were identified: (1) assisting decision making regarding treatment options; (2) reducing pre-procedural anxiety and improving coping skills; and (3) teaching self-care practices. The studies reviewed included a variety of research designs, clinical settings, and patient populations. Despite these differences, several benefits to the use of video modeling were found. Patients who viewed videotapes regarding treatment options had a greater understanding of the risks and benefits of those choices and were more apt to be active participants in decision making. Collective results of the studies focusing on stress and coping revealed that preparatory videotapes using video modeling could have a positive effect on reducing anxiety and physiological arousal during stressful procedures. With self-care practices, several of the studies found that there was an increase in desired behaviors in people whose educational program included video modeling. In this study concluded that the use of video modeling has potential benefits

for clinical practice in facilitating knowledge acquisition, reducing preparatory anxiety, and improving self-care. Nurses must become more actively involved in evaluating various teaching approaches used with patients to enhance practice and outcomes.

Most of results from the review of the literature indicated that various strategies are able to help the persons with diabetes improve disease control. However, it found that most media were developed for use by each individual researcher only, thus creating discontinuity and making it unapproachable by most persons with diabetes. Further more, there was limitations such as booklets, leaflets, flip charts, and videos which do not cover all aspects of diabetes; some research was about feet observation only or eating in combination with exercise and taking medicine; some research are impractical as many experienced personnel in difference fields are required both the personnel and persons with diabetes require more attempt and high investment. As the appointment for teaching and blood glucose testing was not occurring at the same time, therefore many persons with diabetes were not present during the research was being carried out. This may be due to the inconvenient time and venue for them to join the group; they may still have to attend to their family affairs, education or work. Furthermore, sometimes the title of the support and knowledge delivery does not occur during the illness period of each person with diabetes, thus making their not interested in listening. If they are not ready to absorb the media being displayed they will not have listening concentration, they will easily forgot or not receiving all the content.

Therefore, these have not reflected the real practice such as It implementation is rather difficult as the procedures are complicated. Moreover, it was found that most researches concerning the support and knowledge delivery had been using the media for knowledge transfer to persons with diabetes. There were many combination of the media used in a research such as booklets (Suwannaruk, 1999) booklets and video (Hanucharurnkul, et al., 2001; Baineam, 1998; Muangkae, 2000; Phumleng, 2002; Boonchauy, 2001) group process and booklets (Lertprapai, 1996) group process with booklets and videotapes (Plodnaimuang, 1999; Limpapanon, 1994) slides and booklets (Laochot, 1994) slides and videotapes and pamphlets (Tiatakul, 2001) video and pamphlets and postcards (Jaitham, 1998) booklets and posters

(Sanaun, 1999) video and telephone(Ledda, et al.,1997) video and telephone and computer (Glasgow, et al., 1996) slides and booklets and videotape (Funnell, et al., 1992) video and leaflets (Eaden, et al., 2002). It could be seen that most of research used more than 2 types of media, which is corresponding the study of Likitratcharoen (2000), studied of supportive-educative intervention research for persons with diabetes in Thailand form 1997 to 1999 it has been found that there are altogether 57 studies. The results found that the most of researches (56.14%) used mixes teaching media, most media (63.13%) used were booklets, follow by videos (33.33%) and flip charts (15.79%).

The limitations of media, it can be seen that the advantages of the CD-ROM are that content on each part of diabetes is compact, time not too long in each part, making it interesting and not boring; easy language used; clear pictures and sounds, beautiful colors; with action displays by persons with diabetes in actual situation, making easy understanding. But CD-ROM has a limitation in that it can be viewed at the health service center only; they can not make a review at home. Therefore, the researcher used the booklets in support of this knowledge delivery also as this booklets has the content covering all aspects of self-care for persons with diabetes. These booklets have large font sizes, easy language, easy too read, dark fonts for easy viewing, with pictures and explanations for easy understanding, thick papers, illustrations and description, beautiful colors, attractive for reading, and convenient to carry. All number contains each subject, making the search and review easy. It can be read any time and can be read with family members or others. Moreover, in the past research the content of booklets did not cover all aspects of diabetes. Also as this self-care packages (CD-ROM and booklets) was developed in year 2004 by Hanucharurnkul, and colleagues, has not been used therefore it is not known as yet of its feasibility to be used for knowledge delivery to persons with diabetes. Therefore, the researcher tested the self-care packages that it could be used in actual practice by considering from the score of diabetic knowledge and self-care behaviors including the score of the quality of self-care packages as evaluate by the participants. This is for use as guidelines to promote health and encourage self-care of persons with diabetes so that they will have good self-care potential and quality of life in the future.

CHAPTER III
METHODOLOGY

This chapter explains the research design and method. The chapter includes description of research design, population and sample, research setting, research instruments, protection of human rights, data collection, and data analysis.

Research Design

This pre-experimental research, one-group pretest- posttest design aimed at testing the feasibility of using self-care packages to increase knowledge and improve self- care behavior of persons with diabetes mellitus.

Population and Samples

Population

The population of this study was persons with diabetes in the Diabetic Clinic of Nongbua Hospital, Nongbua District, Nakhon Sawan Province; 817 persons in the year 2004. The period of the study was during October to December 2004. The samples were selected by using the following criteria**.**

The inclusion criteria are as follows:

1. Persons with type 2 diabetes mellitus
2. They were 40 to 70 years old, both male and female.
3. They were able to understand the Thai language.
4. They were good hearing and seeing, with no severe complication including paralysis or amputation, diabetic retinopathy or cataract causing visual abnormality, myocardial infraction, and renal disease. These criteria were considered by history, interview and observation by the investigator combined with medical diagnosis.
5. Living in Nongbua District, Nakhon Sawan Province.

6. Willing to participate in this study.

The exclusion criteria are as follows:

1. Failure to attend the study through 8 weeks.
2. They were having illness between using the self-care packages.

Sample size

The sample size of this research is determines by power analysis where the effect sizes were calculated from samples in previous research results. The researcher used research result from meta-analysis of Likitratcharoen (2003) which studied supportive-educative intervention research for persons with diabetes in Thailand form 1997 to 1999 with the total of 57 studies. From the above mentioned researches, a determination is made to calculate the effect size on knowledge and self-care which was large effect (.80). The significance of .05 and desired power of .95 was a statistical power used to determine the approximate sample size. These values were then used to determine the sample size from the table (Cohen, 1998). The sample size 57 persons were obtained. To increase the power of analysis and prevent attrition of the sample in this research the sample size 80 persons was used.

Research Setting

Data collection took place at the Diabetic Clinic at Nongbua Hospital, Nongbua District, Nakhon Sawan Province.

Characteristic of Nongbua Hospital and Diabetic Clinic

It is a community hospital with 60 beds under the Ministry of Public Health. The service is primary care in nature; the majority of the services provided are medical problem. One of the top ten diseases in the Outpatient Department is diabetes and the number of persons with diabetes is increasing.

Diabetic Clinic is situated behind the Outpatient Department building with a corridor connecting between them. It is a room 4×7 m. and it has a small Operation Room adjoining in the North, a Counseling Room in the South, windows along the East wall, and a corridor to a walking verandah connecting with the Outpatient Department building. In the Diabetic Clinic room there is a desk in front of the clinic

for physicians and nurses for service rendering and there are chairs for about 40 persons with diabetes waiting for the physician.

Outside of the Diabetic Clinic room, there is a verandah with benches against the wall able to accommodate more than 40 persons. There are three desk; first desk for the persons with diabetes to submit their identify cards and pick up the queue numbers; second desk is for snacks provides to persons with diabetes by the Dietary Department of the hospital; and the third desk is for personnel from the Pathological Department coming for blood samples taking.

Characteristics of the Services

The Diabetic Clinic opens on Wednesday, Thursday, and Friday between 07.00 am to 12.00 am. The health care providers involved are a physician, two registered nurses, a patient assistant, a laboratory technician, and a pharmacologist. There was average 50-70 persons/day coming to the clinic.

Steps of Providing Service of the Diabetic Clinic

Steps of providing service of the Diabetic Clinic are as follows:

1. At about 06.00 am. The persons with diabetes will pick up a queue number placed on the desk in front of the clinic room and wait to be call for examination.

2. The laboratory technician starts at 07.00 am to provide services to take fasting blood sugar according to the queue. After taking blood samples, the patients will have with snacks and wait for the results.

3. At about 07.30 am. The nurse will take blood pressures and body weights of the persons with diabetes.

4. At about 09.00 am. When the nurse received fasting blood sugar results, the nurse will screen persons with diabetes. For persons with diabetes not requiring to seeing the physician the nurse can dispense them the same medicines, issue the next appointments and make a record in the OPD card of the clinic. Then the persons with diabetes can take the prescriptions for payments at the Financial Department and take the medicines from the Dispensary Department locating adjacent to OPD building.

The criteria of the Diabetic Clinic that persons with diabetes have to see the physician are as follows:

1. Persons with diabetes have to see the doctor every 3 months
2. Persons with diabetes that have FBS before breakfast more than 200 mg% and less than 80 mg%.
3. Persons with diabetes having complications such as cardiovascular, renal failure and diabetic foots ulcer.
4. Persons with diabetes had received treatment with medicine tablets is Metformin 2 tablets 3 times daily after meals and Dionil 2 tablets once daily after meal, then fasting blood sugar level is still more than 200 mg%.
5. Persons with diabetes that have been treated with high dose insulin injection; dosage more than 30-35 units.
6. Persons with diabetes who wants to see the physician.

Having met persons with diabetes with the above criteria the nurse will send them to see the physician at Outpatient Department, for about 5 minutes. Then the persons with diabetes can take the prescriptions for payments at the Financial Department and take the medicines from the Dispensary Department before going to the diabetes clinic to get the next appointment day.

For person with diabetes who did not come as the appointment dates, the OPD card will not be searched for. They have to submit the identification cards at the Medical Registration Room adjacent to OPD building. Having received the OPD card then go to the Diabetic Clinic where they will receive the services in the same procedures as the others.

Pattern of Health Education to Persons with Diabetes

The persons with diabetes get information related knowledge and self-care management from the routine of health education, which is provides by a physician and a nurse. The physician spends a short time to advice them who has the criteria. The nurse provides health education as in a group and the teaching time is about 10-15 minutes conducting during for FBS test results. It was found that the teaching is not effective because persons with diabetes were in large groups; and persons with diabetes who are outside of the diabetes clinic room can not hear the information. The teaching topics are not clearly scheduled. The various media used leaflets which do not cover all the aspects of diabetes and self-care management. In the past, there were not any assessment of the persons with diabetes' knowledge and the quality of the

media. The leaflets made by the nurse which have not continuity and not cover all persons with diabetes. Furthermore, it was observed from the record in the teaching of the Diabetic Clinic found that the teaching was not continuing; the pattern of teaching and media were not clear.

Research Instruments

The instruments of this study consist of 2 parts; data collection instrument and Experimental instruments.

Instrument for Data Collection

1. Demographic Data Questionnaire was used to record the persons with diabetes profile: address, age, gender, FBS level, taking medication, body weight and high**,** marital status, religion, education level, occupation, number of children, number of family members, family income per month, medical expenses, family history of diabetes, other chronic health problem, smoking, and alcohol consumption (See appendix A).

