CHAPTER II

PROJECT DESCRIPTION

2.1 Rational

2.1.1 Diabetes Melletus

Diabetes is an incurable chronic condition. which leads to several major complications; especially vascular disease, heart disease, eye disease (retinopathy), kidney disease (nephropathy) as well as nerve disease (neuropathy). The risk of blood vessels disease in people with diabetes is two or three times greater than the risk in those without (Department of Medical Services, Ministry of Public Health, 2001). In addition, diabetes can gradually damage patients' health causing acute and chronic symptoms and, as a result, it brings on depression to many diabetic patients. This can be considered as the loss in economic for society as a whole as diabetes is a life-long condition and its treatment consumes a lot of time, human resource and expenses (Supawan Manosuwan, 1999: 9)

Diabetes is a metabolic disease which causes high glucose levels in the blood because of abnormal production of insulin or inadequate sensitivity of cells to the action of insulin, or both. There are two main types of diabetes; type 1 and type 2. Type 1 diabetes occurs when the immune system attacks and destroys the beta cells in the pancreas. Mostly, autoimmune factor is primarily involved in the development of this type of diabetes and there are just only a few cases which the cause of this disorder

cannot be identified. Type 1 diabetes can appear at any age, ranging from babies to adults aged 80-90 years. Type 2 diabetes is the most common form of diabetes which occurs due to insulin resistance together with abnormal insulin production in the pancreas. Approximately 90 to 95 percent of people with diabetes have type 2, and most of them are overweight. However, up to present, the exact cause of this type of diabetes is yet unknown (Chaichang Deerotwong, 2000: 6).

There are approximately 2,706 people residing in Tambol Rai Lug Thong, Panatnikhom district in Chonburi province. These days diabetes is becoming one of major public health problems and the seriousness of this prom tends to be increasing every year in this area. That prevalence of diabetic patients reported in 1998 was 1.55% and the death rate due to diabetes and complications was 7%. In 1999, the prevalence increased to 3.3% and the death rate soared to 11.7%. Moreover, in 2000 the prevalence and mortality rates of diabetes and complications climbed up to 4.45% and 28.5% respectively. All these patients were found to develop type 2 diabetes and they all were over 40 years of age (Health Center of Tambol Rai Lug Thong, Report, 2000). It was relatively high comparing with 2.5-6% prevalence of diabetes at the national level (Vitaya Sridama, quoted in Kemmaratsami Khunmegrai, 1998:14)

Risk factor

Risk factors for type 2 diabetes are various; such as, age, obesity and lack of exercises and type 2 diabetes is more common in women than men, especially in women who have a previous history of Gestational Diabetes Mellitus (GDM). Type 2 diabetes can also develop frequently in women who have both high blood pressure and

high cholesterol. In addition, Type 2 diabetes is associated more with a family history of diabetes than type 1. The following is a review of documents concerning risk factors of diabetes;

Age: Wimolrat Chucharoen (1997) pointed out that type 2 diabetes frequently occurred in adults over the age of 40. It is in accordance with an epidemiological report of Department of Medical Services, Ministry of Public Health (2001) which stated that the possibility of developing type 2 diabetes increased with age as it was found that 10% of people over the age of 40 were diagnosed with type 2 diabetes and 18.4% in people age over 65.

Obesity: Supaporn Thanakietwaree (1988) reported that obesity could cause a condition called "insulin resistance" due to the reason that fat can resist insulin. Overweight people, thus, are prone to develop diabetes 3 times more easily than the general population. Consequently they would have insulin resistance (a disorder in which target tissues muscle, fat and liver cell fail to use insulin effectively) and proceed to develop type 2 diabetes. With the onset of insulin resistance, the pancreas compensates by producing more insulin (Diabetes Prevention Program: DPP, 2001). In the United States, more than 80% of diabetic patients are overweight. People whose BMI is greater than 30 have a five-fold greater risk of diabetes than people with normal BMI of 25 or less (National institute of diabetes and Digestive and Kidney Disease: NIDDK, 2001).

