

**THE EFFECTIVENESS OF A HEALTH EDUCATION PROGRAM
FOR BLOOD SUGAR CONTROL AMONG DIABETES MELLITUS
TYPE II PATIENTS ATTENDING KHAOJETLOOK,
PRIMARY CARE UNIT IN TABKHOR DISTRICT,
PICHIT PROVINCE**

ADISAI SRITHONG

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
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MAJOR IN HEALTH EDUCATION AND BEHAVIORAL SCIENCES
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MAHIDOL UNIVERSITY**

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Thesis

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THE EFFECTIVENESS OF A HEALTH EDUCATION PROGRAM FOR BLOOD SUGAR CONTROL AMONG DIABETES MELLITUS TYPE II PATIENTS ATTENDING KHAOJETLOOK, PRIMARY CARE UNIT IN TABKHORDISTRICT, PICHIT PROVINCE

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ABSTRACT

This quasi-experimental research applied protection motivation theory and group process to modifying the behavior of diabetes mellitus type II patients regarding dietary control and physical exercise. The study sample consisted of 60 noninsulin dependent diabetes mellitus patients. The experimental group consisted of 30 diabetic patients attending the primary care unit, Khaojetlook, Tabklor District, Pichit Province, while the comparison group consisted of 30 diabetic patients attending Tabklor Hospital, Pichit Province. The data were collected by using an interviewing schedule and the results of fasting plasma glucose tests. The data analysis was done by using descriptive statistics with regard to frequency distribution, percentage, median, arithmetic mean, standard deviation, Chi-square test, Paired t-test, and Independent t-test.

The result of the study showed that during the follow-up period, no significant difference was found between the experimental and the comparison groups as regards to knowledge, perceived probability of diabetic complications, and perceived severity of diabetic complications, while significant higher scores were found in the experimental group with regard to perceived self-efficacy in practicing dietary control and physical exercise, perceived response efficacy, and practices regarding dietary control and physical exercise, measured at the end of the experimentation, comparing with the scores measured before the experimentation and with the comparison group. It was found that blood sugar levels among the experimental group was reduced significantly at the end of the experiment. However the blood sugar levels between the experimental and the comparison groups were not significantly different in the follow-up period due to the fact that the comparison group had significantly lower level of blood sugar at the beginning of the experimental. The average score of Body Mass Index among the experimental group was not significantly different form that of the comparison group, both at the beginning and after the follow-up period. According to the result of this study, it was seen that the health education program was effective in helping diabetes mellitus Type II patients gain more confidence in controlling blood sugar and maintaining Body Mass Index at a normal level. So this type of program can be applied in other primary care units.

KEY WORDS: PROTECTION MOTIVATION THEORY / DIABETES MELLITUS TYPE II PATIENT / GROUP PROCESS

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ประสิทธิผลโปรแกรมสุศึกษาเพื่อควบคุมระดับน้ำตาลในเลือดของผู้ป่วยเบาหวานชนิดไม่พึ่งอินซูลิน
หน่วยบริการปฐมภูมิ สถานีอนามัยตำบลเขาเจ็ดยอด อำเภอทับคล้อ จังหวัดพิจิตร (THE EFFECTIVENESS
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บทคัดย่อ

การวิจัยครั้งนี้ เป็นการวิจัยกึ่งทดลอง โดยการประยุกต์ทฤษฎีแรงจูงใจการป้องกันโรคร่วมกับ
กระบวนการกลุ่ม เพื่อการปรับเปลี่ยนพฤติกรรมการปฏิบัติด้านการควบคุมอาหารและการออกกำลังกาย
ของผู้ป่วยเบาหวาน กลุ่มตัวอย่างในการศึกษาวิจัยครั้งนี้คือ ผู้ป่วยเบาหวานชนิดไม่พึ่งอินซูลิน จำนวน 60 คน
โดยแบ่งเป็นกลุ่มทดลองจากหน่วยบริการปฐมภูมิสถานีอนามัยตำบลเขาเจ็ดยอด อำเภอทับคล้อ จังหวัดพิจิตร
จำนวน 30 คน และกลุ่มเปรียบเทียบจากโรงพยาบาลทับคล้อ จังหวัดพิจิตร จำนวน 30 คน รวบรวมข้อมูล
โดยใช้แบบสัมภาษณ์ และผลการตรวจค่าระดับน้ำตาลในเลือดก่อนอาหารเช้า วิเคราะห์ข้อมูลด้วยสถิติเชิง
พรรณนา แจกแจงความถี่ ร้อยละ มัธยฐาน ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน Chi-square test Paired t-test
และสถิติ Independent t-test

ผลการวิจัยพบว่า ในระยะติดตามผลการทดลอง กลุ่มทดลองและกลุ่มเปรียบเทียบมีการ
เปลี่ยนแปลงด้านความรู้ การรับรู้โอกาสเสี่ยงของภาวะแทรกซ้อนจากเบาหวาน การรับรู้ความรุนแรงของ
ภาวะแทรกซ้อนจากเบาหวาน ไม่แตกต่างกันอย่างมีนัยสำคัญทางสถิติ ขณะที่ ความคาดหวังใน
ความสามารถตนเองต่อการปฏิบัติด้านการควบคุมอาหารและการออกกำลังกาย การรับรู้ประสิทธิผลการ
ปฏิบัติ และการมีพฤติกรรมการปฏิบัติด้านการควบคุมอาหารและการออกกำลังกาย ไปในทางที่ดีขึ้นกว่า
แต่ก่อนการทดลองและดีกว่ากลุ่มเปรียบเทียบ อย่างมีนัยสำคัญทางสถิติ ค่าระดับน้ำตาลในเลือดก่อน
อาหารเช้า พบว่า กลุ่มทดลองมีระดับน้ำตาลในเลือดก่อนอาหารเช้าลดลงมากกว่าก่อนการทดลองและ
ลดลงมากกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ รวมถึงดัชนีมวลกายที่ค่าเฉลี่ยในกลุ่มทดลอง
ลดลงมากกว่าในกลุ่มเปรียบเทียบ อย่างมีนัยสำคัญทางสถิติ ผลการวิจัยในครั้งนี้ แสดงให้เห็นว่าการจัด
โปรแกรมสุศึกษา น่าจะมีผลทำให้ผู้ป่วยเบาหวานเชื่อมั่นในตนเองควบคุมระดับน้ำตาลในเลือดและดัชนี
มวลกายให้อยู่ใกล้เคียงระดับปกติได้ ซึ่งสามารถนำไปประยุกต์ใช้ในหน่วยบริการปฐมภูมิอื่นได้

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Due to the modern technological development, the present lifestyles of the people have been changed in many aspects including health behaviors, for example, dietary consumption, physical exercise, etc. This situation caused various types of illness, especially diabetes mellitus, a chronic disease which is one of the country's public health problems. Even though the present medical progress has promising provided directions for treatment and prevention of this disease but diabetes mellitus can be inheritable and if occurred, it can not be cured but it can be treated to alleviate the symptoms and the diabetic can live their life normally (Sathit Wannasaeng, 1993: 4). Diabetes mellitus can also cause various problems due to the disease itself and other related factors that affected the organs of every body system. The consequences are complications. If the diabetic practiced improperly, the complications will occur rapidly or seriously that may lead to death (Suntorn Tantanund et al. 1990: 1). Besides, this illness will also cause physical, psychological, economic and social problems and the government has to spend a lot of resources as well as the diabetic, who has to spend a lot of expense and to receive his/her lifetime care. Some patients may lose their organs and have disability. It was estimated that 5 percent of the world population were sick with diabetes mellitus (Krall & Beaser, 1989: 25) and the higher tendency will be found among the people in Asian region who have higher risk to get diabetes mellitus than the Caucasians (<http://www/dms.moph.go.th.accessedOct3,2006>), particularly the developing countries and the new industrialized countries (Pongsamorn Bunnark, 1999: 1).

Diabetes mellitus is the disease which was manifested by higher level of blood glucose due to the minimal level of insulin recreated by the body or the body does not respond to the insulin. This situation causes excessive urination, excessive thirst, extreme hunger, but weight loss (Wittaya Sridama and Puntasakdi Kungswiwatana in Wittaya Sridama (editor), 1998: 1). According to the World Health Organization, there are 2 types of diabetes mellitus (WHO Study Group Technical Report Series No. 727, 1985 cited in Suntorn Tantanund et al., 1990: 1) : Insulin Dependent Diabetes Mellitus (IDDM), about 20 percent of this group aged below 30 years and Noninsulin Dependent Diabetes Mellitus (NIDDM), about 80 percent of the diabetic patients have this type of diabetes (Krall & Beaser, 1989: 15-19). NIDDM is as common to develop in an over 45 year old and in an obese person (Sathit Wannasaeng, 1993: 17). The cause of Noninsulin dependent diabetes is still not clear but heredity and environment have tremendous involvement. The symptoms of noninsulin dependent diabetes or diabetes mellitus type II occur gradually.

American Diabetes Association (1996, years 1991-1993 among the 45-year-old and over group. It was found that the prevalence rate was increased from 0.8 percent to 5.8 percent and it was expected that the present number of diabetic patients is 16 millions. Among this group, 90 percent are the Type II diabetics. The data of the blood sugar measurement of the latest Thailand Population Survey 1996-1997 showed that the prevalence rate of diabetes among the labor-force population group was 4.4 percent and the highest prevalence rate was found in Bangkok (6.1%). The second rank was the northern region (5.3%) while the lowest rate was found in the southern region (2.1%). It was estimated that less than 3.0 percent of all diabetics can control their blood sugar level effectively (Janpen Chooprapawan, 2000: 239). According to the public health statistics report of the Public Health Policy and Plan Bureau, Ministry of Public Health, in 1999 there were 121,547 diabetics (218.9 per 1,000,000 population) who have been treated in all public health services of Thailand. As regard to the causes of deaths due to diabetes, according to the International Classification of basic Diseases, the numbers of deaths caused by diabetes in all provinces of Thailand (excluded Bangkok Metropolis) were 4,837, 7,000 and 7,558 in the years 1998, 1999, and 2000 respectively. With the rates per 100,000 population as 7.9, 11.4

and 12.2 respectively. The increasing trend is expected and the complication from diabetes is one of the causes of deaths (<http://www.dms.moph.go.th>).

Diabetes is a disease that develop chronic and severe complications which are usually found among diabetics who have been sick with this disease for about 8-10 years (Mandana Prateepprasane and Wongduon Pundee, 1999: 40). The factors that caused complications are the consequences from having high level of blood sugar for a long period of time (Wanee Nithiyanund (editor), 1992: 90-91). These consequences have changed the functions of the organs in all body systems gradually. This situation developed problems or other illness situations along with the disease itself. The new situations occurred are usually the chronic symptoms. Most of these chronic symptoms were the abnormality of the circulation system (Sompongs Suwanwalaikorn cited in Wittaya Sridama (editor), 1998: 65). At present, the detection, treatment and control of diabetes have been progressed and the diabetics can live longer. But the various complications were found to be increasing and with more seriousness. The complication with the eyes is one type of the complications that makes the diabetic to be risky to be blind 25 times of the normal people, especially for those diabetics who have been sick for a long period of time (Palmberg, 1977: 703-709 cited in Wanee Nithiyanuend (editor) 1992: 99). The higher number of the blind patients due to diabetes may be found in Thailand because among 12 percent of the total blinds in Thailand, their blindness caused by their illness of diabetes (Edelman & Heney, 1996: 169). The diabetics can get glaucoma 2-4 times earlier than the normal people (Wittaya Sridama (editor) 1998: 750. Besides, the diabetic who also has high blood pressure will have higher possibly to get eye problem than those who do not have a high blood pressure (Murphy, et al., 1984: 1980 cited in Wanee Nithiyanund (editor), 1992: 100). Normally, the diabetic has a tendency to have a high blood pressure, 1.5-2 times than the normal persons (Pickup & Williams, 1994: 213) Whereby the high blood pressure is a risk factor for atherosclerosis among diabetics. The diabetic has 2-4 times to develop atherosclerosis than nondiabetic and atherosclerosis was found to be the leading cause of death (75-80%) (Srisuda Sitpreecha cited in Wittaya Sridama (editor), 1998 : 87). Atherosclerosis affected the circulation system and led to the lack of blood flow to the organs, for example, arms,

legs, etc. This situation caused wounds, especially of the feet. The diabetic has about 17 times to have wounds of their feet comparing to the normal people (Apichart Wichayarnratana cited in Wannee Nithiyanund, (editor), 1992: 191). These wounds are difficult to be cured because the lack of blood flow makes healing take longer and infections become more likely. Due to the lack of insulin, the growth of the skin's cells has decreased and with reduced blood flow, the body cannot battle the infection as well, so infections are likely to be worse. The diabetic is at risk of losing that severe infected organ. Sometimes the infection spreads to the blood circulation and this condition may cause death. Therefore, if the diabetic patients cannot control their blood sugar level effectively, it may lead to the severe situation and resulting in various and severe situation. At present, the treatment has been focused on centrally the blood sugar level to be normal (Sompongs Suwanwalaikorn cited in Wittaya Sridama (editor) 1998: 65).

It was evidenced that diabetes is the chronic disease with a high prevalence rate and will lead to the severe complications which were due to the very high blood sugar level that the diabetic cannot control. Therefore, the purpose of the treatment of this disease is to control the blood sugar level not to be higher than 126 mg%. The effective method for controlling blood sugar level that can be performed by the patient is centrally food intake and physical exercise (Sathit Wannasaeng, 1993: 220). Thus, if the diabetics received proper treatment and care it will be helpful in decreasing death rate, disability, anxiety, medical expense, and helping the diabetics live their life happily as the normal people do.

During the years 1999 to 2001, there were 1,094, 1,215, and 1,345 diabetics respectively who were hospitalized in all hospitals of Pichit Province and the rates per 100,000 population were 190.48, 203.51 and 226.89 respectively. The numbers of deaths due to diabetes during that period were 57, 49 and 72, with the rates of 9.92, 8.21 and 21.51 respectively (Pichit Provincial Public Health Office, 2001). From the mentioned data it was found that there is the trend of increasing number of diabetics and the deaths due to this diseases, particularly the death rate due to diabetes is higher than the criteria set by the country that should not be higher than 5 per 100,000 population.

In Tabklor District, during the years 2000-2001, there were 147 and 133 diabetics who were admitted in the district Hospital, with the rates of 281.48 and 256.6 per 100,000 population (Tabklor District Public Health Office, 2004). In the fiscal year of 2004 the diabetic clinic has been established in the Primary Care Unit of Khaojetlook Health Center, Tabklor District, Pichit Province. This clinic was open every Wednesday, 08.30-16.00 hours. The service was provided by physicians, nurses and medical supplies from Tabklor District Hospital and the clinic has been started in October, 2004. The services concerned with giving the treatment accordingly with the patients' symptoms including individual health education activities. During the last 6 months, it was found that there were 64 diabetic cases with the prevalence rate of 1.19 percent. Among this group there were 33 patients (51.56%) who could not control their blood sugar level to 126 mg%. There were 14 cases (21.88%) who had complications and one of them (1.56%) had chronic wound at the foot. Even though it was found that the admission rate of diabetics in Tabklor Hospital was decreased but this rate was higher than the rate of Pichit Province and the majority of the diabetics could not control their blood sugar level to be or close to normal whereas the chance to get complications is very high. Therefore, the appropriate measure should be done in order to promote diabetic patients to practice properly for delaying the illness progress and complications.

The researcher collected the preliminary data by using the modified interviewing schedule developed by Narit Zennoi (1999: 133-142) and Boopha Arsrairaj (1998: 154-65) whereby the Protection Motivation Theory was applied. The interview was carried out with 13 diabetics who could not control their blood sugar level down to 140 mg% as regards to dietary control and physical exercise. The findings were as follows:

1. General information. The patients consisted of : 23.08 percent of males, 76.92 percent of females; aged 42-62 years; 76.92 percent had primary education; 84.62 percent were married; 46.15 percent did not work (housewives-heads of the family), 30.76 percent were agriculturists and 15.38 percent were traders and private business; 76.92 percent stayed with their husbands/wives; 46.15 percent did

not have relatives who were sick of diabetes, 30.77 percent had relatives who have been sick of diabetes and 2308 percent mentioned that their mothers were sick of diabetes; 53.85 percent had been sick of diabetes for less than 10 years.

2. Perceived susceptibility of getting complications. The majority of the sampled patients (76.86%) mentioned that they did not know the consequences of being unable to control blood sugar level to their body or their illness, including the relationship the control between of good consumption, physical exercise and the blood sugar level.

3. Perceived severity of diabetic complications. The high percentage of the sampled patients (84.62%) knew that if they have wounds, they will be very difficult to be healed but they did not the reason of that. Besides, they did not know the effects of the complications on themselves including the dangers and the possibility of getting complications.

4. Perceived self-efficacy for controlling food consumption and physical exercise. Regarding dietary control, the majority of the sampled patients (76.92%) could not control the consumption of carbohydrate and sugar with the following reasons: could not work to earn money; frequent hunger; dared not to consume other food exchanges and to practice physical exercise until sweating and longer than 20 minutes; have already practiced physical exercise by doing housework, with and without sweating; and 4 cases indicated that they were farmers so they did not practice physical exercise. It was also found that all of the sampled patients kept their medical appointment regularly and took medicines continuously.

5. Response-expectancy of practicing dietary control and physical exercise. For all statements, the sampled patients perceived the benefits of following the proper practices but they could not do all of the practices, for example, regarding consuming less rice and carbohydrate but more vegetables, the patients could not follow the recommendations because they believed that since they have to work they need to take more rice instead of more vegetables. Regarding physical exercise, they thought that doing housework or waling to visit their relatives in the village was enough. It

was found that the sampled patients perceived the importance of diabetic medication for curing the disease.

6. Practices regarding dietary control and physical exercise.

6.1 Dietary Control. It was found that there were 61.54 percent who indicated that they still eat the foods cooked with coconut-milk while 92.30 percent still eat high-fat foods at least 1 meal a week, for example, fried foods, curry cooked with coconut milk, etc. All of them mentioned that they eat vegetables regularly. Regarding sweet, 84.61 percent said that they consume sweet some days because they love sweet or they see family members eat it so they just join them and sometimes their relatives brought some sweets for them as the gift. For sweet fruits, 46.15 percent have them sometimes, 38.46 percent consume regularly while 15.38 percent mentioned that they never consume. The reasons for consuming sweet fruits are: they like those sweet fruits; they did not know why they should not consume them; and their relatives gave them as the gift. There were 84.62 percent of the sampled patients indicated that they never drink alcoholic beverages or they have ever but presently, they have quitted since they have known that they get diabetes.

6.2 Physical exercise. There were 61.54 percent indicated that they did not practice physical exercise with the reason that they are too tired from house working. There were 38.46 percent who practiced physical exercise regularly by farming, gardening and walking around their houses. They also mentioned that they never been encouraged or discussed about physical exercise with their relatives or their family members.

6.3 Medication use. Every sampled patients took medicine every day in accordance with the medical prescription. They took the medicine before meal every time but not punctually since they consume their foods not punctually.

The aforementioned data revealed that most of the diabetic patients lack of knowledge, perceptions and skills regarding self-care. Because diabetes is the disease that needs a proper self-care which will be very helpful in caring and presenting

complications, therefore, it is necessary for the patients to gain proper knowledge, understanding and skills that will motivate them to practice properly. The proper knowledge and understanding will help them know about what to do and be able to perform the behaviors properly (Poonsiri Aroonnatre, 1998: 60). Therefore, it is necessary to help the diabetics learn and practice the skills for controlling diabetes especially regarding food intake and physical exercise in order to bring down the blood sugar level as close as to the normal level. The effective control of diabetes will help decrease the prevalence rate of complications (Wittaya Sridama, 1998: 185). Therefore, the researcher has applied the Protection Motivation Theory developed by Rogers to organize a health education program for diabetic patients. This program was aimed to help the diabetic patients perceived the severity of diabetes and complications, perceived susceptibility of getting complications, perceived self-efficacy expectancy, and perceived response-expectancy, which will help the patients be willing to practice and practice health behaviors properly as regards to dietary control and physical exercise. These proper practices will help control blood sugar level, prevent complications and help the diabetics live their life normally.

Research Questions

Whether or not the health education program organized by applying Rogers' Protection Motivation Theory will be effective in increasing perceived severity of diabetes, perceived susceptibility of getting complications, perceived self-efficacy expectancy, and response-expectancy of practicing dietary control and physical exercise of the diabetic patients attending the primary care unit, Khaojetlook Subdistrict Health Center, Tabklor District, Pichit Province, and these outcomes will help the diabetic patients learn, be aware and gain skills for changing their health behaviors regarding dietary control and physical exercise so they can control their blood pressure level?

Research Objectives

General Objective

This study was aimed to study the effectiveness of the health education program applying the Protection Motivation Theory developed by Rogers on dietary control, physical exercise and the changes of Body Mass Index and fasting blood sugar level of Type II diabetic patients attending the primary care unit at Khaojetlook Subdistrict Health Center, Tabklor District, Pichit Province.

Specific Objectives

1. To study the diabetic patients' knowledge about diabetes and practices after participating in the health education program organized.
2. To study the changes of health behaviors of the Type II diabetic patients after participating in the health education program, as regards to:
 - 2.1 Threat appraisal regarding diabetes and complications:
 - 2.1.1 Perceived severity of diabetes and its complications
 - 2.1.2 Perceived susceptibility of getting complications
 - 2.2 Coping appraisal of dietary control and physical exercise:
 - 2.2.1 Self-efficacy expectancy regarding dietary control and physical exercise
 - 2.2.2 Response-expectancy of practices regarding dietary control and physical exercise
 - 2.3 Health practices regarding dietary control and physical exercise after participating in the health education program.
3. To study the changes of Body Mass Index after participating in the health education program.

4. To study the changes of blood sugar level after participating in the health education program.

Research Hypotheses

1. The Type II diabetic patients who participated in the health education program organized by applying Rogers' Protection Motivation Theory, who attending a primary care, Khaojetlook Subdistrict Health Center, Tabklor District, Pichit Province, had changed their health behaviors regarding dietary control and physical exercise in the positive direction in the following aspects:

1.1 Knowledge about diabetes and complications

1.2 Threat appraisal of diabetes and complications regarding:

1.2.1 Perceived severity of diabetes

1.2.2 Perceived susceptibility of getting complications

1.3 Coping appraisal of dietary control and physical exercise regarding:

1.3.1 Self-efficacy expectancy regarding dietary control and physical exercise

1.3.2 Response-expectancy of practices regarding dietary control and physical exercise

1.4 Health practices regarding dietary control and Physical exercise

2. After participating in the health education program, the diabetic patients' Body Mass Index or nutritional status was found to be better before the program.

3. After participating in the health education program the diabetic patients' fasting blood sugar level was found to be lower than before the program.

Research Variables

1. Independent Variable: A health education program applying Protection Motivation Theory.

2. Dependent Variables:

2.1 Threat appraisal of dietary control and physical exercise:

2.1.1 Perceived severity of diabetes and its complications

2.1.2 Perceived susceptibility of getting

2.2 Coping appraisal of dietary control and physical exercise:

2.2.1 Response-expectancy of practices regarding dietary control and physical exercise

2.2.2 Self-efficacy expectancy regarding dietary control and physical exercise

2.3 The changes of health practices regarding dietary control and physical exercise after participating in the health education program

2.4 Body Mass Index or nutritional status

2.5 Fasting blood sugar level

Scope of the Research

This study was aimed to study health behaviors regarding dietary control and physical exercise in order to change the blood sugar level of Type II diabetic patients aged 40 years and over who were attending the primary care unit, Khaojetlook Subdistrict Health Center, Tabkhlor District, Pichit Province.

Basic Assumptions

1. This study was carried out in the real situation whereby the interviewing schedule was used to collect the data as well as the observation during the interview session, the health recording form developed by the researcher, and the information provided by the patients' relatives the patient groups. Thus, the data obtained were reliable.

2. The implementation of each health education activity may be different in term of time duration but no difference should not be found as regards to contents, processes, venues and the organizer.

Definitions of Terms

1. Noninsulin Independent Diabetic patient refers to the patient who has been diagnosed that he/she has diabetes mellitus and has been treated by taking oral medication. The patient's blood sugar level was over 126 mg/dl but do not have any complications. The patient aged during 40-60 years and has been sick of diabetes for 3 months to 5 years.

2. Health education program refers to health education activities and processes organized by applying Rogers' protection Motivation Theory, by the researcher. The activities included showing videotape regarding: knowledge, causes, dangers, severity, and complications of diabetes mellitus; group discussion, positive and negative modeling; recording the Personal Health Manual; etc. The activities were organized for the experimental group for 12 weeks.

3. Threat appraisal refers to the patients' perceived severity and perceived susceptibility of getting complications if they did not follow the recommendations properly.

3.1 Perceived severity of diabetes mellitus refers to the condition that the patient believes or feels that if he/she did not practice properly or did not get medical treatment or did not control blood sugar level down to or close to the normal level, he/she may get dangerous complications that may lead to disability or death.

3.2 Perceived susceptibility of getting complication refers to the condition that the patient believes or feels that he/she may be susceptible to have complications from diabetes mellitus if he/she did not take a good self-care for controlling blood sugar level down to or close to the normal level.

4. Coping appraisal refers to the patients' perceived outcomes by comparing critically about self-efficacy to perform the behaviors and the outcome expectancy.

4.1 Self-efficacy expectancy refers to the patient's self-confidence that he/she can perform the behavior to control food consumption and physical exercise.

4.2 Response-expectancy refers to the patient's perception that if he/she performed proper behaviors regarding dietary control and physical exercise, the outcome will be the positive change of fasting blood sugar level.

5. Dietary control and physical exercise behavior refers to the proper practice of daily life behaviors regarding dietary control and physical exercise that can lower the blood sugar level.

5.1 Dietary control refers to the consumption of balanced and proper diet accordingly with the illness conditions by consuming the foods from the unlimited diets, the foods that can be consumed but need to be controlled, and the foods that must not be consumed or food exchanges.

5.2 Physical exercise refers to the physical exercise activities emphasizing on appropriateness in accordance with the patients' preference or skills as well as their lifestyles, for example, walking, jogging, bicycling, rope-jumping, etc. These types of physical exercise help many muscles move and get strengths. But the exercise activities should not be the ones that the patients have to work hard against the gravity, for example, weight lifting, etc. The patients should exercise for at least 20-30 minutes each time, everyday or every 2 days or at least 3 times a week.

6. Effectiveness of a health education program refers to the changes of Type II diabetic patients' behaviors regarding dietary control and physical exercise occurred after they have participated in the health education program organized. Those behaviors include perceived severity and susceptibility of diabetes and its complications; self-expectancy of the practices regarding dietary control and physical exercise and resulting in the proper practices about dietary control and physical exercise. These proper practices lead to the positive change of fasting blood sugar level of the diabetic patients.

7. Blood sugar level refers to the density of glucose in the blood circulation measured before taking breakfast and without taking any foods or water at least 6 hours before blood drawing of the Type II diabetic patients. Three levels are set to evaluate the outcome of the controlling behaviors as good, moderate, and low/need to be improved.

8. Body Mass Index refers to the value that shows the size or the density of the body. This index was calculated by dividing the body weight (kilogram) by the height² (meter). This BMI value is used as the criteria to evaluates the effectiveness of the body weight control behavior of Type II diabetic patients. The levels were classified into 3 levels: normal nutritional status (BMI = 18.5-24.9 kg./m².); over weight (BMI = 25-29.9 kg./m².); and obesity (BMI = 30 kg./m². and higher).

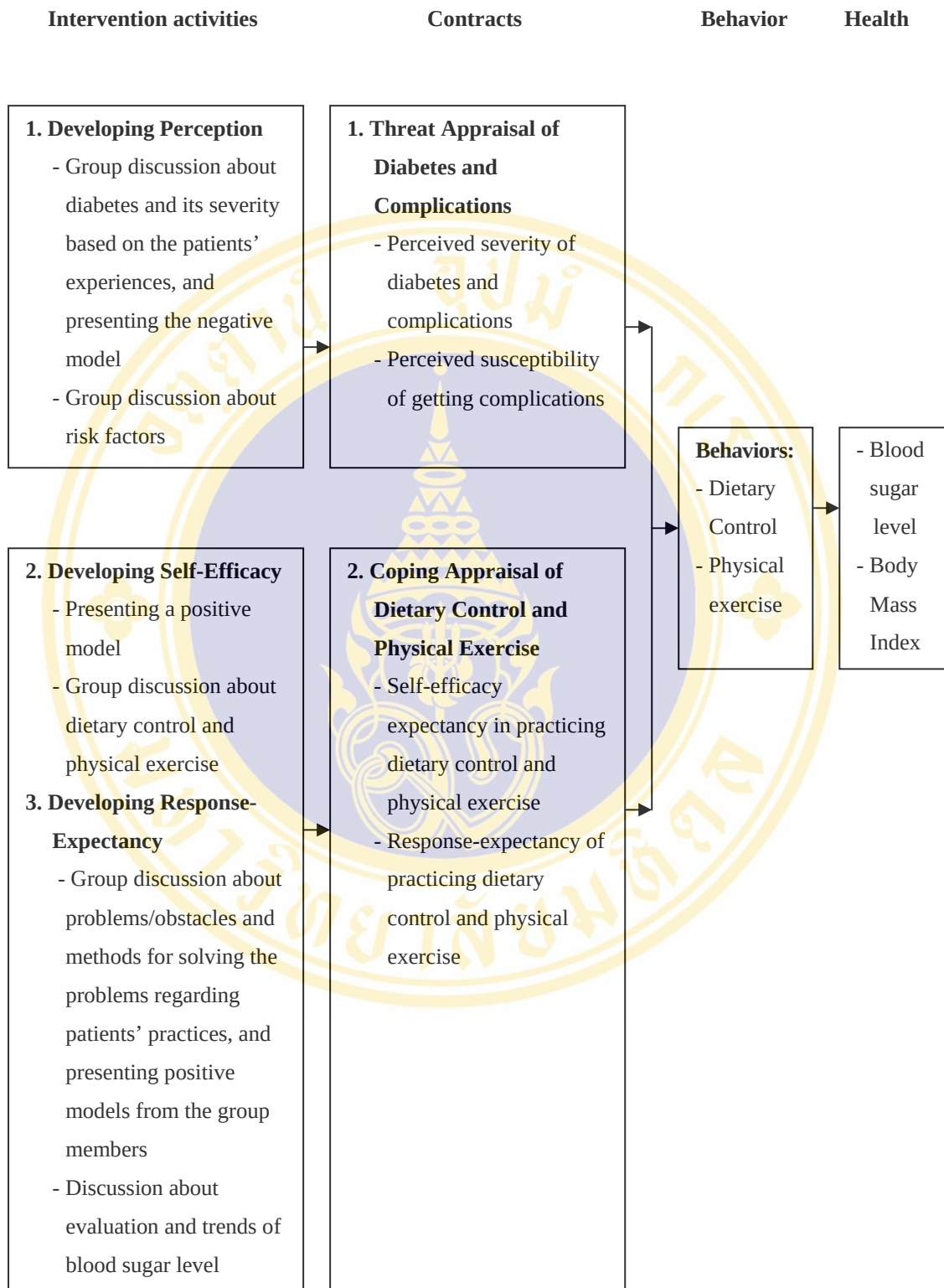


Figure 1 Research conceptual framework

CHAPTER 2

LITERATIVE REVIEW

In implementing this research project, the researcher has reviewed the literature regarding knowledge about diabetes, concepts, theories, and related researches both in Thailand and other countries, in order to organize the activities aiming to modify health behavior of Type II diabetic patients who could not control blood sugar level effectively, who attended health service at Khaojetlook Subdistrict Health Center, Tabklor District, Pichit province. The literature reviewed were divided into the following parts:

Part 1 Knowledge About Diabetes Mellitus

- Important symptoms
- Types of diabetes
- Diagnosis
- Complications
- Assessment of the diabetic control outcomes
- Aims of diabetic control
- Treatment & care

Part 2 Primary Care Unit

Part 3 Concepts and Theories Used

- Protection Motivation Theory
- Group process
- Learning process by using group process techniques
- Group discussion

Part 1 Knowledge About Diabetes Mellitus

Diabetes is a number of metabolic diseases, with the high level of blood sugar. Diabetes is caused by the abnormal insulin recreation, abnormal insulin function, or the combination of both. This condition makes the blood sugar level higher than the normal blood sugar level of 60-120 mg./al (Kral & Beaser, 1989: 2).

Important Symptoms

The diabetic patients usually have the following symptoms (Sathit Wannasaeng, 1973: 15-16): excessive urination and high quantity of urine (come times ants can be found at the urine), excessive thirst and drinking a lot of water, fatigue, weight loss although eating a lot, having abscess frequently especially carbuncle, unexplained itching at the sweating parts of the body or at the vagina, blurred vision, and numbness and burning sensation of the hands or feet, etc.

Types of Diabetes

The World Health Organization categorized diabetes into 2 types (WHO Study Group, Technical Report Series No. 727, 1985 cited in Suntrorn Tantanand et al., 1990; 10, as follows:

1. Insulin Dependent Diabetes Mellitus (IDDM) or Type I. Type I diabetic patients need insulin for controlling the sugar level. Most of the patients develop this type of diabetes at the early age, usually lower than 30 years old. The symptoms occur rapidly and severely. The patients usually have diabetic ketoacidosis. Due to the damaged Beta cells of the pancreases, adequate quantity of insulin and not be secreted.

2. Noninsulin Dependent Diabetes Mellitus (NIDDM) or Type II. The symptoms of Type II diabetes occur slowly and it usually does not need insulin to decrease blood sugar level except for some situations. It can be cured by only dietary control or with medication. Mostly it occurs with people aged higher than 40 years

old and with obese people or those who had relatives with diabetes (Edelman & Henry, 1996: 26). Diabetic Ketosis usually does not occur except for some situations, for example, during being infected, etc.

Diagnosis

The methods of diabetic diagnosis are as follows: (Witaya Sridama and Punsakdi Kungsawiwatana cited in Witaya sridama (ed.) 1998: 2-3), Paiboon Suriyawongse (ed.) 1996 : 16-17).

1. Having explicit diabetic symptoms: frequent urination; extreme thirst; weight loss; or having history of infection of urinary tract, vagina, or skin caused by fungi; aged over 40 years old; having risk factors, e.g. family history of having diabetes; obesity; females who ever had abnormal pregnancy; hypertension; high blood cholesterol; or ever have Impaired glucose tolerant test (IGT) or Impaired fasting glucose (IFG).