2. Diabetes knowledge Questionnaires of Persons with Diabetes is a cognitive measure of diabetes knowledge. The original version of diabetes knowledge developed by Tantayotai (1982) consist of 5 dimensions, 40 items: dimension 1, general knowledge (9 items), dimension 2, diabetic food (8 items), dimension 3, medication taking (12 items), dimension 4, exercise (5 items), and dimension 5, hygiene and foot care (6 items). The recent version was revised by Kiratiyuttawong (2004) added one question in dimension 1 and one question in dimension 3 and excluded 7 questions in this dimension. Finally, total question consist of 5 dimensions, 35 items, general knowledge about diabetes mellitus (10 items), dimension 2, diabetic food (8 items), dimension 3, medication taking (6 items), dimension 4, exercise (5 items), and dimension 5, hygiene and foot care (6 items). There are 4 choices of which only one will be chosen from each question. In the scoring there is only 0 and 1; score 1 for the correct answers and score 0 for the wrong answers. Scores will be calculated by means number of total score in each dimension. The actual scores ranged from 0-35.

The researcher has classified score levels of diabetes knowledge of the subjects by applying from Lachroj (1994) into 3 levels: poor, fair, and good levels. To some extent, poor level refers to the score which are under 60% of the total score, medium level refers to the score which 60 – 79% of the total score, and good level refers to the score which are over 80% of the total score. And the scores are classified in 3 levels as shown below:

Scores		**Knowledge**
0 - 20	=	Poor
21 - 27	=	Fair
28 - 35	=	Good

Validity and Reliability

The instrument was examined for content validity by a group of experts including two expert endocrinologists, three nursing instructors in the field of chronic illness including diabetes. Tantayotai (1982) examined the reliability of this instrument in 20 persons with diabetes at Ramathibodi Hospital, Phayathai Hospital, and Clong Toey Clinic. Reliability, KR-20 was 0.76 for type 1 diabetes and 0.80 for type 2 diabetes.

Kiratiyuttawong (2004) examined the reliability of this instrument in 30 persons with type 2 diabetes at Banbueng Hospital, Cholburi Province. Reliability, KR-20 was 0.81.

In this study, the researcher examined the reliability of this instrument in 30 persons with type 2 diabetes at Nonhbua Hospital, Nakhon Sawan Province. Reliability, KR-20 was .843.

3. The summary of Diabetes Self-care Activity is a brief self-report measure of diabetes self-care activity. The original version developed by Tobert, Hampson, and Glasgow (1994) assessed 5 aspects of diabetes regimen: general diet, specific diet, exercise, medication taking, and hygiene. The questions ask about diabetes self-care activities during the past 7 days. Then, Tobert, Hampson, and Glasgow (2000) included item on foot care and smoking. The recent version was revised by Kiratiyuttawong (2004), consist of 5 dimensions, 19 items: dietary control

(7 items), exercise (2 items), self-monitoring (3 items), hygiene and foot care (5 items), and medicine taking (2 items). The actual scores ranged from 0-133. The examples of a question in each item are as follows:

Dietary control

"In the past 7 days, how many days did you eat between meals?"

Exercise

"In the past 7 days, how many days did you do continued activities using force at least 30 minutes such as cleaning house till sweating, gardening, and walking?"

Self-monitoring

"In the past 7 days, how many days did you make a self-review in eating too much or too little?"

Hygiene and foot care

"In the past 7 days, how many days did you examine your feet?"

Medicine taking

"In the past 7 days, how many days did you take medicines in every meal as treatment plan of the physician?"

Scores will be calculated by means of number of days in each item. The guideline for scoring is as follows:

Positive items			**Negative items**		
Duration		**Score**	**Duration**		**Score**
0	=	0	0	=	7
1	=	1	1	=	6
2	=	2	2	=	5
3	=	3	3	=	4
4	=	4	4	=	3
5	=	5	5	=	2
6	=	6	6	=	1
7	=	7	7	=	0

Positive items are no. 1, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19. Negative items are no. 2, 3, 4, and 7.

The researcher has classified score levels of self-care behavior of the subjects by applying from Lachroj (1994) into 3 levels: poor, fair, and good levels. Poor level refers to the score which are under 60% of the total score, medium level refers to the score which 60 – 79% of the total score, and good level refers to the score which are over 80% of the total score. And the items are classified in to 3 levels as shown below:

Scores		**Self-care**
0 - 80	=	Poor
81 – 105	=	Fair
106 - 133	=	Good

Validity and Reliability

The instrument was examined for content validity by a group of experts including two bilingual doctoral prepared nurses and one linguistic. Kiratiyuttawong (2004) examined the reliability of this instrument in 30 persons with type 2 diabetes at Banbueng Hospital, Cholburi Province. Inter-item correlations were uses to assess relationship among items within a scale because the various SDSCA scales had different numbers of items and some scale has a small number of items. The average inter-item correlations within scales were high (mean = 0.43, SD = .21). The two weeks test-retest reliability of SDSCA was .894.

In this study, the researcher examined the reliability of this instrument in 30 persons with type 2 diabetes at Nonhbua Hospital, Nakhon Sawan Province. The average inter-item correlations within scales were high (mean = 0.46, SD = .06). The two weeks test-retest reliability of SDSCA was .898.

4. Questionnaire on CD-ROM Quality is instrument used to evaluate the patients' satisfaction of the CD-ROM for persons with diabetes concerning the design, content, benefits and suitability for distribution to persons with diabetes and their families. This questionnaire was developed by Hanucharurnkul, and colleagues (2004) which are 4 rating scale which are as follows:

Scores		Quality of the CD-ROM
4	=	Very good
3	=	Good
2	=	Fair
1	=	To be improve

The examples of a question are as follows: content is clearly, content is precise and easily understood, content is interesting, appropriate length of time used, appropriate for person with diabetes and their families, content is usefulness, and overall quality. This instrument was examined for content validity by a group of experts including five nursing instructors in the field of chronic illness including diabetes.

The quality of self-care packages were classified into 4 levels according to Gronlund, 1981 (cited by Kichpreedaborisut, 1992; 2003): very good, good, fair, and to be improve levels. Very good level refers to the mean score which are over or equal 3.80, good level refers to the mean score which 3.0 to 3.79, fair level refers to the mean score which 2.6 to 2.99, and to be improve level refers to the mean score which 1.00 to 2.59.

5. Questionnaire on Booklets Quality is instrument used to evaluate the patients' satisfaction of the booklets for persons with diabetes concerning the design, literature, benefits and suitability for distribution to persons with diabetes and their families. This questionnaire was developed by Hanucharurnkul, and colleagues (2004) which are 4 rating scales which are as follows:

Scores		Quality of the booklets
4	=	Very good
3	=	Good
2	=	Fair
1	=	To be improve

The examples of a question are as follows: content is clear, precise, easily understood, interesting, and usefulness; appropriate size of font used; appropriate for

person with diabetes and their families and overall quality. This instrument was examined for content validity by a group of experts including five nursing instructors in the field of chronic illness including diabetes.

The quality of self-care packages were classified into 4 levels according to Gronlund, 1981 (cited by Kichpreedaborisut, 1992; 2003): very good, good, fair, and to be improve levels. To some extent, very good level refers to the mean score which are over or equal 3.80, good level refers to the mean score which 3.0 to 3.79, fair level refers to the mean score which 2.6 to 2.99, and to be improve level refers to the mean score which 1.00 to 2.59.

6. Recording Form on Reading the Booklets is instrument used for recording the frequencies in reading each number of booklets and any question found of persons with diabetes. This recording form was developed by Hanucharurnkul, colleagues (2004) and it was examined for content validity by a group of experts including five nursing instructors in the field of chronic illness including diabetes.

Experimental Instruments

1. CD-ROM titled "Guidelines for self-care of persons with diabetes" which was developed by Hanucharurnkul, and colleagues (2004) consisted of 5 parts, which included:

Part 1 Knowledge about diabetes mellitus, 10 minutes

Part 2 Living with diabetes normally, 10 minutes

Part 3 Guideline for healthy eating, 20 minutes

Part 4 Exercises and diabetes mellitus, 10 minutes

Part 5 Foot care for the persons with diabetes mellitus, 12 minutes

The content validity was evaluated by five experts including three physician and two nursing instructors in the field of chronic illness including diabetes.

2. Booklets titled "Packages on knowledge for self-care of persons with diabetes" which was developed by Hanucharurnkul, and colleagues (2004) based on the information gathered from texts, journals, and related research consisted of 10 numbers, which included:

Number 1 Diabetes mellitus: Prevention better than cure

Number 2 What is diabetes mellitus?

Number 3 Diabetic control and prevention of diabetic complications

Number 4 Guidelines for healthy caring

Number 5 Diabetic control with medication

Number 6 Exercises and diabetes mellitus.

Number 7 Self-monitoring for diabetic control

Number 8 Foot care and diabetes mellitus

Number 9 Self-care in special situations: illness, traveling and eating out

Number 10 Interesting questions for the persons with diabetes mellitus

The content validity of booklets was examined for accuracy and appropriateness of the language used by five experts including three physicians and two nursing instructors in the field of chronic illness including diabetes.

3. Postcard is instrument used to send to persons with diabetes after they watched the CD-ROM in very week for 6 weeks as week no. 2, 3, 4, 5, 6 and 7 since the researcher first met the persons with diabetes to remind them to reading booklets and encourage them for continuing self-care behavior.

Data Collection

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

Preparation Stage

1. The researcher submitted the letter asking for permission from the Faculty of Graduate Studies to the Director of Nongbua Hospital.

2. The researcher asked for co-operation from the chief nurse, the head nurse in the Outpatient Department, the physician, the nurse in the Diabetic Clinic, and the technician in Laboratory Department.

Data Collection Stage was divided into 2 phases: selection of the samples and implementation of the self care packages.

Phase 1: Selection of the Sample

1. The researcher collected data at the Diabetic Clinic every Tuesday, Wednesday, and Friday. The researcher selected the persons with diabetes who qualified to the criteria from OPD card. Then, the researcher wrote down all names of them and randomly selected 15 of them.

2. The researcher met them for asked their voluntary to participate in the study at the Diabetic Clinic every Wednesday, Thursday, and Friday between 07.00 am to 12.00 am. The study objectives and processed of the intervention of the study were explained to all participants. When the participants agreed to participate in the study, the participants signed names in the consent from (Appendix B). The following questionnaires were administered in the following order; demographic data questionnaires (Appendix D), diabetes knowledge measurement (Appendix E) and the summary of diabetes self-care activity (Appendix F).

3. The researcher assigned by drawing tickets to divide the participants into 2 groups of 8 to 11 persons. To begin with, the researcher arranged the tickets with two types: one with number 1 written in the ticket represented the participation on Saturday's group and another with number 2 written in the ticket represented the participation on Sunday's group. The subjects will be entering the implementation of the self-care packages phase on Saturdays and Sundays at 9.00-11.00 am in the same week.

Phase 2: Implementations of the Self-care Packages

This phase consisted of small group meeting. The duration of this phase was 2 hours. The implementations of the self-care packages were as follow:

1. The researcher introduced the self-care packages to the subjects, followed by them to watch CD-ROM part 1 to part 5. Before they watched the CD-ROM, the researcher concluded the content each part. After they watched the CD-ROM, the researcher has facilitated the subjects asked about their doubt and they filled in the questionnaire on CD-ROM quality each part (Appendix G/1 to G/5). Then the subjects rested for 5 minutes after finished filling in it.

2. The researcher provided the booklets to the subjects for review at home. All the numbers of booklets have a questionnaire on booklets quality (Appendix H/1 to H/10) that they have to be filled in after finished reading. Any number can be read first and re-read as their required. Furthermore, there is a recording form on reading the booklets (Appendix I) for them to record the frequency of reading the booklets. They have to be brought the questionnaire on booklets quality and the questionnaire on reading the booklets to the researcher in the eighth week.