Lack of exercises: Department of Medical Services (2001) reported in 2001 that people who hardly had exercises tended to develop diabetes 2-4 times higher than those who had exercises regularly. The data of the Nurses' Health Study, in comparison to women who had very minimal exercise for the period of 8 years, the risks of developing type 2 diabetes of women who had regular activities were reduced by 41%. Similarly, women who were initially inactive and had no activities, their risks of developing diabetes were reduced by 29% after they started and continued having regular activities thereafter. (Jama 1999, quoted in Department of Medical Services, Ministry of Public Health)

Gender: The Committee of non-communicable diseases (1995) reported that women were at risk of developing diabetes two times higher than men, particularly women who had a prior history of Gestational Diabetes Mellitus (GDM). This was in accordance with a study conducted by Wimolrat Chucharoen (1999) which found that women had a higher incidence of diabetes.

High blood pressure and blood lipid abnormality: Both are associated with the development of type 2 diabetes, however, most patients do not come for treatments, because blood sugar increases so gradually that the persons do not feel having any abnormal symptoms. In order to diagnose type 2 diabetes, fasting plasma glucose must be applied in the diagnostic procedure (Chaichang Deerotwong, 2000:11).

Family history of diabetes: People are at higher risk if there is a history of diabetes in any members in their family (American Diabetes Association: ADA, 2001).

Petch Rodaree (1999) reported that people with a family history of diabetes were 10 times more risky of developing diabetes than those without.

Prevention

The strategies for the prevention and treatment of diabetes prevention should be implemented in three levels. Firstly, the "primary prevention" to prevent the development of diabetes, especially in high-risk people. Secondly, the "secondary prevention" to delay the progression of the disease by health promotion using the measures available, which include the diagnosis of this disease in patients who do not have any symptoms so that they would receive appropriate treatments from the beginning. And thirdly, the "tertiary prevention" to prevent and delay the development of complications and disability caused by diabetes (Suppawan Manosuthorn, 1999:119). However, the most effective strategy to reduce the impact of diabetes is to prevent people from developing the disease (www.dsdph. wsahs.nsw.gov.av/project/ diabetes.htm). Diabetes prevention in high-risk group in particular is currently a popular topic in research studies. Obesity and sedentary lifestyle are known to increase the risk of both insulin resistance and type 2 diabetes (Diabetes Prevention program: DPP, 2001).

Changing or adjusting behaviors and lifestyle in regard to diet and exercise would help preventing or delaying the disease development. Several studies showed that appropriate health promotion, knowledge about diabetes, attitude changes and adjustment of eating and exercise habits can decrease the risk of diabetes in high-risk groups. Small studies in China and Finland have shown that diet and exercise can delay

the development of type 2 diabetes in risky people (National Institute of Diabetes and Digestive and Kidney Disease: NIDDK, 2001).

Medical and health checkup also prevents the disease before any symptom occurs. It is economical and yields good results. This is especially true for people at risk of diabetes who should have medical health checkup beforehand. Even with a blood sugar test (done before meals) that gives the result of high level for once, the possibility to have diabetes is greater than 30% in the further period of 5-10 years (Department of Medical Services, Ministry of Public Health, 2001). However, most people tend to ignore it because of two reasons; they fear to know about of diseases that are hiding inside them or they are too lazy (Charueyporn Thoranin, 1995, Theera Siriarchawattna, 1997 quoted in Kularp Rattanasatjathum, 1999: 43). In Thailand, it is found that the number of people in their 35-59 years of age who paid attention to their own health was not exceeding 50%, most of which only had blood pressure taken, blood test and urinary analysis. In 1991 it was found that less than 15% of diabetic patients undertook treatments (Department of Medical Services, Ministry of Public Health, 2001).

At the time of reporting period, 1,061 people in Tambol Rai Lug Thong were over 40 years of age or, in other words, 39.2% of the population were at risk of developing diabetes. As Dr. Vitune Sangsingkao quoted in the Report of the Second Chronic Communicable Disease Conference (1995: 31) that people at risk of developing diabetes usually lacked of awareness knowledge and information about the disease. They also lacked skills on how to get access to necessary health services as a measure of their self-care when they were in risky conditions or had illnesses.