2. Laboratory Tests

- 2.1 Random plasma glucose test: the value ≥ 200 mg./dl with diabetic symptoms

- 2.2 Oral glucose tolerant test: the value ≥ 200 mg./dl

- 2.3 Fasting plasma glucose test (no food for 8 hours): the value ≥ 126 mg./dl (having the test 2 times)

Diabetic Complications

There are 2 types of diabetic complications which are very serious and may lead to death (Sunthorn Tuntanand, 1990: 2-3, Wannee Nithiyanund in Wannee Nithiyanund (ed.), 1992: 78-88) as follows:

1. **Acute Complication.** This type of complication is caused by the high level of blood sugar. The complication includes: diabetic ketoacidosis; hyperosmolar non-ketotic hyperglycemic coma (HNHC); lactic acidosis; or hypoglycemia. These

conditions may cause the following symptoms: thirst, nausea, vomiting, depress, or even loss of consciousness. These symptoms may be caused by some medicines and oftenly occur with those who did not know that they have diabetes. The patients get infection easily, may be of the lung or skin, including having stress.

2. Chronic Complication. This Type of complication was caused by having high blood sugar level for a long period of time. It usually occurs with the Type II diabetic patients. Pathological changes occur slowly with various parts of body organs. Most of the symptoms are the effects of the circulation system and/tissues. There are 2 types of chronic complication (Wannee Nithiyanund in Wannee Nithiyanund (ed.) 1992; 90-91, Sompongs Suwanwalaia follows:

2.1 Macro vascular Complication

2.1.1 Atherosclerosis. This complicate was found most oftenly among NIDDM patients and is the important cause of disability and death among diabetic patients. Diabetic patients have 2-3 times to have diseases of the blood vessels of the brain and the heart than the normal persons and 4 times to have diseases of the blood vessels of the extremities of the normal persons (<http://www.dms.moph.go.th>). These diseases are the important causes of gangrene and are the co-causes of the diabetic foot ulcer, besides the damage of the nerves at the extremities and infection. They are also the important causes of the loss of some body organs among the diabetic patients. Atherosclerosis in diabetic patients is caused by many co-factors. The long duration of high blood sugar level developed the combination of sugar and protein as well as other substances which is called advanced glycosylation end-products and the abnormal function of lipoprotein occurs especially at the arteries' walls. The abnormal level of blood cholesterol and the changed function of lipoprotein, for example, the change of LDL (atherogenic modified LDL), hyperinsulinemia, and insulin resistance, etc. caused myointimal profilation and accelerated atherosclerosis. The higher level of fibrinogen and von-Willerbrand factor including the abnormal function of blood platelets may cause thrombogenesis. Besides, other risk factors can also elevate the formation of atherosclerosis, for example, hypertension, smoking, etc.

2.2 Microvascular Complications. This type of complication includes diabetic retinopathy and diabetic nephropathy. This group of complication caused by the changes of the capillaries. The high prevalence of the microvaseular complications goes up with the longer duration of the illness. Specific lesions occur. Eyes and kidney are the most organs that affected most including Kidney failure which is the important cause of death among diabetic patients. Therefore, diabetic retinopathy in diabetic patients caused by the changes of capillaries within the eyeball and the severe condition may lead to blindness (Apichort Singkarlwanich cited in Wannee Nithiyanund (ed.), 1992: 111). For diabetic nephropathy in diabetic patients, 30-35 percent will lead to last stage of kidney failure which needs to be treated by kidney transplant or using artificial kidney (Leena Ong-artyuthi cited in Wannee Nithiyanand (ed.) 1992: 113-127).

2.3 Complication of the Nervous System. The change of the nervous system may occur at the central nervous system (cause mostly by atherosclerosis), peripheral nervous system, and automatic nervous system. This type of complication can be found in about 40 percent of diabetic patients. The number of this complication goes up with the increasing time of the disease. Besides, most of this complication is found in the diabetic patients who can not control blood sugar level, who can not control blood sugar level, who smoke, or having cardiovascular diseases. The change of the peripheral nervous system that was found most in diabetic patients is distal symmetrical polyneuropathy. The patients may have numbness or loss of senses at the extremities (the end of hands or feet) and some may have pain. The control of blood sugar level to be closer to the normal level may help prevent or alleviate the complication of the nervous system especially at the early state.

The diabetic patients who have complication of the nervous system especially those who have numbness of feet, have to take a good care of feet in order to prevent diabetic foot ulcer. The patients who have orthostatic hypotension must be careful about rapid change of the position because it may cause dizziness that may lead to faint.

Therefore, it can be said that complication can be the cause of death among diabetic patients. According to the study of Bertoni (2002: 471-479), who carried out the survey research about illness of diabetic patients that related to the causes of morbidity and mortality of U.S. population, The research lasted for 1 year, in 1995, and the data were collected from 148,562 people, aged 65 years and over. These patients were diagnosed to have diabetes mellitus. The follow-up has been made for the sampled group. It was found that mortality rate of diabetic patients in both genders related with the increasing ages of the patients. It was also found that the number deaths caused by diabetes among the elderly was higher than other causes in every age-group. Besides, it was found that the mortality rates of elderly with diabetes who died because of heart disease and vascular diseases of the brain were 181.5 and 126.2 per 1,000 population respectively. Therefore, among the elderly, there was a high percentage of deaths due to diabetes when compared with the whole population in every age group. It is necessary to be concerned seriously about the mortality and morbidity rates caused by diabetes and complications.

Outcome Assessment of Diabetic Control

Diabetes is a noncommunicable disease that can not be cured. Its mortality rate is very high with very serious complications. If the patients can control blood sugar level, it decrease of delay the onset of chronic complications and hospitalization (Wanee Nithayanund (ed.), 1992: 1). Therefore, it needs to assess the outcomes of diabetic control and try to control it to be the “good” condition. The outcome assessment can be made as follows (Weerasikdi Srinonpakorn cited in Witaya Sridama (ed.), 1998: 191-198).

1. History. History concerned with the signs & symptoms of high or low blood sugar levels. If the patient has the symptoms of frequent thirst, frequent urination and weight loss, these symptoms may be the indicators of high blood sugar. If the patient has the symptoms of extreme hunger, palpitation, sweating dizziness, nausea, etc., these symptoms may be the indicators of low blood sugar level. If these symptoms are more serious, the patient will loss of consciousness. The other aspect of taking history is about the regular behavior for controlling blood sugar level that the

patient has performed. For example, physical exercise, dietary control, taking medication, or insulin injection. For some patients, these practices may be done just only a short time before coming to see the physician/health personnel which made the good outcome of the blood sugar test but during the past days the blood sugar control may not be good. Some patients may do not have enough medicines to take for 2-3 days before come to the clinic or may consumes a lot of food so the blood sugar level is high but the blood sugar control may be good. The history of the patient may also concern with taking some medicines or having some illness that affect the blood sugar level, for example, contraceptive pills, steroid drugs, diuretic drugs, tuberculosis drugs, etc. (Krall & Beaser, 1989: 23-24).

2. Physical Check-Up. The assessment is made from body weight and Body Mass Index.

2.1 Body weight. The diabetic patient should have a normal body weight, not over or under. If the body weight is high, the patient has the tendency to have insulin tolerance or if the body weight is lower, the patient may have protein deficiency which may relate to blood sugar control. The following-up of the patient's body weight every time will indicate the patient's behavior and diabetic control. For instance, for the obese patient, he/she should try to lose weight. But if the is lower too much it may lead to high blood sugar level or for the thin patient, if the patient gained a lot of weight, it may indicate the low blood sugar level.

2.2 Body Mass Index. Body mass Index id used to evaluate the appropriateness of the body weight of the person aged 20 years and higher. It can be computed by dividing body weight (kilogram) be height² (metre). The normal standard of Body Mass Index is 20-24.9 kg/m². For this research, the assessment of Body Mass Index was used by applying the principle developed by Sricamai Wiboonyanund (1997: 33-34) and Walai Inarumpun cited in Wannee Nithiyanund (ed.), 1992: 8). The BMI scores were divided into 4 levels: normal (BMI = 20-24.9 kg/m²); underweight malnutrition (BMI < 19.9 kg/m²); and obesity (BMI > 30 kg/m²).

3. Laboratory Test. The test will help to evaluate the outcome of diabetic control in regards to blood sugar level, for example, plasma glucose test, urine test, and the tests that can be used to evaluate the long-term outcome of diabetic control, e.g. glycosylated hemoglobin test, fructosamine test, or other metabolic tests relating to diabetic complication, for example, the change of blood cholesterol, etc.

3.1 The Tests for Assessing the Outcome of Diabetic Control at One Specific Time:

3.1.1 Plasma glucose test. There are 2 types of the test. Fasting plasma glucose test is the test that the sample was collected before breakfast by having the patients fasted by avoiding food/water/medicines at least 6 hours. If the plasma glucose level was higher than 140 mg/dl, the patient is considered having diabetes. Another test can be done 2 hours after breakfast. The sample was collected after breakfast. If the plasma glucose level was higher than 200 mg/dl, the patient is considered as diabetic (Sathit Wannasaeng, 1993: 21). At present, the enzymatic method has been used. The plasma glucose test that was done once during the follow-up period is not enough especially Type II diabetic patients enough especially Type II diabetic patients whereby on different blood sugar level in each period of time was found and there was a relationship between the blood sugar level measured before breakfast and the average blood sugar level and HbA_{1c} level. Fasting blood sugar test (plasma glucose test) can be used in Type II diabetic patients but it may not be accurate enough for the cases that practiced irregular dietary control behavior and irregular medication use or having some factors that affect the blood sugar level during the follow-up period, for example, illness on taking steroid drugs, etc.

3.1.2 Urine Test. This method is an easy one, no hurt and cheap. It composed of urine sugar test and urine ketene test. If the urine sugar test is > 180 mg/dl, the patient is considered to be diabetic. There are many limitations or contradictions regarding urine sugar test. In other countries, the urine sugar test has been decreasing due to the research finding that it is not the accurate method for diabetic diagnosis. It shows the blood sugar level roughly. However, the test has been recommended for the patient who could not have blood sugar test at home. For urine ketene test, it is useful for Type diabetic patients aiming to diagnose ketoacidosis or

for the patients who had blood sugar level higher than 240 mg/dl or those who have often illness. For the Type II diabetic patients, since they have low opportunity to have ketoacidosis, urine ketone test is not necessary (McKague, 1999: 8-9).

3.2 The Tests for Assessing the Outcome of Diabetic Control in the Long Period of Time

3.2.1 HbA_{1c} or Glycosylated Hemoglobin Test. Generally, glucose can combine with Hemoglobinein without the need of any interaction. This process is called non-enzymatic glycosylation or glaciations. Every type of protein can do this. The sate of placation depends on the blood sugar level. This principle has been applied to the long-period blood sugar test. With the assumption that plasma glucose (blood sugar) will combine with hemoglobin all the time and the life cycle of red blood cells is about 120 days, the HbA_{1c} value indicates the blood sugar level of the past 6-8 weeks. The value is measured in the percentage of the total amount of hemoglobin. This type of test should be done every 3-6 months (Edelmen & Henry, 199 : 111).

3.2.2 Glycosylated or Fructosamine Test. Because protein the blood circulation lasts for 20 days, the test value will indicate the sugar level during the past 7-10 days. This test is simple and cheaper than the HbA_{1c} test and it can be used for controlling diabetes in the short per of time, for example, during pregnancy. This test is another alternative for the HbA_{1c} test in assessing the control of diabetes.]

3.3 Other Metabolic Tests for the Risk Factors Affecting Complications.

Other risk factors affecting the diabetic complications are high blood cholesterol, for example. The blood cholesterol level will changed in the patient who could not control their diabetes effectively, by having higher level of triglyceride. For the patient who lacks a large amount of insulin, the lipoprotein than 141 mg/dl.

Treatment and Care of Diabetic Patients

Diabetes is an chronic disease that needs continuous care for their lifetime as well as the need for getting cooperation and participation from the diabetic patients themselves. In order to lower the blood sugar level to be closer to the normal

level, to prevent diabetic complications, and to help them to live their life happily, the patients have to practice the following behaviors:

1. Dietary Control

The proper and balanced diet is very important for the treatment and care of diabetes. Consuming large amount of food, especially sugar, will lead to higher level of blood sugar level. The patients must control their diet regularly because during the early stage of having Type II diabetes, only dietary control can be effective in caring diabetic patients (Witaya Srodama (ed.), 1998: 16), with the following important objectives (Walai Intarumpun cited in Wannee Nithiyanund, 1992: 8):

1. To bring down the blood sugar level to be closes to the normal level.
2. To get adequate energy for controlling body weight to the normal level.
3. To help the Type I diabetic children get adequate energy for their normal growth.
4. To prevent or delay the onset of complications.
5. To get adequate nutrients needed for healthy condition.

The principle for identifying the appropriate and balanced diet for diabetic patients accordingly with the daily energy requirement are as follows: (Walai Intarumpun cited in Wannee Nithiyanund, 1992: 8-20, Srisamai Wiboonyanund, 1997: 1-12).

1. Quantity of Clones. Patients' energy requirement will depend on age, body size and individual's activities of each Type II diabetic patient.

1.1 Body size. It is necessary to know that the patient is obese thin, or normal by computing Body Mass Index (BMI). The computation can be done by dividing the body weight (kilogram) by the height (metre²). The normal BMI is 20-24.9 kg/m²; underweight (thin) is < 20 kg/m² and obesity is > 24.9 kg/m².

1.2 Energy. The diabetic patients who are overweight and are the middle age or elderly groups should get energy of 20-25 kilocalories per standard body weight of 1 kilogram a day. The patients whose Body Mass Index was normal should get energy 1,400-1,800 kilocalories per standard body weight of 1 kilogram. For the patients who are pregnant or giving breast feeding, they should get additional energy about 300-500 kilocalories a day.

2. Carbohydrate Requirement. One gram of carbohydrate will give 4 kilocalories of energy. The diet of the diabetic patients should contain the proportion of carbohydrate about 50-60% of the daily requirement. This requirement should be 40-45% of the complex carbohydrate and refined carbohydrate. Consuming high quantity of refined carbohydrate will lead to high level of blood sugar. This type of carbohydrate was derived from sugar. It was recommended to have the refined carbohydrate not higher than 5% of the required carbohydrate per day. Another source of refined carbohydrate is fruits. Diabetic patients should consume fruits about 10% of the required carbohydrate a day. Besides, the diabetic patients should consume fibers 20 grams per energy of 1,000 kilocalories per day. Fibers are the substances from vegetables that can not be digested by enzyme in the stomach. Those substances are cellulose, hemicelluloses, pectin and lignin. These substances functioned as the structure of the walls of the plants' cell, they will help making the movement of the stomach and intestines as well as absorbing fat and cholesterol from the stomach wall, helping the movement occurs, and lowering the absorption of glucose in the blood vessels which effect on the lower level of blood sugar and lowering the need of insulin. The level of blood sugar of diabetic patients depends on carbohydrate consumption. The glycolic index can be used to identify the level of sugar in each kind of carbohydrates. Therefore, consuming the carbohydrate that has low glycolic index will help lower flood sugar level.

3. Protein Requirement. One gram of protein gives the energy of 4 kilocalories. For diabetic patients, the protein requirement is 12-15 percent of the total energy per day or about 50-60 gram. If the patients need to gain more weight the protein can be added to 20% and the percentage of fat must be decreased. This protein

must be the high biological value protein, for example, the protein from milk, egg, protein from animals, tofu, dried nuts, etc.

4. Fat Requirement. One gram of fat gives the energy of 9 kilocalories. The fat requirement for diabetic patients is not higher than 30 percent of the total energy per day by lowering saturated fatty acid to be less than 10 percent, 6-8 percent of the polyunsaturated fatty acid (PUFA), and monounsaturated fatty acid (MUFA) of not less than 10 percent of saturated fatty acid. In case that the diabetic patients have problems about cardiovascular diseases or arteriosclerosis, they must avoid saturated fatty acid from animals, for example, pork oil and the oil from some plants e.g. coconut, etc. If the patients are overweight, the fat intake will be lower to 20-25 percent and using the vegetable oil for cooking, e.g. oil from Soya bean, bran oil, etc. The diabetic patients should consume about 20-25 percent of fat and use vegetable oil for cooking every meal. For the patients who have high level of cholesterol, should consume fat not higher than 300 mg per day and should select the correct type of food. Higher level of cholesterol found in animal meats, egg yolk, milk and butter, animal organs, etc. Diabetic patients should limit the consumption the low level of fat and cholesterol.

Food Exchange List

According the Srisamai Wiboolyanond (2003 : 13), the food exchange list refers to the grouping of foods in order to substitute and rotate the selection of foods. In each type of food exchange, the average number of the nutrients regarding carbohydrate, protein, fat and energy are provided. These averages are not the correct ones but the alternatives have to be selected for very day and every meal.

Group 1 : Milk. Milk is the nutrient that provides useful nutrients including the sources of important vitamins and minerals. Milk is classified as the complete protein because it consisted of complete amino acid. Diabetic children should drink whole milk and diabetic adults who need to lose body weight and lower body fat, the patients should drink low fat milk or skim milk and should not drink sweet flavored milk.

Group 2: Vegetables. Vegetables are the sources of vitamins and minerals that the patients should consume every kind of vegetables, both green or yellow leaves which are the sources of vitamin A. The green and white leave vegetables contain high fibres but low level of carbohydrate, protein, fat and energy while having high levels of Vitamins A and C. For the vegetables that are roots and various type of nuts, for example, carrot, pumpkin, onion etc. contain higher levels of protein, fat and energy than green and white-leave-vegetables.

Group 3 : Fruits. Fruits contain fructose. Diabetic patients should consume fruits regularly rather than sweets everyday and every meal but the fruits should have low sugar level (not too sweet), for example, papaya, mango stein, oranges, jujube, pineapple, etc. The patients should avoid the high sweet fruits, for example, durian, sapota, sugar apple, etc.

Group 4 : Rice and the Products of Rice and Starch. The diabetic patients and consume this group of foods every meal but they should also consume protein.

Group 5 : Animal Meat and Egg. The group of food helps developing in children and repairing tissues in adults. The body needs this group of food but the patients should consume lean meat, for example, lean pork, chicken without skin, while egg, lean meat, etc.

Group 6 : Fat. There are two types of fat, fat from vegetables and fat from animals. Diabetic patients should avoid consuming fat from animals and coconut oil. Vegetable oil should be used for cooking, for example, Soya bean oil, corn oil, bran oil, etc. Consuming high cholesterol should be avoided in order to get more linoleum fatty acid.

Group 7 : Sugar. Eating high quantity of sugar causes overweight and is the cause of high level of blood sugar as well as the onset of diabetes mellitus and high glycoside. The appropriate amount of sugar should be consumed. One tea spoon of sugar (about 5 grams) contains 5 grams of carbohydrate and 20 kilocalories of energy, another words, consuming sugar 5-10 percent of energy requirement per day among the normal people. Sugar can be found in the sweets, soda drinking, syrup, etc.

Therefore, Type II diabetic patients should lower their body weight about 0.5 kilogram per week until the body weight is normal, lower the energy from the food consumed about half of the food that have used to consume but should still consume 3 meals a day. For the patients who had normal body weight, they should: consume the same quantity of food but avoid snacks and snacks between meals, every fried food; consume lean meat; prepare food by boiling, steaming; frying instead of deep frying; avoid adding sugar in food or beverages; avoid consuming sweets, sweet drinks, sweet fruits; avoid having alcoholic beverages; consume more green-leave vegetables, low-salt food; practice physical exercise regularly; avoid eating after physical exercise; and take medication regular aryl.

2. Physical Exercise

About 90 percent of type II diabetic patients are overweight (Edelman & Henry, 1996: 260). Therefore, it is necessary for them to lower blood sugar level by practicing physical exercise. During exercise body muscles and fat will use higher amount of sugar which will help release the symptoms of the illness. Physical exercise will help the body burns fat whereby it will help lower the diabetic complications (<http://www.dms.moph.go.th>), including using the body food that were accumulated in the body. The body system will function better and weight loss will be found (Anant Utchoo, 1984: 54). This condition will help control diabetes. Therefore, physical exercise is considered as one method for healing diabetes that the patients have to perform an extra activity to their daily activities. The physical exercise helps the various body muscles and joints moved which will affect better blood circulation and leads to better function of the lung and heart. Therefore physical exercise is very necessary for diabetic patients. According to Sake Agsaranukhroh (1991: 84), physical exercise causes the secretion of more glucagons and norepinephrin which will lower the secretion of insulin and increases the efficiency of insulin sensitivity at the muscles and kidney. This condition means that the need for more insulin has been lowered. The food consumed will be used for the energy while performing physical exercise and the blood sugar level will not be high and be good for diabetic patients. But the physical exercise performed must be the light to moderate physical exercise

and last for a longer period of time and continuously. Aerobic exercise is the most appropriate one.

Aerobic exercise refers to the exercise that has been performed continuously longer than 3 minutes, another words, aerobic words, aerobic exercise will be started after the person performed physical exercise continuously for 3 minutes. After 3 minutes, the person has to continue that physical exercise for not less than 30 minutes but not than 30 minutes. This duration does not include the warm-up and cooling-down period (Damrong Kijkusol, 1984 : 9), except for the mild / light exercise e.g. walking which may be done for 60 minutes.

Criteria for Performing Physical Exercise

1. The intensity of the aerobic exercise is very important for development endurance. According to Sake Aksaranukro (1991 : 129), the recommendation was made that a person should make the intensity of the exercise less than 60% or the good practice is about 50% which will be enough and the person can continue exercise longer. In this way, the danger to the cardiovascular system (acute heart failure) will be less. Practically, it is very difficult to measure the intensity of physical exercise by using a machine. Dumrong Kijkusol (1984 : 75) recommended the use of the formula developed by American College of Sport Medicine by computing the highest heart beat rate as the criterion. It is recommended that the physical exercise performed should reach the intensity of 60-85% of the highest heart-beat rate, another words, the pulse rate must be 60-85% of the highest heart-beat rate which is “220”. This number was subtracted by the person’s age (years). The formula for computing the intensity of physical exercise = the intensity set x (220-age).

The target pulse rate = $(70 \times 100) \times (220 - 60) - 112/\text{minute}$.

The intensity set depends on the fitness and health status of the person. It should be set at the lowest level first which is 50% and then adding up. The measurement can be done by his / her own taking pulse rate for 10 minutes and then multiplied by 6. The outcome will be the pulse rate in 1 minute.

2. The appropriateness. The type of exercise used should be selected appropriately with age, health status, and occupation. The patients should select the physical exercise that they like and have skill to do it. They should be able to practice and should also consider the place to practice, weather condition, time (it should be done in the morning or evening in order to avoid hot weather), and appropriate clothes. The clothes should not be too thick but can absorb sweat, as well as wearing good shoes.

3. Frequency of practicing aerobic exercise. Exercise at least 3 to 4 times per week for 20 to 40 minutes each session (Anant Utchoo, 1984 : 83, Sake Akaranukro, 1991 : 129). Ideally, the patients, should exercise everyday, or 5 days a week and keep the other 2 days for playing sports.

4. Duration. It should take about 20-30 minutes each time. But for the beginner, a short period of time for 5-10 minutes may be alright and then take longer time.

5. Warming-up before doing aerobic exercise and cooling-down after the exercise (Krall & Beaser, 1989 : 97-88). For these 2 periods, it should take about 5 minutes each. The purposes for warming-up are to prepare body, muscles, joints and circulation system to be ready for exercise. The warming up will help to increase the temperature of muscles and be able to increase the speed and lower the obstructed force which lead to the effective muscle contraction. It also helps the sensitivity of the respiratory center toward the stimulation and increase the amount of blood flowing to the heart. The warming up should be done slowly and gradually by moving all parts of the body and stop slowly, do not stop the movement suddenly because it may cause cramps or acute heart failure. If a person stops the warming-up by releasing the movement slowly, the muscles will gradually contract and the amount of blood will flow back slowly to the circulation system and the condition of lacking the blood will not occur. Regarding cramps and muscle pain, the problems occur because of the accumulation of lactic acid in the muscles, relaxation will help release lactic acid spreads through the blood circulation and the lower amount of lactic acid in the muscles will occur.

There are 3 types of aerobic expertise by having the muscles exercised, as follows :

1. Isotonic : the condition that the muscles contracted and the muscle fibre shortened or extended where by the tightness in the muscles does not change.

2. Isometric : the condition that the muscles have been tensed but the length of muscle fibres does not change no matter the tense is but the tightness in the muscles is increasing.

3. Is kinetic : the condition that the contraction of muscles occurs slowly at the constant speed and the same rate of force has been used during the contraction. This type of movement occurs by using a special machine called cyber.

Only the isotonic and isometric that concern with aerobic exercise because the contraction and relaxation of the muscles occur rotately and during the relaxation of the muscles the blood can flow to those muscles because the blood vessels have not been squeezed by the muscles. The blood will bring nutrients : glucose, fatty acid, protein and the important one is oxygen, to the muscles in order to develop new energy substance ATP.

For the isometric type of muscle exercise, because the muscles will be tensed all the time therefore the muscles will squeeze on the blood vessels that serve those muscles. No nutrients and oxygen can not be brought to the muscles. This type is not the aerobic exercise. Besides the tensed muscles will make the increased amount of lactic acid which will lead to fatigue and pain. So the person can not continue exercising. The exercise practices can be done in a short period of time and can not reach to aerobic period.

Therefore, aerobic exercise must be the type of exercise that there is a movement of the organs that muscle attached to and the contraction period and relaxation period occur once at a time. This condition must be continued longer than 3 minutes. The physical exercise that is effective in making a healthy status must be the exercise that affects positively on the lung, heart and blood vessels, which should be composed of the following conditions :

1. A lot of movement
2. The rotated rhythm of contraction and relaxation
3. Continuation of exercise for longer than 3 minutes and at least 20 minutes in order to affect fully the heart. It can also be continued to 30 minutes, or 45 minutes, or 60 minutes depending on type and intensity of the exercise.
4. It is the exercise that does not exceeded 60% of the highest heartbeat rate.

Therefore, physical exercise among diabetic patients produced the same benefits as among the normal people. The diabetic patients should practice physical exercise in order to be healthy, especially Type II diabetic patients. Physical exercise will help lower blood sugar level as well as the body weight (Wannu Nithiyanund, 1993 : 33). But they should be careful about injury and accident during practicing. For the who have very high blood sugar level, physical exercise may make the blood sugar level goes up and causes bet acidosis (Witaga Sridama, 1998 : 16-17). Besides, the excessive or interned exercise may cause the eye and kidney complications get worst. In this study, the patients were recommended to take a walk, moving hands, and running for health. According to Piyapun Tientorg (1997 : 117-129), who studied the family supports affecting self-care behavior of diabetic patients by applying the concepts and theories related to self-care, and social and family supports. The recommendation was made from the results of the study that the self-care behavior of the patients that should be promoted were physical exercise and the promoting education program for patients' relatives and family members because family support affected self-care behavior of diabetic patients. This finding was similar to the study carried out by Adisrai Pumiwises (1997 : 112-127), who studied the effects of home-visits on self-care among diabetic patients. The Quasi experimental research was carried out with 15 Type II diabetic patients attending a diabetic clinic at Lampoon Hospital. Orem's self-care theory has been applied. The emphasis was made on home-visits, organizing educational activities for the patients and observing the self-care behaviors of the sampled patients. It was found that after the program the sampled patients had "good" level of knowledge about self-care and

self-care behavior higher than before the program. It was also found that blood sugar level of the sample had decreased and the patients had the problems regarding dietary control, punctuality of food consumption, and physical exercise.

3. Medication of the Treatment of Type II Diabetes Mellitus

The use of medication usually, prescribes for the patients who did not respond to the dietary control and physical exercise but could not be able to control blood sugar level or those who have clear diabetic symptoms and have blood sugar level of >250 mg/dl (Paiboon Suriya Wongpaisarn (ed.), 1996 : 25), and those who do not have and contra conditions of the use of drugs for lower blood sugar level. Presently, there are 3 groups of medication of the treatment of diabetes (Witaya Sridama (ed.) 1998 : 39), as follows:

1. Sulfonylurea Group : tobutamide, chlorpromazine, acetohexamide, tolazamide, libenclamide, gliclazide, and glipizide. This group stimulates the pancreas to release insulin and makes the better condition of insulin sensitivity and decreases gluconeogenesis. The main reaction is to increase insulin secretion. This group is not effective for the patients whose pancreases has damaged, for example, Type I diabetic patients. This group of medication should be used with the patients who practiced dietary control and physical exercise by could not lower blood level and have diabetes for less than 10 years, never had bet acidosis. For those who have kidney disease or have diabetes due to the damage pancreas, kidney failure, have stress, acute infection and pregnant women, should not use this group of medication, including the younger age group. Except for those who are obese or blood sugar level is not too high, and the Type I diabetes patients. This mediation group should be taken 30 minutes before meal and the lower dose should be started with and higher dose should be gradually added until reach the appropriate dose. Fasting blood sugar test should be done every month in order to check blood sugar level and HbA_{1c} test should be done every 3 months.

2. Biguanide Group. This group of medicines included phenformin, metformin and buformin. Its reaction is different from the Sulphonylurea group. It can lower the blood sugar through the following mechanism : (Thawatchai Pirapattanadis cited in Wanee Nithayanund (ed.) 1992 : 41) lowering glucose absorption from the digestive tract; helping more glucose goes into the cells; lowering the secretion of glucose from the kidney ; increasing anaerobic glycolysis that leads to the appetite loss which is a side effect of the medicine and resulting in weight loss; and increasing binding affinity of receptors to insulin. This group of medicines can be used with the Sulphonylurea group in case that no effectiveness was found when using only the Sulphonylurea group. But this group may cause the accumulation of lactic acid and therefore, it should not be used with the patients with the abnormality of kidney and liver, or chronic lung disease, shock, leukemia, chronic alcoholism, heart diseases with blood circulation failure (Piboon Suriyawongpaisarn (ed.), 1996 : 29). This group of medicine should be taken after meal because nausea and vomiting are the side effects due to Vitamin B12 deficiency. The most serious side effect found is the congestion of lactic acid.

3. Intestinal Glycosidase Inhibitor Group. The reaction of this group is to inhibit the absorption of carbohydrate by combining with alpha glycosidase enzyme at the small intestine. This condition cause the problem about carbohydrate digestion and resulting in the lower rate of glucose absorption to blood circulation. But these drugs will not affect on lactase enzyme or the absorption of monosaccharide and alcohol. The medicines in this group are anaerobes and voglibose.

4. Thiazolidinedione Group. It has the reaction of increasing insulin sensitivity in muscles, liver and adipose tissue by increasing the effectiveness of the combination of insulin receptor. This condition leads to the decreasing of insulin resistance and the secretion of insulin from the liver. It also lower the glycoside level and increase HDL. Because its reaction affects on the increasing of insulin interaction without the increasing of insulin secretion, therefore it does not affect the lower blood sugar level. The group of medicines can be used with other groups or can be used to prevent the onset of diabetes among the patients with impaired glucose tolerance. The trade names of the group are : ciglitazone, troglitazone pioglitazone, and englitazone.

Part 2 Primary Care Unit (PCU)

Definition of Primary Care Unit According to Songsri Kitterugstrayul et al. (ed) (2002 : 15), primary care unit is the health care of individuals, family, the community a whole including the social environmental factors. It is the health care that provides for the whole family and community in every related aspect that promote and support the healthy state of the people. It can be concluded the definition of Primary care unity as the following 6 important characteristics :

1. It is the front-line care that can reach the community people in the responsible areas and it is not only the medical treatment.
2. It is the proactive health care that emphasizes on promoting health and controlling and preventing diseases with the focus on promotion rather than carnation.
3. It is the holistic care that emphasizes on health care of the following aspects : physical mental, emotional, social and spiritual.
4. It is the integrated care that covers 4 integrated health services : health promotion, disease controlling and prevention, primary medical service, and rehabilitation.
5. It is an ongoing care that collaborates health care service between health care center and family and community.
6. It is the service that promotes self-care of individuals, groups, and community so that they can primarily manage their ours health problems during their normal, risky and illness states.

The Ministry of Public Health (<http://www.moph.go.th>) makes the conclusion of the complete definition of primary care as the medical and public health services applying the integrated knowledge regarding medicine, psychology and sociology in order to provided services related to health promotion, disease prevention, disease curtion, and rehabilitation. Ti is the continuous service that provided for individuals,

family and community with the holistic principle. The appropriate referral and network system has been established with the hospitals as well as the collaboration with the community organizations in the local areas with the aims to educate people about self-care during illness as well as promoting their own health which will help them be healthy.

The aim of primary care unit is to set the holistic health care for community people, individuals, family, and community. The services provided cover health promotion, disease prevention, primary medical care, and rehabilitation with the emphasis on “human-being”. The human centered concept was applied along with the proactive strategies to cover all groups of the people as follows :

1. The healthy group. The services provided include proactive services regarding health promotion, disease prevention and control, promoting the people keep their healthy status and prevent illness.

2. The risky group. The services provided include caring, watching, protection health from risk factors, supporting for being able to develop self-care behavior aiming to lower and get rid of risk factors.

3. The sick group. The services provided include :

3.1 Chronic illness : caring & helping ; investigating the causes of illness ; solving the problems to lower the severity and lower the illness duration to speedy recovery.

3.2 Chronic illness with disability.

Principles of Organizing Primary Care Unit

From the aforementioned definition and importance of primary care unit, supattra Sriwanichakorn et al. (2002 : 5) indicated that the important characteristics of the effective and concrete primary care unit that the integrate care; continuous program, supporting people for self-reliance on health to some extent, and the service that emphasized on the holistic consideration of the problem which will lead to

various practices in accordance with the context of people in each local area. There are multidisciplinary health teams providing comprehensive health services whereby no specific service has provided except for some areas, but this special service does not affect the concepts and methods of comprehensive and holistic services (The Committee on Development of Network Services, 2002 : 22-25). The principles of organizing primary care unit are as follows:

1. It is a front-line care that people can access easily. This service takes care of the health of all age-groups of the people and every standard disease groups. Various services have been carried out accordingly with the important health problem situation of the people. It is the service that provided for the people before referring to other special service areas.
2. It is a ongoing/longitudinal care, stating from prior to illness until illness and rehabilitation duration, another words, form birth to death. It include the good mutual and continuous understanding and friendship between the care providers and care receivers / people.
3. It is a comprehensive care that considers the related physical, mental, social and economic factors and provides a comprehensive services accordingly with the needs of the care receivers as regards to health promotion, disease prevention, health services, and rehabilitation.
4. It is an co-ordinate care that responsible for referring and collaborating other services as regards to necessity medical and social services including connecting information for the ultimate benefits of the people.

Role and Responsibilities of Primary Care Unit

From the aforementioned concepts and principle, the conclusion can be made as regards to the roles and responsibilities of primary care unit, as follows (Sunee Wongsongkarn et al. (ed.), 2000: 17):

1. Being a consultant and helping to enhance people health knowledge and understanding comprehensively including giving the recommendations for appropriate self-care and health behavior. If the patients need care that the unit can provide, comprehensive service will be provided. If the unit can not provide that service, collaboration and referral will be made with the concerned service units.