3. The researcher sent postcards (Appendix J) to the subjects to remind them in reading booklets and encourage them for continuing self-care behavior every week for 6 weeks since first meeting with them. Moreover, in postcard number 6 the researcher wrote the appointment date in the eighth week for assesses using the self-care packages.

4. The researcher met with all the subjects as the appointment date to assess the research results by asking the subjects to fill in the diabetes knowledge questionnaires of persons with diabetes and the summary of diabetes self-care activity which is the same questionnaires as for the first assessment.

The summary of the procedure is shown in Figure 2.

Protection of Human Rights

The researcher was fully aware of ethical circumstance to carry out the study. Therefore, to use the information gained from the study, at all time the researcher concern about participants' pride, value and effect of the study on the participants. The researcher provides an information consent form (Appendix A) for the participants to request for participation in the study. The study objectives and processed of the intervention of the study were explained to all participants. The participants were informed of entire study. They were also ensured that their decisions to participate or withdraws themselves from the study would not affect the medical care in any way. Moreover, termination of the interview could be made at any time without any negative effect. The answer, and information raised from the study were kept confidentially and the results were analyzed as a whole group. Furthermore, the participants had all rights to ask any questions and any time in relevant to the study. After they agree to participate in the study, they signed names in the consent form (Appendix B).

The Research Procedure

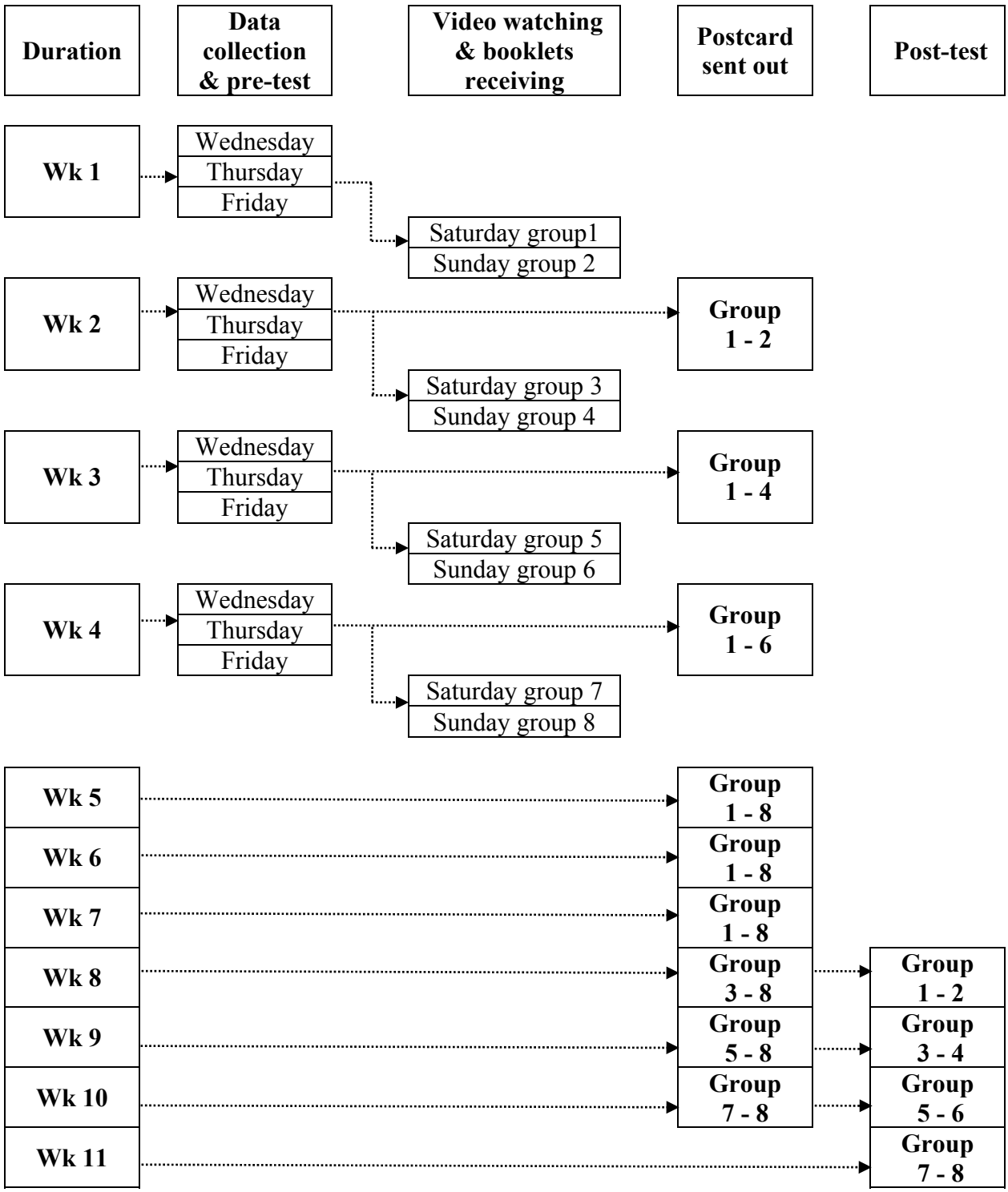

Figure 2 The Research Procedure

Data Analysis

The computer program was used to analyze the data. The significant confidence level for statistical test was set at 0.05 for data analysis:

1. Demographic data, questionnaire on CD-ROM quality, questionnaire on booklets quality, and questionnaire on reading the booklets were was using descriptive statistics as frequencies, percentages, and arithmetic means.

2. Comparison analysis of the differences of arithmetic means of diabetes knowledge and self-care behavior before and after using the self-care packages were using paired t-test.

CHAPTER IV
RESULTS

The purpose of this pre-experimental research was to test the feasibility of using self-care packages to increase knowledge and improve self- care behavior of persons with diabetic mellitus. The results of the data analysis were presented as follows:

Part 1: Demographic characteristics of the persons with diabetes

1.1 Demographic data

1.2 Data related to diabetes and treatment of the persons with diabetes

Part 2: The feasibility of using self-care packages among persons with diabetes

2.1 Diabetes knowledge of the persons with diabetes

2.2 Self-care behavior of the persons with diabetes

2.3 The quality of self-care packages of persons with diabetes

2.3.1 The quality of CD-ROM

2.3.2 The quality of booklets

Demographic Characteristics of the Persons with Diabetes

Demographic Data

The total subjects who completed the study consisted of 80 persons with type 2 diabetes. The subjects were comprised of 55 females (68.75%) and 25 males (31.25%), the average age was 53.91 (range 40-70, SD 9.69). The majority of the subjects (78.75%) had BMI higher than standard level. The majority of the subjects (91.25%) were married. Moreover, all of them were Buddhists, and 71.25% worked as agriculture, and 86.25% had primary education. The majority of the subjects (95%) did not smoking and did not use Alcohol consumption. Sixty-eight percent of the subjects had a family income less than 5,000 baht/month. The number of children

ranged 0-15 (Mean 3.16, SD 2.23), and the number of family members ranged from 1-7 persons/family (Mean 3.31, SD 1.24) (See Table 3).

Table 3 Demographic Characteristics of the Subjects (n=80)

Characteristics	Number	percentage
Gender		
Female	55	68.75
Male	25	31.25
Age (year)		
40-49	32	40
50-59	22	27.5
60-70	26	32.5
Range 40-70, Mean = 53.91, SD = 9.69		
Body Mass Index (kg/m^2)		
Normal (18.5 - 23)	17	21.25
Overweight (> 23)	63	78.75
Marital Status		
Single	2	2.5
Married	73	91.25
Widowed/ Divorce/ Separated	5	6.25
Occupation		
Employee	7	8.75
Merchant	7	8.75
Agriculture	57	71.25
House work	9	11.25
Education Level		
Primary school	69	86.25
High school	8	10
Diploma	2	2.5
Bachelor Degree	1	1.25

Table 3 Demographic Characteristics of the Subjects (n=80) (continuous)

Characteristics	Number	percentage
Smoking		
No	76	95
Yes	4	5
Alcohol Consumption	76	95
No	4	5
Yes		
Number of Children		
None	3	3.75
1 - 5	68	85
6 - 10	8	10
> 10	1	1.25
Range 0 - 15, Mean = 3.16, SD = 2.23		
Number of Family members		
1-5	74	92.5
6-10	6	7.5
Range 1-7, Mean 3.31, SD 1.24		
Family Income per Month (baht/month)		
≤ 5,000	55	68.75
5,001-10,000	16	20
10,001-20,000	5	6.25
20,001-30,000	4	5
Range 1,500-30,000, Mean 6,162.50, SD 4823.974		

Data Related to Diabetes and Treatment of the Persons with Diabetes

The findings of the study revealed that 62.5% were FBS as more than 126 mg%, and the most of the subjects (87.5%) were oral hypoglycemic therapy. The majority of the subjects (91.25%) paid for medical expenses by a universal health card (92.5 %). In addition, the duration of diabetes mellitus ranged from 0.17 to 20 years (Mean = 4.97, SD = 4.55). Moreover, all of them are continuing of cure, and do not

problem about self-care behavior. Finally, around 22.5 % had other diseases including 16 persons with hypertension, two persons with asthma (See Table 4).

Table 4 Data Related to Diabetes and Treatment of the Subjects (n=80)

Characteristics	Number	percentage
FBS		
Good control (80 - 126 mg %)	30	37.5
Fair control (127 - 140 mg %)	9	11.25
Poor control (< 80 or > 140 mg %)	41	51.25
Taking Medication		
Oral hypoglycemic therapy	70	87.5
Oral hypoglycemic with Insulin treatment	10	12.5
Medical Expense		
Government funds	6	7.5
Universal health card	74	92.5
Duration of DM Diagnosis (year)		
< 1	16	20
1-10	55	68.75
11-20	9	11.25
Range 0.17-20, Mean 4.97, SD 4.55		
Family History of Diabetes		
None	51	63.75
Yes	29	36.25
Father / Mother	21	72.41
Younger sister / Brother	8	27.59
Others Chronic Health Problem		
No	62	77.5
Yes	18	22.5
Hypertension	16	88.89
Asthma	2	11.11

The Feasibility of Using Self-care Packages among Persons with Diabetes

Diabetes Knowledge of the Persons with Diabetes

Before using the self-care packages, the subjects had total scores at good level in knowledge about diabetes mellitus at the percentage of 10 %, 33.75 % in fair level, and poor level of 56.25 %. After using the self-care packages, it was found that at good, fair, and poor level in knowledge about diabetes mellitus increase to 66.25 %, 32.5 %, and 1.25 %, respectively. For each dimension, the percentage for each dimension of knowledge was also higher than those obtained before using the self-care packages (See Table 5).

Table 5 Knowledge of Diabetes Mellitus Before and After Using Self-care Packages of the Subjects (n =80)

Knowledge	Before			After		
	Poor n (%)	**Fair** n (%)	**Good** n (%)	**Poor** n (%)	**Fair** n (%)	**Good** n (%)
Total	45 (56.25)	27 (33.75)	8 (10)	1 (1.25)	26 (32.5)	53 (66.25)
Each dimension						
General knowledge	52 (65)	24 (30)	4 (5)	7 (8.75)	17 (21.25)	56 (70)
Dietary control	27 (33.75)	35 (43.75)	18 (22.5)	7 (8.75)	38 (47.5)	35 (43.75)
Medicine taking	18 (22.5)	36 (45)	26 (32.5)	-	19 (23.75)	61 (76.25)
Exercise	37 (46.25)	40 (50)	3 (3.75)	6 (7.5)	59 (73.75)	15 (18.75)
Hygiene and foot care	19 (23.75)	39 (48.75)	22 (27.5)	8 (10)	26 (32.5)	46 (57.5)

The total knowledge score before using self-care packages ranged from 7-31 (Mean = 19.52, SD = 6.127), and after using self-care packages, they ranged from 19-34 (Mean = 28.81, SD = 3.090). The actual scores ranged from 0-35. The total mean scores before and after using the self-care packages were 19.25 and 28.81, respectively. After using the self-care packages, all mean scores on each dimension were higher than those obtained before using the self-care packages. For the comparative analysis, paired t-test showed that after using self-care packages, the total mean scores of knowledge was significantly higher than those before using self-care

packages ($p < .0001$). The mean scores for each dimension of knowledge were also significantly higher than those obtained before using the self-care packages ($p < .0001$) (See Table 6).