Therefore, the objective of this project was to prevent and slow down the development of diabetes in the high-risk group in Tambol Rai Lug Thong. To achieve this goal or objective, the following strategies were used. Firstly, the screening strategy to identify persons at risk of diabetes in the population who were over 40 years of age. Secondly, the referral strategy to refer patients for treatment. The third strategy used was health promotion strategy to change health behaviors in diet and exercise.

The purpose of the screening was to identify asymptomatic individuals who were likely to have diabetes. Risk factors for diabetes included family history, obesity, a previous history of gestational diabetes, high blood pressure and blood lipid abnormality. The most commonly used screening tests was fasting blood sugar (FBS). Patient referral for treatment was a process of passing a patient to undertake a treatment in a hospital when the patient was diagnosed with diabetes in order to prevent various possible complications.

Health promotion was motivated by the desire to increase well-being and the actualization of human health potential (Pender, 1996:7). High-risk group of people whose blood results were normal would be encouraged to be educated on health promotion. They would receive information about diet and exercise. Physical exercise training program was a method to change people's behaviors in order to minimize the risk of developing diabetes. It was an effective way in the aspect of cost-effectiveness, especially when it was compared with the costs of nursing care services (Suppawan Manosoonthorn, 1999:122).

This project involved public health volunteers to assist in the screening of high-risk people because they got acquainted and knew how to reach the underprivileged better than the staff (Suwannachai Wattanayungjaroenchai, 2000: 23). The volunteers would refer high-risk people to have blood tested as a screening diagnosis.

Continuous "proactive" cares comprised of the screening and providing health education for people in high-risk group, and the early diagnosis made in the early stage of disease development in order to prevent complications and to rehabilitate conditions of patients. If this "proactive" cares could be practiced in full cycle, it would yield the result in the intermediate term of 3-5 years that the behaviors risky to develop diabetes would be reduced. The result of this immediate term would extend to the long-term result (period of longer than 5 years) that the diabetic incident rate would be slowed down and decreased (Department of Medical Services, Ministry of Public Health, 1999).

2.2 Goal and Objectives

The goal of this program was the intention to decrease or delay the development of type 2 diabetes in people over the age of 40. The main objectives of this project were:

1. To increase knowledge of diabetes among people in high-risk groups.
2. To encourage high-risk group to have more exercises and diets control.

2.3 Methods

2.3.1 Setting and participants

The Type 2 Diabetes Prevention Program (T2DPP) were implemented in Tambol Rai Lug Thong, Panatnikhom district, Chonburi province. The high-risk group of diabetes was defined as people who met one of the following criteria; being over than 40 years of age, overweight and having Body Mass Index (BMI) greater than 25, having a family history of diabetes, having high blood pressure and high cholesterol or being female with a prior history of Gestitional Diabetes Mellitus (American Diabetes Association: ADA, 2001).

2.3.2 Framework for Health Promotion and Diabetes Prevention

The organizing framework for the study was based on Health Promotion Model (HPM) of Pender (1996), which was originated from the expectancy-value theory and the social cognitive theory. The HPM was developed to provide a framework for predicting health promoting behaviors. The model sought to explain individual characteristics and experiences as well as how behavior-specific cognitions and affects influenced these behavioral outcomes.

According to Pender (1996), there are two types of individual characteristics and experiences that affect behavioral outcomes. The first is the prior related behaviors that an individual possesses. The second is personal characteristics comprising of biological, psychological, and socio-cultural experiences. These individual characteristics and

experiences interact with interpersonal and situational influences to shape the behavioral outcomes.