2. Providing comprehensive health services regarding physical and mental services.

3. Providing psychological and social consultation at the primary level and referring to other services for the cases that have move or specific problems.

4. Providing services regarding health promotion, disease prevention, and promoting health self-reliance.

5. It is the service center that equipped with the information that help to understand lifestyles of the people better than the higher health service centers. This information will be the good condition leading to better understanding about health behavior of the people from prior to the illness.

6. It is the health service center that responsible for providing knowledge about medical technology and training health care skills for the people, for example, wound dressing, caring children with high-fever or asthma, following-up the illness progress and appropriate care.

7. Providing care for people with chronic illness who need continuous care. Since this primary care unit located closely to the people's houses and the villagers can get the service conveniently. With the good understanding of basic situation of the community, the unit can modify the services relevantly with the real situation and the lifestyles of the people.

8. Collaborating with the other related organizations in order to make the services continuously and comprehensively including being able to refer the patients to other organizations with the appropriate time and situation.

Important Characteristics of Primary Care Unit

The important characteristics of primary care unit are as follows:

1. It is the unit that provides a comprehensive service regarding health promotion, disease prevention, medical services, and rehabilitation by considering the problems holistically.
2. It is the front-line health care that the people can access the services easily as regards to geographical, psychological and economic aspects.
3. The health service provided has emphasized on proactive services with the aim to promoting health, preventing diseases and enhancing potentiality of self-care among the people.
4. Providing health care service for the people continuously from before the onset of illness, during the illness and during the rehabilitation period including setting the information system of the people from birth to death.
5. Working collaboratively with other related service units, for example, specialized health service centers, social welfare organizations, and local administration organizations:

Therefore, the health center that works as quality primary care unit regarding medical and social aspects is the heart of effective service system management as well as a comprehensive health care service for the people. It also works as the health consultant center for individual, and family of people in the community.

The important unique of a primary care unit is the front-line care of the health service system that people come to get services. The unit that gets closer and understands lifestyles and social aspects of the community people. It takes more responsibility to the people than the hospitals or other specialized units do. Therefore, the services provided by this unit have to be qualified that show better understanding of needs, expectations, and feelings of the care receives than other organizations. This unit should be able to apply medical knowledge relevantly with the real needs and situation as well as the socio-cultural situation of the people. It can communicate effectively with the community people. It is responsible for providing services

continuously as well as promoting people's capacity for being able to perform self-care behavior appropriately, be self-reliant and to utilize the service effectively. The center is also responsible for collaborating effectively with other related organizations for collaborative services and referring. It is not necessary that this center has to provide direct services in every aspect but it has to be able to manage health problems that oftenly found among the people.

Therefore, it is important to establish the primary care unit closer to people's house and heart by establishing friendly atmosphere with the care receivers, being closer with the people, establishing the system that making friendship between care providers and care receivers, the personnel of the center are being able to apply medical knowledge for providing the services relevantly with lifestyles, social and psychological characteristics of the people, setting the system that creates health care responsibility among the personnel and the people continuously, including encouraging health promotion activities along with medical service.

Management of Primary Care Unit

The services provided by the primary care unit to the people are different from the services provided by the health centers as regards to providing health services while the health centers are still responsible for providing primary care services no collaboration or Connecting With the same level health centers. The primary care unit provided one-stop service by multidisciplinary health team and this team provides services for patients and the general public collaboratively and holistically, from individual, family and community level (Wanida Wirakul, 2002: 129). Besides, there was a collaboration between the same level primary care units for referring patients. The management characteristics of the networking services are as follows: (<http://www.moph.go.th>)

1.1 Integrated Services. It was composed of the following services:

1.1.1 Medical services for general and chronic diseases including organization educational activities for the care receives regarding health problems, home-visits for some cases, and rehabilitation.

1.1.2 Providing services regarding health promotion and disease prevention at the individual and family levels, for average age-group both inside and outside the unit.

1.2 Proactive Services. The activities provided are as follows:

1.2.1 Promoting self-reliance of the people, community organizations and community.

1.2.2 Providing knowledge and confidence of the people as regards to taking care of the health problems that were found frequently.

1.2.3 Organizing educational activities for enhancing people's health behavior.

1.2.4 Managing the coverage of various activities as regards to promoting health, preventing diseases, and rehabilitation.

1.2.5 Evaluating health problems of individuals, family and community.

1.2.6 Cooperating with community and other organizations in analyzing, planning and implementing the programs for solving the problems.

1.3 Dental Health Services. Providing primary dental health services and the services regarding dental health promotion and prevention.

Outcomes of Primary Care Unit

If the primary care unit has implemented its activities effectively and accomplished, it will meet the goals the country's health insurance policy (Supatra Sriwanichakorn et al., 2002: 15) as follows:

1. Providing medical assistance at the primary emergency level.
2. Providing primary care at the individual and community levels.
3. Ability to participate in taking care of the health of the whole human being, physical, mental, and social health.
4. Ability to take responsibility regards to health cooperatively with the people, both active and proactive, especially regarding the modification of health

risk factors, the changing of environmental the individual, family and community levels; following-up the health status of the at risk people; and the important health problems of the people in the responsible areas in time.

5. Being the effective collaborative unit among people; communities and the health service system.

From the above principles, the researcher selected the Type II diabetic mellitus patients attending the primary care unit. Because, in order to control blood sugar level of diabetic patients, the patients not only take medication regularly and keep the appointment but they also have to have skills in performing dietary control and physical exercise behaviors. The patients attending the primary care unit usually meet with the multidisciplinary health team whereby the services provided are not only giving medical treatment in accordance with the patients' symptoms but the patients have received suggestions and practiced skills of carrying out health behaviors appropriately with their present illness situation as well as patients, cultures and lifestyles, as has been known as holistic approach. Besides, the primary care unit is very close to the people's house and it is convenient for them to get medical service or consultation. The patients have had a chance to participate and make decision regarding medical and their self-health care which makes them satisfy and be willing to perform health behaviors appropriately. This situation will be good role-model for the patients or general population be aware and understand that taking health care is the duty that every body has to do, in accordance with the primary health care principle.

Part 3 Concepts and Theories Used

Protection Motivation Theory

Protection Motivation Theory was firstly developed in 1975 by Ronald W. Roger (1975: 93 cited in the Office of the Permanent Secretary, Ministry of Public Health , 1999:34), with the concept of fear arousal. The theory consisted of 2 components, the Health Belief Model and Self-Efficacy Theory. Another word, it is the combination of the factors affecting the whole perception of an individual. This

perception will be the connection leading to attitudinal and behavioral changes. Later, the theory has been improved and put into practice in 1983. The Protection Motivation Theory emphasized on the assessment of perceived information from the dissemination of information. This perception assessment has been made by using mediation that caused fears. In the process of perception assessment, Rogers identified 4 variables that cause fears in an individual as follows:

Noxiousness. Noxiousness derives from the condition that an individual has been threatened that he/she will get negative effects from doing or not doing a specific behavior by using media to disseminate the health-threatened messages. The messages may be, for example threatening to life or explaining that it does not cause severe dangers, for example, only a little irritation to the lung, etc. However, the message that causes the high level of fear may not affect behavioral changes directly. But if encouragement or persuasion was used along with the threats, it may make that message be more interesting. The use of media for motivating will make the individual gets perceived severity of a disease than using only the normal motivation and will lead to the attitudinal and behavioral changes.

Perceived Probability. Health threat communications typically attempt to convince individuals that they personally are at some risk. Like noxiousness, perceived probability has been investigated by utilizing orthogonal manipulation, e.g. high versus low reported probability. A manipulation check has not been highly effective on the influence of perceived probability in population where the given probabilities are high.

Response-Efficacy

Presentation of recommended actions to reduce risk is typical in health threat communications. This is usually in the form of either behaviors to be performed and/or behavior to be eliminated or reduced. The literature indicated that, with few exceptions, increased efficacy of the coping response is associated with stronger intent to adopt the recommended behavior (Beck & Frankle, 1981: Sutton, 1982 cited in Mackay, Bruce C. 1992: 31).

A helpless reaction may well be engendered when individuals are faced with a severe health threat and there is no means available to reduce that threat (Beck & Frankle, 1981 cited in Mackay, Bruce C., 1992: 33). Specific instruction with regard to the performance of the recommended action further promotes intent and actual performance of the behavior.

Self-Efficacy. From the former 3 variables of the Protection Motivation Theory, perceived severity; perceived probability and response-efficacy, self-efficacy is a recent addition to Protection Motivation Theory. It can be said that the Protection Motivation Theory has basic concepts from Health Belief Model and Bandura's Self-Efficacy Theory.

From the aforementioned variables, we can see that there is a high level of relationship between perceived self-efficacy and perceived response-expectancy if a person sees the benefits of the behavior and can be put into practice. The interaction between these two variables can be seen as if a person holds higher level of ability to perform the compliance behavior and the high level of perceived benefits of the compliance behavior, he/she will hold higher level of intention to follow the compliance. In the contrary, if the perceived self-efficacy is high but perceived response-expectancy is low, the intention to practice will be low. In case that the perceived self-efficacy is low and the perceived response-expectancy is low, the intention to practice will be certainly low.

Rogers has tried to improve the Protection Motivation Theory by bringing 4 variables, perceived severity of the disease, perceived probability, response-expectancy, and self-efficacy expectancy, to put into 2 perception processes as follows:

1. Threat appraisal: composed of 2 variables: perceived severity of the disease and perceived probability of getting the disease.

2. Coping appraisal: Composed of 2 variables: response-expectancy and perceived self-efficacy.

The above perception process influenced by the sources of information which include environment, persuasion, observation learning, and personality characteristics or personal experiences.

1. Threat Appraisal. It composed of two types of perception, perceived severity and perceived probability of getting the disease. These perceptions will lead to the changes of attitudes and behaviors as well as the adaptation of the individual to response or perform desirable behaviors, for example, using safety belt every time, quit smoking, etc. or to response or perform undesirable behaviors, for example, do not use safety belt, start smoking, etc. However, the important factors affecting the performance of undesirable behaviors are intrinsic rewards and external rewards.

2. Coping Appraisal. This process composes of perceived response-expectancy and self-efficacy expectancy. Avoiding threat effectively is the important factor affecting the changes of behaviors. The problems that the individual found may be inconvenience, cost, unsatisfaction, difficulty, confusion, complications, problems of living, etc.

It can be concluded that according to the Protection Motivation Theory, it has been believed that the motivation to prevent illness or disease will be effective if:

1. The individual believes that the health threat is severe.
2. The individual believes that he/she is weak or is susceptible to the illness.
3. The individual believes that having the response by self-adaptation is the best way to get rid of that threat.
4. The individual is confident that he/she can be able to adapt or respond or change that behavior completely.
5. There is less benefits from the response by prating undesirable behaviors.
6. There is less obstacles of self-adaptation or behavioral change.

The results of the studies applying the Protection Motivation Theory showed that in order to have a person changed behavior it is necessary to develop in that person perceived threat of the illness/disease that he/she is going to face or is risky to get. He/she should perceive that he/she can be able to prevent those dangers/threats and after he/she has practiced the good benefits for his/her health will occur. If the individual holds those perceptions, he/she will change attitudes and health behaviors in the desirable direction. Therefore, the research has applied the concepts of the Protection Motivation Theory for organizing a health education program with the aim to change health behavior of diabetic patients, self-care for lowering blood sugar level to preventing complications. The health education activities organized were aimed to enhance the patients perceived severity of diabetic complications, perceived susceptibility of getting diabetic complications, response-expectancy, and perceived self-efficacy of performing self-care behavior for lowering blood sugar level and preventing complication. It was expected that the attitudes and health behavior of the respondents will be change. The relationship between perceived response-expectancy and self-efficacy expectancy of the individual will affect the decision to practice or not practice the desirable behavior.

The high relationship between the variables regarding perceived response-expectancy and self-efficacy expectancy which affects on the decision to practice the behavior of a person shows in Figure 3.

		Response-expectancy	
		High	Low
Perceived Self-Efficacy	High	Likely to Practice Certainly	Likely to not Practice
	Low	Likely to not Practice	Likely to not Practice Certainly

Figure 2 Relationship between perceived self-efficacy and response-expectancy
(Bandura, 1978)

As regards to perceived self-efficacy, Bandura suggested that there are 4 factors self- efficacy, Bandura suggested that there are 4 factors affecting perceived self-efficacy, as follows: (Evans,, 1989 cited in Sompochana, 1998: 59)

1. Mastery Experiences. Mastery experiences are the most effective factor affecting perceived self-efficacy since they derived from a person's direct experience. Achievement increased self-efficacy and he/she will believe that he/she can perform the behavior. Therefore, in order to develop a person's perceived self-efficacy, it is necessary to train the person adequate skills to achieve the task and at the same time, the person should perceive that he/she possesses ability to perform that task. This will help the person use the skills effectively. The person who perceived self-efficacy will not surrender but will try again and again in order to reach the goal.

2. Modeling. The model observation about complex behaviors that the model has practiced that behavior successfully will help the observer feels that he/she should also be able to accomplish the task if he/she try hard. The example of the type of models that will affect the observer's feelings of being able to perform the solving the problem of a person who feels fear about various thing which can be done by having the person observes the role model that holds the same characteristics as of that person. This method could help lower the fear level the person effectively (Kazlin, 1974 cited in Sompoch Iamsupasit, 1998: 59).

3. Verbal Persuasion. This method is to inform the person that he/she is capable to be successful in performing the task. This method is easy to be used. According to Bandura, verbal persuasion alone may not be effective in developing perceived self-efficacy (Evans, 1989 cited in Sompoch Iamsupasit, 1998: 60) unless using this method along with having the individual had mastery experience. The development of achievement may have to be done gradually by following step by step and at the same time using verbal persuasion. This procedure will help develop perceived self-efficacy.

In this study, relatives and close friends of the patients were selected and have them participated in the activities with the aim to have them encouraged,

persuaded and motivated the sampled patients to perform behaviors for controlling blood sugar level. Besides the verbal persuasion from other diabetic patients in the group and the health personnel was also provided for the sampled patients.

4. Emotional Arousal. Emotional arousal affects perceived self-efficacy.

The person who exposed to negative emotional arousal, for example, threat, he/she will develop anxiety and stress, including fear which will lead to lower level of perceived self-efficacy. Low level of perceived self-efficacy will result in failure which will make perceived self-efficacy gets worst. But, if a person can release or stop the emotional arousal perceived self-efficacy of that person will be better which will lead to the expression of better ability.

According to Bandura, there are 3 factors that must exist in order to develop perceived self-efficacy, as follows:

1. Magnitude. Magnitude refers to the level or the size of difficulty of the task that to be done. A person with low level of self-efficacy or limited ability, will be able to do the easy task. If the individual was assigned to work on the difficult task he/she will fail. Therefore, the assigned task should not more difficult than the ability of the person. However, it should be the moderate level of difficulty.

2. Strength. Strength refers to ability of a person to consider the possibility of the person to be able to perform the task. This process can be done by using 2 steps. Firstly, assigning the task list that to be performed which will reflect the level of difficulty of each activity. Secondly, having the person who will perform the task asked questions about the directions of doing those activities. The confidence about the success of doing the task can be determined or estimated from the strength. The rating value may be in the interval of 1-10 or 10-100.

3. Generality. Some experiences will help develop ability to perform other tasks in similar condition. For example, the belief of a patient with heart disease regarding the test of the body fitness tolerance on performing physical exercise under the supervision of physician, belief of the patient that he/she can be able to do the behavior when they went back home.

Besides, Bandura believes that most of our learning development from observing a model, which is different from learning from direct experience whereby the person has to learn through trial-and-error. This direct-experience learning needs time and in doing some behaviors, some dangers may occur. In learning by observing a model, one model can communicate opinions and overt behavior. Since most of us live our life each day in the small environment. Therefore, perception about various social situations have been transferred from other persons' experiences through hearing and seeing without direct experience. Most of the people perceived information of the society through various media.

Fischer & Gochros (1975) and Ross (1981) concluded the roles of a model as follows;

1. Developing new experience. If the observer had never learned that task before observing the model, for example, children's speaking, self-care skills, etc.

2. Reinforcing the former behavior. If the observer had learned about that behavior before the observation of the model. The model will act as the motivator for the observer to improve that behavior. For example, watching tennis game playing by the World Class Champion may be the motivator for the observer to improve his/her tennis playing. The observer may remember the techniques of that World Class Champion and use those techniques to improve his/her skills.

3. Inhibiting the forming of behavior. If the observer had ever of never practiced undesirable behavior before observing the model, that model may help decrease that undesirable behavior on the observer may never practiced that behavior at all, for example, seeing a person got an accident while crossing the street at the place that was not the cross-walk or flying-over bridge, that model will make the observer not behave like that model when he/she want to cross a street.

There are 2 types of model:

1. Life model. The model whom the observer can directly observe and associate with.

2. Symbolic model. This type of model was presented through various media, for example, radio, television, cartoon, novels, etc.

Characteristics of the Model

Selection of the models used for this study was done by consideration the characteristics of the behaviors/that need to be developed, characteristics of the observers or the target group, and interaction between characteristics of the behaviors and of the observers. The general criteria used were as follows (Perry & Furukawa, 1986 cited in Sompoch Iamsupasit, 1998: 256):

1. The model should possess similar characteristics as of the observers as regards to gender, race and attitudes. These similar characteristics will add the confidence in the observers that the behaviors of the models are appropriate and they can be able to do those behaviors because the models are quite similar to them.

2. The models should be respected by the observers. But of the level of the fame or respect is too high, the observer may think that they will not be able to practice those behaviors.

- 2.1 The ability level of the models should be similar to the observers. If the models used hold very high level of ability, the observer will think that they will not be able to perform the behaviors so they regret to follow the behaviors. The models should hold the ability that is a little bit higher than of the observers, or starting with the same ability and then should the models who have some higher ability. The change of the models' ability should be done gradually.

- 2.2 The models should have friendly and warned characteristics.

- 2.3 After the models have performed their behaviors they should be reinforced in order to get more attention from the observers.

For this study, two types of the models were used. The life model was Type II diabetic patient whose residency is in the responsible areas of Khaojetlook Subdistrict Health Center. This model had performed appropriate health behaviors, did not have any complications, and had blood sugar level close to the

normal level. This model was considered as the positive model. For the negative model, the model was selected from Type II diabetic patients living in the responsible areas of Khaojetlook Subdistrict Health Center. This negative model was the one who did not practice appropriate health behaviors and had some complications. Both two models were well-known by the observers. They were informed about the objectives of the presentation and asked for cooperation, with the goal to have the observer had direct experience. Video tape was selected by the researcher to be the symbolic model with the aim to help the observer get clearer additional information regarding physical exercise and dietary control behavior which will lead to the higher level of perceived response-expectancy and self-efficacy among the sampled diabetic patients and their relatives.

Group Process

Sampon (1990: 38-39) defined the definition of “group” as the situation that 2 person and more have come together and have some interaction to perform activities with the mutual objectives. During the interaction of these people, there is the communication among the members including the change of behaviors of the group members in order to get to the mutual goal set by the members. The interaction between the group member will push the group move step by step in accordance with the group’s goal. The interaction changes occurred is called “group process”. Some other definitions have been also presented as follows:

Winij Gatekhum and Kompech Chatsupakul (1979 : 14-15) defined group process as the center of experiences from various people who joined together, had interaction and satisfied with that interaction. This interaction will help the group members discoursed the resolutions satisfaction. If provided the opportunity for each member to share knowledge and experiences. The outcome followed is the mutual motivation of each group member that has been extended to cell group members, including the feeling of care. The combination of these experiences creates the group power, with specific direction, speed and magnitude.

Jutha Bureepakdee (1984 : 1-2) stated that group process is the interaction between group members aiming to motivate the group to implement activities to reach the goals of the group and the members. The important characteristics of the group process are as follows:

1. There is the mutual goal of group members.
2. There are interaction and communication between group members.
3. The group members carry out the activities together to reach the groups' goals
4. The group members hold the same direction of opinions, the conflicts may be occurred but the group members agree with the consensus
5. Group's decision or consensus
6. Being stacked to the group to the performance which is different from the existing situation.
7. Group interaction was aimed to change the group to the performance which is different from the existing situation.

The sociologists and anthropologists believe that being together as a group, the group members will have some autistics that they can do together, regarding living their life, solving the problems, implementing various activities including carrying out the responsible duties. Some considerations about being together as a group are presented as follows:

1. Each member hold special ability and this ability will be useful for the group.
2. The experiences, skills and attitudes that the members received from the group will help the members being self-reliant and they can utilized for the benefits of themselves and of the group.
3. Interaction among the group members helped develop learning, experiences, and opinion sharing. There will influent the group members agree with the group's decision.

4. Group will help the group members learn and develop positive attitudes and skills.

Therefore, the value of the group process occurs when the group is in action. The group members will be changed and developed in the desirable direction. The benefits of the group process are concluded as follows:

1. Values regarding development. Group can develop its group members as regards to the following aspects:

1.1 Serving the basic minimum needs of the individual. Some basic needs can be served by group process, for example, the need for being the part in group, the need for being accepted by the group, etc.

1.2 Emotional and social development. When the people joined the group, they will learn how to express and control their emotion.

1.3 Development of attitudes, interest, and ability to live their life in the society

2. Value regarding making diagnosis. Generally, the group leader will have a chance to observe behaviors of the group members which help to understand the members' characteristics.

3. Value regarding therapy. Being in the group will help some members with emotional problems as well as improvement their job satisfaction.

4. Value regarding education. Schools can use group process, for example, the establishment of student clubs or using group process as the teaching method, e.g. small group discussion, role-playing, etc.

5. Value regarding practices. Being in the group will help group members have a chance to think, plan, implement the plan, and produce some projects together. They may develop the organizations

It can be concluded that group process is very beneficial in human development. It will help the group member gain correct knowledge and understanding and positive attitudes that will lead to proper practices. It also helps develop individual's capacity that can be applied with Type II diabetic patients with the aim to

help them perform correct behaviors regarding dietary control and physical exercise. The study of Rickheim (2002: 269-274) about the assessment of the effectiveness of using group process and individual health education on the changes of behaviors of 170 Type II diabetic patients whereby 83 patients and 87 patients received individual health education and group health education respectively. The study lasted for 2 years. It was found that both groups did not have significant difference in controlling blood sugar level.

Learning Process by Using Group Process Technique

As being together in the group, the group members implement the activation together and express their opinions. This situation leads to the performing of activities by the member themselves, including exchanging experiences and opinions. The group members can develop their feelings, conceptualize the problems and the solutions of the problems. The group members also learn skills through practicing in the group as well as develop positive attitudes. These situations are the real learning experiences. That are very meaningful for them, and this process is the learning process through the use of group process. Tissama Khammanee (1989: 239) defined the term “Learning process through the use of group process” as the process that 2 groups of the people and higher, participated together in the activities related to the learning of the groups problems whereas the learners participated in the learning process by themselves and the analysis of learners’ behaviors occurred was the important process of the learning. This definition was agreed with the definition of Phagar Satayatham (1981: 57-60) that it is the learning management that allows every group members participate in learning and teaching activities, the members have to be responsible for their one learning, exchange experiences, learn emotional situation, feelings and opinions of each group member. These opinions can be helpful for solving the problems that being faced with or for improving themselves in order to be able to live in the society happily. Besides, the learners can learn about themselves, understand and know themselves better, for example, accepting other persons, more expression of opinions, having a chance to practice their self-confidence. Chalong Piromratana (1976: 61-62 cited in Boopha Arsrirach, 1998: 44) concluded the following characteristics which lead to the development of group process.

1. Every group member has the mutual objectives.
2. Free interaction between group members is occurred.
3. Every group member performs activities in order to reach the group's objectives.
4. Every group member has to hold mutual opinion which is considered as the group's opinion.
5. The group participated in making the group's decision.
6. Every group member has to stick on the group's perspective and perform the similar behaviors accordingly
7. The identified activities that group members have to perform will be helpful to lower stress and to serve the needs of the group.
8. All group members have to understand the direction and the factors affecting the progress of the group for reaching the group's objectives, which will help the members to be responsible for the group's activities.

From the above characteristics, the learning process occurred. All group members have learned about problems, perspectives, recommendations, and measures to solving the problems. The group members can apply these learning's for self-development. The benefits of learning derived from group process can be summarized as follows: (Jutha Barecpakdee, 1984: 4-5)

1. Every group member has a chance to express opinions and attitudes, which will help them learn more.
2. All group members have a chance to learn by practice and discover themselves by their own not by hearing from others.
3. The learning will serve the group members' needs or members' problems which will help the learners be interested in and want to learn more,
4. The group members have mutual responsibilities in learning by being able to identify contents, accordingly with their needs and are the organizers of the learning process.

5. The members have listened to the experiences and variety of methods for solving the problem for their daily living appropriately.

6. This knowledge derived from the learners, discovery will help them remember the information better and lead to behavioral change better than the learning that received from the telling of other persons.

7. The members have to utilize their own knowledge and try to get more information from other resources.

8. The learning derived from their own learning experience will help the learners understand the outcomes of that learning.

9. The group members can practice various experiences and can be able to work cooperatively with other persons effectively.

10. It is the method to promote the relationship among the group members including sympathy, unity, and assistance in solving the problems.

In learning by the use of group process, the people who will be very important in helping the group the successful is the group leader or the group manager because the group leader has to make the group members changed in the positive direction. Therefore, the group leader needs to understand and perform the tasks appropriately (Marram, 1978: 124). The group leader is responsible for organizing learning experiences; providing assistance and consultation; collaborating; and encouraging the group members express their opinions or role-playing; and help the group progressed step by step. In organizing the group activities, starting from the beginning until getting to the goal set, there are 5 stages that should be organized (Baron, et al., 1992: 14) as follows:

1. Forming Stage. It is the first stage that the members come together. If they did not know each other, firstly, they will be afraid to express their opinions. In this stage, the group leader should collaborate to have the group members get acquainted with each others for example, having the members introduced themselves, etc.

2. Norming Stage. During this stage, the members have already known each other and started to set the goal of the group and the activities that the

group needs to do. The group leader will take part in setting the group's goal and participate in the activities of the group.

3. Storming Stage. This stage concerns with the more serious part of the group process. The group members will identify regulations of the group. The group leader will be responsible for 2 roles:- letting the group members do the activities by themselves; or getting involved as one member of the group.

4. Reforming Stage. This is the stage that the group members knew each other very well and perceived thoroughly their roles and responsibilities.

5. Disbanding Stage or Adjourment. It is the last stage of the group process. After the group members have implemented the activities and the group's objectives have been reached, the duty of the group will be decreased and the group will be faded out.

In order to develop the learning process by using group process techniques as the basic guideline to help the group members reached the goals or practiced desirable behaviors, it is necessary to use various group process methods, for example, role-play, buzz session, group discussion, etc.

Group Discussion

Group discussion or buzz session is the method that is very useful in enhancing knowledge by using group process technique (John & John, 1991: 393) whereby the group members will gain skills in working together and exchanging opinions, attitude and experiences by discussing about the real situation in order to find out the facts (Winich Katukhum and Kompech Chutarasupakul, 1979: 134: 136). The process will help solving group members' problems and the learning can come to the conclusion that there are methods to solve the group's problems (Louis Jampates cited in Tissana Khammanee (ed.), 1989: 70-71). At present, group discussion have been used widely in organizing health education activities for patients, family and various target population with the aim to have group members exchanged knowledge, opinions, and experiences through verbal communication. The members also have

the chance to express their feeling both concrete and abstract aspects and the group members could be able to seek more fact, analyze their own understanding, and accept and listen to other group has been made by rationalization, facts, appropriateness and correctness, democracy, and freedom to express opinions. The group members provided cooperation in finding the methods to solve the problems. Because, group discussion helps the group members practice rational thinking, so it can be applied to their daily living because the answers got from the group discussion are not the fixed answers. Besides the effects of group discussion can partly help the group members changed their health behaviors, could be able to make decision, had acceptance and willingness, which will lead to permanent change (Suree Chantaramolee, 2000: 78-79).

The size and seating of group members are very important to be considered because the member of the group members affecting the achievement of the group process. However, the number of the group members depends on the tasks of the group, time, and skills of the group since they affect the interaction and communication within the group (Baron, et al., 1992: 5). For the group discussion, Suree chanthamolee (2000: 79) start that it is the appropriate method for group discussion that has small number of the group members, approximately 10-12 members. If the number of the group member is high, the members will not have chance to discuss in the small subgroups may be developed and the consensus. This concept is congruent with the statement made by Ottaway (1966: 7) that the group should be small so that the group members can express opinions and reactions freely without making loud noise and every member can hear. The highest member of the group members should not be higher than 12. The highest number may be up to 15 but not higher than this number because it will cause the separation in the group. The appropriate size of the group should be 9-20, for the effective group discussion.

Time and Place. The Health Education Division, the Office of Permanent Secretary, Ministry of Public Health (1999: 95) recommended that the appropriate time should be the the time that most of the group members are free of con convenient and them time should be set clearly. If the groups has to meet for more than 1 time,

the contract among the group members should be made to get the commitment of the group members. Regarding the place, it should be a privacy without and noise or any distractions and should not be closely packed. The selecte place is very important in making the group members have long concentration, feel confident, and feel safe. The appropriate time for each group discussion should be about 45-60 minutes and not longer than 2 hours with the frequency of at least 1-2 sessions a week.

Regarding the seating of the group members, it was recommended that the circle seating with the members. Set face-to face in order to have the all members see each others (Winich Katukhum and Kompechra Chataasupakul, 1979: 141). Regarding this type of seating, Withal & Levis (1963: 684, cited in Tassanee Pruegsacheewa, 1972: 86) indicated that this circle seating type will make more participation among group members. The communication will be very that will help create good feelings, opinions, and emotions of the group members toward each others. Therefore, the good group should have the following characteristics:

1. It is composed of 2 members and higher.
2. The members are aware that they belong to the group.
3. The group members have the mutual goals.
4. The members give assistance and care to other members and feel satisfied to participate, work with the group and learn together.
5. There are interaction and communication among the members,
6. The members have similar behavior (if they are patients, they have the same illness).
7. The members accept and listen to other members opinions.

In Thailand, many researches have been carried out about the study of effectiveness of group process in implementing the activities aiming to enhance patients and people knowledge about health and health information, as follows:

Tassanee Pruegsachewa (1982: 85-93) studied the effects of group process on knowledge about health and health behavior of the pregnant women who were carriers of infectious hepatitis B attending antenatal care clinic and the labor room, Ramathibodi Hospital. The sample was composed of 60 patients, with 30 patients each in the experimental and the comparison group received the normal health education program provided by the hospital and the experimental group received a health education by using group process along with the use of flip charts, and Practice Manual for Pregnancy. The results of the study showed that the knowledge and practices of the experimental group were higher than of the comparison group.

Karnjana Jaithum (1998: 84-89) studied the effects of goal setting for changing behavior regarding blood sugar level control of Type II diabetic patients attending Center Hospital, Yala Providence. Forty patients were assigned of health education program were organized for the experimental group. The health education program was developed by applying Self-Efficacy theory and the concept of goal setting. The activities organized were emphasized on discussion, questioning, watching video tape, exchanging opinions of the group members, modeling, the use of daily health record, and demonstration with returned demonstration. It was found that among the experimental group there were the higher levels of the following variables, compared with before the program and the comparison group: knowledge about diabetes; perceived self-efficacy to practice behaviors regarding dietary control and physical exercise; response-expectancy of practicing behaviors regarding dietary control and physical exercise; and blood sugar control behaviors. It was also found that after the program HbA1C value has decreased which meant that patients could control blood sugar level effectively.

Pornsiri Chinsawangwattanakul (1995: 55-60) studied the outcomes of teaching activities using group process on the adjustment of the post operated breast & cancer patients who were receiving Chemotherapy. The Sample was composed of 40 patients, the experimental and the comparison groups, who were attending Siriraj Hospital. The comparison group received the routine health education program and the experimental group received the health instruction using group process along with

the use of the Personal and group discussion. The study showed that the adjustment regarding roles and responsibility of both groups was different but no difference was found between the average score of adjustment. Among the experimental group it was found that the patients feel satisfied, no anxiety, have been encouraged have exchange experiences regarding treatment and they were able to open with their illness and the Treatments appropriately.

It can be said that the aforementioned researches have been carried out by using group process to enhance knowledge and the use of group discussion as well as video tape for motivating interest and emphasizing the understanding. The personal diary was also used with the sessions on reviewing knowledge and practices which helped the patients develop appropriate skills. Therefore, in this research, the research has used group process; group discussion for exchanging knowledge and developing perception; watching video tape for motivating the senses, enhancing perception and remembrance; and the clear understanding motivated the patients interest and will lead a systematic learning regarding diabetes and complications; and having the sampled patients taken the note on the Manual Record Booklet distributed was aimed to help the patients review the contents and motivate them to practice when they get home. The researcher believed that the proper knowledge the patients gained will lead them to proper practices.

There are also many researches that were carried out regarding the modification of patients' behaviors by applying Roger's Protection Motivation Theory and group process in giving knowledge, information and data that can develop fear-arousal that lead to appropriate health behavior. This information derived from group discussion among the patients themselves and with the life models which was the direct experience as well as the information from the patients and environment. The video tape presentation will reemphasize the patients' understanding and the longer remembrance. The patients also have reviewed their knowledge and understanding from their diary. These processes helped them changed their health behaviors for controlling and preventing disease. The review of related researches is presented in the following section:

Jarupa Laohapojanart (2544: 98-101) study the effects of applying Protection Motivation Theory and the self-help group on the control of hypertension of the patients of the Out patients Department, Pichit Hospital. The sample was composed of 80 patients, the experimental and the comparison group, 40 patients each. The health education activities organized were composed of: group process; self-help group; demonstration and modeling regarding physical exercise, dietary control, and stress management; and personal Health Diary for recording daily activities and the outcomes of the treatment. It was found that the activities organized were effective in helping the experimental group had better hypertensive preventive behaviors and could be able to lower the blood pressure level and Body Mass Index.

Supattra Sombut (2000: 113) studied the effectiveness of applying Protection Motivation Theory and group process on haemorrhagic fever prevention behavior of village health volunteers, Kutngong Subdistrict, Panusnikom District, Choburi Province. The sample was composed of 42 village health volunteers and 155 villages, with comparison group. Health education activities were organized by using group process, group discussion. Knowledge were enhanced by using slides, distribution of teaching manual, and the group was assigned to organize activity in the community by organizing "Excellence House Contest. It was found that the experimental group better perception regarding threat appraisal and coping appraisal except perceived self-efficacy, because the perceived self-efficacy of the village health volunteers has already high. The behaviors of controlling the Aedi Egpti larva as measured by the intensity index of Aedi Egpti larva showed he increased level.