Table 6 The Mean Score of Knowledge of Diabetes Mellitus Before and After Using Self-care Packages of the Subjects (n =80)

Knowledge	Before		After		$\overline{D}$	t
	Mean	SD	Mean	SD		
Total	19.52	6.127	28.81	3.090	9.29	16.103
Each dimension						
General knowledge	4.64	1.924	7.84	1.354	3.20	14.203
Dietary control	5.03	1.622	6.18	1.003	1.15	6.560
Medicine taking	3.83	1.581	5.14	.838	1.31	8.118
Exercise	2.66	1.232	3.65	.873	0.99	6.520
Hygiene and foot care	3.38	1.546	5.54	1.262	2.16	11.952

***p < .0001**

Self-care Behavior of the Persons with Diabetes

Before using the self-care packages, the subjects had total scores at good level in self-care behavior at the percentage of 2.5 %, 36.25 % in fair level, and poor level of 61.25 %. After using the self-care packages, it was found that at good and fair level in self-care behavior increase to 92.5 and 7.5 %, respectively. For each dimension, the percentage for each dimension of self-care behavior was also higher than those obtained before using the self-care packages (See Table 7).

Table 7 Self-care Behavior of Persons with Diabetes Before and After Using Self-care Packages of the Subjects (n =80)

Self-care	Before			After		
	Poor n (%)	**Fair** n (%)	**Good** n (%)	**Poor** n (%)	**Fair** n (%)	**Good** n (%)
Total	49 (61.25)	29 (36.25)	2 (2.5)	-	6 (7.5)	74 (92.5)
Each dimension						
Dietary control	72 (90)	8 (10)	-	1 (1.25)	17 (21.25)	62 (77.5)
Medicine taking	2 (2.5)	7 (8.75)	71 (88.75)	-	1 (1.25)	79 (98.75)
Exercise	50 (62.5)	13 (16.25)	17 (21.25)	21 (26.25)	10 (12.5)	49 (61.25)
Hygiene and foot care	29 (36.25)	28 (35)	23 (28.75)	-	1 (1.25)	79 (98.75)
Self-monitoring	52 (65)	20 (25)	8 (10)	-	12 (15)	68 (85)

The total self-care behavior scores before using self-care packages were 36 - 112 (Mean = 74.34, SD = 9.205). After using self-care packages were 82 - 120 (Mean = 121.14, SD = 15.139). The actual scores ranged from 0-133. The total means score before and after using the self-care packages were 74.34 and 121.14, respectively. After using the self-care packages, all mean scores on each dimension were higher than those obtained before using the self-care packages. For the comparative analysis, paired t-test showed that after using self-care packages, the total mean scores of self-care behavior was significantly higher than those before using self-care packages ($p < .0001$). The mean scores for each dimension of self-care behavior were also significantly higher than those obtained before using the self-care packages ($p < .0001$) (See Table 8).

Table 8 The Mean Score on the Self-care Behavior Before and After Using Self-care Packages of the Subjects (n =80)

Self-care	Before		After		$\overline{D}$	t
	Mean	SD	Mean	SD		
Total	74.34	9.205	121.14	15.139	46.80	23.523
Each dimension						
Dietary control	21.34	6.688	24.16	4.169	2.82	3.784
Medicine taking	12.75	1.768	13.65	.781	0.90	5.019
Exercise	8.09	3.042	11.34	3.337	3.25	6.498
Hygiene and foot care	22.90	8.488	34.48	1.728	11.58	12.375
Self-monitoring	9.26	5.076	19.64	2.388	10.38	16.500

***p < .0001**

From the Table 7-8, after using the self-care packages, the subjects had higher the mean score of knowledge of diabetes mellitus, and had higher the mean score on the self-care behavior than before using self-care packages.

The Quality of Self-care Packages of Persons with Diabetes

The Quality of CD-ROM

The mean score of the quality of CD-ROM part 1 - 5 as evaluated by the subjects in all items were at good level (See Table 9).

Table 9 The Quality of CD-ROM of the Subjects (n =80)

Items	Level of quality			Mean	Level
	Very good n (%)	Good n (%)	Fair n (%)		
Part 1: Knowledge about diabetes mellitus					
Clarity of content	52 (65)	28 (35)	-	3.65	Good
Content is precise and easily understood	20 (25)	55 (68.75)	5 (6.25)	3.19	Good
Content is interesting	35 (43.75)	45 (56.25)	-	3.44	Good
Appropriate length of time used	35 (43.75)	45 (56.25)	-	3.44	Good
Appropriate for persons with diabetes and their families	47 (58.75)	33 (41.25)	-	3.59	Good
Content is useful	48 (60)	32 (40)	-	3.60	Good
Overall quality	38 (47.5)	42 (52.5)	-	3.48	Good
Part 2: Living with diabetes normally					
Clarity of content	25 (31.25)	55 (68.75)	-	3.31	Good
Content is precise and easily understood	6 (7.5)	65 (81.25)	9 (11.25)	2.96	Good
Content is interesting	13 (16.25)	67 (83.75)	-	3.16	Good
Appropriate length of time used	10 (12.5)	70 (87.5)	-	3.13	Good
Appropriate for persons with diabetes and their families	18 (22.5)	62 (77.5)	-	3.23	Good
Content is useful	18 (22.5)	62 (77.5)	-	3.23	Good
Overall quality	8 (10)	72 (90)	-	3.10	Good
Part 3: Guideline for healthy eating					
Clarity of content	26 (32.5)	54 (67.5)	-	3.33	Good
Content is precise and easily understood	4 (5)	62 (77.5)	14(17.5)	2.88	Good
Content is interesting	22 (27.5)	58 (72.5)	-	3.28	Good
Appropriate length of time used	3 (3.75)	73 (91.25)	-	2.99	Good
Appropriate for persons with diabetes and their families	20 (25)	60 (75)	-	3.25	Good
Content is useful	24 (30)	56 (70)	-	3.30	Good
Overall quality	12 (15)	68 (85)	-	3.15	Good

Table 9 The Quality of CD-ROM of the Subjects (n =80) (continuous)

Items	Level of quality			Mean	Level
	Very Good n (%)	Good n (%)	Fair n (%)		
Part 4: Exercises and diabetes mellitus					
Clarity of content	17 (21.25)	63 (78.75)	-	3.21	Good
Content is precise and easily understood	6 (7.5)	69 (86.25)	5 (6.25)	3.01	Good
Content is interesting	7 (8.75)	73 (91.25)	-	3.09	Good
Appropriate length of time used	10 (12.5)	70 (87.5)	-	3.13	Good
Appropriate for persons with diabetes and their families	15 (18.75)	65 (81.25)	-	3.19	Good
Content is useful	15 (18.75)	65 (81.25)	-	3.19	Good
Overall quality	8 (10)	72 (90)	-	310	Good
Part 5: Foot care for the persons with diabetes mellitus					
Clarity of content	53 (66.25)	27 (33.75)	-	3.66	Good
Content is precise and easily understood	57 (71.25)	23 (28.75)	-	3.29	Good
Content is interesting	36 (45)	44 (55)	-	3.45	Good
Appropriate length of time used	34 (42.5)	46 (57.5)	-	3.43	Good
Appropriate for persons with diabetes and their families	50 (62.5)	30 (37.5)	-	3.63	Good
Content is useful	50 (62.5)	30 (37.5)	-	3.63	Good
Overall quality	41 (51.25)	39 (48.75)	-	3.51	Good

The Quality of Booklets

The mean score of the quality of booklet number 1 -10 as evaluated by the subjects in all items were at good level (See Table 10).

Table 10 The Quality of Booklets of the Subjects (n =80)

Items	Level of quality			Mean	Level
	Very Good n (%)	Good n (%)	Fair n (%)		
No.1: Diabetes mellitus: Prevention better than cure					
Clarity of content	49 (61.25)	26 (32.5)	5 (6.25)	3.55	Good
Content is precise and easily understood	33 (41.25)	37 (46.25)	10 (12.5)	3.29	Good
Content is interesting	45 (56.25)	35 (43.75)	-	3.56	Good
Appropriate size of font used	28 (35)	46 (57.5)	1 (1.25)	3.26	Good
Appropriate for persons with diabetes and their families	64 (80)	15 (18.75)	1 (1.25)	3.79	Good
Content is useful	58 (72.5)	21 (26.25)	1 (1.25)	3.71	Good
Overall quality	29 (36.25)	50 (62.5)	1 (1.25)	3.55	Good
No.2: What is diabetes mellitus?					
Clarity of content	42 (52.5)	33 (37.5)	5 (6.25)	3.46	Good
Content is precise and easily understood	29 (36.25)	39 (48.75)	12 (15)	3.21	Good
Content is interesting	53 (66.25)	26 (32.5)	1 (1.25)	3.66	Good
Appropriate size of font used	36 (45)	37 (46.25)	7 (8.75)	3.36	Good
Appropriate for persons with diabetes and their families	60 (75)	19 (23.75)	1 (1.25)	3.74	Good
Content is useful	60 (75)	17 (21.25)	3 (3.75)	3.70	Good
Overall quality	44 (55)	33 (41.25)	3 (3.75)	3.51	Good
No.3: Diabetic control and prevention of diabetic complications					
Clarity of content	38 (47.5)	34 (42.5)	8 (10)	3.38	Good
Content is precise and easily understood	21 (26.25)	58 (72.5)	1 (1.25)	3.25	Good
Content is interesting	55 (68.75)	25 (31.25)	-	3.69	Good
Appropriate size of font used	36 (45)	36 (45)	8 (10)	3.35	Good
Appropriate for persons with diabetes and their families	57 (71.25)	22 (27.25)	1 (1.25)	3.70	Good
Content is useful	50 (62.5)	25 (31.25)	5 (6.25)	3.56	Good
Overall quality	28 (35)	52 (65)	-	3.35	Good

Table 10 The Quality of Booklets of the Subjects (n =80) (continuous)

Items	Level of quality			Mean	Level
	Very Good n (%)	Good n (%)	Fair n (%)		
No.4: Guidelines for healthy caring					
Clarity of content	39 (48.75)	34 (42.5)	7 (8.75)	3.40	Good
Content is precise and easily understood	35 (43.75)	34 (42.5)	11 (13.75)	3.30	Good
Content is interesting	47 (58.75)	27 (33.75)	6 (7.5)	3.51	Good
Appropriate size of font used	46 (57.5)	31 (38.75)	3 (3.75)	3.54	Good
Appropriate for persons with diabetes and their families	61 (76.25)	19 (23.75)	-	3.76	Good
Content is useful	54 (67.5)	26 (32.5)		3.68	Good
Overall quality	36 (45)	43 (53.75)	1 (1.25)	3.44	Good
No.5: Diabetic control with medication					
Clarity of content	28 (35)	47 (58.75)	5 (6.25)	3.29	Good
Content is precise and easily understood	26 (32.5)	51 (63.75)	3 (3.75)	3.29	Good
Content is interesting	48 (60)	29 (36.25)	3 (3.75)	3.56	Good
Appropriate size of font used	37 (46.25)	34 (42.5)	9 (11.25)	3.35	Good
Appropriate for persons with diabetes and their families	55 (68.75)	25 (31.25)	-	3.69	Good
Content is useful	52 (65)	27 (33.75)	1 (1.25)	3.64	Good
Overall quality	34 (42.5)	45 (56.25)	1 (1.25)	3.41	Good
No.6: Exercises and diabetes mellitus					
Clarity of content	47 (58.75)	31 (38.75)	2 (2.5)	3.56	Good
Content is precise and easily understood	33 (41.25)	41 (51.25)	6 (7.5)	3.34	Good
Content is interesting	49 (61.25)	30 (37.5)	1 (1.25)	3.60	Good
Appropriate size of font used	45 (56.25)	26 (32.5)	9 (11.25)	3.45	Good
Appropriate for persons with diabetes and their families	61 (76.25)	19 (23.75)	-	3.67	Good
Content is useful	55 (68.75)	24 (30)	1 (1.25)	3.68	Good
Overall quality	43 (53.75)	37 (46.25)	-	3.54	Good

Table 10 The Quality of Booklets of the Subjects (n =80) (continuous)

Items	Level of quality			Mean	Level
	Very Good n (%)	Good n (%)	Fair n (%)		
No.7: Self-monitoring for diabetic control					
Clarity of content	37 (46.25)	40 (50)	3 (3.75)	3.43	Good
Content is precise and easily understood	22 (27.5)	45 (56.25)	13 (16.25)	3.11	Good
Content is interesting	53 (62.5)	20 (25)	7 (8.75)	3.58	Good
Appropriate size of font used	41 (51.25)	28 (35)	11 (13.75)	3.38	Good
Appropriate for persons with diabetes and their families	59 (73.75)	18 (22.5)	3 (3.75)	3.70	Good
Content is useful	56 (70)	24 (30)	-	3.70	Good
Overall quality	39 (48.75)	41 (51.25)	-	3.49	Good
No.8: Foot care and diabetes mellitus					
Clarity of content	43 (53.75)	32 (40)	5 (6.25)	3.48	Good
Content is precise and easily understood	41 (51.25)	35 (43.75)	4 (5)	3.16	Good
Content is interesting	52 (65)	26 (32.5)	2 (2.5)	3.63	Good
Appropriate size of font used	49 (61.25)	25 (31.25)	6 (7.5)	3.54	Good
Appropriate for persons with diabetes and their families	58 (72.5)	21 (26.25)	1 (1.25)	3.71	Good
Content is useful	56 (70)	24 (30)	-	3.70	Good
Overall quality	44 (55)	36 (45)	-	3.55	Good
No.9: Self-care in special situations: illness, traveling and eating					
Clarity of content	35 (43.75)	44 (55)	1 (1.25)	3.43	Good
Content is precise and easily understood	23 (28.75)	56 (70)	1 (1.25)	3.28	Good
Content is interesting	40 (50)	9 (48.75)	1 (1.25)	3.49	Good
Appropriate size of font used	31 (38.75)	37 (46.25)	12 (15)	3.24	Good
Appropriate for persons with diabetes and their families	55 (68.75)	25 (31.25)	-	3.69	Good
Content is useful	54 (67.5)	26 (32.5)	-	3.68	Good
Overall quality	34 (42.5)	46 (57.5)	-	3.43	Good

Table 10 The Quality of Booklets of the Subjects (n =80) (continuous)

Items	Level of quality			Mean	Level
	Very Good	Good	Fair		
	n (%)	n (%)	n (%)		
No.10: Interesting questions for the persons with diabetes mellitus					
Clarity of content	55 (68.75)	24 (30)	1 (1.25)	3.68	Good
Content is precise and easily understood	40 (50)	37 (46.25)	3 (3.75)	3.46	Good
Content is interesting	60 (75)	18 (22.5)	2 (2.5)	3.73	Good
Appropriate size of font used	49 (61.25)	26 (32.5)	5 (6.25)	3.55	Good
Appropriate for persons with diabetes and their families	59 (73.75)	20 (25)	1 (1.25)	3.73	Good
Content is useful	57 (71.25)	1 (26.25)	2 (2.5)	3.69	Good
Overall quality	50 (62.5)	27 (33.75)	3 (3.75)	3.59	Good

The Frequency in Reading Booklets of Persons with Diabetes

The majority of the subjects read all number of the booklets and all number they read about 2 times. The mean score of the frequency in reading booklets all number of them was 2.002, SD 1.009, and range 1 to 5 (See Table 11).

Table 11 Number, Percentage, Mean Scores, and Standard Deviation of Frequency in Reading Booklets of the Subjects (n =80)

Booklets	Frequency in reading booklets (time)					Mean	SD
	1	2	3	4	5		
	n (%)	n (%)	n (%)	n (%)	n (%)		
No.1	26 (32.5)	32 (40)	16 (20)	3 (3.75)	3 (3.75)	2.06	1.011
No.2	24 (30)	35 (43.75)	16(20)	3 (3.75)	2 (2.5)	2.05	.940
No.3	30 (37.5)	31 (38.75)	14 (17.5)	3 (3.75)	2 (2.5)	1.95	.967
No.4	30 (37.5)	30 (37.5)	15 (18.75)	3 (3.75)	2 (2.5)	1.96	.974
No.5	30 (37.5)	31 (38.75)	3 (16.25)	4 (5)	2 (2.5)	1.96	.987
No.6	29 (36.25)	29 (36.25)	16 (20)	3 (3.75)	3 (3.75)	2.03	1.031
No.7	19 (23.75)	30 (37.5)	16 (20)	3 (3.75)	2 (2.5)	1.99	.974
No.8	29 (36.25)	29 (36.25)	16 (20)	4 (5)	2 (2.5)	2.01	1.000
No.9	29 (36.25)	28 (35)	18 (22.5)	3 (3.75)	2 (2.5)	2.01	.987
No.10	29 (36.25)	31 (38.75)	14 (17.5)	3 (3.75)	3 (3.75)	2.00	1.019

The Persons Involve in Reading Booklets with Persons with Diabetes

The majority of subjects (58.75%) reported that they read the booklets by themselves, 26.25% read with children, 11.25% read with husband or wife, and only 3.75% read with other persons with diabetes.

From the Table 9-11, the mean score of the quality of self-care packages (CD-ROM and booklets) in every item were at good level. These self-care packages are ability to use in actual practice. In this research the feasibility to use self-care packages in actual practice is considered as follows: after using self-care packages the mean score of diabetes knowledge and the means score of self-care behavior had increased, the mean score of the quality of self-care packages in each item was at good level, and persons with diabetes had read all numbers of booklets (Range = 1-5, Mean = 2.002, SD = 1.009).

CHAPTER V
DISCUSSION

The results of this study indicated the feasibility of using self-care packages in persons with diabetes which could increase the diabetes knowledge and improve self-care behavior in persons with type 2 diabetes. Discussion of the finding will be presented as evidence supported the hypothesis are follows: characteristics of the subjects, the feasibility of using self-care packages among persons with diabetes which included; the quality of the CD-ROM and the quality of booklets, diabetes knowledge of the persons with diabetes, and self-care behavior of the persons with diabetes.

Characteristics of the Persons with Diabetes

Demographic Data

The subjects were mostly female (68.75%), with age range between 40 to 70 year an average age of 53.91 years. There are no differences from the previous studies which implemented in Thai or abroad, such as Arunneatara, 1998; Baineam, 1998; Sanaun, 1999; Boonyuen, 1999; Plodnaimuang, 1999; Masawang, 2001; Phumleng, 2002; Wibunrattanasri, 2002; Muangkae, 2002; Marcus, Wing, Guare, Blair, and Jawad, 1992; Monnier et al., 2002), that the prevalence of type 2 diabetes is found in more female than male and in those who are 45 years in age or older (Health System Research of Thailand, 1998 cited by Chuprapawan, 2000). Likewise, WHO (2001) reported that the prevalence rate of diabetes type 2 in females doubles more than males and the rate increases in over the 40 years age group. The large group of the subjects had over-weight (78.75%), this finding was consistent with previous studies, such as Muangkae, 2002; Phumleng, 2002. The majority of the subjects were married (91.25%) because all of them were middle aged and over. The large group of the subjects had low education and low income; 86.25% of them completed primary school and 68.75% had a family income less than 5,000 baht/month. Moreover, the majority of the subjects were 71.25% worked as agriculture. These finding were

consistent with previous studies, such as Sanaun, 1999; Muangkae, 2002; Phumleng, 2002. This reflects the economical status of Thailand and inadequate policy in human resource development, especially the most of population in Nongbua District worked in agriculture. In this study it was found that numbers of family members of the subjects were 1 to 7 persons (Mean 3.31) and numbers of family children of the subjects were 0 to 15 persons (Mean 3.16), These finding were consistent with previous studies such as Boonchuay, 2001; Phumleng, 2002. Furthermore, all of them were Buddhists and the majority of the subjects (95%) do not smoking and do not alcohol consumption.

Data Related to Diabetes and Treatments

The findings of the study revealed that 62.5% were FBS as more than 126 mg % indicated that only 37.5% of the subjects were in good control. Most of the subjects (87.5%) were oral hypoglycemic therapy. The majority of the subjects (92.5%) paid for medical expenses by a universal health card and 7.5% paid for medical expenses by a government funds. Thus, all of them had no problem affording medical expenses. This reflected the government's great burden to cover immense expenses in taking care of all population. In addition, around 22.5 % had other diseases; the majority of them were hypertension (88.89%). It is a common disease that is presented at the time of diagnosis with type 2 diabetes and it was found in one in three persons with diabetes, which is more than persons without diabetes does 1.5 to 2 times (ADA, 2000; Bunnag, 2000; Zinman, 2001). These finding were consistent with previous studies, such as Plodnaimuang, 1999; Boonchuay, 2001; Sanaun, 1999; Muangkae, 2002; Phumleng, 2002.

The Feasibility of using Self-care Packages among Persons with Diabetes

After using self-care packages, the mean score of diabetes knowledge and self-care behavior had increased, the mean score of the quality of self-care packages in each item was at good level, and persons with diabetes had read all numbers of booklets. Thus the discussion will cover all of these criteria.

Diabetes Knowledge of the Persons with Diabetes

Before using self-care packages, more than half (56.25 %) of the subjects knowledge were at poor level. After using the self-care packages, more than half (66.25 %) of the subjects knowledge were at good level (See Table 5). The total knowledge score before using self-care packages ranged from 7-31(Mean = 19.52, SD = 6.127), and after using self-care packages, they ranged from19-34(Mean = 28.81, SD = 3.090). The increasement of knowledge after using the self-care packages indicated that the feasibility of this self-care packages in improvement of knowledge among the subjects. This finding was consistent with previous studies (Plodnaimuang, 1999; Masawang, 2001).

In addition, the poor of diabetic knowledge found before receiving self-care packages was probably due to inadequate diabetic knowledge provided by health care provider. In addition, more than eighty percent of the subjects completed primary school whereas only 10% finished high school and 68.75% had a family income less than 5,000 baht/month, which may contribute to inability to obtain knowledge from other resource. Also in the past, they have not receive information through CD-ROM add booklets. Thus, they have attention and collaboration in this research as a result the majority of the subjects read the booklets 2 times. Many subjects stated they should have self-care packages since they were diagnosed of having diabetes.