Jongkol Sakditragool (2000: 125-133) studied the application of Protection Motivation Theory in promoting Breast Self-Examination of adult females, Muang District, Nakornratchasima Province. The sample was composed of 120 females which was divided into the comparison group and the experimental group, 50 and 52 females respectively. The health education activities organized were lecture with showing slides, modeling, group process, demonstration, and practicing, encouraging by family leaders. It was found that the experimental group practiced better Breast Self-Examination practice which should be due to their awareness and perceived

threat appraisal and perceived severity of breast cancer. These situations had led them to have skills in doing proper Breast Self-Examination.

Promchij Jongsoowiwatwongs (1996: 148-158) studied the effects of applying Protection Motivation Theory on the prevention of complication among the essential hypertensive patients attending Srinakarintara Hospital. This Quasi-experiment research was done with hypertensive patients who did not have complication. The sample was divided into the experimental and comparison groups, 50 patients each. The health education activities organized were group process, group discussion, showing video tape, slides, manual and Self-Care Diary, demonstration, and practicing. It was found that the experimental group had higher level of perceived threat appraisal and coping appraisal resulting in intention to follow the compliance behavior continuously including performing better behavior regarding physical exercise, complication prevention, dietary control, and stress management, and leading to lower blood pressure level.

Narit Zennoi (1999: 104-118) studied the effectiveness of a health education program on behavioral changes regarding dietary control and physical exercise of Type II diabetic patients attending Hunka Hospital, Chainat Province. The experimental group was composed of 44 Type II diabetic patients attending Hunka Hospital and the comparison group was composed of 44 Type II diabetes patients attending Sunkaburi Hospital. The health education activities organized were emphasized on demonstration and practicing regarding dietary and physical exercise and group discussion aiming to have the sampled patients exchanged experiences. Other activities included lecture with the use of video tape, and Health Manual Booklet. After the program, it was found that perceived susceptibility of complications, perceived severity of diabetes, response-expectancy, perceived self-efficacy, and behaviors regarding dietary control and physical exercise for preventing diabetic complications among the experimental group have changed in the better direction than the comparison group. The fasting blood sugar level of the experimental group was found to be decreased that of the comparison groups.

Boopha Arprairach (1998: 126-144) studied the application of Protection Motivation Theory for changing behaviors to prevent the risk of cardiovascular diseases among Type II female diabetic patients who had high levels of blood sugar and blood cholesterol, at Diabetic Clinic, Udontani Center Hospital. The sample was composed of 40 patients in the experimental group and 40 patients in the comparison group. The health education activities were group discussion, showing video tape, and the use of the Health Manual and Diary. The study showed that complication preventive behaviors and physical exercise behaviors of the experimental group were higher than before the program and of the comparison group. But no difference was found between the dietary control behavior of both group after the experimentation. It was also found that fasting blood sugar level and blood cholesterol level of the experimental group were decreased more than before the program. It was evident that the health education program applying Protection Motivation Theory was effective in changing cardiovascular diseases preventive behaviors to the better direction.

Sudaporn Dumrongwanich (1993: 97-115) studied the effectiveness of a health education program on blood sugar level of Type II diabetic patients attending Diabetes Clinic at Chareonkrungpracharrach Hospital, Bangkok Metropolis. The experimental group was consisted of 50 patients and the comparison group 48 patients. There sessions of health education activities were organized every 2 months, by emphasizing on demonstration and practicing, group process, modeling individual practicing by recording information in the Health Manual Diary. The study showed that perceived severity, perceived susceptibility, self-efficacy expectancy, response-expectancy, dietary control and physical exercise behavior of the experimental group were appropriate and higher than before the program and them of the comparison group. These variables related positively with the behaviors regarding dietary control and physical exercise. Besides decrease blood sugar level among the experimental group was found compared to before the comparison group.

Surasakdi Thamphenjit (1995: 112-128) studied the application of Protection Motivation Theory and the concept of Health Belief Model to change health behaviors of Type II diabetic patients, Sakonnakorn Hospital, Sakonnakorn Province. The

sample was divided into the experimental group and the comparison group, of 48 and 50 patients respectively. There sessions of health education activities were organized for the experimental group. It was found that after the program, among the experimental group, there were the increased and correct levels of knowledge, perceived susceptibility, perceived severity, perceived self-efficacy, response-expectancy, higher than before the program and than the comparison group. Besides, the higher level of decreases blood sugar level was found in the experimental group that the

Therefore, in this study, the Protection Motivation Theory developed by Rogers was applied for developing a health education program by using, group process, modeling, video presentation, and the use of Health Recording Booklet, with the aim to study blood sugar control behavior of Type II diabetic patients.

From the literature review it was evidenced that the aim of controlling diabetes is to control blood sugar level to or closer to the Norman level which will help the patients can live their life happily and prevent complications. In order to reach the aim mentioned, the important factors needed are: dietary control, physical exercise, medication use, educating patients, and practicing self-care skills. Therefore, it is necessary to promote patients to perform appropriate health behaviors. Because, most of the patients lacked knowledge and understanding about diabetes, so they had lower level of perception that the patients themselves are very important and can be able to take a good self-care. The patients also lacked skills in performing some behaviors especially dietary control and physical exercise, so they could not control blood sugar level effectively even through they used medication regularly. Besides, the present health service system is being emphasized on promoting the patients' health aiming to help them be able to take care of themselves and the family numbers. Therefore, the researcher has focused to develop the skills of the patients for performing dietary control and physical exercise behaviors, by applying Rogers' Protection Motivation Theory as well as developing participatory learning of the patients through group process, in order to reinforce the development of perceived severity, perceived susceptibility, self-efficacy expectancy and response-expectancy. These factors will be helpful in lowering blood sugar level to be close to the normal level.

CHAPTER 3

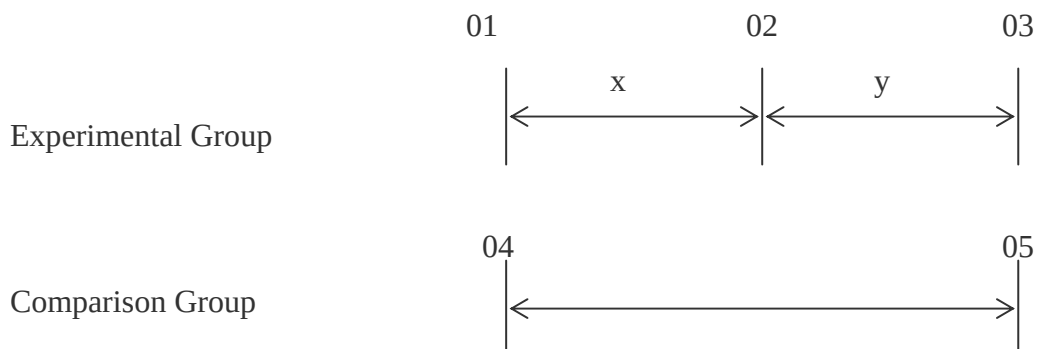
RESEARCH METHODOLOGY

In carrying out this research project the researcher has applied the concepts and principles of the Protection Motivation Theory with the aim to modify the health behaviors of Type II diabetic patients who could not be able to control their blood sugar level as regards to dietary control and physical exercise, with the following research procedures:

1. Research Design

This study was the Quasi-experimental research, pretest-posttest two group design. The samples consisted of 2 groups and the research has been carried out for 36 weeks: the implementation of the health education program with the experimental group for 12 weeks. The data were collected from the experimental group before the experimentation, after the experimentation and during the follow-up period 24 weeks after the completion of the program. Among the comparison group, the data were collected before the experimentation and during the follow-up period at the 36th week of the experimentation. The research design is presented as follows:

Research Design Diagram



01, 04 : Collecting data before the experimentation

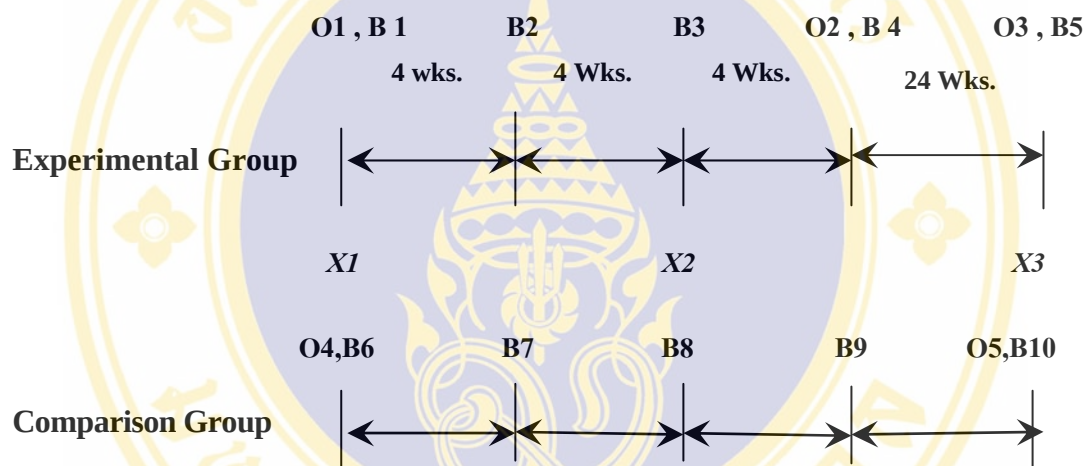
02 : Collecting data after the experimentation

03, 05 : Collecting data during the follow-up period

X : Health education program developed by the researcher

Y : Follow-up period after completion of the experimentation

Experimentation Diagram



O1, B1 : Collecting data before the experimentation in the sampled Type II diabetic patients both the experimental and the comparison groups by using the interviewing schedule developed by the researcher, on the 1st week at the beginning of the experimentation

O2 : Collecting data after the experimentation in the sampled Type II diabetic patients both the experimental and the comparison groups by using the interviewing schedule developed by the researcher, on the 12th week

O3, O5: Collecting data at the follow-up period after the experimentation in the sampled Type II diabetic patients both the experimental and the Comparison groups by using the interviewing schedule developed by the researcher, on the 36 the week

B1, B6 : Taking the blood samples for blood sugar test from the experimental and the from the experimental and the comparison groups before organizing health education Program activities, on the 1st week

B5, B10 : Taking the blood samples for blood sugar test from the experimental and the comparison groups during the follow-up period after organizing health education program activities, on the 36th week

B2, B3, B7, Taking blood samples for blood sugar test of the experimental
B8, B9 : and the comparison groups during the implementation of health education activities in accordance with the normal health care standard of a diabetic clinic

X1, X2, X3: Organizing 3 health education sessions on the 1st, 4th, and 8th weeks respectively

2. Population and Sampling

Population

The population of this research were the Type II diabetic patients whose blood sugar level Was higher than 126 mg% who were attending the primary care unit and they were the residents of Tabklor District, Pichit Provinve. The same health care standards, physicians and medical supplies were provided to both the experimental and the comparison groups. All of the population were homogenous with the similar demographic, traditional and cultural characteristics.

Samples

The following criteria were used for selecting the research site:

1. It was a primary care unit or community health center
2. There was a clinic that provided services for diabetic patients.

3. There were at least 40 diabetic patients whose blood sugar level was higher than 126 mg% attended this clinic per month.

4. Its health care standards and medical supplies managed by physicians and nurses were

In Tabklor District, there were 2 primary care units located in Tabklor Hospital and Khaojetlook Subdistrict Health Center. The primary care unit of Tabklor Hospital was assigned to be the experimental group and the primary care unit of Khaojetlook Subdistrict Health Center was Assigned to be the comparison group. For selecting the sampled patients, purposive sampling method was employed and the following criteria were used:

1. The Type II diabetic patients whose blood sugar level was over 126 mg/dl at least 1 time during 3 months prior to the experimentation. These patients did not have any complications or being pregnant.
2. The illness duration was 3 months to 5 years.
3. Age of 40 years old or over, both male and female
4. Who did not have any problems or disability as regards to hearing, vision or speaking
5. Who could be able to identify the referent persons/relatives or close neighbors if he/she stayed alone on he/she could not read or write.
6. Willing to participate the whole period of the research project.

According to the above criteria, the experimental and the comparison groups were set by the researcher as follows:

Experimental Group. This group consisted of 30 patients with Type II diabetes mellitus whose blood sugar level was higher than 126 mg/dl. They have been checked and diagnosed by the physician/or from history that they did not have any complications or other chronic diseases before being diagnosed that they have Type II diabetes. This sampled group came to get services at the primary care unit of Khaojetlook Subdistrict Health Center, Tabklor District, Pichit Province and have

participated in the health education program activities, organized by the researcher, for 3 sessions.

Comparison Group. This group consisted of 30 Type II diabetic patients whose blood sugar level was higher than 126 mg/dl. These patients have been checked and diagnosed by the physician/or from history that they did not have any complications or other chronic diseases before being diagnosed that they have Type II diabetes. This sampled group came to get services at the primary care unit, Tabklor Hospital, Pichit Province and received services and participate in the routine health education program activities organized by the hospital staff but not the health education program organized by the researcher.

3. Research Instruments

The research instruments used were consisted of the instrument for collecting data and the instrument for carrying out the experimentation. These instruments were developed in accordance with the concepts, principles, and theories derived from literature review, indepth interview and related literature.

3.1 The Instrument Used for Data Collection. This instrument was the interviewing schedule developed by the researcher. It consisted of the following parts:

3.1.1 General information. This part was used for collecting data regarding age, gender, body weight, income, educational level, marital status, illness duration, etc. It was composed of 14 questions of multiple-choice and open-ended types.

3.1.2 Knowledge about diabetes as regards to causes, self-care, complications, etc. This part was composed of 18 questions. In each question, two choices were presented and after the respondent selected one choice were presented and after the respondent selected one choice another question was used to verify the correctness of the respondent's knowledge. The following scoring criteria were used:

Response	Score (Positive statement)	Score (Negative statement)
Know or correct	1	0
Don't know or incorrect	0	1

3.1.3 Perceived Severity and Susceptibility of Diabetes and Its Complications. This part was consisted of 10 statements of “Perceived severity of diabetes and its complications” and 9 statement of “Perceived susceptibility of diabetic complications”. The 3-point rating scale used consisted of both positive and negative statement. Likert’s method for attitude scale development was employed for developing the scale. The following scoring system was used:

Response	Score (Positive statement)	Score (Negative statement)
Agree (Yes)	2	0
Uncertain	1	1
Disagree (No)	0	2

3.1.4 Self-Efficacy Expectancy and Response-Expectancy. This part was consisted of 16 statements of “Self-efficacy expectancy” and 9 statements of “Response-expectancy of the practices of dietary control and physical exercise for preventing complications”. The 5-point rating scale used consisted of both positive and negative statements. Likert’s method for developing the scale. The following scoring criteria were used:

Response	Score (Positive statement)	Score (Negative statement)
Strongly Agree	4	0
Agree	3	1
Uncertain	2	2
Disagree	1	3
Strongly Disagree	0	4

3.15 Dietary Control and Physical Exercise Behavior. This part was composed of 11 questions regarding dietary control behavior and 7 questions regarding physical exercise. Three choices were offered in each question. The following scoring criteria were used:

Response (Frequency)	Definition
Did not practice	Never perform the activity in a week
Practiced sometimes	Performed the activity 1-3 days/wk.
Practiced all the time	Performed the activity 4-7 days/wk.

Response	Score (Positive statement)	Score (Negative statement)
Practiced all the time	2	0
Practice sometimes	1	1
Never (did not practice)	0	2

3.1.6 Evaluation and Interpretation of the Data. According to Saree Lacharoj (1994: 67-68), the criteria for interpretation the score from learning measurement and evaluation were recommended as follows.

Percent (%)	Interpretation
Lower than 60	Low
60 – 79	Moderate
80 – 100	Good

3.1.7 The following criteria were used for evaluating the control of blood sugar level of the Type II diabetic patients after they participated in the health education program (Paiboon Suriyawongpaisarn (1996: 11):

Level of Accomplishment	Fasting Blood Sugar Level
Good	80 – 120 mg/dl
Moderate	121 – 140 mg/dl
Low/Need to be improved	>141 mg-dl

3.1.8 The criteria for evaluating the outcome of body weight control developed by Srisamai Wiboonyanond (1997: 33–34) and Walai Intarumpun (cited in Wannee Nithiyanund (editor), 1992: 8) were modified for evaluating the BMI of the sampled patients. Three levels were classified as follows:

Nutritional Status	BMI
Normal	18.5 – 24.9 kg/m. ²
Overweight	25 – 29.9 Kg/m. ²
Obesity	> 30 Kg/m. ²

3.2 Principles of Developing the Instrument for Data Collection

3.2.1 Studying/reviewing articles, related researches, related theories and formulating the themes and questions accordingly.

3.2.2 Consulting experts and physicians in the field of diabetes.

3.2.3 Checking the quality of the interviewing schedule with diabetic experts and thesis advisors as regards to content validity and construct validity. Revision has then been followed.

3.2.4 Trying out the revised interviewing schedule with 30 diabetic patients who were similar to the study group. The analysis of Cronbach's Alpha Coefficient was made and the reliability of the interviewing schedule was 0.7253. Independent t-test was applied for item analysis. The statement with p-value <0.05 has been selected (Nirat Iamee, 2001: 3; Boonthum Kijpreedaborisuthi, 1999: 112-113 and 208-213). The reliability value of each part of the interviewing schedule was presented as follows:

Variable	Reliability Value
- Knowledge about diabetes	0.7967
- Perceived susceptibility of getting complications	0.7543
- Perceived severity of diabetic complications	0.6848
- Self-efficacy expectancy in practicing dietary control and physical exercise	0.7654
- Response-expectancy of practicing Dietary control and physical exercise	0.7077

3.3 The Instruments Used for Carrying Out the Experimentation

1. The Health Education Program developed by the researcher
2. Positive Models. These models were selected by the sampled diabetic patients in the experimental group who participated in the health education program. The criteria used for selection were the experiences informed by each group member regarding self-care behaviors, food intake, and physical exercise
3. Negative Models. This group of the models were selected by the research. These models did not perform correct behaviors or had never performed at all. They also had chronic illness. These negative models were the diabetic patients' relatives who have participated in the health education activities and were willing to act as the models.

4. Research Procedures and Data Collection

4.1 Preparatory Phase

4.1.1 Meeting with the District Health Officer of Tabklor District Health Center, the Head of Khaojetlook Subdistrict Health Center and the Director of Tabklor Hospital in order to get permission for carrying out the research project in the Primary Care Units of Khaojetlook Subdistrict Health Center and Tabklor Hospital including explaining the research procedures and objectives.

4.1.2 Coordinating and explaining the research objectives and procedures to the concerned persons and the sampled patients. The explanation was also included asking for the respondent's willingness to participate in the program, rights and responsibilities, research procedures, participation in the research program can be cancelled at any time during the research activities and keeping the data confidentially. Question-answer session was open and having the sampled patients studied and signed the consent forms.

4.1.3 Preparing the research assistants. One to two officers working in each selected Primary Care Units were selected to be the research assistants. These assistants have helped organizing 3 sessions of the health education program activities including making home visits to encourage the sampled patients to perform proper health behavior. The preparation of this group included the explanation about the research procedures, the questionnaire, and how to answer the related questions that may be brought up by the sampled patients.

4.1.4 Working with the officers of Khaojetlook Subdistrict Health Center to select positive and negative models and having the selected models signed the consent form to participate in the research program.

4.1.5 Preparing the materials, themes for group discussion, and other related materials for carrying out the health education program including the venues.

4.2 Implementing Phase

Comparison Group. The researcher and the research assistants selected the target group from the diabetic patients attending the Primary Care Unit at Tabklor Hospital on Tuesday every week by checking the patients' records as regards to nursing care received, blood sugar control, screening and diagnosis made by the health team who provided medical treatment to make sure that the selected patients did not have any diabetic complications or any chronic illness before being diagnosed to have diabetes. The selected diabetic patients were asked to sign the informed consent forms for being the comparison group, 9-10 persons per week. Data were collected by using the interviewing schedule developed by the researcher as regards to: general information; perceived severity of diabetes, perceived susceptibility of getting diabetic complications, self-efficacy expectancy, response-expectancy, and practices regarding dietary control and physical exercise. The selected diabetic patients were asked to sign the informed consent forms for being the comparison group, 9-10 persons per week. Data were collected by using the interviewing schedule developed by the researcher as regards to: general information; perceived severity of diabetes, perceived susceptibility of getting diabetic complications, self-efficacy

expectancy, response-expectancy, and practices regarding dietary control and physical exercise. The blood samples were taken from the sampled patients for blood sugar test on the 1st and the 36th week of the research program. The research has been carried out for 36 weeks.

Experimental Group. The researcher worked cooperatively with the research assistants selected the target group from the diabetic patients attending the Primary Care Unit at Khaojetlook Subdistrict Health Center on Wednesday every week by checking the patients' records as regards to nursing care received, blood sugar control, screening and diagnosis made by the medical team and nurses to make sure that the selected patients did not have any complications or any chronic illness before being diagnosed to have diabetes. The selection criteria set have been used for selecting the sampled patients from the patients attending the Primary Care Unit. The selected group had been asked to sign the informed consent forms and to agree to be the experimental group, 9-10 persons a week. The data were collected from the experimental group by using the interviewing schedule developed by the researcher as regards to: general information; perceived severity of the diabetes; perceived susceptibility of getting diabetic complication, self-efficacy expectancy, response-expectancy, and practices. Blood samples were taken from the experimental group for blood sugar test on the 1st week and 36th week of the research program. During 36 weeks of the program this experimental group participated in 3 sessions of the health education program on the 1st, 4th, and the 8th weeks.

Regarding the blood samples taking for blood sugar test of the experimental and comparison groups, the procedure has been done by following the service system by the diabetic clinics of both selected Primary Care Units whereby the similar pattern of health service management system and medical team have been used.

Health Education Activity #1 (For the experimental group) See Appendix

Procedures:

1. The researcher and the research assistants introduced themselves to the group and informed the group about research objectives and procedures, activities, roles and responsibilities of the group members, steps, time, and the next schedule including answering the questions.

2. Establishing the relationship of the group members by having the members introduced themselves to the group in order to get acquainted and develop friendship and have them be ready for the next activities. (10 minutes)

3. The researcher proposed the questions to the group relating to the contents about diabetes, complications and blood sugar level. Having the group discussed the questions presented accordingly the members' experiences. The group summarized the conclusions. During the discussion the researcher acted as the group leader and tried to add the correct contents and suggestions to the group in case that some essential contents were missed. (20 minutes)

4. Having the group discussed about the advantages/ disadvantages, severity/danger that Might occur due to the high blood sugar level, accordingly with their non experiences. The researcher was the group leader and informed the group members more correct information as well as trying to have the group members changed their misperceptions. (16 minutes)

5. As the group leader, the researcher asked the group members discussed the dangers and the severity of diabetes including diabetic complications. The negative model who had complications was presented to the sampled diabetic patients, aiming to tell the group about their Experience, feelings and loss that occurred to them. After the group members have exchanged their experiences the conclusions were made including the guideline for preventing complications. (15 minutes)

6. The researcher asked the group to summarize the main issues discussed by the group regarding diabetes and its complications, dangers, and severity of the illness in order to motivate and emphasize the group to be afraid of he severity of the disease. Opportunity was open for the group to ask questions. The researcher

added some important issues and confirmed about the next appointment which will be the next month. (20 minutes)

Health Education Activity #2 (For the experimental group) See Appendix B

Procedures:

1. Establishing a good relationship and making the group relaxed by having them sang a song together and greeted each other. (5 minutes)
2. The researcher led the group members reviewed the main concepts derived from the last meeting and having the group members asked questions/obstacles. The group members were asked to discuss the measures for solving problems/obstacles. The group members praised and encouraged each other. (10 minutes)
3. The researcher introduced the group members to the main activities by having them reviewed their own behavior regarding dietary control and physical exercise that they have done in the day before. The group members were asked to discuss and exchange their experiences and then make the conclusion of the group. (10 minutes)
4. The researcher presented the positive model to the group and asked the group to discuss and exchange their experiences regarding dietary control and physical exercise including problems/ obstacle and measures for solving the problems. The researcher and the research assistants encouraged the group shared their opinions and summarized the main concepts and directions to follow in order to make the conclusions be possible. The encouragement, persuasion, suggestions and supports were made by the researcher and the positive model. (30 minutes)
5. The researcher and the positive model set the issues for the group to discuss aiming to check the progress of the practices performed including the continuity of the practices. The emphasis was made on proper participation and support from the family and community. The positive model had also provided suggestions and opinions. The group members made the summary of the performance

guideline and the researcher and the research assistants added some important information. (20 minutes)

6. The researcher and the research assistants summarized the opinions and the benefits derived from today-discussion. The results of the blood sugar test were informed the group members and this matter was set as the topic to be discussed in the next session regarding the changed blood sugar levels comparing with the previous results. The next appointment was reconfirmed. (15 minutes)

Health Education Activity#3 (For the experimental group) See Appendix B

Procedures:

1. Establishing a good relationship among the group members by having the members clapped their hands, greeted each others, and encouraged the friendly atmosphere. (5 minutes)

2. The researcher made the conclusions and reviewed the knowledge about diabetes and the severity of the diabetic complications, dietary control and physical exercise by asking the sampled group members the questions related to the contents. The group members were asked to give the recommendations for preventing and solving the problems/obstacles occurred. (10 minutes)

3. The researcher selected the positive model from the group members who had practiced correct behaviors regarding dietary control and physical exercise. The positive model was asked to inform the group about experiences, problems/obstacles, measures for preventing and solving the problems/obstacles, and the changes occurred. The group members were asked to express their opinions and asked the questions. The researcher praised, encouraged and added some important issues. (15 minutes)

4. The individual group members was asked to tell the group about his/her experiences regarding problems/obstacles, motives, and reasons for practicing and non-practicing. Group discussion was followed and the group members encouraged each others. (20 minutes)

5. The researcher presented the results and trends of the blood sugar tests and Body Mass Index of the sampled patients by using the graph. The sampled patients had been praised and encouraged by the researcher. The researcher had provided the suggestions in practicing physical exercise and dietary control for the group members who could not practice properly or have not practiced. Rewards were also given to the patients who had made progress, could be able to control their blood sugar levels effectively, or practiced regularly. (10 minutes)

6. The researcher asked the sampled patients to summarize the necessity and the benefits of dietary control and physical exercise in lowering blood sugar level which will result in lowering the severity and complications of diabetes including problems/obstacles and suggestions for furthering the practices. The group members brainstormed the ways to get the healthy persons or other diabetic patients to get involved in the activities as well as how to maintain the activities in the community. (10 minutes)

7. The sampled patients have been evaluated after the experimentation through interviewing.

5. Research Ethics

This research project has been carried out in accordance with the principles of the right protection of the human subjects including the risks that might be occurred during implementing the research project. The researcher has introduced herself, explained the research objectives, asked for cooperation in collecting data, and informed the patients their rights to participate the research project. The sampled patients have been informed that their agreement or non-agreement would not affect their medical treatment and the respondents' answers or information will be kept confidentially. The results of this study will be reported in the general profile and just only for this study. During the implementation of this research project, the sample will be allowed to stop participating in the project at any time. After the group had decided to join the research project they have been asked to sign the informed consent form. As regards to the research ethics recommended in the Declaration of Helsinki

2000, the researcher had submitted the research proposal and related materials to the Committee on Protection of the Human Right and Ethics, Mahidol University, of approval. The research project has been approved on June 25, 2003.

6. Data Analysis and Statistics Used

The programmed computer has been used for analyzing the data collected and 95% level of Confidence has been set for difference analysis of the means. The statistics used were as follows:

1. General information. Descriptive statistics were computed: frequency, percentage, median, arithmetic means, and standard deviation.
2. Comparison analysis of demographic characteristics of the experimental group and the comparison group was made by using percentage and Chi-square test.
3. Difference analysis of the means between before and after the experimentation within the experimental and comparison groups as regards to knowledge regarding diabetes, causes, food intake, physical exercise and complication; practices regarding dietary control and physical exercise; and fasting blood sugar levels, was made by using Paired t-test.
4. Difference analysis of the means, before and after the experimentation between the experimental and the comparison groups as regards to knowledge regarding diabetes, causes, food intake, physical exercise and complications; practices regarding dietary control and physical exercise; and fasting blood sugar levels, was made by using Independent t-test.
5. Difference analysis of the means between before and after the experimentation within the experimental and comparison groups as regards to perceived severity of diabetes and complications, perceived susceptibility of getting diabetic complications, self-efficacy expectancy, in practicing dietary control and physical exercise, and response-expectancy of practicing regarding dietary control and physical exercise and fasting blood sugar levels, was made by using Paired t-test.

6. Difference analysis of the means between the experimental and comparison groups, before and after the experimentation, as regards of perceived severity of diabetes and complications, perceived susceptibility of getting diabetic complications, self-efficacy expectancy in practicing dietary control and physical exercise, response-expectancy of practicing dietary control and physical exercise, practices regarding dietary control and physical exercise and fasting blood sugar levels, was made by using Independent t-test.



CHAPTER 4

RESULTS

This study was aimed to assess the effectiveness of a health education program, developed by applying Rogers' Protection Motivation Theory, on dietary control and physical exercise and the change of fasting blood sugar level among Type II diabetic patients. The experimental group was consisted of 30 diabetic patients attending the Primary Care Unit, Khaojetlook Subdistrict Health Center, District, Pichit Province while the comparison group was consisted of 30 diabetic patients attending the Outpatient Department, Tabklor Hospital, Tabklor District, Pichit Province. The data were collected from the experimental and comparison groups, before and after the implementation of a health education program. The data analysis has been made and the results were presented as the following outline :

1. General information
2. Levels of knowledge and perception regarding diabetes and behaviors, before the experimentation, after the experimentation, follow-up period, within and between the experimental and the comparison groups.
3. Comparison of threat appraisal and coping appraisal as regards to perceived susceptibility of getting complications, perceived severity of complications, self-efficacy expectancy, response expectancy of practices, and behaviors regarding dietary control and physical exercise
4. Comparison of fasting blood sugar level and Body Mass Index, within and between the experimental and comparison groups

1. General information

1.1 Socio-demographic Characteristics and Health Status

Table 1 Distribution of frequency and percentage of the sampled group by socio-demographic characteristics

Socio-demographic Characteristics	Experimental (n=30)		Comparison (n=30)		p-value
	Number	Percent	Number	Percent	
Gender					0.023
Male	7	23.3	1	3.3	
Female	23	76.7	29	96.7	
Age (years)					0.421
40-59	22	73.3	22	80.0	
>60	8	26.7	6	20.0	
$\bar{x}$	52.17		51.20		
Standard deviation	6.85		7.80		
Minimal age	30		35		
Maximal age	64		64		
Education Level					0.503
Did not attend school	1	3.3	2	6.7	
Primary education	28	93.3	27	90.0	
Secondary education and higher	1	3.3	1	3.3	
Marital Status					0.213
Single/widow	5	16.6	1	3.3	
Married	25	83.3	29	96.7	
Religion					0.000
Buddhism	30	100.0	30	100.0	
Occupation					0.156
Agriculture	14	46.7	18	60.0	
Other	16	53.3	12	40.0	

Table 1 Distribution of frequency and percentage of the sampled group by socio-demographic characteristics (continued)

Socio-demographic Characteristics	Experimental (n=30)		Comparison (n=30)		p-value
	Number	Percent	Number	Percent	
Family Economic Status					0.747
Not enough	9	30.0	10	33.3	
Enough but no saving	16	53.3	17	56.7	
Have saving	5	16.7	3	10.0	
Food Preparation					0.240
Standard deviation	19	63.3	23	76.7	
Family members	11	36.7	6	20.0	
Bought from food shop	0	0.0	1	3.3	

Table 2 Distribution of frequency of the sampled group by health status

Health Status	Experimental (n=30)		Comparison (n=30)		p-value
	Number	Percent	Number	Percent	
Illness Duration (years)					0.349
<5	19	63.3	22	73.3	
>5	11	37.7	8	27.7	
$\bar{x}$	5.01		3.71		
Standard deviation	4.88		4.95		
Minimal duration (yr.)	0.25		0.33		
Maximal duration (yr.)	20		20		
Family History					0.605
- Have some relatives who were sick with diabetes	15	50.0	17	56.7	
- No relatives were sick with diabetes	15	50.0	13	43.3	

Table 2 Distribution of frequency of the sampled group by health status (continued)

Health Status	Experimental (n=30)		Comparison (n=30)		p-value
	Number	Percent	Number	Percent	
Diabetic Diagnosis					0.043
Yearly physical check-up	4	13.3	1	3.3	
Check-up of other illness	2	6.7	7	23.3	
Having an abnormal condition	24	80.0	22	73.4	
Body Mass Index					0.474
Underweight (<18.4 kg/m ²)	0	0.0	1	3.3	
Normal (18.5-24.9 kg/m ²)	19	63.3	11	36.7	
	7	23.3	18	60.0	
Overweight (>30 kg/m ²)	4	13.4	0	0.0	
$\bar{x}$	25.04		25.39		
Standard deviation	3.09		2.71		
Minimal value	33.20		29.86		
Maximal value	19.98		17.48		

The analysis of the general information of 60 sampled patients by socio-demographic data and health status (Table 1 and Table 2) showed that :

Gender. The high percentage of the experimental and the comparison groups were females (76.7% and 96.7% respectively) while 23.3 and 3.3 percent were males respectively. Significant difference was found between the two groups as regards to gender (p-value = 0.023).

Age. The majority of the experimental and the comparison groups aged between 40-59 years (70.0% and 73.3% respectively). The maximal age of both groups was 64 years. Among the experiment group, the minimal age was 39 years and the average age was 52.17 years with the standard deviation of 6.85. For the comparison group it was found that the minimal age was 35 years and the average age was 51.20 years with the standard deviation of 7.80. No significant was found between two groups as regards to age (p-value=0.421).

Educational Level. Most of both groups, the experimental and the comparison groups, had primary education, 93.3 and 90.0 percent respectively. No significant difference was found between the two groups as regards to educational level (p-value = 0.503).

Marital Status. Most of the experimental and the comparison group were married, 83.3 and 96.7 percent respectively. There were 16.6% and 3.3% respectively who were single/widow. No significant difference was found between the two groups as regards to marital status (p-value = 0.213).

Religion. A hundred percent of the respondents were Buddhists.

Occupation. The majority of the experimental and the comparison group earned their living as agriculturists, 46.7 and 60.0 percent respectively while 53.3 and 40.0 percent had other types of occupation. No significant difference between both groups as regards to occupation (p-value = 0.156).

Family Economic Status. The majority of the experimental and the comparison group (53.3% and 56.7% respectively) mentioned that their economic status was alright but without saving. Thirty percent of the experimental group and 33.3 percent of the comparison group stated that their income was not enough. The percentage of the respondents who stated that their family income was enough and they have some savings was low, 16.7 percent and 10.0 percent of the experimental and the comparisons groups respectively. No significant difference was found between the two groups as regards to family economic status (p-value = 0.747).