Self-care Behavior of the Persons with Diabetes

Before receiving knowledge from self-care packages, more than half (61.25 %) of the subjects had poor level of self-care behavior. After using self-care packages, mostly (92.5 %) of the subjects had self-care behavior at good level. The total self-care behavior scores before and after using self-care packages were 36-112 (Mean = 74.34, SD = 9.205), and 82- 120 (Mean = 121.14, SD = 15.139) respectively. The mean scores of self-care behavior after using self-care packages were significantly higher than those obtained before using self-care packages. Results of this study were consistent with previous studies (Arunneatara, 1998; Boonyeun, 1998; Jaitham, 1998; Baineam, 1998; Masawang, 2001; Tiatrakul, 2001; Suwannaruk, 1999; Sanaun, 1999). Self-care may be influenced by a number of factors such as motivation, self-care

ability and resources or supporting environment Orem (1995). To respond to this condition, the researcher sent postcards to persons with diabetes every week to remind them in reading booklets and encourage them for continuing self-care behavior.

The increased diabetic knowledge reflected better understanding of persons with diabetes on their illness situations. The improvement of diabetes knowledge and the improvement of self-care behavior after using the self-care packages resulted from the self-care packages that were designed by providing suggestions to the missing parts or malpractices through the CD-ROM. The health education activities are CD-ROM presentation of model person, the subjects received the same information from healthcare providers and mass media, that Since these CD-ROMs have following characteristics is included; necessary content in each part, not taking to long, making it interesting and not boring; easy language used; clear pictures and sounds, beautiful colors; with action displays by persons with diabetes in actual situation, making easy understanding. It is the media that can promote knowledge up to 88% of contact senses as can be perceived by ears and eyes (Sigkabantit, 1989). But there is a limitation of its use as it can be used by a person having a CD-ROM player and television or computer only and can not make a review at home. Therefore, the researcher has provided the booklets in support of this education for the subjects review at home. Theses booklets cover all aspects of diabetes; have large font sizes, having easy language, with pictures and explanations for easy understanding, thick papers, illustrations and description, beautiful colors, attractive for reading, and convenient to carry. Each booklet contains specific subject, making the search and review easy. It can be read any time. The more they read the more they will understand and can be read with family members or others.

The Quality of Self-care Packages

The Quality of the CD-ROM

The mean score of the quality of all 5 CD-ROMs as evaluated by the subjects in each item was at good level. Since these CD-ROMs have following characteristics is included; necessary content in each part, not taking to long, making it interesting and not boring; easy language used; clear pictures and sounds, beautiful colors; with action displays by persons with diabetes in actual situation, making easy

understanding. Teaching through CD-ROM will be perceived through eyes 75 %, ears 13 %, contact 6 %, nose 3%, and taste 3% (Sigkabantid, 1989). Moreover, CD-ROM is easy to use and accesses by a large number of persons with diabetes each time. By using video different detailed procedures can be shown and repeated many time; they will receive complete literature always; they will receive experience closest to the actual practice; making the education more efficient (Antaricanont, 1996; Mailer, Twitty, and Sauve, 1997 cited by Oermann, Marilyn, Webb, and Ashare, 2003).

Furthermore, teaching through CD-ROM should be more effective if the teacher and the learner are interaction (Uniphan, 1989). Thus, in this teaching the researcher to organized the samples into groups for 8-11 persons each, summarizations the content before the subjects watch the CD-ROM, and providing opportunity for the subject to ask questions if they were not clear. Moreover, provision of a developmental environment will be more conducive for learning (Hanyut, 1989). Thus, in this session the researcher organized the meeting in a private room with good ventilation, proper of the light, do not ambient noise, having enough seat. Also, the researcher arranged about the media such as television, CD-ROM player, CD-ROM, and booklets. This environment promotes learning for the patients.

The Quality of the Booklets

The mean score of the quality of all 10 booklets as evaluated by the subjects in all items was at good level. From the limitation of CD-ROM, which many patients may not be able to use at home, the researcher used the booklets in support of this knowledge delivery. There booklets has the content covering all aspects of self-care for persons with diabetes. These booklets have large font sizes, easy language, easy too read, dark fonts for easy viewing, with pictures and explanations for easy understanding, thick papers, illustrations and description, beautiful colors, attractive for reading, and convenient to carry. Each booklet contains specific subject, making the search and review easy. It can be read any time and can be read with family members or others. Moreover, these booklets were improved by Hanucharurnkul, and colleagues (2004), from the original to be more comprehensive and cover every aspects of content that persons with diabetes should be known. Therefore, the researcher tested the self-care packages that it could be used in actual practice by considering from the score of diabetic knowledge and self-care behaviors including

the score of satisfaction of participants. This is for use as guidelines to promote health and encourage self-care of persons with diabetes so that they will have good self-care behavior and quality of life in the future. However, content difficult to read or difficult to understand but when they reread they can understand more. Furthermore, some samples asked that “what is ketone?”, “what is Insulin?”, “Am I overweigh?”, “where I can buy the saccharine?” This indicated that the content in the booklets stimulate the patients to seek more information related to their health status.

The frequency in reading booklets of persons with diabetes, the majority of the subjects read the booklets 2 times in each numbers (mean 2.002, range 1 to 5, and SD 1.009). Many subjects said that the booklets are interesting to read but they have not enough time to read it because the period of this research is the harvest season. They feel exhausted from their work, then, they could read a few pages per day. The persons involve in reading booklets with persons with diabetes, the majority of subjects (58.75%) reported that they read the booklets by themselves, 26.25% read with children, 11.25% read with husband or wife, and only 3.75% read with other persons with diabetes. Theses points indicated that the subjects are not limitation in self-care and able to care themselves, hence giving the diabetes knowledge and self-care to persons with diabetes could facilitate the clarity and the retention level of knowledge. These findings reflect patients’ ability to read as well as the supporters of various family members in helping the patients to gain knowledge related to diabetes and self-care. In addition, family members might gain knowledge from booklets and can facilitate patients’ self-care behavior. All these findings suggested that the acceptance of self-care packages by the patients. These acceptances are necessary for them to use as a source of knowledge to perform self-care behavior.

In conclusion, the self-care packages, which composed of CD-ROM and booklets plus postcard or telephone to remind in reading booklets and motivate to perform self-care behavior, is feasibility to use in self-care promotion for persons with diabetes in the community. These self-care packages could be a standard for providing information related to diabetes and self-care by health care providers in various setting. Other strategies such as cognitive behavior training, problem solving still training, communication training and changing attitude should be used combine with these self-care packages especially in persons with uncontrolled diabetes.

CHAPTER VI
CONCLUSION

The conclusion of this study is presented in the following order: summary of the study, the findings of the study, and recommendations for application.

Summary of the Study

This pre-experimental research and one-group pretest- posttest design aimed at testing the feasibility of using self-care packages to increase knowledge and improve self- care behavior of persons with diabetic mellitus at Diabetic Clinic of Nongbua Hospital, Nongbua District, Nakhon Sawan Province. The period of the study was during October to December 2004. Eighty samples were recruited by simple random sampling according to the conclusion criteria.

The research was proceeded by selecting a sample group on every Wednesday, Thursday, and Friday. The selected samples were then formed in a group of 8-11 persons each; for watching the CD-ROM on Saturdays and Sundays. The researcher introduced the self-care packages to the subjects, followed by them to watch CD-ROM part 1 to part 5. Before they watched the CD-ROM, the researcher concluded the content each part. After they watched the CD-ROM, the researcher has facilitated the subjects asked about their doubt and they filled in the questionnaire on CD-ROM quality each part. Then the subjects rested for 5 minutes after finished filling in it. The researcher provided the booklets to the subjects for review at home. All the numbers of booklets have a questionnaire on booklets quality that they have to be filled in after finished reading. Any number can be read first and re-read as their required. Furthermore, there is a recording form on reading the booklets for them to record the frequency of reading the booklets. They have to be brought the questionnaire on booklets quality and the questionnaire on reading the booklets to the researcher in the eighth week. Moreover, the researcher sent postcards to the subjects to remind them in reading booklets and encourage them for continuing self-care

behavior every week for 6 weeks since first meeting with them. Moreover, in postcard number 6 the researcher wrote the appointment date in the eighth week for assesses using the self-care packages. The researcher met with all the subjects as the appointment date to assess the research results by asking the subjects to fill in the diabetes knowledge questionnaires of persons with diabetes and the summary of diabetes self-care activity which is the same questionnaires as for the first assessment.

The Findings of the Study

Demographic Characteristics of the Subjects

Demographic Data

The total subjects who completed the study consisted of 80 persons with type 2 diabetes. The subjects were comprised of 55 females (68.75%) and 25 males (31.25%), the average age was 53.91 (range 40-70, SD 9.69). The BMI of the subjects 21.25% have normal and 78.75 have overweight. The majority of the subjects (91.25%) were married. Moreover, all of them were Buddhists, and 71.25% worked as agriculture, and 86.25% had primary education, and 68.75% had a family income less than 5,000 baht/month. The number of children ranged 0-15 (Mean 3.16, SD 2.23), and the number of family members ranged from 1-7 persons/family (Mean 3.31, SD 1.24). Finally, the majority of the subjects (95%) do not smoking and do not alcohol consumption.

Data Related to Diabetes and Treatment

The findings of the study revealed that 62.5% were FBS as more than 126 mg%, and the most of the subjects (87.5%) were oral hypoglycemic therapy. The majority of the subjects (91.25%) paid for medical expenses by a universal health card (92.5 %). In addition, the duration of diabetes mellitus ranged from range 0.17-20 years (Mean = 4.97, SD = 4.55). Moreover, all of them are continuing of cure, and do not problem about self-care behavior. Finally, around 22.5 % had other diseases including 16 persons with hypertension (88.89 %), two persons with asthma (11.11 %).

The Feasibility of Using Self-care Package among Persons with Diabetes

Diabetes Knowledge of the Persons with Diabetes

The total knowledge score before using self-care packages ranged from 7-31 (Mean = 19.52, SD = 6.127), and after using self-care packages they ranged from 19-34 (Mean = 28.81, SD = 3.090). The total means score before and after using the self-care packages were 19.25 and 28.81, respectively. After using the self-care packages, all mean scores on each dimension were higher than those obtained before using the self-care packages. For the comparative analysis, paired t-test showed that after using self-care packages, the total mean scores of knowledge was significantly higher than those before using self-care packages ($p < .0001$). The mean scores for each dimension of knowledge were also significantly higher than those obtained before using the self-care packages ($p < .0001$).

Self-care Behavior of the Persons with Diabetes

The total self-care behavior scores before using self-care packages were 36-112 (Mean = 74.34, SD = 9.205). After using self-care packages were 82- 120 (Mean = 121.14, SD = 15.139). The total means score before and after using the self-care packages were 74.34 and 121.14, respectively. After using the self-care packages, all mean scores on each dimension were higher than those obtained before using the self-care packages. For the comparative analysis, paired t-test showed that after using self-care packages, the total mean scores of self-care behavior was significantly higher than those before using self-care packages ($p < .0001$). The mean scores for each dimension of self-care behavior were also significantly higher than those obtained before using the self-care packages ($p < .0001$).