Food Preparation. Most of the experimental and the comparison group (63.3% and 76.7% respectively) prepared food by themselves while 36.7 and 20.0 percent respectively mentioned that their food was prepared by the family members. No significant difference was found between the two groups as regards to food preparation (p-value = 0.240).

Illness Duration. Most of the sampled group have been sick with diabetes less than 5 years, 63.3 percent of the experimental group compared to 73.3 percent of the comparison group. There were 37.7 percent of the experimental group and

2.77 percent of the comparison group had been sick with diabetes for more than 5 years. No significant difference was found between two groups as regards to illness duration.

Family History. Among the experimental group, 50 percent of them mentioned that their relatives had and had no diabetes. For the comparison group 56.7 percent mentioned that relatives were sick with diabetes and 43.3 percent did not have relatives with diabetes. No significant between two groups was found as regards to family history ($p = 0.605$)

Diabetic Diagnosis. The high percentage of the experimental and the comparison group mentioned that they have been diagnosed that they have this disease when they had diabetes related symptoms, 80.0 and 73.4 percent respectively while 13.3 and 3.3 percent mentioned that they have been diagnosed of having diabetes when they went to get their yearly check-up. Some of them have been diagnosed of diabetes when they have been diagnosed of other illness, 6.7 and 23.3 percent respectively. No significant difference was found between the two groups as regards to diabetic diagnosis ($p\text{-value} = 0.605$)

In conclusion, no significant difference between the two groups was found as regards to socio-demographic characterization except gender and the number of male patients in the experimental group was higher than in the comparison group. It was found that, as regards to diagnosis of diabetes, higher percentage of the experimental group had found that they have diabetes when they took yearly physical check-up compared to having other illness diagnosis. The finding was different from the comparison group

2. Levels of knowledge and perception regarding diabetes and behaviors, before the experimentation, after the experimentation, follow-up period, within and between the experimental and the comparison groups.

The classification of the scores regarding knowledge and perception regarding diabetes and behavior was done by applying the educational measurement and evaluation principles developed by Saerse Lacharoj (1984 : 67-68). The levels were classified into 3 levels : “lower than criteria” ($>60\%$); “moderate” (60-79% and “good” (80-100%). The results are as follows :

Table 3 Distribution of number and percentage of sampled diabetic patients by levels of knowledge about diabetes, threat appraisal of complications and coping appraisal of complication, before and after the experimentation, and follow-up period, within the experimental group (n = 30) and the comparison group

Variables	High		Moderate		Low	
	Number	Percent	Number	Percent	Number	Percent
Knowledge About Diabetes						
Experimental Group						
Before the program	4	13.3	17	56.7	9	30.0
After the program	30	100.0	0	0.0	0	0.0
Follow-up Period	26	86.7	4	13.3	0	0.0
Comparison Group						
Before the program	1	3.3	11	36.7	18	60.0
Follow-up Period	15	50.0	12	40.0	3	10.0
Threat Appraisal						
Perceived Susceptibility of Getting Complication						
Experimental Group						
Before the program	4	13.3	15	50.0	11	36.7
After the program	30	100.0	0	0.0	0	0.0
Follow-up Period	28	93.3	2	6.7	0	0.0
Comparison Group						
Before the program	4	13.3	6	20.0	20	66.7
Follow-up Period	26	86.7	4	13.3	0	0.0
Perceived Severity of Complications						
Experimental Group						
Before the program	5	16.7	16	53.3	9	30.0
After the program	30	100.0	0	0.0	0	0.0
Follow-up Period	29	96.7	1	3.3	0	0.0

Table 3 Distribution of number and percentage of sampled diabetic patients by levels of knowledge about diabetes, threat appraisal of complications and coping appraisal of complication, before and after the experimentation, and follow-up period, within the experimental group (n=30) and the comparison group (continued)

Variables	High		Moderate		Low	
	Number	Percent	Number	Percent	Number	Percent
Comparison Group						
Before the program	5	16.7	7	23.3	18	60.0
Follow-up Period	22	73.3	8	26.7	0	0.0
Coping Appraisal						
Self-efficacy Expectancy						
Experimental Group						
Before the program	11	36.7	13	43.3	6	20.0
After the program	6	20.0	24	80.0	0	0.0
Follow-up Period	20	66.7	9	30.0	1	3.3
Comparison Group						
Before the program	8	26.7	14	46.7	8	26.7
Follow-up Period	1	3.3	21	70.0	8	26.7
Response-Expectancy						
Experimental Group						
Before the program	12	40.0	12	40.0	6	20.0
After the program	19	63.3	11	36.7	0	0.0
Follow-up Period	27	90.0	3	10.0	0	0.0
Comparison Group						
Before the program	8	26.70	18	60.0	4	13.3
Follow-up Period	1	3.3	29	96.7	0	0.0

2.1 Comparison of the Levels of Knowledge Perception about Diabetes, Threat Appraisal and Coping Appraisal, Before and After the Program and the Follow-up Period (Table 3)

2.1.1 Knowledge About Diabetes. The total knowledge score was derived from 18 questions and it was classified accordingly with the criteria set. The findings are presented as follows :

Experimental Group. Before the experimentation, It was found that 17 respondents (56.7%) had “moderate” level of knowledge while 30 percent had “low” level of knowledge. After the experimentation, it was found that 100 percent of the respondents had “high” level of knowledge about diabetes compared with during the follow-up period, level of knowledge and 4 respondents (13.3%) had lower knowledge score but not respondents had “low” knowledge level.

Comparison Group. Before the experimentation, it was found that 18 respondents (60.0%) had “low” knowledge level. At the follow-up period, 15 and 12 respondents (50.0% and 40%) had “high” and “moderate” knowledge levels while 3 respondents (10.0%) had “low” knowledge level.

2.1.2 Threat Appraisal of Complications

The results of the analysis of threat appraisal of complication are presented as follows:

2.1.2.1 Perceived Susceptibility of Getting Diabetic Complications.

Experimental Group. It was found that before the experimentation there were 15 and 11 respondents (50.0% and 36.7%) had “moderate” and “low” levels of perceived susceptibility of getting diabetic complications. After the program it was found that all respondents (100.0%) had “high” level of perceived susceptibility. During the follow-up period, there were 2 respondents (6.7%) who had “moderate” perceived susceptibility level while the rest of them had “high” perceived susceptibility level and no respondents had “low” perceived susceptibility.

Comparison Group. Before the program it was found that 20 respondents (66.7%) had “low” perceived susceptibility level compared to during the follow-up period there were 26 respondents (86.7%) had “high” level of perceived susceptibility of getting complications while 4 respondents (13.3%) had “moderate” perceived susceptibility level, which is higher than the experimental group.

2.1.2.2 Perceived Severity of Complications

Experimental Group. It was found that before the program, 16 and 9 respondents (53.3% and 30.0%) had “moderate” and “low” perceived severity levels respectively. After the program, it was found that all 30 respondents (100.0%) had “high” perceived severity level comparing to the follow-up period, 29 respondents (86.7%) had “high” perceived severity level and 1 respondent (3.3%) had “moderate” perceived severity level.

Comparison Group. Before the program it was found that most of the respondents, 18 respondents (60.0%) had “low” level of perceived severity of complications comparing to during the follow-up period, 22 and 8 respondents had “high” and “moderate” perceived severity of diabetic.

2.1.3 Coping Appraisal

2.1.3.1 Self-Efficacy Expectancy in Preventing Diabetic

Complication

Experimental Group. It was found that before the program, there were 6 respondents (20.0%) who had “low” level of self-efficacy expectancy and after the program there were 6 respondents (20.0%) who had “high” level of self-efficacy expectancy. During the follow-up period, it was found that 20 and 1 respondents had “high” and “low” levels of self-efficacy expectancy respectively (66.7% and 3.3%).

Comparison Group. Before the program and during the follow-up period, it was found that the same number of respondents (8) had “low” level of self-efficacy expectancy (26.7%).

2.1.3.2 Response-Expectancy in Preventing Diabetic Complications

Experimental Group. Before the program, it was found that 6 respondents (20.0%) had “low” level of perceived benefits of preventing diabetic complications but after the program and during the follow-up period, the number of respondents has increased, 19 and 27 respondents (63.3% and 90.0 respectively had “high” level of perceived benefits in preventing diabetic complications.

Comparison Group. Before the program, it was found that 8 respondents (26.70%) had “high” perceived benefits level and after the program, 1 respondent (3.3%) had the “high” level of perceived benefits of preventing diabetic complications.

In conclusion at the follow-up period after the completion of the program for 6 months, it was found that both groups, the experimental and the comparison group who had had not participated in the health education program had higher scores of knowledge about diabetes, perceived susceptibility and perceived severity of diabetic complications. But for the scores of perceived self-efficacy and perceived benefits of preventing diabetic complications, the higher scores were found in the experimental group while lower scores were found in the comparison group, comparing with before the program. It should be expected that the experimental group that received health education program organized will perform the practices of dietary control and physical exercise better than the comparison group which will lead to better control of Body Mass Index and fasting blood sugar level.

Table 4 Distribution of number and percentage of sampled diabetic patents by the levels of behavior regarding dietary control and physical exercise to control blood level, before the program and during the follow-up period, within the experimental group (n= 30) and the comparison group (n = 30)

Variables	Good		Moderate		Need improvement	
	Number	Percent	Number	Percent	Number	Percent
Dietary Control						
Experimental Group						
Before the program	5	16.7	18	60.0	7	23.3
Follow-up Period	14	46.7	16	53.3	0.0	0.0
Comparison Group						
Before the program	10	33.3	15	50.0	5	16.7
Follow-up Period	11	36.7	15	50.0	4	13.3
Physical Exercise						
Experimental Group						
Before the program	3	10.0	6	20.0	21	70.0
Follow-up Period	12	40.0	3	10.0	15	50.0
Comparison Group						
Before the program	0.0	0.0	2	6.70	28	93.3
Follow-up Period	5	16.7	12	40.0	13	43.3

2.2 Diabetic Complication Preventive Behavior Regarding Dietary Control Physical Exercise

The analysis of diabetic complication prevention behaviors was made from the behavior scores of dietary control and physical exercise and the scores were classified into 3 levels “good”, “moderate” and “need to be improved” . There were 11 and 7 questions in the dietary control and physical exercise parts respectively. See detailed information in Table 4.

2.2.1 Dietary Control before the program, in the experimental group there were 18 and 7 respondents (60.0% and 23.3% respectively) who practiced “moderate” and “need to be improved” levels of dietary control behavior. For the comparison group, there were 15 and 10 respondents (50.0% and 33.3%) practiced “moderate” and “good” levels of dietary control behavior. During the follow-up period, there were 14 respondents of the experimental group (46.7%) whose behavior score was at “good” level compared to 4 respondents in the comparison group (13.3%) whose behavior score was at “need” to be improved”.

In summary, during the follow-up period after the completion of the health education program for 6 months, the behavior regarding dietary control of the experimental group was at the “high” level which was higher than of the comparison group and of the score measured before the program

2.2.2 Physical Exercise. Before the program the majority of the experimental group (21 respondents) whose behavior score of physical exercise was at the level of “need to be improved” (70.0%) while 28 respondents (93.3%) of the comparison group practiced physical exercise at the need to be improved” level. During the follow-up period, there were 12 respondents (40.0%) of the experimental group and 5 respondents (16.7%) of the comparison group whose behavior level on physical exercise was at the “good” level.

It can be concluded that during the follow-up period 6 months the completion of the program, the behavior score respondents physical exercise of the experimental group was “good” and was higher than of the comparison group and of the score measured before the experimentation.

3. Comparison of Threat Appraisal and Coping Appraisal As Regards to Perceived Susceptibility of Getting Complications, Perceived Severity of Complications, Self-Efficacy Expectancy, Response Expectancy of Practicing Dietary Control and Physical Exercise Behaviors.

3.1 Difference Comparison of Mean Scores of Knowledge, Perceived. Threats of Complications, Coping Appraisal, Dietary Control and Physical Exercise, Before the Program, Between the Experimental and the Comparison group.

Table 5 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications coping appraisal, dietary control and physical exercise, before the program, between the experimental and the comparison group (n = 30)

Variables	Experimental		Comparison		t	df	p-value
	Group (n =30)		Group (n =30)				
	Number	Percent	Number	Percent			
Knowledge About Diabetes							
Perceived Threats of Complications	10.03	3.3	10.17	3.12	1.046	58	0.300
Perceived Susceptibility of Getting Complications	12.37	2.95	9.60	4.52	2.809	58	0.007
Perceived Severity of Complications	12.37	2.95	9.60	4.52	2.809	58	0.007
Coping Appraising							
Perceived Self-Efficacy	46.37	8.27	44.20	8.86	0.979	58	0.332
Perceived Benefits	25.77	4.44	25.47	4.17	0.270	58	0.788
Dietary Control	14.50	2.99	16.07	2.60	2.165	58	0.034
Physical Exercise	4.53	4.38	2.10	2.71	2.590	58	0.012

3.1.1 Differences of Knowledge Mean Scores. The analysis of the difference of Knowledge mean scores between the experimental and the comparison groups before the program was made from the scores derived of 18 questions regarding knowledge about diabetes, whereby the total score was 18. It was found the similar finding was found between the experimental and the comparison group, the mean score of 11.03 and 10.17 respectively with the standard deviation of 3.3 and 3.12. No significant difference was found between the tow means.

3.1.2 Differences of Perceived Susceptibility of Getting Diabetic Complication Mean Scores. The difference analysis was made from the score derived from 10 statements, with the total score of 20. It was found that the mean scores of the experimental group the comparison group were 14.93 and 13.11 respectively, with the standard deviation of 3.75 and 4.24 respectively. No significant difference was fond between the two means.

3.1.3 Difference of Perceived Severity of Diabetic Complications. The analysis of the mean score difference was made from the scores derived from 9 statements, with the total score of 18. The mean scores of the experimental and the comparison groups were 12.37 and 9.60 and standard deviation of 2.95 and 4.52 respectively. Significant difference was found between the two means ($p\text{-value}=0.007$).

3.1.4 Difference of Perceived Self-Efficacy to Prevent Diabetic complications Mean Scores. The difference analysis of the mean scores was made from the scores derived from 18 statements, with the total score of 80. It was found that the mean scores of the experimental and the comparison groups were 46.37 and 44.20, with the standard deviation of 8.27 and 8.86 respectively. No significant difference was found between the two means.

3.1.5 Difference of Perceived Benefits of Practicing Complication Prevention Behavior Mean Scores. The difference analysis of the mean scores was made from the total score of 45 which was derived from 9 statements. The similar mean score was found in the experimental and the comparison groups, 25.77 and 25.47 with the standard deviation of 4.44 and 4.17 respectively. No statically significant difference between the two means was found.

3.1.6 Difference of Mean Scores of Dietary Control Behavior. The difference analysis of the behavior mean scores was made from the scores derived from 11 questions, with the total score of 22. The behavior mean scores of the experimental and the comparison groups, were 14.50 and 16.07 with the standard deviation of 2.99 and 2.60 respectively. Significant difference was found between the two means ($p<0.05$).

3.1.7 Difference of Mean Scores of Physical Exercise Behavior. The difference analysis was made from the scores derived from 7 questions, with the total score of 21. It was frond that the mean scores of the experimental and the comparison groups were 4.53 and 2.10 with the standard deviation of 4.38 and 3.71 respectively/ Significant difference was found between the two mean scores ($p<0.05$).

It can be concluded that the perceived severity of complications of the experimental group was significantly higher than of the comparison group but the experimental group practiced dietary control behavior less than the comparison

group while the physical exercise behavior of the experimental group was better than of the comparison group.

3.2 Difference Comparison of the Mean Scores of Knowledge Perception About Diabetes, Threats of Complications Coping Appraisal, Dietary Control, and Physical Exercise, During the Follow-up Period, Between the Experimental and the Comparison group.

Table 6 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications coping appraisal, dietary control and physical exercise, before the follow-up period, between the experimental and the comparison group (n = 30)

Variables	Experimental Group (n =30)		Comparison Group (n =30)		t	df	P-value
	Number	Percent	Number	Percent			
Knowledge About Diabetes							
Perceived Threats of Complications	5.23	3.28	3.73	3.47	1.721	58	0.091
Perceived Susceptibility of Getting Complications	3.30	3.68	3.03	3.68	0.280	58	0.780
Perceived Severity of Complications	4.43	3.24	5.73	3.89	1.407	58	0.165
Coping Appraising							
Perceived Self-Efficacy	8.83	11.13	2.90	9.99	4.297	58	<0.001
Perceived Benefits	7.80	5.08	3.33	5.03	5.947	58	<0.001
Dietary Control	2.87	3.25	0.20	3.43	3.094	58	0.003
Physical Exercise	3.60	5.67	6.03	4.25	1.880	58	0.065

From Table 5, the data showed the significant differences of the perceived threats of complication, dietary control and physical exercise behaviors between the two groups, p-value=0.007, 0.034 and 0.012 respectively, the researcher has used the differences of mean scores of the experimental and the comparison group for analyzing the difference of the mean scores during the follow-up period, as presented in Table 6.

3.2.1 Difference of Knowledge Mean Scores. In the follow-up period, it was found that the mean score difference of the experimental group was 5.23 and of the comparison group was 3.73 with the standard deviation of 3.28 and 3.4 respectively. No significant difference was found between the two means.

3.2.2 Difference of Perceived Susceptibility of Getting Diabetic Complication Mean Scores. During the follow-up period, it was found the mean score difference of the experimental group was 3.30 which was higher than the mean score difference of the comparison group of 3.03, with same value of standard deviation of both groups (3.68). No significant difference was found between the two difference mean scores.

3.2.3 Difference of Perceived Severity of Diabetic Complication Mean Scores. It was found that the mean score differences of the experimental and the comparison group groups were 4.43 and 5.73, with the standard deviation of 3.24 and 3.89 respectively. No significant difference was found between the two mean difference scores.

3.2.4 Difference of Perceived Self-Efficacy to Prevent Diabetic Complications Mean Scores. In the follow-up period, it was found that the mean score differences of the experimental and the comparison group were 8.83 and 2.90, with the standard deviation of 11.13 and 9.99 respectively. Significant difference was found between the two means ($p < 0.001$).

3.2.5 Difference of Perceived Benefits of Prevent Diabetic Complications Preventive Behavior Mean Scores. It was found that during the follow-up period the mean score differences of the experimental and the comparison group were 7.80 and 3.30, with the standard deviation of 5.08 and 5.03 respectively. Perceived benefits of experimental group was significantly higher than of the comparison group ($p < 0.001$).

3.2.6 Difference of Perceived Mean Scores of Diabetic Complications Preventive Behavior Mean Scores. It was found that the mean score differences of dietary control behavior of the experimental and the comparison groups were 2.87 and 0.20, with the standard deviation of 3.25 and 3.43 respectively. The statistical analysis showed that dietary control behavior of the experimental was significantly better than the comparison group ($p\text{-value} = 0.003$).

3.2.7 Difference of Mean Scores of Physical Exercise Behavior. At the follow-up period it was found that the mean score differences of physical exercise behaviors among the experimental and the comparison groups were 3.60 and 6.03, with the standard deviation of 5.67 and 4.25 respectively. No significant difference was found between the two mean score differences.

It can be concluded that during the follow-up period, the knowledge about diabetes, perceived threats of diabetic complications and physical exercise behavior of the experimental and the comparison groups were not different but the experimental group had better coping appraisal and dietary control behavior than the comparison group.

3.3 Difference Comparison of the Mean Scores of Knowledge About Diabetes, Perceived Threats of Complications and Coping Appraisal of the Experimental Group, Before and After the Program,

Table 7 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications and coping appraisal, of the experimental group, before the comparison group (n = 30)

Variables	Experimental Group (n =30)		Comparison Group (n =30)		t	df	p-value
	Number	Percent	Number	Percent			
Knowledge About Diabetes	11.03	3.3	17.83	0.53	10.770	29	<0.001
Perceived Threats of Complications							
Perceived Susceptibility of Getting Complications	14.93	3.75	19.83	0.38	7.026	29	<0.001
Perceived Severity of Complications	12.37	2.95	17.97	0.18	10.506	29	<0.001
Coping Appraising							
Perceived Self-Efficacy	46.37	8.27	50.40	5.14	2.129	29	0.042
Perceived Benefits	25.77	4.44	31.90	4.24	5.921	29	<0.001

3.3.1 Difference of Knowledge Mean Scores. It was found that the mean score of the experimental group before and after the program were 11.03 and 17.83 with the standard deviation of 3.3 and 0.53 respectively. Significant difference was found between the two means ($p\text{-value}<0.001$)

3.3.2 Difference of Perceived Susceptibility of Getting Complications Mean Score. In the experimental group it was found that the mean score of perceived susceptibility of complication measured before the program was 14.93 which is lower than the mean score measured after the program (19.83), with the standard deviation of 3.75 and 0.38 respectively. Significant difference was found between the two means ($p<0.001$).

3.3.3 Difference of Perceived Susceptibility of Diabetic Complications Mean Score. Among the experimental group it was found that the mean score before the program was 12.37 which was lower than the mean score measured after the program (17.97), with the standard deviation of 2.95 and 0.18 respectively. Significant difference was found between the two means ($p<0.001$).

3.3.4 Difference of Perceived Self-Efficacy to Prevent Complications Mean Score. Before the program, it was found that the mean scores of the experimental group was 46.37 which was lower than the mean score measured after the program (50.40), with the standard deviation of 8.27 and 5.14 respectively. According to the statistical test, the significant difference was found between the two means ($p<0.005$).

3.3.5 Difference of Perceived Briefest of practicing Complication Prevention Behavior. Among the experimental group, it was found that the mean scores of perceived benefits measured before and after the program were 25.77 and 31.90 with the similar standard deviation of 4.42 and 4.24 respectively. Significant difference was found between the two means ($p<0.001$).

It can be concluded that after the completion of the program knowledge about diabetes and perceived threats of complications and coping appraisal of the experimental group were higher than before the program.

3.4 Difference Comparison of the Mean Scores of Knowledge About Diabetes, Perceived Threats of Complications and Coping Appraisal of the Experimental Group, After the Program and During the Follow-up Period.

Table 8 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications and coping appraisal, of the experimental group, (n = 30), after the program and during the follow-up period

Variables	After the Program		Follow-up Program		t	df	p-value
	Mean	S.D.	Mean	S.D.			
Knowledge About Diabetes	17.83	0.53	16.27	1.96	4.127	29	<0.001
Perceived Threats of Complications							
Perceived Susceptibility of Getting Complications	19.83	0.38	18.60	1.83	3.578	29	<0.001
Perceived Severity of Complications	17.97	0.18	16.80	1.19	5.299	29	<0.001
Coping Appraising							
Perceived Self-Efficacy	50.40	5.14	55.20	8.10	3.298	29	0.003
Perceived Benefits	31.90	4.24	33.57	3.16	1.980	29	0.057

3.4.1 Difference of the Mean Scores of Knowledge About Diabetes. It was found that, among the experimental group, the knowledge mean score measured after the program was 17.83 which was higher than the mean score measured at the follow-up period ($\bar{x} = 16.27$), with the standard deviation of 0.53 and 1.96 respectively. The statistical analysis showed the significant difference between the two means (p-value<0.001).

3.4.2 Difference of Perceived Susceptibility of Getting Complications Mean Scores. It found that the mean scores of perceived susceptibility of getting complications of the experimental group measured after the program and at the follow-up period were 19.83 and 18.60 with the standard deviation of 0.38 1.38

respectively. The statistical analysis showed the significant relationship between the two means (p-value<0.001).

3.4.3 Difference of Perceived Severity of Diabetic Complications Mean Scores. At the end of the program, the mean score of the experimental group was 17.97 which was higher than the mean score measured at the follow-up period (16.80), with the standard deviation of 0.18 and 1.19 respectively. Significant difference was found between the two means (p-value<0.001).

3.4.4 Difference of Perceived Self-Efficacy to Prevent Diabetic Complication Mean Scores. At the completion of the program, the mean score of the experimental group was 50.40 which was lower than the mean score measured at the follow-up period (55.20), with the standard deviation of 5.14 and 8.10. The statistical analysis showed the significant increase of perceived self-efficacy to prevent difference complication (p-value<0.003).

3.4.5 Difference of Perceived Benefits Mean Scores. It was found that at the end of the program and at the follow-up period the means score of the experimental group were 31.90 and 33.57, with the standard deviation of 4.24 3.16 respectively. No statistically significant difference was found between the two means (p-value<0.057).

It can be included that during the follow-up period, knowledge about diabetes and perceived threats of complications of the experimental group have decreased but their perceived coping appraisal has increased compared to after the program even though the time duration was long. Generally, the remembrance of people will be less if the time is longer especially among the elderly. But if the people practice regularly and they believe the benefits of that behavior they will gain more self-confidence about their practice.

3.5 Difference Comparison of the Mean Scores of Knowledge About Diabetes, Perceived Threats of the Complications, Coping Appraisal, Dietary Control and Physical Exercise of the Experimental group, Before the Program and At the Follow-up Period

Table 9 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications coping appraisal, dietary control and physical exercise, of the experimental group (n = 30), before the program and at the follow-up period (n = 30)

Variables	Before the Program		Follow-up Period		t	df	p-value
	Mean	S.D	Mean	S.D			
Knowledge About Diabetes							
Perceived Threats of Complications	11.03	3.3	16.27	1.96	8.748	29	<0.001
Perceived Susceptibility of Getting Complications	14.96	3.75	18.60	1.83	5.024	29	<0.001
Perceived Severity of Complications	12.37	2.95	16.80	1.19	7.483	29	<0.001
Coping Appraising							
Perceived Self-Efficacy	46.37	8.27	55.20	8.10	2.129	29	0.042
Perceived Benefits	25.77	4.44	33.57	3.16	5.921	29	<0.001
Dietary Control	14.50	2.99	17.37	1.99	4.838	29	<0.001
Physical Exercise	4.53	4.38	8.13	5.01	3.476	29	0.002

3.5.1 Difference of the Mean Scores of Knowledge About Diabetes.

It was found that the mean scores before the program and at the follow-up period of the experimental group were 11.03 and 16.27, with the standard deviation of 3.3 and 1.96 respectively. Statistical analysis showed that the experimental group had significantly higher knowledge mean score (p-value<0.001)

3.5.2 Difference of the Mean Scores of Perceived Susceptibility of Getting Complication. It was found that the mean scores before the program and at the follow-up period were 12.37 and 18.60, with the standard deviation of 2.95 and 1.83 respectively. Statistical analysis showed that the experimental group gained significantly higher perceived susceptibility of getting diabetic complications (p-value<0.001).

3.5.3 Difference of Perceived Susceptibility of Diabetic Complications Mean Scores. It was found that the mean scores perceived severity of diabetic

complications measured before the program and at the follow-up period were 12.37 and 16.80, with the standard deviation of 2.95 and 1.19 respectively. The mean score of perceived severity of the experimental group was significantly increased ($p\text{-value}<0.001$).

3.5.4 Difference of Perceived Self-Efficacy to Prevent Complications

Mean Scores. It was found that the perceived self-efficacy mean scores of before the program and at the follow-up period were 46.37 and 55.20, with the standard deviation of 8.27 and 8.10 respectively. The statistic analysis showed that the perceived self-efficacy mean score of the experimental group was increased significantly ($p\text{-value}<0.042$).

3.5.5 Difference of Perceived of Complication Prevention Behavior

Mean Scores. It was found that the mean scores measured before the program and at the follow-up period were 25.77 and 33.57 with the standard deviation of 4.44 and 3.16 respectively. Statistic analysis showed that the experimental group gained significantly higher perceived benefits of practicing complication preventive behavior ($p\text{-value}<0.001$).

3.5.6 Difference of Dietary Control Behavior Mean Scores.

The mean scores of dietary control behavior of the experimental group measured before the program and at the follow-up period were 14.50 and 17.37, with the standard deviation of 2.99 and 1.99 respectively. The statistic analysis showed that the experimental group practiced dietary control behavior significantly better than before the program ($p\text{-value}<0.001$).

3.5.7 Difference of Physical Exercise Behavior Mean Scores.

It was found that the mean score of physical exercise behavior before the program was lower than the mean score measured at the follow-up period, 4.53 and 8.13 respectively. The standard deviation of before the program was 4.38 which was lower than the value at the follow-up period (5.01). The statistical analysis showed that physical exercise behavior of the experimental group was significantly increased ($p\text{-value} = 0.002$).

It can be concluded that at the follow-up period the experimental group gained higher level of knowledge about diabetes and perceived threats of complications than before the program. The experimental group also had higher

level of perceived self-efficacy to prevent complication which was evidenced by practicing better dietary control and physical exercise behavior.

3.6 Difference Comparison of the Mean Scores of Knowledge About Diabetes, Perceived Threats of complications, coping Appraisal, Dietary Control, and Physical Exercise, within the Comparison Group, Before the Program and at the Follow-up Period.

Table 10 Comparison of the mean scores of knowledge about diabetes, perceived threats of complications coping appraisal, dietary control and physical exercise, within the comparison group (n = 30), before the program and at the follow-up period (n = 30)

Variables	Before the Program		Follow-up Period		t	df	p-value
	Mean	S.D	Mean	S.D			
Knowledge About Diabetes							
Perceived Threats of Complications	10.17	3.12	13.90	2.71	5.887	29	0.000
Perceived Susceptibility of Getting Complications	9.60	4.52	16.90	1.75	9.550	29	0.000
Perceived Severity of Complications	9.60	4.52	15.33	1.97	8.082	29	0.000
Coping Appraising							
Perceived Self-Efficacy	44.20	8.86	41.30	4.82	1.590	29	0.123
Perceived Benefits	25.47	4.17	25.50	2.47	0.036	29	0.971
Dietary Control	16.07	2.60	16.27	3.27	0.320	29	0.752
Physical Exercise	2.10	2.71	8.13	3.44	7.767	29	0.000

3.6.1 Difference of the Mean Scores of Knowledge About Diabetes.

Before the program, the mean score of diabetic knowledge was 10.17 which was lower than the mean score of the follow-up period, 13.90, with the standard

deviation of 3.12 and 2.71 respectively. According to the statistic analysis, the mean score of the comparison group has increased significantly ($p\text{-value} < 0.001$).

3.6.2 Difference of Perceived Susceptibility of Getting Complications Mean Scores. The mean score of before the program and at the follow-up period were 9.60 and 16.90, with the standard deviation of 4.52 and 1.75 respectively. The statistic analysis showed that the perceived susceptibility of getting complication had increased significantly compared to the mean score measured before the program y ($p\text{-value} < 0.001$).

3.6.3 Difference of Perceived Severity of Diabetic Complication Mean Scores. The mean score of before the program and at period were 9.60 and 15.33 with the standard deviation of 4.52 and 1.97 respectively. Significant difference between the two mean scores was found ($p\text{-value} < 0.001$)

3.6.4 Difference of Perceived Self-Efficacy to Prevent Diabetic Complications Mean Scores. The mean score of before the program was higher than the mean score at the follow-up period, 44.20 compared to 41.30. The standard deviation was 8.86 compared to 4.82 respectively. The mean score of perceived self-efficacy was found to be decreased significantly ($p\text{-value} < 0.0123$).

3.6.5 Difference of the Mean Scores Benefits of Practicing Diabetic Complications Preventive Behavior. The mean score of before the program and at the follow-up period were 25.47 and 25.50 respectively, with the standard deviation of 4.17 and 2.47 respectively. No significant difference was found between the two means ($p\text{-value} = 0.971$)

3.6.6 Difference of the Dietary Control Behavior Mean Scores. The mean score of before the program was 16.07 and of the follow-up period was 16.27, with the standard deviation of 2.60 and 3.27 respectively. The statistic analysis showed the no significant difference between the two means ($p\text{-value} = 0.752$)

3.6.7 Difference of Physical exercise Behavior Mean Scores. The mean score of before the program was lower than of the follow-up period, 2.10 and 8.13 respectively. The standard deviation of before the program was 2.71 compared

to 3.44 of the follow-up period. The statistic analysis showed that physical exercise behavior of the comparison group was increased significantly (p -value = 0.000)

It can be concluded that there a difference among the companion group, between before the program and at the follow-up period, as regards to knowledge about diabetes and their perceived severity of diabetic complications has increased except perceived coping appraisal. This condition affected on the increased dietary control behavior but not on physical exercise. The comparison group was aware about their illness and understood about diabetes which may be due to the information given by the health personnel but their perception about coping appraisal was not effective to make them perform health behavior.

4. Comparison of fasting blood sugar level and Body Mass Index, within and between the experimental and comparison groups

4.1 Comparison of BMI of the Sampled Group, Before the Program and At the Follow-up Period

Table 11 Distribution of number and parentage of the experimental and comparison group by BMI, before the program and at the follow-up period

Nutritional Status / BMI	Experimental Group		Comparison Group		p-value
	Mean	S.D	Mean	S.D	
Before the Program					0.198
Normal	5	16.7	4	13.3	
Underweight	1	3.3	1	3.3	
Overweight	20	66.7	25	83.3	
Obesity	4	13.3	0	0.0	
Follow-up Period					0.523
Normal	10	33.3	6	20.0	
Underweight	0	0.0	1	3.3	
Overweight	17	56.7	20	66.7	
Obesity	3	10	3	10.0	

The assessment of the outcome of body weight control was made by using BMI of the respondents. The nutritional status was classified into 3 levels. Normal (BMI = 18.5-24.9 kg/m²) ; overweight (BMI = 25-29.9 kg/m²) ; and obesity (BMI >30 kg/m²). From Table 11 it was found that :

Before the program, in the experimental group, it was found that the nutritional status of 7 and 4 respondents were overweight and obesity (23.3% and 13.3% respectively). Among the comparison group, 18 respondents were obesity (60.0%). No significant difference between the experimental and the comparison group as regards to nutritional status (p-value = 0.198).

At the follow up period it was found that 10 respondents of the experimental group had “normal” nutritional status (33.3%) compared to the comparison group, 3 respondents had “obesity” nutritional status (10.0%). No significant difference was found between the two groups nutritional status (p-value = 0.523)

It can be concluded that after the experimental group had participated in the health education program for 6 months, they performed dietary control and physical exercise behavior continuously and can better control their BMI at the normal level than before the program. But for the comparison group, it was found that the number of obese respondents has increased. It was confident that the health education program organized was effective in changing dietary control and physical exercise behavior.

Table 12 Comparison of the nutritional status / BMI mean scores between the experimental and the comparison groups, before the program and at the follow-up period

Nutritional Status/ BMI	n	Mean	S.D.	t	df	p-value
Before the Program				0.468	58	0.320
Experimental Group	30	25.04	3.09			
Comparison Group	30	25.39	2.71			
Follow-up Period				1.134	58	0.130
Experimental Group	30	24.83	3.04			
Comparison Group	30	25.75	3.25			

The analysis of the mean scores of BMI of the sampled respondents (Table 12) showed that before the program, the BMI mean score of the experimental group was 25.04 kg/m² with the standard deviation of 3.09. For the comparison group, the mean score of BMI was found to be 25.39 kg/m² with the standard deviation of 2.71. No significant difference was found between the two means (p-value = 0.230).

At the follow-up period, the mean score of BMI of the experimental group has decreased to be 24.83 kg/m² with the standard deviation of 3.04 compared with the BMI mean of 25.7 kg/m² with comparison group and the standard deviation was 3.25. No significant difference was found between the two means (p-value = 0.130).

In conclusion, 6 months after the completion of the intervention it was found that the BMI mean of the experimental group has decreased while the increased BMI mean was found in the comparison group. This finding showed that the experimental group could be able to control their BMI which was due to their dietary control and physical exercise behavior.

Table 13 Comparison of the nutritional status / BMI mean scores within the experimental and the comparison groups, before the program and at the follow-up period

Nutritional Status/ BMI	n	Mean	S.D.	t	df	p-value
Experimental Group				0.814	29	0.422
Before the Program	30	25.04	3.09			
Follow-up Period	30	24.83	3.04			
Comparison Group				1.366	29	0.182
Before the Program	30	25.39	2.72			
Follow-up Period	30	25.75	3.25			

Experimental group. Before the program, the mean score of BMI was 25.04 and the standard deviation was 3.09 compared to the mean score of 24.83 with the standard deviation of 3.04, measured at the follow-up period. No significant difference was found between the two means (p-value = 0.422).

Comparison group. Before the program, the mean score of BMI was 25.39 with the standard deviation of 2.72 compared to the mean score of 25.75 measured at the follow-up period and the standard deviation was 3.25. No significant difference was found between the two means ($p\text{-value} = 0.182$).

It can be concluded that the experimental group could be able to control their body weight since their BMI was decreased while the comparison group had increased BMI, another words, their body weight had increased and they could not be able to control their body weight. But the difference of the increased or decreased BMI was not found which may be due to their food and age.

4.2 Comparison of Fasting Blood Sugar Levels of the Sampled Group, Before the Program and At the Follow-up Period

Table 14 Comparison of mean scores of fasting blood sugar (FBS) levels between the experimental and the comparison groups, before the program and at the follow-up period

Fasting Blood Sugar Level	n	Mean	S.D.	t	df	p-value
Before the Program				2.756	58	0.008
Experimental Group	30	192.97	73.01			
Comparison Group	30	152.00	36.06			
Follow-up Period				1.256	58	0.214
Experimental Group	30	160.80	46.29			
Comparison Group	30	148.43	27.67			

From Table 14, the analysis of the FBS mean scores showed the following results :

Before the Program. In the experimental group, the FBS mean was 192.97 with the standard deviation of 73.01 compared with the FBS mean of the comparison group of 152.0, with the standard deviation of 36.06. Significant difference was found between the two means ($p\text{-value}=0.008$).

Follow-up Period. Among the experimental group, the FBS mean was decreased to 160.8, with the standard deviation of 46.29. For the comparison group, the FBS mean was 148.43, which was quite similar to before the program, with the standard deviation of 27.67. No significant difference between the two means was found (p-value=0.214).

It can be concluded that the experimental group could be able to control their fasting blood sugar level, with the decreased of FBS mean and lower value of standard deviation compared to the comparison group, both before the program and at the follow-up period.

Table 15 Comparison of mean scores of fasting blood sugar (FBS) levels within the experimental and the comparison groups, before the program and at the follow-up period

Fasting Blood Sugar Level	n	Mean	S.D.	t	df	p-value
Experimental Group				2.748	29	0.010
Before the Program	30	192.67	73.01			
Follow-up Period	30	160.80	46.29			
Comparison Group				0.467	29	0.644
Before the Program	30	152.00	36.06			
Follow-up Period	30	148.43	27.67			

From Table 15, the result of the analysis of FBS mean scores within the experimental and the comparison groups, before the program and at the follow-up period, was presented as follows :

Experimental group. Before the program, the FBS mean was found to be 192.67 mg/dl, with the standard deviation of 73.01. At the follow-up period, the FBS mean was decreased to 160.80 mg/dl, with the standard deviation of 46.29. Significant difference was found between the two means (p-value = 0.010).

Comparison group. Before the program, the FBS mean was 152.00 mg/dl with the standard deviation of 36.06. At the follow-up period, the FBS mean was 148.43 and the standard deviation was 27.67. No significant difference was found between the two means (p-value = 0.644).

It can be concluded that the experimental group positive change of FBS level, another words, they could be able to control blood sugar level better than the comparison group.

Table 16 Distribution of number and parentage of the sampled group by FBS levels, before and after the program, and at the follow-up period

Fasting Blood Sugar Level	Experimental Group		Comparison Group		p-value
	Number	Percent	Number	Percent	
Before the Program					0.097
Good (18-120 mg/dl)	1	3.3	6	20.0	
Moderate (121-140 mg/dl)	6	20.0	3	10.0	
Need to be Improved (>141 mg/dl)	23	76.7	21	70.0	
Follow-up Period					0.523
Good (18-120 mg/dl)	6	20.0	2	6.0	
Moderate (121-140 mg/dl)	9	30.0	9	30.0	
Need to be Improved (>141 mg/dl)	15	50.0	19	63.4	

After the completion of the health education program developed by applying Roger's Protection Motivation Theory, aiming to help diabetic patients be able to control their fasting blood sugar level in order to prevent complications, the results of the intervention are as follows : (See Table 16)

Before the Grogram. The higher number of the patients of both the experimental and the comparison groups had the FBS level at “Weed to be improved” level, 23 and 21 patients (76.7& and 70.0% respectively). No significant difference was found between these numbers (p-value = 0.097).

Follow-up Period. It was found that in the experimental group, the control of blood sugar level was improved, 6 patients had “good” level (20.0%) while in the comparison group, the number of the patients who could control their blood sugar at the “good” level was decreased to 2 (6.6%) and the increased number of the patients at the “Need to be improved” FBS was found to be 19 patients (63.4%). No significant difference was found between the two groups (p -value = 0.169).

In conclusion, at the 6th month after the completion of health education program, the increased number of the patients in the experimental group, who could control their food intake and physical exercise and could bring down their blood sugar level to close to the normal level, was found. This condition will help to prevent diabetic complications in the long run.

CHAPTER 5

DISCUSSION

The results of the implementing the health education program applying Roger's Protection Motivation Theory aiming to modify blood sugar control behavior of the sampled Type II diabetic patients, by dividing the research procedures into 3 phases: before the program, during the program, and after the program, with the 3 month duration, showed that health behavior of the experimental group has been changed as regards to threat appraisal (perceived susceptibility and severity of diabetic complications) and coping appraisal (perceived self-efficacy and response-expectancy). These changes affected the better blood sugar control than the comparison group. The results of the research were discussed as follows:

1. Hypothesis 1.1 Health education program organized was effective in changing health behavior of Type II diabetic patients who participated in the activities as regards to threat appraisal, which composed of perceived severity of diabetic complications and perceived susceptibility of getting complications, and coping appraisal which composed of perceived self-efficacy to perform dietary control and physical exercise behavior and response-expectancy from dietary control and physical education behavior and will result in better dietary control and physical exercise behavior.

1.1 Threat Appraisal of Diabetes and Diabetic Complications. It was found that before the program, more than half of the experimental group had "moderate" level of knowledge about diabetes, perceived severity of diabetic complications, and perceived susceptibility of getting diabetic complications. After the program, all respondents of the experimental group had "high" levels of all the mentioned variables. At the follow-up period, 6 months after the completion of the intervention, most of the experimental group had "high" level of perception. In the

comparison group, it was also found that most of them had “high” level of perception. Both groups had the similar level of knowledge about diabetes but the experimental group had significantly higher perceived severity and susceptibility of diabetic complication than the comparison group ($p\text{-value}>.05$). The increased perception of the experimental group was found after the program but significantly decreased perception was found at the follow-up period ($p\text{-value}>0.05$). However, the increased perceptions found were as follows:

1.1.1 Perceived Severity of Diabetes, During and After the Program. Among the experimental group, the increased aspects were: “Diabetes causes the damage of nerves at the extremities.”; “Diabetes can damage the blood vessels when the patient has a wound, it will take a long time to heal the wound and that organ may have to be cut”; “The wound will be easy to be infected”; “Diabetic is risky to have atherosclerosis which may lead to cardio infarction, heart failure and death”; “Diabetes may cause the block of blood circulation to various parts of the body and may result in paralysis.

1.1.2 Perceived Susceptibility of Getting Diabetic Complications. After the program it was found that the experimental group perceived higher level of the following aspects; the chronic high level of blood sugar will cause glaucoma/ cataract and atherosclerosis including the diseases of circulatory system, for example, hypertension, heart diseases, diseases of the urinary system which included kidney disease, the complication usually found in the diabetic patients

The health education program has been developed by applying Roger’s Protection Motivation Theory. Based on this theory, the activities and group process have been set for participants to discuss about: signs and symptoms that led them to see the physician; risk factors of getting complications; possibility of getting complications; patients’ susceptibility to get complications; and severity of complications to health. The participants were encouraged by the research to express their feelings and opinions, analyze the risk factors of themselves and of the group. Additional information was also made by the researcher. These activities helped the participants exchanged their experiences, knowledge, and other information and the

group learned through these group activities. As stated by Prapapen Suwan (1983: 113) that the group members who hold the problems relating to the same disease will motivate each others, exchange knowledge, opinions and experiences. They will realize that not only themselves who are facing with various problems but also others. This experience will help them get more psychological support and motivate them to learn more. The life modeling will also help the participants realize more about the threats from the sickness and complications. Since both the experimental and the comparison groups hold the similar socio-demographic characteristics as well as having experiences and perceptions about diabetes. This condition agreed with the statement made by Prapapen Suwan (1982: 171, 218) that perceptions can be developed by various factors, for example, information from other sources, and direct and indirect experiences, etc. Besides, the similar demographic characteristics (Table 1) including social-cultural characteristics, lifestyles, illness duration, are the factors relating and influencing health behavior (WHO-ISH Guidelines, 1999: 154-156; Pender, 1987: 71). The similar finding was found in the study of Siriluksana Sawangwongsin (1998: 103) which was found that the experimental and the comparison groups had the similar mean score of perceived severity and susceptibility of getting iron-deficiency anemia. This finding was due to the similar characteristics of the sampled group which was set as the criteria for selecting the sample. However, this finding was different from the study of Boopha Arsrai (1998: 126: 127) whereby the Protection Motivation Theory was applied with the aim to modify behavior for lowering the risk of cardiovascular diseases of Type II diabetic patients. The study showed that the mean scores of the experimental group were increased and significantly higher than before the program and than the comparison group. The finding did not agree with the study carried out by Wipawan Junsuparintara (2001: 122-123) who applied the Protection Motivation Theory and social support from relatives in changing complication preventive behaviors of essential hypertensive patients. It was found that the mean score of perceived severity of complications of the experimental group was higher than before the program. The different finding was found in the study of Parinda Tunkam (1998: 98) who had applied the Promotion Motivation Theory for Promoting breast self-examination behavior among female students attending Ratchaput Nakornswan Institute. It was found that the mean

scores of perceived severity of breast cancer and perceived susceptibility of getting breast cancer of the sample students were significantly higher than before the program.

1.2 Coping Appraisal in Performing Dietary Control and Physical Exercise Behavior Perceived Self-efficacy and response-expectancy). It was found that before the program most of the experimental and comparison groups had perceived coping appraisal as regards to perceived self-efficacy at the “moderate” and “high” levels and no difference was found between the two groups. After the experimental group participated in 3 sessions of health education program, it was found that all of the experimental group had “high” level of perception. At the follow-up period, 6 months after the completion of the intervention, it was found that perceptions regarding coping appraisal as regards to self-efficacy and perceived benefits of performing complication prevention behaviors as regards to dietary control and physical exercise of the high percentage of the experimental group have increased to be the “high” level. This finding was different from the comparison group, the percentage of those who had “high” level of perception had been decreased to “moderate” level. The comparison analysis of the mean scores of before the program showed no significant difference but for after the program analysis it was found that the mean score of the experimental group was increased. At the follow-up period, at the 6th month after the completion of the intervention, it was found that the mean score of the experimental group was significantly higher than of the comparison group ($p < 0.01$), particularly perceived self-efficacy of the experimental group has increased significantly but the mean score of perceived self-efficacy of comparison group has decreased. The aspects of the increased perceptions found were as follows:

1.2.1 Perceived Self-Efficacy for Performing Dietary Control and Physical Exercise Behavior. After the program, the increased aspects were as follows: eating punctually; consuming food, sweets, entrails, sweet fruits, high-fat food, food substitutes; consuming more vegetables when still feel hungry; using proper cooking methods; proper physical exercise; and appropriate time for physical exercise.

1.2.2 Perceived Benefits of Performing Dietary Control and Physical Exercise Behavior. After the program, the following aspects have been found to be increased: proper eating in accordance with the illness condition will help prevent complications, for example, avoiding consuming high sugar/high carbohydrate will help lowering blood sugar level, avoiding high fat food and addictive substances, e.g. cigarette, alcoholic beverages, etc. will help prevent complications, including regular and proper physical exercise will help prevent complications.

The changes found were due to the health education program organized. The group process has been used including the use of live positive models. These models were selected from the sampled patients who have performed proper behaviors, could be able to control blood sugar level and did not have any complications. Besides, the negative models were also used, be selecting them from the group of the sampled patients who practiced health behaviors improperly, had complications, had chronic wounds and lastly some organs have been cut. The negative models who died because of shock and high blood sugar level, were also presented to the group. These types of modeling had provided the direct experience to the group and then the group members have exchanged their opinions, the ways to develop their own capacity, and methods used for solving problems/obstacles. The group members who had similar problems as regards to the same disease will help encourage each others, exchange knowledge, opinions, and experience among the group members. This conditions will realize that they are not the ones that are facing with problems but other persons also have the same problems. This feeling will help individuals hold self-confidence and have expectation about the good benefits from their behaviors (Prapapen Suwan 1983: 113). The health education activities organized helped diabetic patients perceived response-expectancy of the performance of complication preventive behaviors, for example, no diabetic complications, normal or close to normal blood sugar level, normal daily living, no paralysis, be able to help themselves, including not to be blinds, a risk of losing limbs or losing eyesight. The sampled patients were encouraged by making the comparison of the negative outcomes/consequences get from having direct-experience from the negative models,

especially they have encouraged to think about their beloved persons, to value the benefits of healthy behavior, and to motivate the group members to discuss the benefits of healthy behavior again in order to review the contents. The group members were asked to analyze problems/obstacles together in order to find the proper ways to solve the problems as well as providing psychological the group additional information. According to Bandura (1977: 191-215), in order to develop patients confidence that they can be able to perform some specific behavior the direct experiences of other persons, persuasive activities, and proper emotion-arousal techniques should be organized. These activities will help patients develop their self-efficacy. This principle agreed with the study carried out by Wanne Jansawang and Usanee Pechararatchatachart (2002: 515) which was concluded that perceived health status, past experiences and perceived self-efficacy related with health behavior. This conclusion was congruent with the study of Wipawan Junsuparint (2001: 123-124), who studied composed of the activities regarding the showing slider, the use of positive and negative models, demonstration, practicing, and the self-care manual. It was found that after the program the experimental group had high levels regarding perceived self-efficacy to perform hypertension complication prevention behaviors and perceived benefits of performing hypertension complication prevention behavior and the significantly higher mean score-difference was found after the program compared to before the program. This finding was similar with the study of Karnchana Jaithum (1998: 8-86) which was found that the mean scores of the experimental group regarding perceived self-efficacy and perceived benefits of performing dietary control and physical exercise were significantly increased and significantly higher than of the similar to the study of Jongkol Sakditragool (2000: 124-127) who applied the Protection Motivation Theory in promoting breast self-examination behavior among female adults, Muang District, Nakornratchasima. It was found that the level of coping appraisal of the experimental group was increased significantly and was higher than of the comparison group.

1.3 Dietary Control and Physical Exercise Behavior. It was found that before the Program, most of experimental group had “moderate” level of dietary control behavior while about half of the comparison group had the “moderate” level

of dietary control behavior. Regarding the physical exercise behavior, most of the respondents in the experimental group and the comparison group were at the “need to be improved” level. After participated in the program, at the 6th month during the follow-up period, more members of the experimental, group practiced the “high” level of dietary control behavior while in the comparison group, half of them still practiced dietary control behavior at the “moderate” level and the same percentage of them practiced physical exercise behavior at the “need to be improved and “moderate” levels. The difference comparison analysis between the mean scores of dietary control and physical exercise behaviors showed that, before the program, the comparison group’ mean score of dietary control behavior was higher than of the experimental group but significant difference was not found. But at the follow-up period, the mean score of dietary control behavior of the experimental group was significantly higher than of the comparison group (p-value = 0.003). Regarding physical exercise behavior, no significant difference was found between the behavior mean scores of the experimental and the comparison groups. But within the experimental group, significantly increased mean score was found. The following aspects was found to be increased:

1.3.1 Dietary Control Behavior: eating frequency, snack/junk food, high-fat food, sweet fruits, sweets; the emphasis on eating low/non-fat food e.g. fish, vegetables; eating less: coffee, tea, soothing beverages; and the use of sugar in cooking or for adding the taste of the food.

1.3.2 Physical Exercise Behavior: practicing physical exercise every 2 days at the same time, practicing physical exercise at least 20 minutes per time, and practicing physical exercise until sweating or until have the feeling that the heart beat is faster; walking or jogging can be done for exercise.

The Effects of the Health Education Program. The activities were organized by pressing models and organizing group process. It was found that the patients realized the direction for performing and could be able to apply and change in accordance with the environment and the patients themselves. They also discussed, asked questions, and gave the samples of the foods that they have eaten.

The sessions were also provided for the patients for asking some questions that will help them to be confident to put to practice, for example, because they are farmers and have to work hard in the farm. If they did not eat enough food they will be hungry as well as not be strong enough to work in the field. The group were asked to discuss about this issue and the researchers provided additional information regarding the types of food that they can eat or they should avoid aiming to help them be aware about their eating behavior. The group also discussed about the problems/obstacles and resolution. Each member told the group about his/her own methods for solving the problems. The group members have developed their own behaviors through there group processes. After having been checked-up, the patients were informed about blood sugar level. If they found that their fasting blood sugar level was high they brought this issue to discuss in the group about the factors or the effects of food t the high fasting blood sugar level. This will help them be able to better control their food intake and physical exercise. The patients were also informed about their body weight. Because high body weight is one of the obstacles to control diabetes. It reduces the number of insulin receptors in the body tissues resulting in the abnormal sugar metabolism and high level of blood sugar (Wallapa Tantayothai and Adisai Songdee, 1997: 255-256). The patients were praised, encouraged, and persuaded to take a better self-care regarding dietary control and physical exercise since good dietary control will help reduce body weight as well as better insulin reaction and lower blood sugar level (Salaya Kongsomboonwech, 2002: 132 cited in Somkit Srihasiti, 2003: 37). Physical exercise affects all body systems as well as making a person be healthy both physically and mentally, and work efficiently (Goonsong Ongpipatanakul, 2002: 92-97). For the diabetic, physical exercise will help lower blood sugar level by increasing the glucose utilization rate at the extremities and this rate is higher than glucose reproduction rate in the liver. The body tissues will also more sensitive to insulin, glucose can be absorbed in the cells and resulting in lower level of blood sugar level (Boonsong Ongpipatanakul, 2002: 93). The researcher had used the models who were selected from the group to present the group about their physical exercise methods used including the factors and motives that encourage them to perform physical exercise, problems/obstacles. The patients usually said that after they practiced physical exercise they had fatigue and being tired. They also

mentioned that they have done their tired. They also mentioned that they have done their housework everyday, and did not have time to do physical exercise. The models, the researcher, and the group members discussed about the problems/obstacle, achievement, methods for solving the problems and the positive consequences of physical exercise, etc. The study of Supawadee Limpapahond (1984: 102) showed that the diabetic patients who have participated in a health promotion program had practiced physical exercise behavior significantly higher than before participating in the program and than the comparison group. This finding was agreed with the study of Boopha Arsrairach (1998: 132) which was found that the diabetic patient who have participated in a health education program had significantly lower blood sugar level than before the program and than the comparison group. But this finding was not agreed with the study of Thanomkhuan Kumpan (1996: 142-143), who studied the effectiveness of a health education program applying the Protection Motivation Program. It was found that after the program, the higher level of dietary control behavior among the comparison group was found.

2. Hypotheses 2 and 3: At the 6th month after the completion of the program, fasting blood sugar level and Body Mass Index/nutritional status of the diabetic patients in the experimental group were decreased to the proper levels, compared to before the program. It was found that there was no difference of Body Mass Index between the two groups. But, among the experimental group, the Body Mass Index of the obsess patients was found to be decreased while increased Body Mass Index was found among the comparison group. But no significant difference was found. Regarding the change of fasting blood sugar, before the program, the significantly higher number of the patients in the comparison group who have “good” blood sugar level control, while in the comparison group, the decreased number was found and more that half of the patients had fasting blood sugar level of higher than 14 mg/dl or the “need to be improved” blood sugar level control. There was a significant difference of the mean difference of the decreased fasting blood sugar levels between the experimental and the comparison group. The mean difference of the experimental group was significant higher than of the comparison group (p-value = 0.045)

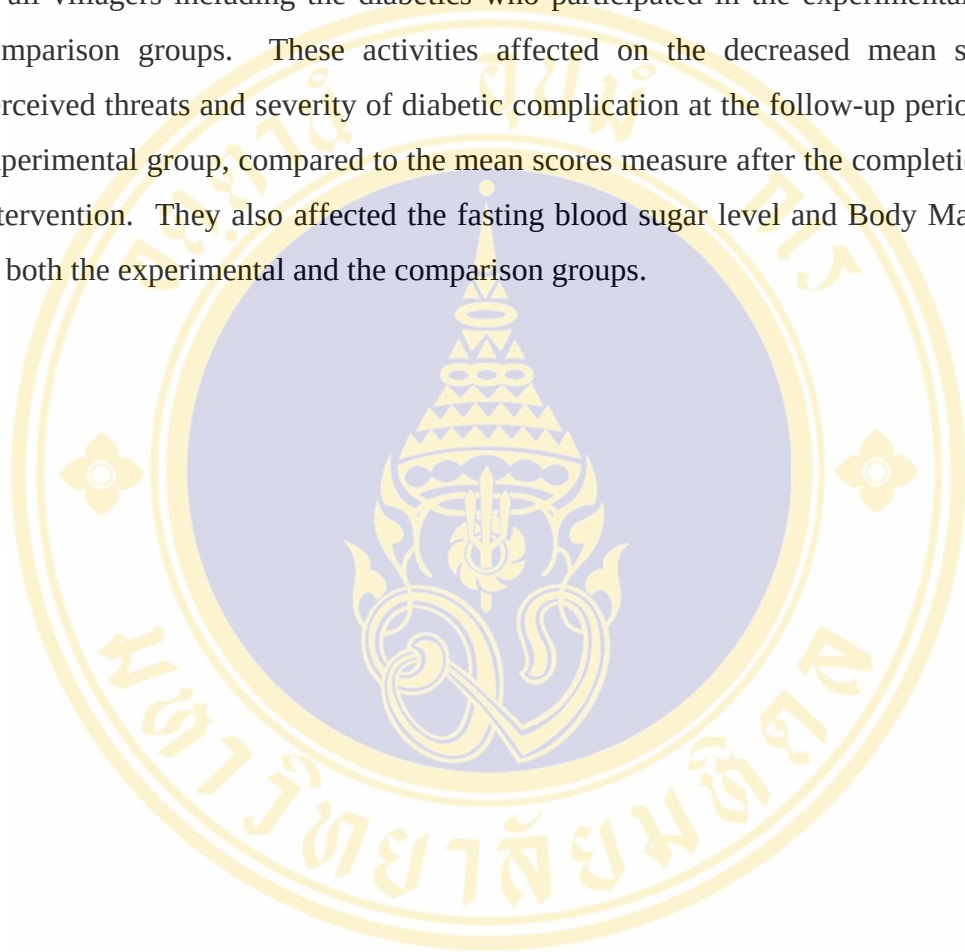
This research concerned with the organization of a health education program in a Primary Care Unit which is the first health service center that the village people can contact and also the diabetic patients can easily assess health services. They also have very close relationship with the health team. This condition helped the patients could be able to find the real causes of their problems and be able to plan and practice appropriate health behaviors or took their self-care behaviors relevantly with their living (Suntarawadee Thienpichet and Urai Huthakit Cite in Somkit Srihasiti, 2003: 47). This principle was congruent with the study of Harris (2001) which was found that health service accessibility and health service utilization associated with health outcomes of adult-patients with Type II diabetes, for example, blood sugar level, blood pressure, blood cholesterol level, and urinary albumin level, etc. During the implementation of the health education program and the group discussions, the results of the fasting blood sugar tests and body weight were presented to the group, with the permission of the group members, and the group was asked to discuss the cause and the factors affecting the rising and lowering of the blood sugar level. Other activities organized were exchanging the experiences of the group members and presenting positive life models. These activities helped the patients changed their dietary control and physical exercise behaviors resulting in bringing the level of fasting blood sugar closer to the normal level and being able to prevent diabetic complications. This finding supports Hypothesis 3 regarding the lower level of fasting blood sugar level. This finding revealed the effects of the change of dietary control behavior as regards to the avoidance of eating sweet food and fruits and eating less high-carbohydrate and high-sugar food e.g. rice, junk food, high-fast food, alcoholic beverages, including eating the foods from the food-exchange list, and using the proper cooking methods in accordance with the present illness condition. Besides, the patients' realization of the importance of regular physical exercise in helping the effective body use of blood sugar made them practiced appropriate physical exercise regularly. This finding was similar to the study of Boopha Arsrairach (1998: 132) who studied the behavioral modification as regards to lowering the risk of cardio vascular diseases among Type II diabetic patients aged 40-60 years in Udonthanee Center Hospital, Udonthanee Province, by applying the Protection Motivation Theory and using group process. It was found that

the blood sugar level of the experimental group decreased significantly compared to before the program and of the comparison group. This finding was agreed with the study of Narit Cennoi (1999: 110: 112) who studied the effectiveness of health education program in changing dietary control and physical exercise behaviors of diabetic patients attending Hunka Hospital, Chainat Province. The program was developed by applying Rogers' Protection Motivation Theory. The result of the study showed that the fasting blood sugar level of the experimental group has decreased significantly. This finding was supported by the study of Supawadee Limpapamond (1994: 400) who found that the experimental group who had participated in the health education program organized had significantly lower level of fasting blood sugar than before the program and than the comparison group. Another study by Suntara Hirannan (1995: 94) also supported this finding, which was found that there was an association between physical exercise, dietary control and blood sugar level. But different finding was found in the study of Somkid Srihasiti (2003: 77), which was found that there was no relationship between Body Mass Index and health status of diabetic patents.

Limitations of the Study

As it was found that the fasting blood sugar level and Body Mass Index of the comparison group were decreased after the intervention, it should be due to the fact that the diabetic patients in the comparison group also went to see the physician accordingly with their appointment and they also received the similar health services as of the experimental group. If their blood sugar level and Body Mass Index were increased, they will receive recommendations and encouragement from physicians and nurses of the diabetic clinic. According to the statement made by Wisarn Yaowapongsiri (1996: 120) that getting rid of carbohydrate, sugar and fat from food consumed will help decrease body weight as well as blood sugar level. Besides, during the implementation phase of this study, the Government was implementing the practice health promotion policy on "Healthy Thailand" and one of the program achievement indices was the free diabetic screening for the population aged 40 years

and older including the promotion of physical exercise among all people in every village of the country. Other activities under this project that were organized were Educational program about diabetes, organizing activities for promoting physical exercise inside and outside health service centers, distribution of educational materials to all villagers including the diabetics who participated in the experimental and the comparison groups. These activities affected on the decreased mean scores of perceived threats and severity of diabetic complication at the follow-up period, of the experimental group, compared to the mean scores measure after the completion of the intervention. They also affected the fasting blood sugar level and Body Mass Index of both the experimental and the comparison groups.



CHAPTER 6

SUMMARY AND RECOMMENDATION

This study was a quasi-experimental research aiming to assess the effectiveness of a health education program, applying Rogers' Protection Motivation Theory, on dietary control, physical exercise and the change of fasting blood sugar level of Type II diabetic patients attending the Primary Care Unit, Khaojetlook Subdistrict Health Center, Tabklor District, Pichit Province. The project lasted for 36 weeks. The sample was divided into 2 groups, experimental and comparison groups, with 30 patients each. The experimental group received 3 sessions of health education program, each session about 1 month apart. The Comparison group was selected from the diabetic clinic of the Outpatient Department of Tabklor Hospital, and did not participate in the health education program organized by the researcher. The data were collected from the group by using the interviewing schedule, before and during the program and at the follow-up period including taking blood samples from the sample for fasting blood sugar test. For the comparison group, the data were collected before the program and at the follow-up period including taking the blood samples for fasting blood sugar level test. The study has been carried out during July 1, 2003 to April 4, 2004, the total of 36 weeks. The data analysis was made to compare the effectiveness of the health education program organized before and after the program and at the follow-up period by using the programmed computer, with the level of confidence at 95% ($p > 0.005$). The summary of the research is presented as follows:

1. Socio-Demographic Characteristics and Health Status of the Sample

1.1 General Information. Similar Characteristics were found among the two groups : age of 40-60 years and over and high percentage of them aged 40-59 years (70.0% and 73.3% of the experimental and the comparison groups respectively); most of them were females, 76.7% and 96.7% in the experimental and

the comparison group respectively ; high percentage of the sample finished primary school, were married; were agriculturists p were Buddhists, had enough income but without saving while some of them had inadequate income; most of them cooked by themselves ; had been sick with diabetes for less than 5 years and longer than 5 year respectively ; the similar percentage of them had and had no relatives with diabetes; most of them were diagnosed of having diabetes because they had diabetes related symptoms, and the average body weight of 61.03 kilograms in the experimental group while of the comparison group was 62.74 kilograms.

2. The Results of the Comparative Analysis of the Mean Scores. The comparative analysis was made between and within the experimental and the comparison groups, before and after the intervention, and at the follow-up period. It was found that after the completion of the intervention and at the follow-up period, the significant higher levels regarding knowledge, perceived susceptibility of getting diabetic complications, perceived severity of diabetic complications, perceived self-efficacy, diabetic complication preventive behavior regarding dietary control and physical exercise, perceived response-expectancy of performing diabetic complications as regards to dietary control and physical exercise were found among the experimental group as compared to before the program and the comparison group.

3. Dietary control and Physical Exercise Behavior. The comparison between and with the experimental the program, and at the follow-up period, as regards dietary control and physical exercise behavior. It was found that diabetic complication preventive behavior as regards to dietary control and physical exercise of the experimental group was significantly higher than before the program and than

4. The result of the comparative analysis of the levels of fasting blood sugar and Body Mass Index between the experimental group the comparison groups, before the program and at the follow-up period and within the experimental group showed that the experimental group could significantly lower their Body Mass Index compared to before the program and the comparison group. Regarding the fasting blood sugar level, the experimental group could control fasting blood sugar level significantly better than before the program and than the comparison group

Recommendations

1. This study showed that the health education program organized by applying the Protection Motivation Theory with the aim to change preventive behavior of diabetic complications as regards to dietary control and physical exercise for controlling blood sugar level. Group discussion was also used in implementing the program. The health education program organized was found to be effective in helping diabetic patients performed appropriate dietary control and physical exercise behavior. Thus, this type of health education program should be promoted in other public health service units for diabetic patients and should be extended to other types of patients or even to the healthy people at risk.

2. As it was found that through group process, the patients have learned from their own direct-experience and from other patients. They have exchanged learning experience and understanding, suggested other patients about methods for solving the problems and obstacles, sympathized others, provided encouragement to each others. Therefore, these activities should be sued as the guideline for organizing group discussion for other situations that will help group members learned effectively.

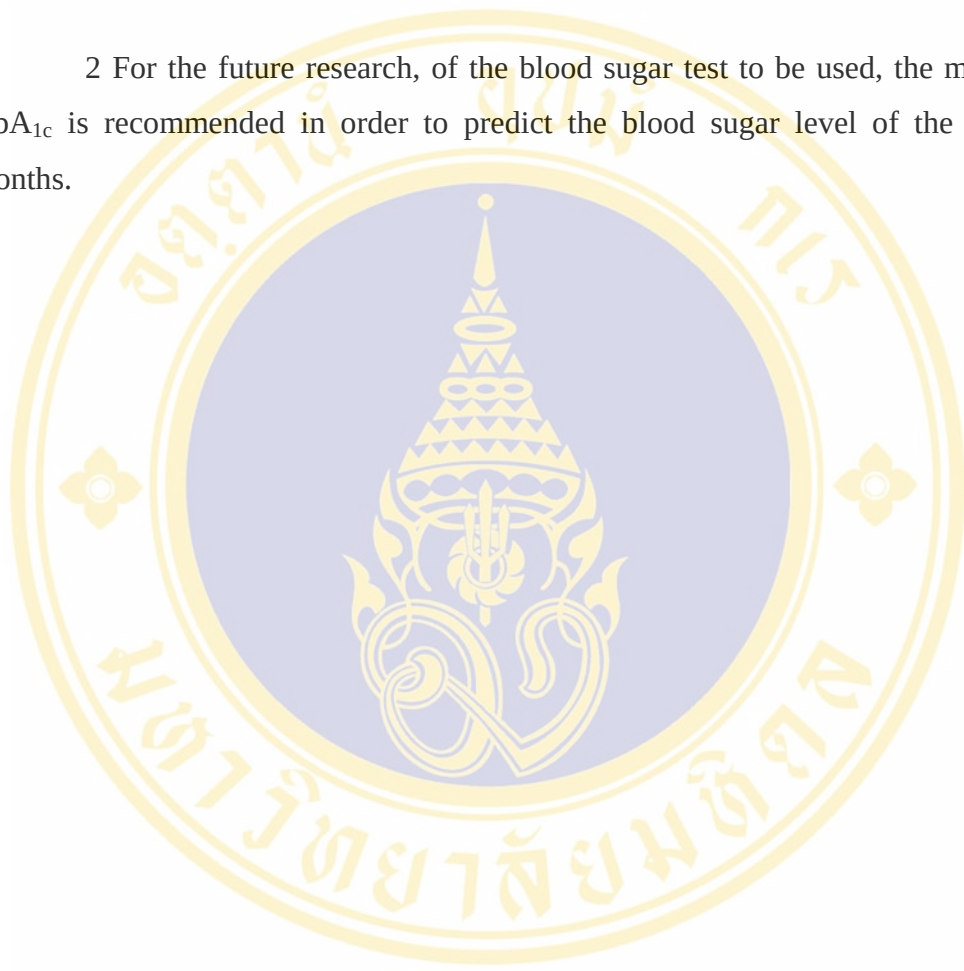
3. In implementing the health education program of this study, the positive and the negative models were used with the aim to develop in the sampled patients knowledge, attitudes and concrete directions for practicing, therefore, modeling should be used for enhancing people health and other useful knowledge.