The Quality of Self-care Packages of Persons with Diabetes

The total score of the quality of self-care packages in each item was at good level and the mean score of the quality of self-care packages (CD-ROM and booklets) as evaluated by the subjects in all items was at good level. These self-care packages are ability to use in actual practice. In research the feasibility to use self-care packages in actual practice is considered as follow:

1. After using self-care packages the mean score of diabetes knowledge had increased.
2. After using self-care packages the mean score of self-care behavior had increased.
3. The mean score of the quality of self-care packages in all items were at good level.
4. From the record of reading the booklets, every persons with diabetes had read all numbers of booklets (Range = 1-5, Mean = 2.002, SD = 1.009).

Recommendations for Application

The finding of this study provides various important implications for the nursing profession including nursing practice and future research.

Implications of Research Finding on Nursing Practice

1. Position for diabetic nurse specialist should be set up. Because this nurse will be responsible for diabetic care and diabetic education.
2. Hospital should manage resources for developing knowledge and self-care behavior of persons with diabetes including private rooms and should have a budget to support for instruction media such as CD-ROM player, television, should post card or telephone to follow persons with diabetes.
3. Diabetic education program should be established in every health care setting.

Implications of Research Finding on Further Research

Based on the finding of this present study certain recommendations for future research are presented.

1. The evaluation should increase at 6 to 12 months periods to study how the same subjects could sustain or improve self-care behavior and diabetic control (FBS, HbA1c, and BMI). This will evaluate diabetic control and confirm the effectiveness of this package.
2. The self-care packages should be applied in studies of other disease such as hypertension, renal failure, and cardiovascular disease.

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APPENDIX

APPENDIX A

Information Consent Form

เอกสารชี้แจงข้อมูลสำหรับผู้เข้าร่วมการวิจัย

ดิฉันชื่อ นางสาวลักษณา ลอยเจริญ เป็นนักศึกษาพยาบาลปริญญาโท คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล กำลังศึกษาเกี่ยวกับการใช้สื่อส่งเสริมการดูแลตนเองเพื่อเพิ่มความรู้และปรับปรุงพฤติกรรมการดูแลตนเองในผู้เป็นเบาหวาน โดยมีเป้าหมายเพื่อให้ผู้ป่วยเบาหวานมีความรู้ สามารถดูแลตนเองได้อย่างเหมาะสม ผลที่ได้จากการศึกษาครั้งนี้จะเป็นประโยชน์ในการพัฒนาการบริการสุขภาพ ให้ผู้ป่วยเบาหวานมีคุณภาพมากขึ้น

เมื่อท่านเข้าร่วมการวิจัยนี้ ดิฉันจะมาพบท่านที่โรงพยาบาลหนองบัว 2 ครั้ง ห่างกัน 8 สัปดาห์ ตามรายละเอียดดังนี้

ครั้งที่ 1 ท่านจะได้เข้ากลุ่มเพื่อชมวีดีทัศน์ ชุด ‘‘แนวทางในการดูแลตนเองในผู้เป็นเบาหวาน’’ และได้รับหนังสือคู่มือ ชุด ‘‘ความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน’’ เพื่อนำกลับไปอ่านทบทวนที่บ้าน และได้รับไปรษณียบัตรที่ผู้วิจัยส่งไปให้ท่านเพื่อกระตุ้นและให้กำลังใจในการอ่านทุกสัปดาห์ จำนวน 7 ครั้ง

ครั้งที่ 2 ดิฉันจะนัดพบท่านในสัปดาห์ที่ 8 ซึ่งเป็นวันเดียวกับวันที่แพทย์นัดตรวจตามปกติเพื่อสอบถามปัญหาในการอ่านหนังสือคู่มือและปัญหาในการดูแลตนเองของท่าน

ท่านสามารถยุติหรืองดการเข้าร่วมโครงการวิจัยเมื่อใดก็ได้ตามที่ท่านต้องการ โดยที่ไม่มีผลต่อการได้รับการบริการหรือการรักษาที่ท่านมีสิทธิได้รับแต่ประการใด ข้อมูลทั้งหมดที่ได้รับจากการศึกษาครั้งนี้จะรักษาไว้เป็นความลับและไม่เสนอผลการวิจัยเป็นรายบุคคลต่อสาธารณชน แต่จะเสนอผลการวิจัยเป็นภาพรวม

ในกรณีที่ท่านมีข้อเสนอแนะหรือข้อสงสัยหรือข้อขัดข้องในการเข้าร่วมโครงการวิจัยครั้งนี้ ท่านสามารถติดต่อสอบถามดิฉันได้ที่ หมายเลขโทรศัพท์ 06-5115664 เมื่อท่านสมัครใจเข้าร่วมโครงการวิจัยครั้งนี้ ขอให้ท่านลงชื่อยินยอมในแบบยินยอมเข้าร่วมการวิจัย เพื่ออนุญาตให้ดิฉันดำเนินการดังกล่าวข้างต้นได้และขอความกรุณาท่านมาพบดิฉันตามวันเวลาที่นัดหมาย

ขอขอบคุณในความร่วมมือของท่าน

.....ผู้วิจัย

(นางสาวลักษณา ลอยเจริญ)

APPENDIX B

Consent Form

แบบยินยอมเข้าร่วมการวิจัย

ชื่อโครงการ ความเป็นไปได้ในการใช้สื่อส่งเสริมการดูแลตนเองเพื่อเพิ่มความรู้และปรับปรุง พฤติกรรมการดูแลตนเองของผู้เป็นเบาหวาน

ชื่อผู้วิจัย นางสาวลักษณา ลอยเจริญ นักศึกษาพยาบาลปริญญาโท คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

คำยินยอมของผู้ป่วย

ข้าพเจ้า.....ได้รับทราบรายละเอียดของโครงการวิจัย เรื่อง ความเป็นไปได้ในการใช้สื่อส่งเสริมการดูตนเองเพื่อเพิ่มความรู้และปรับปรุงพฤติกรรมการดูแลตนเองของผู้เป็นเบาหวาน และทราบจากผู้วิจัยว่าจะไม่เปิดเผยข้อมูลของข้าพเจ้าหรือผลการวิจัยเป็นรายบุคคลต่อสาธารณชน ถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้นข้าพเจ้าสามารถถามผู้วิจัยได้ และข้าพเจ้ามีสิทธิที่จะขอยุติการเข้าร่วมโครงการวิจัยนี้ โดยไม่มีผลกระทบต่อการได้รับการบริการหรือการรักษาที่ข้าพเจ้ามีสิทธิได้รับแต่ประการใด ข้าพเจ้ายินดีที่จะเข้าร่วมโครงการวิจัยนี้ จึงได้ลงลายมือชื่อไว้เป็นหลักฐาน

ลงชื่อ .....(ผู้ยินยอม)

(.....)

.....(พยาน)

(.....)

.....(พยาน)

(.....)

วันที่.....เดือน.....พ.ศ. .....

APPENDIX C

Permission Letters for Protection of Human Rights

No. 133/2004

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

Title of Project: The Feasibility Study of Using Self-Care Package to Increase Knowledge and Improve Self-Care Behavior of Persons with Diabetic Mellitus (Thesis for Master Degree)

Principle Investigator: Miss Laksana Loycharoen

Name of Institution: Faculty of Nursing

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: .....
(Professor Dr.Srisin Khusmith)

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

Date of Approval: 15 NOV 2004

APPENDIX D

Demographic data form

แบบบันทึกข้อมูลทั่วไป

วันที่.....เดือน.....พ.ศ..... เลขที่แบบสัมภาษณ์.....
ที่อยู่บ้านเลขที่.....หมู่ที่.....ตำบล.....อำเภอหนองบัว จังหวัดนครสวรรค์
หมายเลขโทรศัพท์.....

<u>ส่วนที่ 1</u> ข้อมูลทั่วไป

<u>คำชี้แจง</u> โปรดเขียนข้อความลงในช่องว่าง.....หรือทำเครื่องหมาย ✓ ลงใน ( ) หน้าข้อความแต่ละข้อ ตามความเป็นจริง

1. เพศ ( ) ชาย ( ) หญิง 2. อายุ.....ปี
3. น้ำหนัก.....กิโลกรัม 4. ส่วนสูง .....เซนติเมตร
5. ค่าระดับน้ำตาลในเลือด ..... มิลลิกรัมต่อเดซิลิตร
6. วิธีการรักษาที่ได้รับ ( ) 1. ยากิน
   ( ) 2. ยาฉีด
   ( ) 3. ยากินร่วมกับยาฉีด
7. สถานภาพสมรส ( ) 1. โสด ( ) 2. คู่
   ( ) 3. หม้าย / หย่า /แยก
8. นับถือศาสนา ( ) 1. พุทธ ( ) 2. คริสต์
   ( ) 3. อิสลาม ( ) 4. อื่นๆ.....
9. อาชีพ ( ) 1. รับจ้างทั่วไป ( ) 2. ค้าขาย
   ( ) 3. ทำไร่ ทำนา ทำสวน ( ) 4 พนักงานรัฐวิสาหกิจ / ข้าราชการ
   ( ) 5. อื่น ๆ ระบุ .....
10. การศึกษา ( ) 1. ประถมศึกษา ( ) 2. มัธยมศึกษาหรืออาชีวศึกษา
    ( ) 3. ประกาศนียบัตร ( ) 4. ปริญญาตรี
11. รายได้ของครอบครัวท่าน มีรายได้ต่อเดือน
    ( ) น้อยกว่าหรือเท่ากับ 5,000 บาท ( ) 5,001 - 10,000 บาท
    ( ) 10,001 – 20,000 บาท ( ) 20,000 บาทขึ้นไป

12. ท่านมีสวัสดิการด้านสุขภาพอะไรบ้าง

( ) บัตรประกันสังคม ( ) สวัสดิการข้าราชการ

( ) บัตรประกันสุขภาพ 30 บาท ( ) ชำระค่ารักษาพยาบาลเอง

( ) อื่น ๆ.....

13. ท่านมีบุตรจำนวน.....คน

14. จำนวนสมาชิกในครอบครัว.....คน

15. ระยะเวลาที่ท่านป่วยเป็นโรคเบาหวาน.....ปี .....เดือน

16. ท่านมีญาติพี่น้องที่เป็นเบาหวานหรือไม่ (นับเฉพาะที่สืบสายเลือดเท่านั้น ไม่รวมเขยหรือสะใภ้)

( ) 1. ไม่มี

( ) 2. มี เกี่ยวข้องเป็น ( ) พ่อ ( ) แม่

( ) พี่น้องร่วมบิดาหรือมารดา

( ) น้า อา ป้า ลุง

17. ท่านมีปัญหาเกี่ยวกับการดูแลตนเองเกี่ยวกับการควบคุมโรคเบาหวานหรือไม่ อย่างไร

( ) 1. ไม่มี

( ) 2. มี ระบุ.....

18. ท่านรับการรักษาต่อเนื่องหรือไม่หลังจากที่ทราบว่าเป็นโรคเบาหวาน

( ) 1. ต่อเนื่อง

( ) 2. ไม่ต่อเนื่องเพราะ.....

19. ท่านมีโรคประจำตัวหรือไม่

( ) 1. ไม่มี

( ) 2. มี ระบุ.....