4. In order to help patients perform health behavior conterminously, the patients should receive supports from community, family and patients' relatives. These supports will help encourage patients to practice as well as providing support.

Recommendations for Furthering Researches

1. Patients' relatives should involve in the activities in order to give support and expose to the good model for taking care of diabetic patients.

2 For the future research, of the blood sugar test to be used, the method of HbA_{1c} is recommended in order to predict the blood sugar level of the past 2-3 months.



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แบบสัมภาษณ์ผู้ป่วยเบาหวาน

ID No.....

ครั้งที่สัมภาษณ์.....

ชื่อผู้ให้สัมภาษณ์ (นาย, นาง, นางสาว) นามสกุล

บ้านเลขที่ หมู่ ตรอก/ซอย..... ถนน..... ตำบล.....

อำเภอ ทับคล้อ จังหวัดพิจิตร

ชื่อ ผู้สัมภาษณ์ (นาย, นาง, นางสาว) นามสกุล.....

วัน เดือน ปี ที่สัมภาษณ์.....

คำชี้แจง ให้ผู้สัมภาษณ์ทำเครื่องหมาย ถูก (/) หรือ กากบาท (x) ลงในช่อง () หรือเติมคำลงในช่องว่าง ตามคำตอบที่ผู้ถูกสัมภาษณ์ตอบ

แบบสัมภาษณ์นี้ จัดทำขึ้นเพื่อใช้ในการศึกษาวิจัยการควบคุมระดับน้ำตาลในเลือดด้านพฤติกรรมควบคุมอาหารและการออกกำลังกายของผู้ป่วยเบาหวาน โดยตอบคำถามตามความเป็นจริงมากที่สุด หรือสามารถปฏิเสธการให้คำตอบหรือหยุดการให้สัมภาษณ์ได้ ถ้าไม่ประสงค์จะเข้าร่วมโครงการต่อไป และทุกคำตอบผู้วิจัยจะเก็บเป็นความลับและใช้ในการศึกษาวิจัยเท่านั้น โดยแบ่งออกเป็น 5 ส่วน ดังนี้

- ส่วนที่ 1 ข้อมูลทั่วไป
- ส่วนที่ 2 ความรู้เรื่องโรคเบาหวาน
- ส่วนที่ 3 การประเมินอันตรายของโรคเบาหวานและภาวะแทรกซ้อน
- ส่วนที่ 4 การประเมินการประเพณีปัญหาต่อการเกิดภาวะแทรกซ้อน
- ส่วนที่ 5 พฤติกรรมการปฏิบัติตัวด้านการควบคุมอาหารและการออกกำลังกาย

ส่วนที่ 1 ข้อมูลทั่วไป

1. เพศ ☐ 1.ชาย ☐ 2.หญิง
2. อายุ ปี (เกิน 6 เดือน นับเป็น 1 ปี)
3. น้ำหนักร่างกาย ก่อนการวิจัย กิโลกรัม หลังการวิจัย.....กิโลกรัม
4. ส่วนสูง เซนติเมตร
5. ระดับน้ำตาลในเลือด
- | |
|-------------------------|
| ก่อนการวิจัย.....มก/ดล. |
| ระหว่างการวิจัย |
| เดือนที่ 1 มก/ดล |
| เดือนที่ 2 มก/ดล |
| หลังการวิจัย.....มก/ดล. |
6. ศาสนา ☐ 1. พุทธ ☐ 2. คริสต์ ☐ 3. อิสลาม ☐ 4. อื่นๆ ระบุ.....
7. สถานภาพสมรส ☐ 1. โสด ☐ 2. สมรส (คู่) ☐ 4. หม้าย
8. ปัจจุบันท่านประกอบอาชีพ
- ☐ 1. เกษตรกรรม (ทำไร่/ทำนา/ทำสวน)
 - ☐ 2. ค้าขาย / ธุรกิจส่วนตัว
 - ☐ 3. รับราชการ / รัฐวิสาหกิจ
 - ☐ 4. รับจ้างทั่วไป
 - ☐ 5. ไม่ได้ประกอบอาชีพ (พ่อบ้าน / แม่บ้าน)
 - ☐ 6. พนักงานห้างร้าน / บริษัท
 - ☐ 7. อื่น ๆ ระบุ.....
9. ฐานะทางเศรษฐกิจของท่านและครอบครัวต่อเดือน
- ☐ 1. ไม่พอใช้
 - ☐ 2. พอมี พอกิน ไม่เหลือเก็บ
 - ☐ 3. ไม่เดือนร้อน มีเหลือเก็บ

10. ระดับการศึกษาของท่าน

- ☐ 1. ไม่ได้เรียน
- ☐ 2. ระดับประถมศึกษา
- ☐ 3. ระดับมัธยมศึกษาตอนต้น
- ☐ 4. ระดับมัธยมศึกษาตอนปลาย
- ☐ 5. อนุปริญญา / ประกาศนียบัตร
- ☐ 6. ระดับปริญญาตรีขึ้นไปหรือเทียบเท่า
- ☐ 7. อื่น ๆ ระบุ.....

11. ส่วนใหญ่ใครเป็นผู้ประกอบอาหารให้ท่านรับประทาน

- ☐ 1. ตัวท่านเอง
- ☐ 2. บุคคลในครอบครัว
- ☒ 3. เพื่อนบ้าน
- ☐ 4. ซื้อจากร้านค้า
- ☐ 5. อื่นๆ ระบุ

12. มีใครในครอบครัวของท่านป่วยเป็นเบาหวานหรือไม่?

- ☐ 1. มี
- ☐ 2. ไม่มี (ข้ามไปตอบในข้อต่อไป)

ถ้า “มี” โปรดระบุ ความสัมพันธ์กับท่านอย่างไร?

- ☐ 1.1 พ่อ
- ☐ 1.2 แม่
- ☐ 1.3 พี่/น้อง
- ☐ 1.4 ปู่/ย่า
- ☐ 1.5 ตา/ยาย
- ☐ 1.6 น้า/อา
- ☐ 1.7 ลุง/ป้า
- ☐ 1.8 ลูก
- ☐ 1.9 อื่นๆ ระบุ

13. ท่านป่วยด้วยโรคเบาหวาน มานาน ปี เดือน

14. ท่านทราบได้อย่างไรว่าป่วยเป็นโรคเบาหวาน

- ☐ 1. จากการตรวจสุขภาพประจำปี
- ☐ 2. จากการตรวจรักษาโรคอื่น
- ☐ 3. จากการผิดปกติของร่างกาย
- ☐ 4. ปัสสาวะมีมดอม
- ☐ 5. ทานบ่อยแต่น้ำหนักลด
- ☐ 6. อื่น ๆ ระบุ.....



ส่วนที่ 2 การประเมินอันตรายของภาวะแทรกซ้อนจากโรคเบาหวาน

ข้อความ	ใช่	ไม่ใช่	ไม่ทราบ
1. ผู้ป่วยเบาหวานที่มีระดับน้ำตาลในเลือดสูงเรื้อรัง ทำให้เป็นดื้อกระจกได้			
2. โรคหัวใจเป็นภาวะแทรกซ้อนที่เกิดขึ้นได้ในเบาหวาน			
3. โรคไตเป็นภาวะแทรกซ้อนที่เกิดขึ้นได้ในเบาหวาน			
4. เบาหวานทำให้ปลายประสาทเสื่อม เกิดอาการชา ตามปลายแขนปลายขาได้			
5. ผู้ป่วยเบาหวานมักเกิดการเสื่อมของหลอดเลือดดำ เมื่อเป็นแผลที่เท้าจะหายช้าและติดเชื้อโรคได้ง่าย			
6. วิธีการรักษาผู้ป่วยเบาหวานเบื้องต้น คือการควบคุมอาหารและการออกกำลังกาย			
7. เพื่อการควบคุมระดับน้ำตาลในเลือดให้ได้ผล ผู้ป่วยเบาหวานควรกินอาหารวันละ 2 มื้อเท่านั้น คือมื้อเช้าและมื้อเย็น			
8. อาหารของผู้ป่วยเบาหวานควรปรุงได้จากการ คั้ม นึ่ง ย่าง ปิ้ง			
9. น้ำมันพืชที่ไม่เหมาะสมในการใช้ปรุงอาหาร ได้แก่ น้ำมันมะพร้าว น้ำมันปาล์ม			
10. ผู้ป่วยเบาหวานไม่ควรกินขนมหวานและน้ำตาล			
11. ผู้ป่วยเบาหวานไม่ควรกินอาหารที่มีไขมันสูง เช่น ไข่แดง กุ้ง เครื่องในสัตว์			
12. อาหารที่ผู้ป่วยเบาหวานรับประทานได้ไม่จำกัดคือผักใบเขียว			
13. ถ้ามีอาการหน้ามืด ใจสั่น คล้ายเป็นลม ควรรีบอมลูกอมทันที			
14. เมื่อมีอาการปกติ ผู้ป่วยเบาหวานสามารถหยุดรับประทานยาได้เอง			
15. ผู้ป่วยเบาหวานควรได้รับการตรวจตา จากจักษุแพทย์อย่างน้อยปีละ 1 ครั้ง			
16. ผู้ป่วยเบาหวานควรตรวจการทำงานของไตอย่างน้อยปีละ 1 ครั้ง			
17. เมื่อมีอาการเท้าชาไม่ควรแช่เท้าด้วยน้ำอุ่นหรือวางกระเป๋าน้ำร้อน			
18. ผู้ที่ป่วยด้วยเบาหวานมานาน ไม่ควรนั่งไขว่ห้าง เพื่อป้องกันเลือดไหลเวียนไม่สะดวก			

ส่วนที่ 3 การประเมินอันตรายของภาวะแทรกซ้อนจากโรคเบาหวาน

ข้อความ	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
3.1 การรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน			
1. ผู้ป่วยเบาหวานเสี่ยงต่อการเกิดโรคหลอดเลือดตีบตามส่วนต่างๆ ของร่างกาย			
2. ผู้ป่วยเบาหวานที่มีระดับน้ำตาลสูงเรื้อรังมานาน เสี่ยงต่อการเกิดหลอดเลือดแดงแข็งตัว			
3. ผู้ป่วยเบาหวานที่มีระดับน้ำตาลในเลือดสูงเรื้อรัง มีโอกาสเกิดตามัวหรือการมองเห็นเปลี่ยนแปลง			
4. ผู้ป่วยเบาหวานเสี่ยงต่อการเกิดโรคหลอดเลือดหัวใจได้ง่ายกว่าปกติ			
5. ผู้ป่วยเบาหวานที่มีระดับน้ำตาลในเลือดสูงเรื้อรังมีโอกาสรุนแรงต่อการอุดตันของหลอดเลือดได้ง่าย			
6. ผู้ป่วยเบาหวานมีโอกาสดังเกิดโรคความดันโลหิตสูงแทรกซ้อนได้ง่าย			
7. ผู้ป่วยเบาหวานมีโอกาสรุนแรงต่อการติดเชื้อได้ง่ายกว่าปกติ			
8. การสูบบุหรี่ในผู้ป่วยเบาหวาน เสี่ยงต่อการเกิดโรคไตและเส้นเลือดอุดตันได้ง่าย			
9. ผู้ป่วยเบาหวานที่สูบบุหรี่ หรือดื่มสุรา อาจทำให้สมรรถภาพทางเพศลดลง			
10. การดื่มสุราในผู้ป่วยเบาหวาน มีโอกาสเสี่ยงในการเสื่อมของเส้นประสาทส่วนปลายเพิ่มขึ้น			
3.2 การรับรู้ความรุนแรงของภาวะแทรกซ้อนจากเบาหวาน			
1. ภาวะหลอดเลือดในสมองตีบตันเป็นสาเหตุทำให้ผู้ป่วยเบาหวานเสียชีวิต			
2. ภาวะน้ำตาลในเลือดสูง ทำให้เกิดคั่งหินและตาบอดได้			
3. ภาวะน้ำตาลในเลือดสูง ทำให้เกิดต่อกระดูกได้ง่ายกว่าปกติ			
4. ผู้ป่วยเบาหวานควบคุมระดับน้ำตาลไม่ดี อาจเกิดอาการอัมพาตที่หน้า ทำให้เห็นภาพซ้อนหรือปากเบี้ยวได้			
5. ภาวะแทรกซ้อนจากโรคหัวใจเป็นสาเหตุการตายที่สำคัญของผู้ป่วยเบาหวาน			
6. ภาวะหลอดเลือดหัวใจตีบตัน ทำให้กล้ามเนื้อหัวใจตายฉับพลันในผู้ป่วยเบาหวาน			
7. ผู้ป่วยเบาหวานเกิดการติดเชื้อวัณโรคปอดได้ง่ายกว่าปกติ			
8. ผู้ป่วยเบาหวานที่ควบคุมระดับน้ำตาลไม่ดี ทำให้แผลหรือฝีหายช้า เสี่ยงต่อการถูกตัดขาได้ง่าย			
9. ภาวะหลอดเลือดส่วนขาตีบตันในผู้ป่วยเบาหวาน ทำให้เป็นอัมพาตได้			

ส่วนที่ 4 การประเมินการประเพณีปัญหาต่อการเกิดภาวะแทรกซ้อน

ข้อความ	ทำได้ แน่นอน	ทำได้	ไม่ แน่ใจ	ทำ ไม่ได้	ทำไม่ได้ แน่นอน
4.1 การรับรู้ความคาดหวังในความสามารถของตนเองด้านการควบคุมอาหารและการออกกำลังกายป้องกันภาวะแทรกซ้อน					
1. ท่านสามารถรับประทานอาหารในแต่ละมื้อให้ตรงเวลาทุกวันได้					
2. ท่านสามารถลดปริมาณ ข้าวหรือก๋วยเตี๋ยวเล็กน้อยลงกว่าเดิมได้					
3. ท่านสามารถงดการรับประทานของหวานหลังรับประทานอาหารได้					
4. ท่านไม่สามารถงดรับประทานอาหารขนมหวานหรือผลไม้รสจัดได้					
5. ท่านสามารถงดการรับประทานอาหารประเภทเครื่องในสัตว์ ลงได้					
6. ท่านสามารถงดรับประทานอาหารประเภทไขมัน เช่น ข้าวมันไก่ ข้าวขาหมู ต้มหมูพะโล้ ได้					
7. ท่านสามารถรับประทานอาหารที่มีส่วนผสมของ “กะทิ” ให้น้อยลงได้					
8. ท่านรับประทานอาหารในแต่ละมื้อยังไม่อิ่ม สามารถที่จะรับประทานผักแทนได้					
9. ท่านสามารถหลีกเลี่ยงการรับประทานขนมทานเล่นหรือของขบเคี้ยวระหว่างมื้อได้ เช่น ข้าวเกรียบทอดกล้วยทอด					
10. ท่านจะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง แทนการทอดและการผัดเสมอ					
11. ท่านสามารถดื่มน้ำเปล่า แทนเครื่องดื่มที่มีรสหวานได้					
12. ท่านสามารถหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้					
13. ท่านสามารถออกกำลังกายต่อเนื่องได้ อย่างน้อย 20 นาที					
14. ท่านสามารถออกกำลังกายอย่างน้อย 3 ครั้งต่อสัปดาห์ได้					
15. ท่านสามารถออกกำลังกายกลางแจ้ง จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้					
16. ท่านสามารถออกกำลังกายในช่วงเวลาเดียวกันของทุกวันได้					

ส่วนที่ 5 พฤติกรรมการปฏิบัติตัวด้านการควบคุมอาหารและการออกกำลังกาย

5.1 พฤติกรรมการปฏิบัติพฤติกรรมควบคุมอาหาร

คำชี้แจง ให้ผู้สัมภาษณ์ทำเครื่องหมายถูก (/) ลงในช่องการปฏิบัติตามคำตอบของผู้ถูกสัมภาษณ์

ข้อคำถาม	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ ปฏิบัติ
1. ท่านรับประทานอาหารว่างหรือของจุจกิระหว่างมื้ออาหาร			
2. ท่านรับประทานอาหารประเภท กะทิหรืออาหารมัน เช่น ข้าวมันไก่ ข้าวขาหมู เป็นต้น			
3. ท่านรับประทานขนมหวาน หรือผลไม้สุกจัด หรือรสหวาน			
4. ท่านใช้น้ำมันพืช ยกเว้น น้ำมันมะพร้าว ในการผัดหรือทอด			
5. ท่านรับประทานอาหารประเภท เครื่องในสัตว์ ไข่แดง เนื้อ สัตว์ติดมัน หนังสัตว์ เป็นต้น หรือไม่			
6. ท่านรับประทานเนื้อปลา มากกว่าเนื้อหมู เนื้อวัว			
7. ท่านรับประทานอาหารทะเล เช่น กุ้ง หอย ปลาหมึก			
8. เมื่อรับประทานอาหารเช้ายังไม่อิ่ม ท่านรับประทานผักแทน			
9. ท่านดื่มเครื่องดื่มที่มีรสหวาน หรือชา กาแฟใส่น้ำตาล			
10. ท่านดื่มเครื่องดื่มบำรุงกำลัง เช่น กระทิงแดง เป็นต้น			
11. ท่านใช้น้ำตาลในการปรุงรสอาหารหรือไม่			

5.2 พฤติกรรมการปฏิบัติตัวด้านการออกกำลังกาย

คำชี้แจง ให้ผู้สัมภาษณ์ทำเครื่องหมายถูก (/) ลงในช่องการปฏิบัติตามคำตอบของผู้ถูกสัมภาษณ์

ข้อคำถาม	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ ปฏิบัติ
1. ท่านมีการออกกำลังกายแบบวันเว้นวัน			
2. ท่านออกกำลังกายในช่วงเวลาเดียวกันหรือใกล้เคียง			
3. ท่านใช้ระยะเวลาในการออกกำลังกายอย่างน้อย 20 นาที			
4. ท่านออกกำลังกายจนเหงื่อซึมตามร่างกาย			
5. ท่านออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติ			
6. ท่านทำงานบ้าน จนเหงื่อชุ่มพอสมควร			
7. การวิ่งเหยาะ การเดิน เป็นกิจกรรมการออกกำลังกายของท่าน			

8. ปัจจุบันท่านมีการออกกำลังกาย โดยวิธีใด

9. ระยะเวลาที่ท่านใช้ในการออกกำลังกาย.....

10. เหตุใดท่านจึงมีการออกกำลังกายเป็นประจำ

11. หลังการออกกำลังกาย ท่านมีอาการผิดปกติหรือไม่ อย่างไร

Appendix B

แผนการจัดกิจกรรมสุขศึกษา ครั้งที่ 1

เรื่อง ความรู้เกี่ยวกับเบาหวาน ภาวะแทรกซ้อน และความรู้แรงภาวะแทรกซ้อนจากเบาหวานการรับรู้ความสามารถตนเองต่อพฤติกรรมกรปฏิบัติด้านการควบคุมอาหารและการออกกำลังกาย

แนวคิดหลัก

เบาหวานเป็นโรคเรื้อรังที่ไม่สามารถรักษาให้หายขาดได้ แต่สามารถควบคุมให้มีระดับน้ำตาลใกล้เคียงคนปกติได้ สามารถใช้ชีวิตเช่นคนปกติทั่วไปได้ หากรู้และเข้าใจพร้อมทั้งปฏิบัติตัวที่เหมาะสม เพื่อป้องกันภาวะแทรกซ้อนจากเบาหวานที่อาจเกิดขึ้นได้

วัตถุประสงค์ทั่วไป

เพื่อให้กลุ่มทดลองมีความรู้ความเข้าใจ และมีการรับรู้เกี่ยวกับความรู้แรงของโรคเบาหวานและภาวะแทรกซ้อน การรับรู้โอกาสเสี่ยงของการเกิดภาวะแทรกซ้อนที่ถูกต้อง อันจะส่งผลทำให้มีการปฏิบัติตัวและสามารถควบคุมระดับน้ำตาลในเลือดให้อยู่ในระดับใกล้เคียงคนปกติได้

วัตถุประสงค์เฉพาะ

1. เพื่อให้กลุ่มทดลองสามารถอธิบายถึงสาเหตุ อาการของโรคเบาหวานได้อย่างถูกต้อง
2. เพื่อให้กลุ่มทดลองสามารถอธิบายถึงความรู้แรงของโรคเบาหวานและภาวะแทรกซ้อนได้
3. เพื่อให้กลุ่มทดลองเกิดความตระหนักในตนเองว่ามีโอกาสเสี่ยงที่จะเกิดภาวะแทรกซ้อนได้
4. เพื่อให้กลุ่มค้นหาพฤติกรรมที่ไม่เหมาะสมของตนเอง และปรับปรุงแก้ไขได้
5. เพื่อให้กลุ่มทดลองสามารถบอกวิธีการออกกำลังกายที่เหมาะสมหรือไม่เหมาะสมได้

ระยะเวลา 2 ชั่วโมง เริ่มเวลา 13.00 น.

วิธีการและกิจกรรม

1. อภิปรายกลุ่ม โดยผู้วิจัยเป็นผู้ดำเนินการ กระตุ้นให้สมาชิกร่วมแสดงความคิดเห็น และสร้างบรรยากาศ ระหว่างการพูดคุยแลกเปลี่ยนประสบการณ์ ความคิดเห็น
2. สรุปโดยผู้วิจัยและกลุ่มร่วมกัน
3. แจกผลระดับน้ำตาลในเลือด เพื่อเป็นตัวกระตุ้นและชักจูงใจในการปฏิบัติ

แนวคำถาม

- ท่านรู้สึกอย่างไรเมื่อป่วยเป็นเบาหวาน
- ท่านมีวิธีการดูแลตนเองอย่างไร
- ท่านคิดว่าการที่มีระดับน้ำตาลในเลือดสูง มีผลอย่างไรต่อร่างกาย
- ท่านรู้หรือไม่ว่าเบาหวานมีภาวะแทรกซ้อน และความรุนแรง อย่างไร
- ท่านคิดว่าเบาหวานเมื่อเป็นแล้วจะป้องกันการเกิดภาวะแทรกซ้อนอย่างไร
- ท่านคิดว่าการควบคุมอาหาร มีผลดีอย่างไรกับเบาหวาน
- ท่านคิดว่าการออกกำลังกายมีผลดีอย่างไร กับเบาหวาน

การประเมินผล

1. จากการสังเกตความสนใจเข้าร่วมกิจกรรม
2. การร่วมแสดงความคิดเห็นในกลุ่ม ของสมาชิก
3. การซักถาม
4. จากแบบสัมภาษณ์

แผนการจัดกิจกรรมสุศึกษา ครั้งที่ 2

เรื่อง ความรู้เกี่ยวกับเบาหวาน ภาวะแทรกซ้อน และความรุนแรงภาวะแทรกซ้อนจากเบาหวาน
ความคาดหวังในความสามารถตนเอง และความคาดหวังในประสิทธิผลต่อพฤติกรรม
การควบคุมอาหารและการออกกำลังกาย

แนวคิดหลัก

ผู้ป่วยเบาหวาน จะสามารถควบคุมระดับน้ำตาลในเลือดให้ใกล้เคียงคนปกติได้ ต้อง
ควบคุมพฤติกรรมด้านอาหารและการออกกำลังกาย จนเป็นนิสัย เกิดความเคยชิน ซึ่งนั่น หมายถึง
ต้องมีทักษะ ความรู้ความเข้าใจ จึงจะนำไปสู่การปฏิบัติได้ และมีแบบอย่างให้เห็นว่าสามารถทำได้
จริง ทำให้เกิดความมั่นใจที่จะปฏิบัติ และเชื่อว่าเมื่อปฏิบัติแล้วเกิดผลดีกับตนเอง

วัตถุประสงค์ทั่วไป

เพื่อให้กลุ่มทดลองเกิดการรับรู้ในความสามารถของตนเองต่อพฤติกรรมควบคุมอาหาร
และการออกกำลังกาย อันจะส่งผลทำให้ระดับน้ำตาลในเลือดใกล้เคียงคนปกติ

วัตถุประสงค์เฉพาะ

1. เพื่อให้กลุ่มทดลองตระหนักในความสามารถของตนเองในพฤติกรรมควบคุม
อาหารและการออกกำลังกาย
2. เพื่อให้กลุ่มทดลองสามารถบอกถึงผลดีของการปฏิบัติตนที่ถูกต้องได้
3. กลุ่มทดลองสามารถบอกถึงผลดีในการปฏิบัติตามตัวแบบได้และนำไปปฏิบัติ
อย่างต่อเนื่อง
4. เพื่อให้กลุ่มทดลองเกิดทักษะในการปฏิบัติและเชื่อว่าตนเองสามารถปฏิบัติได้

ระยะเวลา 2 ชั่วโมง เริ่มเวลา 13.00 น.

วิธีการและกิจกรรม

1. อภิปรายกลุ่ม โดยผู้วิจัยเป็นผู้ดำเนินการ กระตุ้นให้สมาชิกร่วมแสดงความคิดเห็น และ
สร้างบรรยากาศ ระหว่างการพูดคุยแลกเปลี่ยนประสบการณ์ ความคิดเห็น
2. ทบทวนความรู้ จากครั้งที่แล้ว กระตุ้นกลุ่มให้เกิดการพูดคุยแลกเปลี่ยนเรียนรู้
3. นำเสนอตัวแบบทางบวก

4. ให้สมาชิกกลุ่มทบทวนสิ่งที่ตนเองปฏิบัติในอดีต เพื่อให้สมาชิกในกลุ่มฟัง
5. สรุปโดยผู้วิจัยและกลุ่มร่วมกัน
6. แจ้งผลระดับน้ำตาลในเลือด เพื่อเป็นตัวกระตุ้นและชักจูงใจในการปฏิบัติ

แนวคำถาม

- ท่านคิดว่ามีวิธีการใดที่จะช่วยลดระดับน้ำตาลในเลือดได้
- ท่านคิดว่าจำเป็นหรือไม่ที่ผู้ป่วยเบาหวานต้องทานยาตลอดชีวิต หรือมีวิธีการอื่นหรือไม่ อย่างไร
- ท่านคิดว่า คนที่เป็นเบาหวานสามารถดำเนินชีวิตอย่างคนอื่นได้หรือไม่ ต้องทำอย่างไร
- ท่านคิดว่าผู้ป่วยเบาหวานจำเป็นต้องใส่ใจเรื่อง อาหาร หรือไม่อย่างไร
- ท่านคิดว่าการออกกำลังกายในผู้ป่วยเบาหวาน จำเป็นหรือไม่อย่างไร
- ท่านคิดว่าจากที่เห็นตัวแบบ ปฏิบัติ ท่านสามารถปฏิบัติตามได้หรือไม่ อย่างไร
- ปัญหา/อุปสรรค ที่ผ่านมา ในการดูแลตนเอง ด้านการควบคุมอาหารและออกกำลังกาย ท่านมีวิธีการแก้ไขอย่างไร

การประเมินผล

1. จากการสังเกตความสนใจเข้าร่วมกิจกรรม
2. การร่วมแสดงความคิดเห็นในกลุ่ม ของสมาชิก
3. การซักถาม

แผนการจัดกิจกรรมสุศึกษา ครั้งที่ 3

เรื่อง ความรู้เกี่ยวกับเบาหวาน ภาวะแทรกซ้อน และความรุนแรงภาวะแทรกซ้อนจากเบาหวาน
ความคาดหวังในความสามารถตนเอง และความคาดหวังในประสิทธิผลต่อพฤติกรรม
การควบคุมอาหารและการออกกำลังกาย

แนวคิดหลัก

ผู้ป่วยเบาหวาน จะสามารถควบคุมระดับน้ำตาลในเลือดให้ใกล้เคียงคนปกติได้ ต้อง
ควบคุมพฤติกรรมด้านอาหารและการออกกำลังกาย จนเป็นนิสัย เกิดความเคยชิน ซึ่งนั่น หมายถึง
ต้องมีทักษะ ความรู้ความเข้าใจ จึงจะนำไปสู่การปฏิบัติได้ และมีแบบอย่างให้เห็นว่าสามารถทำได้
จริง ทำให้เกิดความมั่นใจที่จะปฏิบัติ และเชื่อว่าเมื่อปฏิบัติแล้วเกิดผลดีกับตนเอง

วัตถุประสงค์ทั่วไป

เพื่อให้กลุ่มทดลองเกิดการรับรู้ต่อพฤติกรรมควบคุมอาหารและการออกกำลังกาย มี
ผลทำให้ระดับน้ำตาลในเลือดลดลงใกล้เคียงคนปกติ

วัตถุประสงค์เฉพาะ

1. เพื่อให้กลุ่มทดลองสามารถบอกถึงผลดีของการปฏิบัติได้
2. เพื่อให้กลุ่มทดลองมีประสบการณ์จากการนำเสนอตัวแบบทางบวกจากกลุ่มผู้ป่วย
ด้วยกันเอง
3. เพื่อเพิ่มความคาดหวังในความสามารถของตนเองในด้านการควบคุมอาหารและ
การออกกำลังกาย
4. เพื่อให้กลุ่มทดลองมีความคาดหวังในผลดีจากการปฏิบัติด้านการควบคุมอาหาร
และการออกกำลังกาย

ระยะเวลา 2 ชั่วโมง เริ่มเวลา 13.00น.

วิธีการและกิจกรรม

1. อภิปรายกลุ่ม โดยผู้วิจัยเป็นผู้ดำเนินการ กระตุ้นให้สมาชิกร่วมแสดงความคิดเห็น และสร้างบรรยากาศ ระหว่างการพูดคุยแลกเปลี่ยนประสบการณ์ ความคิดเห็น
2. ทบทวนความรู้ จากครั้งที่แล้ว กระตุ้นกลุ่มให้เกิดการพูดคุยแลกเปลี่ยนเรียนรู้
3. นำเสนอตัวแบบทางลบ
4. ให้สมาชิกในกลุ่มเป็นตัวแบบ ด้วยกันเอง
5. ให้สมาชิกกลุ่มทบทวนสิ่งที่ตนเองปฏิบัติในอดีต เพื่อให้สมาชิกในกลุ่มฟัง
6. สรุปโดยผู้วิจัยและกลุ่มร่วมกัน
7. แจ้งผลระดับน้ำตาลในเลือด เพื่อเป็นตัวกระตุ้นและชักจูงใจในการปฏิบัติ

แนวคำถาม

- ท่านคิดว่ามีวิธีการใดที่จะช่วยลดระดับน้ำตาลในเลือดได้
- ท่านคิดว่าจำเป็นหรือไม่ที่ผู้ป่วยเบาหวานต้องทานยาตลอดชีวิต หรือมีวิธีการอื่นหรือไม่ อย่างไร
- ท่านคิดว่า คนที่เป็นเบาหวานสามารถดำเนินชีวิตอย่างคนอื่นได้หรือไม่ ต้องทำอะไร
- ท่านคิดว่าผู้ป่วยเบาหวานจำเป็นต้องใส่ใจเรื่อง อาหาร หรือไม่อย่างไร
- ท่านคิดว่าการออกกำลังกายในผู้ป่วยเบาหวาน จำเป็นหรือไม่อย่างไร
- ท่านคิดว่าจากที่เห็นตัวแบบ ปฏิบัติ ท่านสามารถปฏิบัติตามได้หรือไม่ อย่างไร
- ปัญหา/อุปสรรค ที่ผ่านมา ในการดูแลตนเอง ด้านการควบคุมอาหารและออกกำลังกาย ท่านมีวิธีการแก้ไขอย่างไร

การประเมินผล

1. จากการสังเกตความสนใจเข้าร่วมกิจกรรม
2. การร่วมแสดงความคิดเห็นในกลุ่ม ของสมาชิก
3. การซักถาม
4. จากแบบสัมภาษณ์

Appendix C

ตารางที่ 17 ร้อยละของผู้ป่วยความรู้เรื่องโรคเบาหวาน ในกลุ่มทดลอง ก่อนทดลอง หลังทดลอง และ
ระยะติดตามผล (รายข้อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง			ระยะติดตามผล		
	ใช่	ไม่ใช่	ไม่ทราบ	ใช่	ไม่ใช่	ไม่ทราบ	ใช่	ไม่ใช่	ไม่ทราบ
1. ระดับน้ำตาลในเลือดสูงเรื้อรัง ทำให้เป็นต่อ กระจก	40.0	60.0	0.0	100.0	0.0	0.0	93.3	0.0	6.7
2. โรคหัวใจเป็นภาวะแทรกซ้อน	70.0	30.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
3. โรคไตเป็นภาวะแทรกซ้อน	66.7	33.3	0.0	100.0	0.0	0.0	96.7	0.0	3.3
4. เบาหวานทำให้ปลายประสาทเสื่อม	73.3	26.7	0.0	100.0	0.0	0.0	96.7	0.0	3.3
5. เบาหวานเป็นแผลหายช้า	73.3	26.7	0.0	100.0	0.0	0.0	100.0	0.0	0.0
6. วิธีการรักษาเบาหวานเบื้องต้น คือการควบคุม อาหารและการออกกำลังกาย	70.0	30.0	0.0	90.0	10.0	0.0	93.3	6.7	0.0
7. ผู้ป่วยเบาหวานควรกินอาหารวันละ 2 มื้อ เท่านั้น	60.0	40.0	0.0	100.0	0.0	0.0	80.0	20.0	0.0
8. อาหารควรปรุงจาก ดั้ม นึ่ง ย่าง ปิ้ง	80.0	20.0	0.0	96.7	3.3	0.0	100.0	0.0	0.0
9. น้ำมันพืชที่ไม่เหมาะสม	60.0	30.0	10.0	100.0	0.0	0.0	73.3	6.7	20.0
10. ไม่ควรกินขนมหวานและน้ำตาล	83.3	16.8	0.0	100.0	0.0	0.0	96.7	3.3	0.0
11. ไม่ควรกินอาหารที่มีไขมันสูง	76.7	23.3	0.0	100.0	0.0	0.0	100.0	0.0	0.0
12. อาหารที่ทานได้ไม่จำกัดคือผักใบเขียว	83.3	16.7	0.0	100.0	0.0	0.0	100.0	0.0	0.0
13. อาการหน้ามืด ใจสั่น คล้ายเป็นลม ควรรีบอม ลูกอมทันที	66.7	33.3	0.0	100.0	0.0	0.0	86.7	0.0	13.3
14. ผู้ป่วยเบาหวานสามารถหยุดรับประทานยาได้เอง	56.7	43.3	0.0	100.0	0.0	0.0	93.3	6.7	0.0
15. ควรได้รับการตรวจตา จากจักษุแพทย์อย่างน้อย ปีละ 1 ครั้ง	50.0	50.0	0.0	100.0	0.0	0.0	86.7	0.0	13.3
16. ควรตรวจการทำงานของไตอย่างน้อยปีละ 1 ครั้ง	53.3	26.7	20.0	96.7	3.3	0.0	83.3	0.0	16.7
17. อาการเท้าชาไม่ควรแช่เท้า	10.0	90.0		100.0	0.0	0.0	66.7	30.0	3.3
18. ไม่ควรนั่งไขว่ห้าง	60.0	50.0	20.0	100.0	0.0	0.0	80.0	6.7	13.3