20. ท่านสูบบุหรี่หรือไม่

( ) 1. ไม่สูบ

( ) 2. สูบ วันละ.....มวน

21. ท่านดื่มสุราหรือไม่

( ) 1. ไม่ดื่ม

( ) 2. ดื่ม วันละ.....ต่อวัน

APPENDIX E

Diabetes Knowledge Measurement

แบบทดสอบความรู้เรื่องโรคเบาหวาน

<u>คำชี้แจง</u> ข้อคำถามต่อไปนี้มีคำตอบที่ถูกต้องเพียงข้อเดียว โปรดใส่เครื่องหมายวงกลม ล้อมรอบคำตอบที่ท่านคิดว่าถูกต้องที่สุด

1. โรคเบาหวานเป็นโรคที่มีลักษณะอย่างไร
   ก. มีน้ำตาลในเลือดสูงกว่าปกติ
   ข. มีน้ำตาลในเลือดน้อยกว่าปกติ
   ค. มีน้ำตาลในเลือดเท่าคนปกติ
   ง. ไม่มีน้ำตาลในเลือด
2. ค่าปกติของระดับน้ำตาลในเลือด ควรจะมีค่าเท่าใด
   ก. ต่ำกว่า 80 มก. เปอร์เซ็นต์
   ข. 80 – 120 มก. เปอร์เซ็นต์
   ค. 120 – 140 มก. เปอร์เซ็นต์
   ง. มากกว่า 140 มก. เปอร์เซ็นต์

34. เพื่อให้การไหลเวียนของเลือดที่เท้าดี ควรปฏิบัติอย่างไร
   ก. ยกเท้าสูง ทุกครั้งที่มีโอกาส
   ข. ไม่เดินมาก
   ค. บริหารเท้าทุกวัน
   ง. ไม่ใส่รองเท้าหุ้มส้น
35. เมื่อเกิดบาดแผล หรือตุ่มหนองขึ้นที่ส่วนใดส่วนหนึ่งของร่างกาย ควรปฏิบัติอย่างไร
   ก. ใส่ยาทิงเจอร์
   ข. ซื้อยาแก้อักเสบมารับประทาน
   ค. งดยาเบาหวาน
   ง. รีบไปหาแพทย์

APPENDIX F

The Summary of Diabetes Self-care Activity

แบบวัดกิจกรรมการดูแลตนเองในผู้เป็นเบาหวาน

<u>คำชี้แจง</u> ข้อคำถามต่อไปนี้ ถามท่านเกี่ยวกับกิจกรรมการดูแลตนเองในช่วง 7 วันที่ผ่านมา กรุณาใส่เครื่องหมายวงกลม ลงในหมายเลขที่ตรงกับจำนวนวันที่ท่านดูแลตนเอง ในแต่ละวัน (ถ้าในช่วง 7 วันที่ผ่านมา ท่านมีการเจ็บป่วยที่ทำให้ท่านทำกิจกรรมการดูแลตนเองไม่ได้ ให้นึกย้อนหลังไปอีก 7 วันก่อนช่วงที่ท่านเจ็บป่วย)

การรับประทานอาหาร

1. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารปริมาณที่เหมาะสมกับผู้เป็นเบาหวาน และเหมาะสมกับการใช้แรงงานประจำวันของท่าน กี่วัน

0 1 2 3 4 5 6 7 วัน

2. ในช่วง 7 วันที่ผ่านมา ท่านกินอาหารจุบจิบระหว่างมื้อ กี่วัน

0 1 2 3 4 5 6 7 วัน

14. ในช่วง 7 วันที่ผ่านมา ก่อนใส่รองเท้า ท่านตรวจดูที่รองเท้าว่ามีเศษหิน ทราย หรือของมีคมอยู่ที่รองเท้า กี่วัน

0 1 2 3 4 5 6 7 วัน

18. ในช่วง 7 วันที่ผ่านมา ท่านกินยาครบทุกมื้อ ตามแผนการรักษาของแพทย์กี่วัน

0 1 2 3 4 5 6 7 วัน

19. ในช่วง 7 วันที่ผ่านมา ท่านกินยาเบาหวานได้ตรงเวลาครบทุกมื้อ กี่วัน

0 1 2 3 4 5 6 7 วัน

APPENDIX G / 1 – G / 5

The Questionnaire on CD-ROM Quality Part 1 - 5

แบบสอบถามความคิดเห็นต่อสื่อวีดีทัศน์

ตอนที่ 1 มารู้จักโรคเบาหวานกันเถอะ

คำชี้แจง กรุณาใส่เครื่องหมาย ✓ ลงในช่องที่ตรงกับความคิดเห็นของท่าน

หัวข้อประเมิน	ดีมาก (4)	ดี (3)	พอใช้ (2)	ควรปรับปรุง (1)
1. ภาพสื่อความหมายชัดเจน				
2. เนื้อหาสั้นกระชับเข้าใจง่าย				
3. เนื้อเรื่องน่าสนใจ				
4. ระยะเวลาที่นำเสนอ				
5. เหมาะสมสำหรับการเผยแพร่แก่ผู้เป็นเบาหวานและครอบครัว				
6. เนื้อหาเป็นประโยชน์สามารถนำไปใช้ได้				

ข้อเสนอแนะและความคิดเห็น

โดยภาพรวมท่านคิดว่าสื่อวีดีทัศน์ตอนที่ 1 มีคุณภาพเพียงใด

( ) ดีมาก ( ) ดี ( ) พอใช้ ( ) ควรปรับปรุง

ถ้าควรปรับปรุงควรปรับปรุงในส่วนใดบ้าง .....

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.....

ขอขอบพระคุณอย่างสูง

APPENDIX H / 1 – H / 10

The Questionnaire on Booklets Quality Number 1 - 10

แบบสอบถามความคิดเห็นต่อหนังสือคู่มือ

เล่มที่ 1 เบาหวานป้องกันดีกว่าแก้

คำชี้แจง กรุณาใส่เครื่องหมาย ✓ ลงในช่องที่ตรงกับความคิดเห็นของท่าน

หัวข้อประเมิน	ดีมาก (4)	ดี (3)	พอใช้ (2)	ควรปรับปรุง (1)
1. เนื้อหาเข้าใจง่าย				
2. เนื้อหาสั้นกระชับ				
3. เนื้อหาน่าสนใจ				
4. ขนาดของตัวหนังสือเหมาะสม				
5. หนังสือเหมาะสมแก่การเผยแพร่แก่ ผู้เป็นเบาหวานและครอบครัว				
6. เนื้อหาเป็นประโยชน์สามารถนำไปใช้ได้				

ข้อเสนอแนะและความคิดเห็น

โดยภาพรวมท่านคิดว่าหนังสือคู่มือเล่มที่ 1 มีคุณภาพเพียงใด

( ) ดีมาก ( ) ดี ( ) พอใช้ ( ) ควรปรับปรุง

ถ้าควรปรับปรุงควรปรับปรุงในส่วนใดบ้าง .....

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ขอขอบพระคุณอย่างสูง

APPENDIX I

The Recording Form on Reading the Booklets

แบบบันทึกการอ่านหนังสือคู่มือของผู้เป็นเบาหวาน

<u>คำชี้แจง</u> กรุณาใส่เครื่องหมาย ✓ ลงในช่องที่ตรงกับหนังสือคู่มือเล่มที่ท่านได้อ่านจบแล้ว และ บันทึกข้อคำถามหรือข้อสงสัยที่ท่านไม่เข้าใจในการอ่านหนังสือคู่มือลงในช่องทางขวามือ

เอกสารเล่มที่	ใส่เครื่องหมาย ✓ เมื่อท่านอ่านคู่มือแต่ละเล่มจบ					บันทึกการอ่าน	บันทึกข้อคำถามหรือข้อสงสัยของท่าน
	1	**2**	**3**	**4**	**5**		
1. เบาหวานป้องกันดีกว่าแก้						☐ อ่านคนเดียว ☐ อ่านกับคนอื่น ระบุ.....	
.....							
9. การดูแลตนเองในภาวะพิเศษ						☐ อ่านคนเดียว ☐ อ่านกับคนอื่น ระบุ.....	
10. คำถามน่ารู้สำหรับผู้เป็นเบาหวาน						☐ อ่านคนเดียว ☐ อ่านกับคนอื่น ระบุ.....	

APPENDIX J

Postcards

1

สวัสดีค่ะ

สัปดาห์นี้อ่านคู่มือเล่มใดบ้างคะ?..... อ่านกับใครบ้างคะ?..... อ่านจบกี่รอบแล้วคะ?..... ลงบันทึกการอ่านหรือยังคะ?.... มีปัญหาอะไรจดไว้ นะคะจะได้คุยกันในวันนัดพบค่ะ.... และขอความกรุณาช่วยประเมินความคิดเห็นต่อหนังสือคู่มือแต่ละเล่มด้วยนะคะ.....ขอบคุณค่ะ.....

ด้วยความห่วงใย
ลักษณา ลอยเจริญ

“อ่านมาก... รู้มาก... ปฏิบัติตัวดี....ชีวีมีสุข....”

6

สวัสดีค่ะ

สัปดาห์หน้านี้ท่านต้องไปตรวจตามนัดของโรงพยาบาลหนองบัวแล้ว..... ท่านบันทึกการอ่านหนังสือคู่มือครบทุกเล่มหรือยังคะ?.... และขอความกรุณาช่วยประเมินความคิดเห็นต่อหนังสือคู่มือแต่ละเล่มด้วยนะคะ.....และกรุณานำมาส่งให้ผู้วิจัยในวันที่มาโรงพยาบาลด้วยนะคะ แล้วพบกัน
ในวันที่.....ค่ะ ขอบคุณค่ะ.....

ด้วยความห่วงใย
ลักษณา ลอยเจริญ

“ครอบครัวร่วมใจ...ดูแลร่วมกัน...สุขสรรค์ชีวา.....”

APPENDIX K

คู่มือประกอบการใช้สื่อ

ชุด "ความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน"

คู่มือประกอบการใช้สื่อ "ชุดความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน" จัดทำขึ้นเพื่อเป็นแนวทางในการให้ความรู้แก่ผู้เป็นเบาหวาน ซึ่งผู้ให้ความรู้แก้ผู้เป็นเบาหวานสามารถนำไปใช้ได้ ชุดความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน ประกอบด้วย 2 ส่วน คือ

ส่วนที่ 1 วีดีทัศน์ "ชุดแนวทางในการดูแลตนเองในผู้เป็นเบาหวาน" ประกอบด้วย 5 ตอน ได้แก่

ตอนที่ 1 มารู้จักโรคเบาหวานกันเถอะ

ตอนที่ 2 การมีชีวิตอยู่กับเบาหวานอย่างปกติสุข

ตอนที่ 3 อาหารสำหรับผู้เป็นเบาหวาน

ตอนที่ 4 เบาหวานกับการออกกำลังกาย

ตอนที่ 5 การดูแลเท้าในผู้เป็นเบาหวาน

ส่วนที่ 2 หนังสือคู่มือ "ชุดความรู้เพื่อการดูแลตนเองสำหรับผู้เป็นเบาหวาน" ประกอบด้วย 10 เล่ม ได้แก่

เล่มที่ 1 เบาหวานป้องกันดีกว่าแก้

เล่มที่ 2 โรคเบาหวานคืออะไร

เล่มที่ 3 การควบคุมโรคเบาหวานและภาวะแทรกซ้อน

เล่มที่ 4 แนวทางในการกินอาหารเพื่อสุขภาพที่ดี

เล่มที่ 5 ยาควบคุมโรคเบาหวาน

เล่มที่ 6 การออกกำลังกายกับเบาหวาน

เล่มที่ 7 การประเมินการควบคุมเบาหวานด้วยตนเอง

เล่มที่ 8 เบาหวานกับการดูแลเท้า

เล่มที่ 9 การดูแลตนเองในภาวะพิเศษ : เจ็บป่วย เดินทาง กินอหารนอกบ้าน

เล่มที่ 10 คำถามน่ารู้สำหรับผู้เป็นเบาหวาน

BIOGRAPHY

NAME	Miss. Laksana Loycharoen
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