ตารางที่ 18 ร้อยละการรับรู้ความรุนแรงของภาวะแทรกซ้อนจากเบาหวาน กลุ่มทดลอง ก่อนทดลอง หลังทดลอง และ ระยะติดตามผล (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง			ระยะติดตามผล		
	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
1. หลอดเลือดในสมองตีบตันเป็นสาเหตุเสียชีวิต	60.0	36.7	3.3	100	0.0	0.0	86.7	13.3	0.0
2. น้ำตาลในเลือดสูง ทำให้เกิดต้อหินและตาบอด	53.4	33.3	13.3	100	0.0	0.0	100	0.0	0.0
3. น้ำตาลในเลือดสูง ทำให้เกิดต่อกระดูกได้	46.7	26.7	26.6	100	0.0	0.0	93.3	6.7	0.0
4. ควบคุมน้ำตาลไม่ดี อาจเกิดการอัมพาต	40.0	46.7	13.3	100	0.0	0.0	100	0.0	0.0
5. โรคหัวใจเป็นสาเหตุการตายที่สำคัญ	70.0	20.0	10.0	96.7	3.3	0.0	70.0	30.0	0.0
6. หลอดเลือดหัวใจตีบตัน ทำให้กล้ามเนื้อหัวใจตายฉับพลัน	66.7	20.0	13.3	100	0.0	0.0	93.3	6.7	0.0
7. เบาหวานติดเชื้อโรคปอดได้ง่ายกว่าปกติ	23.3	30.0	46.7	100	0.0	0.0	73.3	23.3	3.4
8. ทำให้แผลหรือฝีหายช้า	83.3	3.3	13.4	100	0.0	0.0	100	0.0	0.0
9. หลอดเลือดขาตีบทำให้เป็นอัมพาตได้	43.3	46.7	10.0	100	0.0	0.0	96.7	3.3	0.0

ตารางที่ 19 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน กลุ่มทดลอง ก่อนทดลอง หลังทดลอง และ ระยะติดตามผล (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง			ระยะติดตามผล		
	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
1. เสี่ยงต่อโรคหลอดเลือดตีบ	70.0	23.3	6.7	100.0	0.0	0.0	90.0	10.0	0.0
2. น้ำตาลสูงเรื้อรังมานาน เสี่ยงต่อหลอดเลือดแดงแข็งตัว	40.0	53.3	6.7	96.7	3.3	0.0	80.0	20.0	0.0
3. น้ำตาลในเลือดสูงเรื้อรัง การมองเห็นเปลี่ยนไป	90	10.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
4. เสี่ยงต่อโรคหลอดเลือดหัวใจได้ง่าย	73.3	23.4	3.3	100.0	0.0	0.0	100.0	0.0	0.0
5. ระดับน้ำตาลในเลือดสูงเรื้อรังเสี่ยงต่อหลอดเลือดอุดตัน	46.6	36.7	16.7	96.7	3.3	0.0	96.7	3.3	0.0
6. เกิดโรคความดันโลหิตสูงแทรกซ้อนได้ง่าย	70.0	20.0	10.0	100.0	0.0	0.0	100.0	0.0	0.0
7. เสี่ยงต่อการติดเชื้อได้ง่าย	63.4	23.3	13.3	100.0	0.0	0.0	86.7	10.0	3.3
8. การสูบบุหรี่เสี่ยงต่อโรคไตและเส้นซอด	46.7	46.7	6.6	100	0.0	0.0	73.3	26.7	0.0
9. สูบบุหรี่ หรือดื่มสุรา ทำให้สมรรถภาพทางเพศลดลง	53.3	40.0	6.7	9	83.3	7.7	63.1	33.3	3.6
10. การดื่มสุราเสี่ยงในการเสื่อเส้นประสาทส่วนปลาย	46.7	20.0	33.3	96.7	3.3	0.0	80.0	16.7	3.3

ตารางที่ 20 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน กลุ่มทดลอง ก่อนทดลอง(รายข้อ)

ข้อความ	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	เห็นด้วย
1. สามารถรับประทานอาหารให้ตรงเวลาได้	23.3	36.7	10.0	13.3	16.7
2. ลดปริมาณข้าวหรือก๋วยเตี๋ยวน้อยลง	36.7	23.3	13.3	16.7	10.0
3. สามารถลดการรับประทานอาหารของหวาน	36.7	46.7	3.3	13.3	0.0
4. สามารถงดผลไม้รสจัด	16.7	36.7	10.0	30.0	6.6
5. สามารถลดทานอาหารประเภทเครื่องในสัตว์ลง	30.0	66.7	3.3	0.0	0.0
6. สามารถลดรับประทานอาหารประเภทไขมัน	46.7	50.0	3.3	0.0	0.0
7. สามารถทานอาหาร “กึ่ง” ให้น้อยลง	43.3	53.3	3.4	0.0	0.0
8. ในแต่ละมื้อยังไม่อิ่ม สามารถรับประทานผักแทนได้	13.3	30.0	26.7	30.0	0.0
9. สามารถหลีกเลี่ยงขนมทานเล่นหรือของขบเคี้ยว	70.0	26.7	0.0	3.3	0.0
10. จะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง	16.7	66.6	6.7	10.0	0.0
11. ทานดื่มน้ำแทนเครื่องดื่มรสหวานได้	60.0	23.3	0.0	10.0	6.7
12. ทานหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้	83.3	10.0	0.0	0.0	6.7
13. ท่านสามารถออกกำลังกายอย่างน้อย 20 นาที	26.6	26.7	23.3	16.7	6.7
14. ท่านออกกำลังกาย อย่างน้อย 3 ครั้ง/สัปดาห์	30.0	33.3	20.0	10.0	6.7
15. ออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้	30.0	30.0	20.0	13.3	6.7
16. ท่านออกกำลังกายในช่วงเวลาเดียวกัน ได้	30.0	23.3	23.4	13.3	10.0

ตารางที่ 21 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อน
จากเบาหวาน กลุ่มทดลอง หลังทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. สามารถรับประทานอาหารให้ตรงเวลาได้	16.7	76.6	6.7	0.0	0.0
2. ลดปริมาณข้าวหรือก๋วยเตี๋ยวน้อยลง	16.7	76.6	6.7	0.0	0.0
3. สามารถลดการรับประทานอาหารของหวาน	13.3	86.7	0.0	0.0	0.0
4. สามารถงดผลไม้รสจัด	16.7	83.3	0.0	0.0	0.0
5. สามารถลดทานอาหารประเภทเครื่องในสัตว์ลง	13.3	86.7	0.0	0.0	0.0
6. สามารถลดรับประทานอาหารประเภทไขมัน	23.3	76.7	0.0	0.0	0.0
7. สามารถทานอาหาร “กึ่ง” ให้น้อยลง	13.3	86.7	0.0	0.0	0.0
8. ในแต่ละมือยังไม่อ้วน สามารถรับประทานผักแทนได้	13.3	86.7	0.0	0.0	0.0
9. สามารถหลีกเลี่ยงขนมทานเล่นหรือของขบเคี้ยว	26.7	73.3	0.0	0.0	0.0
10. จะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง	10.0	90.0	0.0	0.0	0.0
11. ทานดื่มน้ำแทนเครื่องดื่มรสหวานได้	10.0	90.0	0.0	0.0	0.0
12. ทานหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้	56.7	36.7	6.6	0.0	0.0
13. ท่านสามารถออกกำลังกายอย่างน้อย 20 นาที	13.3	83.3	3.4	0.0	0.0
14. ท่านออกกำลังกาย อย่างน้อย 3 ครั้ง/สัปดาห์	10.0	86.7	3.3	0.0	0.0
15. ออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้	10.0	86.7	3.3	0.0	0.0
16. ท่านออกกำลังกายในช่วงเวลาเดียวกัน ได้	10.0	86.7	3.3	0.0	0.0

ตารางที่ 22 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อน
จากเบาหวาน กลุ่มทดลอง ระยะเวลา (รายข้อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. สามารถรับประทานอาหารให้ตรงเวลาได้	53.3	30.0	10.0	6.7	0.0
2. ลดปริมาณข้าวหรือก๋วยเตี๋ยวน้อยลง	60.0	16.7	13.3	10.0	0.0
3. สามารถลดการรับประทานอาหารของหวาน	56.7	40.0	0.0	3.3	0.0
4. สามารถงดผลไม้รสจัด	50.0	40.0	6.7	3.3	0.0
5. สามารถลดทานอาหารประเภทเครื่องในสัตว์ลง	63.3	36.7	0.0	0.0	0.0
6. สามารถลดรับประทานอาหารประเภทไขมัน	63.3	36.7	0.0	0.0	0.0
7. สามารถทานอาหาร “กึ่ง” ให้น้อยลง	60.0	26.7	13.3	0.0	0.0
8. ในแต่ละมือยังไม่อ้วน สามารถรับประทานผักแทนได้	50.0	30.0	6.7	13.3	0.0
9. สามารถหลีกเลี่ยงขนมทานเล่นหรือของขบเคี้ยว	73.4	23.3	3.3	0.0	0.0
10. จะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง	53.3	36.7	10.0	0.0	0.0
11. ทานดื่มน้ำแทนเครื่องดื่มรสหวานได้	73.3	20.0	6.7	0.0	0.0
12. ทานหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้	66.7	20.0	10.0	3.3	0.0
13. ท่านสามารถออกกำลังกายอย่างน้อย 20 นาที	53.3	26.7	20.0	0.0	0.0
14. ท่านออกกำลังกาย อย่างน้อย 3 ครั้ง/สัปดาห์	56.7	23.3	0.0	20.0	0.0
15. ออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้	60.0	23.3	16.7	0.0	0.0
16. ท่านออกกำลังกายในช่วงเวลาเดียวกัน ได้	60.0	23.3	16.7	0.0	0.0

ตารางที่ 23 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน กลุ่มทดลอง ก่อนการทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. งดขนมหวาน ทำให้ระดับน้ำตาลในเลือดลดลง	26.3	50.4	13.3	10.0	0.0
2. ทานอาหารประเภท ข้าว แป้ง น้อยลง ช่วย ลดระดับน้ำตาลในเลือดได้	23.3	60.0	16.7	0.0	0.0
3. ทานอาหารที่มี กะทิ น้อยลงช่วยลดไขมัน	16.7	73.3	6.7	3.3	0.0
4. ทาน ปลา เนื้อไม่ติดมัน	6.7	36.7	56.6	0.0	0.0
5. หลีกเลี่ยงดื่มสุรา ป้องกันเสื่อมสมรรถภาพทางเพศ	6.7	46.7	23.3	20.0	3.3
6. การรับประทานอาหาร ผักหรือธัญพืช ช่วยลดระดับน้ำตาลในกระแสเลือด	30.0	60.0	10.0	0.0	0.0
7. ออกกำลังกายเป็นประจำทำให้น้ำตาลในเลือดลดลง	46.7	16.7	26.6	10.0	0.0
8. ออกกำลังกายเป็นประจำป้องกันโรคแทรกซ้อน	33.3	40.0	26.7	0.0	0.0
9. ออกกำลังกายอย่างน้อย 20 นาที หรือมีเหงื่อออก	20.0	40.0	23.3	16.7	0.0

ตารางที่ 24 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน กลุ่มทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. งดขนมหวาน ทำให้ระดับน้ำตาลในเลือดลดลง	53.3	46.7	0.0	0.0	0.0
2. ทานอาหารประเภท ข้าว แป้ง น้อยลง ช่วย ลดระดับน้ำตาลในเลือดได้	50.0	50.0	0.0	0.0	0.0
3. ทานอาหารที่มี กะทิ น้อยลงช่วยลดไขมัน	50.0	50.0	0.0	0.0	0.0
4. ทาน ปลา เนื้อไม่ติดมัน	50.0	50.0	0.0	0.0	0.0
5. หลีกเลี่ยงดื่มสุรา ป้องกันเสื่อมสมรรถภาพทางเพศ	46.7	53.3	0.0	0.0	0.0
6. การรับประทานอาหาร ผักหรือธัญพืช ช่วยลดระดับน้ำตาลในกระแสเลือด	50.0	50.0	0.0	0.0	0.0
7. ออกกำลังกายเป็นประจำทำให้น้ำตาลในเลือดลดลง	63.3	36.7	0.0	0.0	0.0
8. ออกกำลังกายเป็นประจำป้องกันโรคแทรกซ้อน	63.3	36.7	0.0	0.0	0.0
9. ออกกำลังกายอย่างน้อย 20 นาที หรือมีเหงื่อออก	63.3	36.7	0.0	0.0	0.0

ตารางที่ 25 ร้อยละของผู้ป่วยเบาหวานกลุ่มทดลอง จำแนกตามการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อน จากเบาหวาน กลุ่มทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. งดขนมหวาน ทำให้ระดับน้ำตาลในเลือดลดลง	86.7	13.3	0.0	0.0	0.0
2. ทานอาหารประเภท ข้าว แป้ง น้อยลง ช่วย ลดระดับน้ำตาลในเลือดได้	83.3	16.7	0.0	0.0	0.0
3. ทานอาหารที่มี กะทิ น้อยลงช่วยลดไขมัน	83.3	16.7	0.0	0.0	0.0
4. ทาน ปลา เนื้อไม่ติดมัน	73.3	16.7	10.0	0.0	0.0
5. หลีกเลี่ยงเครื่องดื่มสุรา ป้องกันเสื่อมสภาพทางเพศ	50.0	16.7	33.3	0.0	0.0
6. การรับประทานอาหาร ผักหรือธัญพืช ช่วยลดระดับน้ำตาลในกระแสเลือด	83.3	13.3	3.4	0.0	0.0
7. ออกกำลังกายเป็นประจำทำให้น้ำตาลในเลือดลดลง	80.0	20.0	0.0	0.0	0.0
8. ออกกำลังกายเป็นประจำป้องกันโรคแทรกซ้อน	80.0	20.0	0.0	0.0	0.0
9. ออกกำลังกายอย่างน้อย 20 นาที หรือมีเหงื่อออก	83.3	16.7	0.0	0.0	0.0

ตารางที่ 26 ร้อยละพฤติกรรมการปฏิบัติตัวด้านการควบคุมอาหาร กลุ่มทดลอง ก่อนทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังการทดลอง		
	ปฏิบัติสม่ำเสมอ	ปฏิบัติเป็นบางครั้ง	ไม่ปฏิบัติ	ปฏิบัติสม่ำเสมอ	ปฏิบัติเป็นบางครั้ง	ไม่ปฏิบัติ
1. ทานรับประทานอาหารว่างหรือของจุกจิก	3.3	23.4	73.3	0.0	10.0	90.0
2. ทานทานอาหารประเภท กะทิ หรืออาหารมัน	16.7	33.3	50.0	0.0	46.7	53.3
3. ทานขนมหวาน ผลไม้สุกจัดหรือรสหวาน	53.3	30.0	16.7	26.7	56.7	16.6
4. ทานใช้น้ำมันพืช	83.3	0.0	16.7	76.7	0.0	23.3
5. ทานทานเครื่องในสัตว์ ไข่แดง เนื้อสัตว์ติดมัน หนังสัตว์	23.3	53.3	23.4	0.0	43.3	56.7
6. ทานทานเนื้อปลา	53.3	23.4	23.3	53.3	40.0	6.7
7. ทานทานอาหารทะเล	0.0	26.7	73.3	0.0	6.7	93.3
8. เมื่อไม่อิ่ม ทานทานผักแทน	13.3	10.0	76.7	43.3	40.0	16.7
9. เครื่องดื่มที่มีรสหวาน หรือชากาแฟใส่น้ำตาล	23.3	20.0	56.7	3.3	30.0	66.7
10. ดื่มเครื่องดื่มบำรุงกำลัง	3.3	3.3	93.4	0.0	6.7	93.3
11. ใช้น้ำตาลปรุงรสอาหาร	16.7	13.3	70.0	10.0	10.0	80.0

ตารางที่ 27 ร้อยละพฤติกรรมการปฏิบัติตัวด้านการออกกำลังกายกลุ่มทดลอง ก่อนทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังการทดลอง		
	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ
1. ออกกำลังกายแบบวันเว้นวัน	0.0	0.0	100	33.3	6.7	60.0
2. ออกกำลังกายในช่วงเวลาเดียวกัน	30.0	6.7	63.3	50.0	3.3	46.7
3. ระยะเวลาในการออกกำลังกายอย่างน้อย 20 นาที	23.3	6.7	70.0	40.0	6.7	53.3
4. ออกกำลังกายจนเหงื่อซึม	36.7	3.3	60.0	56.6	6.7	36.7
5. ออกกำลังกาย จนหัวใจเต้นแรง	36.7	3.3	60.0	53.3	6.7	40.0
6. ทำงานบ้าน จนเหงื่อชุ่ม	56.7	16.7	26.6	90.0	3.3	6.7
7. ทานวิ่งเหยาะ การเดิน	23.3	3.4	73.3	60.0	13.3	26.7

ตารางที่ 28 ร้อยละการรับรู้ความคาดหวังในประสิทธิผลของการปฏิบัติการควบคุมอาหารและการออกกำลังกาย ป้องกันภาวะแทรกซ้อน กลุ่มเปรียบเทียบ ก่อนการทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. งดขนมหวาน ทำให้ระดับน้ำตาลในเลือดลดลง	23.3	66.7	6.7	3.3	0.0
2. ทานอาหารประเภท ข้าว แป้ง น้อยลง ช่วย ลดระดับน้ำตาลในเลือดได้	26.7	60.0	3.3	10.0	0.0
3. ทานอาหารที่มี กะทิ น้อยลงช่วยลดไขมัน	23.3	63.3	13.4	0.0	0.0
4. ทาน ปลา เนื้อไม่ติดมัน	13.3	36.7	40.0	10.0	0.0
5. หลีกเลี่ยงดื่มสุรา ป้องกันเสื่อมสภาพทางเพศ	10.0	50.0	26.7	10.0	3.3
6. การรับประทานอาหาร ผักหรือธัญพืช ช่วยลดระดับน้ำตาลในกระแสเลือด	30.0	60.0	10.0	0.0	0.0
7. ออกกำลังกายเป็นประจำทำให้น้ำตาลในเลือดลดลง	30.0	33.3	23.3	13.4	0.0
8. ออกกำลังกายเป็นประจำป้องกันโรคแทรกซ้อน	13.3	50.0	26.7	10.0	0.0
9. ออกกำลังกายอย่างน้อย 20 นาที หรือมีเหงื่อออก	16.7	33.3	33.3	16.7	0.0

ตารางที่ 29 ร้อยละการรับรู้ความคาดหวังในประสิทธิผลของการปฏิบัติการควบคุมอาหารและการออกกำลังกาย
ป้องกันภาวะแทรกซ้อน กลุ่มเปรียบเทียบ หลังการทดลอง (รายชื่อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. งดขนมหวาน ทำให้ระดับน้ำตาลในเลือดลดลง	6.7	90.0	3.3	0.0	0.0
2. ทานอาหารประเภท ข้าว แป้ง น้อยลง ช่วย ลดระดับน้ำตาลในเลือดได้	6.7	93.3	0.0	0.0	0.0
3. ทานอาหารที่มี กะทิ น้อยลงช่วยลดไขมัน	3.4	73.3	23.3	0.0	0.0
4. ทาน ปลา เนื้อไม่ติดมัน	3.3	66.7	30.0	0.0	0.0
5. หลีกเลี่ยงดื่มสุรา ป้องกันเสื่อมสภาพทางเพศ	3.3	50.0	43.4	3.3	0.0
6. การรับประทานอาหาร ผักหรือธัญพืช ช่วยลดระดับน้ำตาลในกระแสเลือด	3.3	90.0	6.7	0.0	0.0
7. ออกกำลังกายเป็นประจำทำให้น้ำตาลในเลือดลดลง	3.3	76.7	16.7	3.3	0.0
8. ออกกำลังกายเป็นประจำป้องกันโรคแทรกซ้อน	3.3	76.7	20.0	0.0	0.0
9. ออกกำลังกายอย่างน้อย 20 นาที หรือมีเหงื่อออก	0.0	73.3	26.7	0.0	0.0

ตารางที่ 30 ร้อยละการรับรู้ความคาดหวังในความสามารถของตนเองด้านการควบคุมอาหารและการ
ออกกำลังกายป้องกันภาวะแทรกซ้อน กลุ่มเปรียบเทียบ ก่อนทดลอง(รายข้อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. สามารถรับประทานอาหารให้ตรงเวลาได้	36.7	26.7	13.2	6.7	16.7
2. ลดปริมาณข้าวหรือก๋วยเตี๋ยวน้อยลง	26.7	40.0	16.7	13.3	3.3
3. สามารถลดการรับประทานอาหารของหวาน	33.3	53.3	3.3	6.7	3.4
4. สามารถงดผลไม้รสจัด	6.7	76.7	6.6	6.7	3.3
5. สามารถลดทานอาหารประเภทเครื่องในสัตว์ลง	70.0	23.3	6.7	0.0	0.0
6. สามารถลดรับประทานอาหารประเภทไขมัน	46.7	46.7	6.6	0.0	0.0
7. สามารถทานอาหาร “กึ่ง” ให้น้อยลง	46.7	53.3	0.0	0.0	0.0
8. ในแต่ละมื้อยังไม่อิ่ม สามารถรับประทานผักแทนได้	20.0	23.3	20.0	36.7	0.0
9. สามารถหลีกเลี่ยงขนมทานเล่นหรือของขบเคี้ยว	56.7	33.3	3.3	0.0	6.7
10. จะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง	13.3	66.7	13.3	6.7	0.0
11. ทานดื่มน้ำแทนเครื่องดื่มรสหวานได้	60.0	16.7	3.3	13.3	6.7
12. ทานหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้	76.7	3.3	6.7	6.7	6.6
13. ท่านสามารถออกกำลังกายอย่างน้อย 20 นาที	6.7	30.0	10.0	30.0	23.3
14. ท่านออกกำลังกาย อย่างน้อย 3 ครั้ง/สัปดาห์	10.0	33.3	13.3	23.4	20.0
15. ออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้	6.7	43.3	10.0	23.3	16.7
16. ท่านออกกำลังกายในช่วงเวลาเดียวกัน ได้	6.7	46.7	6.7	23.2	16.7

ตารางที่ 31 ร้อยละการรับรู้ความคาดหวังในความสามารถของตนเองด้านการควบคุมอาหารและการ
ออกกำลังกายป้องกันภาวะแทรกซ้อน กลุ่มเปรียบเทียบ หลังการทดลอง(รายข้อ)

ข้อความ	ทำได้แน่นอน	ทำได้	ไม่แน่ใจ	ทำไม่ได้	ทำไม่ได้แน่นอน
1. สามารถรับประทานอาหารให้ตรงเวลาได้	0.0	73.3	20.0	6.7	0.0
2. ลดปริมาณข้าวหรือก๋วยเตี๋ยวน้อยลง	3.3	76.7	16.7	3.3	0.0
3. สามารถลดการรับประทานอาหารของหวาน	76.6	0.0	16.7	6.7	0.0
4. สามารถงดผลไม้รสจัด	0.0	66.6	26.7	6.7	0.0
5. สามารถลดทานอาหารประเภทเครื่องในสัตว์ลง	0.0	73.3	26.7	0.0	0.0
6. สามารถลดรับประทานอาหารประเภทไขมัน	10.0	63.3	26.7	0.0	0.0
7. สามารถทานอาหาร “กึ่ง” ให้น้อยลง	0.0	73.4	23.3	3.3	0.0
8. ในแต่ละมื้อยังไม่อิ่ม สามารถรับประทานผักแทนได้	3.3	76.7	6.7	13.3	0.0
9. สามารถหลีกเลี่ยงขนมทานเล่นหรือของขบเคี้ยว	0.0	60.0	30.0	10.0	0.0
10. จะปรุงอาหารด้วยการนึ่ง ต้ม ปิ้งหรือย่าง	0.0	73.4	23.3	3.3	0.0
11. ทานดื่มน้ำแทนเครื่องดื่มรสหวานได้	6.7	80.0	6.7	3.3	3.3
12. ทานหลีกเลี่ยงการดื่มสุรา หรือเบียร์ได้	13.3	73.4	3.3	6.7	3.3
13. ท่านสามารถออกกำลังกายอย่างน้อย 20 นาที	0.0	36.7	40.0	23.3	0.0
14. ท่านออกกำลังกาย อย่างน้อย 3 ครั้ง/สัปดาห์	0.0	33.3	50.0	16.7	0.0
15. ออกกำลังกาย จนหัวใจเต้นแรงกว่าปกติหรือมีเหงื่อซึมตามร่างกายได้	0.0	46.7	33.3	20.0	0.0
16. ท่านออกกำลังกายในช่วงเวลาเดียวกัน ได้	0.0	30.0	50.0	20.0	0.0

ตารางที่ 32 ร้อยละการรับรู้โอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนจากเบาหวาน กลุ่มเปรียบเทียบ
ก่อนการทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง		
	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ
1. เสี่ยงต่อโรคหลอดเลือดตีบ	50.0	40.0	10.0	70.0	30.0	0.0
2. น้ำตาลสูงเรื้อรังมานาน เสี่ยงต่อหลอดเลือดแดงแข็งตัว	50.0	40.0	10.0	53.3	46.7	0.0
3. น้ำตาลในเลือดสูงเรื้อรัง การมองเห็นเปลี่ยนไป	90.0	6.7	3.3	86.7	13.3	0.0
4. เสี่ยงต่อโรคหลอดเลือดหัวใจได้ง่าย	53.3	23.3	23.4	80.0	16.7	3.3
5. ระดับน้ำตาลในเลือดสูงเรื้อรังเสี่ยงต่อหลอดเลือดอุดตัน	50.0	36.7	13.3	66.6	26.7	6.7
6. เกิดโรคความดันโลหิตสูงแทรกซ้อนได้ง่าย	66.7	23.3	10.0	73.3	20.0	6.7
7. เสี่ยงต่อการติดเชื้อได้ง่าย	43.3	36.7	20.0	86.7	10.0	3.3
8. การสูบบุหรี่เสี่ยงต่อโรคไตและเส้นซอก	26.7	33.3	40.0	66.7	26.7	6.7
9. สูบบุหรี่ หรือดื่มสุรา ทำให้สมรรถภาพ ทางเพศลดลง	30.0	36.7	33.3	46.7	50.0	3.3
10. การดื่มสุราเสี่ยงในการเสื่อเส้นประสาทส่วนปลาย	43.3	30.0	26.7	90.0	10.0	0.0

ตารางที่ 33 ร้อยละการรับรู้ความรุนแรงของภาวะแทรกซ้อนจากเบาหวาน กลุ่มเปรียบเทียบ ก่อนการทดลอง
หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง		
	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ
1. หลอดเลือดในสมองตีบตันเป็นสาเหตุเสียชีวิต	30.0	50.0	20.0	73.3	20.0	6.7
2. น้ำตาลในเลือดสูง ทำให้เกิดต้อหินและตาบอด	53.3	16.7	30.0	90.0	10.0	0.0
3. น้ำตาลในเลือดสูง ทำให้เกิดต่อกระดูกได้	30.0	23.3	46.7	83.3	16.7	0.0
4. ควบคุมน้ำตาลไม่ดี อาจเกิดอาการอัมพาต	46.7	20.0	33.3	90.0	6.7	3.3
5. โรคหัวใจเป็นสาเหตุการตายที่สำคัญ	43.3	36.7	20.0	56.7	43.3	0.0
6. หลอดเลือดหัวใจตีบตัน ทำให้กล้ามเนื้อหัวใจตายฉับพลัน	33.3	33.3	33.4	46.7	46.7	6.6
7. เบาหวานติดเชื้อโรคปอดได้ง่ายกว่าปกติ	16.7	23.3	60.0	40.0	40.0	20.0
8. ทำให้แผลหรือฝีหายช้า	66.7	3.3	30.0	93.3	6.7	0.0
9. หลอดเลือดขาตีบทำให้เป็นอัมพาตได้	46.7	20.0	33.3	96.7	3.3	0.0

ตารางที่ 34 ร้อยละความรู้เรื่องโรคเบาหวาน กลุ่มเปรียบเทียบ ก่อนการทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังทดลอง		
	ใช่	ไม่ใช่	ไม่ทราบ	ใช่	ไม่ใช่	ไม่ทราบ
1. ระดับน้ำตาลในเลือดสูงเรื้อรัง ทำให้เป็นต้อกระจก	30.0	70.0	0.0	90.0	6.7	3.3
2. โรคหัวใจเป็นภาวะแทรกซ้อน	50.0	50.0	0.0	80.0	6.7	13.3
3. โรคไตเป็นภาวะแทรกซ้อน	43.3	56.7	0.0	80.0	6.7	13.3
4. เบาหวานทำให้ปลายประสาทเสื่อม	66.7	33.3	0.0	90.0	10.0	0.0
5. เบาหวานเป็นแผลหายช้า	63.3	36.7	0.0	93.3	6.7	0.0
6. วิธีการรักษาเบาหวานเบื้องต้น คือการควบคุมอาหารและการออกกำลังกาย	76.7	23.3	0.0	80.0	3.3	16.7
7. ผู้ป่วยเบาหวานควรกินอาหารวันละ 2 มื้อเท่านั้น	63.3	36.7	0.0	33.3	40.0	26.7
8. อาหารควรปรุงจาก ต้ม นึ่ง ย่าง ปิ้ง	83.3	16.7	0.0	53.3	13.3	33.4
9. น้ำมันพืชที่ไม่เหมาะสม	60.0	33.3	0.0	76.7	13.3	10.0
10. ไม่ควรกินขนมหวานและน้ำตาล	63.3	36.7	6.7	76.7	20.0	3.3
11. ไม่ควรกินอาหารที่มีไขมันสูง	50.0	50.0	0.0	60.0	20.0	20.0
12. อาหารที่ทานได้ไม่จำกัดคือผักใบเขียว	93.3	6.7	0.0	96.7	3.3	0.0
13. อาการหน้ามืด ใจสั่น คล้ายเป็นลม ควรรีบอมลูกอมทันที	73.3	26.7	0.0	90.0	6.7	3.3
14. ผู้ป่วยเบาหวานสามารถหยุดรับประทานยาได้เอง	56.7	43.3	0.0	50.0	33.3	16.7
15. ควรได้รับการตรวจตา จากจักษุแพทย์อย่างน้อยปีละ 1 ครั้ง	60.0	40.0	0.0	50.0	13.3	36.7
16. ควรตรวจการทำงานของไตอย่างน้อยปีละ 1 ครั้ง	60.0	26.7	13.3	56.7	6.6	36.7
17. อาการเท้าชาไม่ควรแช่เท้า	10.0	90.0	0.0	66.7	20.0	13.3
18. ไม่ควรนั่งไขว่ห้าง	13.3	60.0	26.7	80.0	13.3	6.7

ตารางที่ 35 ร้อยละพฤติกรรมกรรมการปฏิบัติตัวด้านการควบคุมอาหาร กลุ่มเปรียบเทียบ ก่อนทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังการทดลอง		
	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ
1. ท่านรับประทานอาหารว่างหรือของจุกจิก	13.3	23.3	63.4	6.7	30.0	63.3
2. ท่านทานอาหารประเภท กะทิ หรืออาหารมัน	0.0	16.7	83.3	3.3	40.0	56.7
3. ท่านขนมหวาน ผลไม้สุกจัดหรือรสหวาน	63.3	26.7	10.0	10.0	50.0	40.0
4. ท่านใช้น้ำมันพืช	90.0	3.3	6.7	66.7	20.0	13.3
5. ท่านทานเครื่องในสัตว์ ไข่แดง เนื้อสัตว์ ดิมนั่น หนังกุ้ง	23.3	23.3	53.4	6.7	76.7	16.6
6. ท่านทานเนื้อปลา	80.0	10.0	10.0	83.3	13.3	3.4
7. ท่านทานอาหารทะเล	0.0	0.0	100	20.0	43.3	36.7
8. เมื่อไม่อิ่ม ท่านทานผักแทน	16.7	13.3	70.0	66.7	26.7	6.6
9. เครื่องดื่มที่มีรสหวาน หรือชา กาแฟใส่น้ำตาล	26.7	13.3	60.0	23.3	33.3	43.4
10. ดื่มเครื่องดื่มบำรุงกำลัง	3.3	3.3	93.4	6.6	6.7	86.7
11. ใช้น้ำตาลปรุงรสอาหาร	10.0	6.7	83.3	6.7	20.0	73.3

ตารางที่ 36 ร้อยละพฤติกรรมกรรมการปฏิบัติตัวด้านการออกกำลังกายกลุ่มทดลอง ก่อนทดลอง หลังการทดลอง (รายชื่อ)

ข้อความ	ก่อนทดลอง			หลังการทดลอง		
	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ	ปฏิบัติ สม่ำเสมอ	ปฏิบัติเป็น บางครั้ง	ไม่ปฏิบัติ
1. ออกกำลังกายแบบวันเว้นวัน	0.0	0.0	100	13.3	36.7	50.0
2. ออกกำลังกายในช่วงเวลาเดียวกัน	6.7	0.0	93.3	20.0	36.7	73.3
3. ระยะเวลาในการออกกำลังกายอย่างน้อย 20 นาที	6.7	0.0	93.3	33.3	36.7	30.0
4. ออกกำลังกายจนเหงื่อซึม	16.7	0.0	83.3	43.3	33.3	23.4
5. ออกกำลังกาย จนหัวใจเต้นแรง	6.7	0.0	93.3	20.0	53.3	26.7
6. ทำงานบ้าน จนเหงื่อชุ่ม	46.7	20.0	33.3	90.0	10.0	0.0
7. ท่านวิ่งเหยาะ การเดิน	13.3	3.3	83.4	76.7	13.3	10.0



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

Title of Project: The Effectiveness of a Health Education Program for Blood Sugar Control among Diabetes Mellitus Type II Patients Attending Primary Care Unit Khaojetlook, Tabkhor District, Pichit Province

Principal Investigator: Mr. Adisai Srithong

Name of Institution: Faculty of Public Health

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman:

(Professor Dr. Srisin Khusmith).

Signature of Head of Institute:

for (Professor Dr. Pornchai Matangkasombut)

Date of Approval: 25 JUN 2003

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