In addition, there are four behavior-specific variables that have equal important influence upon behavioral outcomes. These four variables are the *perceived benefits to action, perceived barriers to action, perceived self-efficacy,* and *activity-related affect.* The variables in combination with interpersonal and situation influences are the *interpersonal* and *situation.* Influences were the ingredients for an individual's commitment to the plan of action. Hopefully, an individual's commitment to the plan of action would result in a health-promoting behavior. Unfortunately, the resulting health promoting behavior was dependent upon *immediate competing demands*, over which an individual had *low control* and preferences, and over which an individual had a *higher level of control* , as presented in Figure 2.1

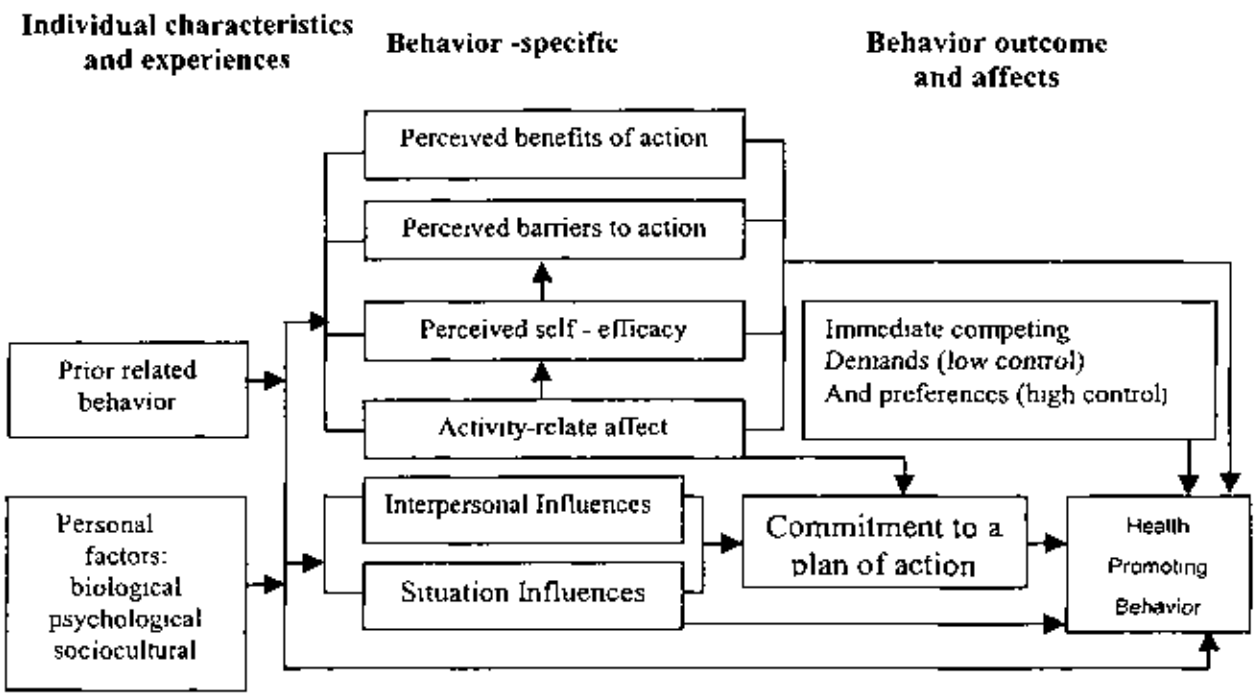

Figure 2.1: Health Promotion Model (HPM) (Pender, 1996: 6)

Pender's theory of health promotion was applied in this project as a conceptual framework of health promotion for behavior modification. And from the literature review, the following were relevant variables:

Individual characteristics, which are gender, ages, education, body mass index, income and the self-health awareness.

Perceived benefits of action -- the most important variable among sub-factors. It means that if an individual thinks health promotion is good and useful, he/she can take care of his/herself correctly (Backer, 1974 quoted in Kanchana Kadkang 1999: 4).

Barriers or obstacles to action – These must be perceived so that solutions would be investigated so as to avoid the barriers (Bandura, 1997 quoted in Wandee Yamchangchai, 1995: 6).

Self-efficacy – This is a vital incentive in behavior modification which a person thinks that he/she is capable of doing things.

Mutual commitment to proceed action activities together -- emphases that group members participate in making the plans together which would lead to *health promoting behaviors* on diet and physical exercises to minimize the development of type 2 diabetes.

The researcher was interested in using these variables in this study in order to change behaviors of the high-risk group. (Figure 2)

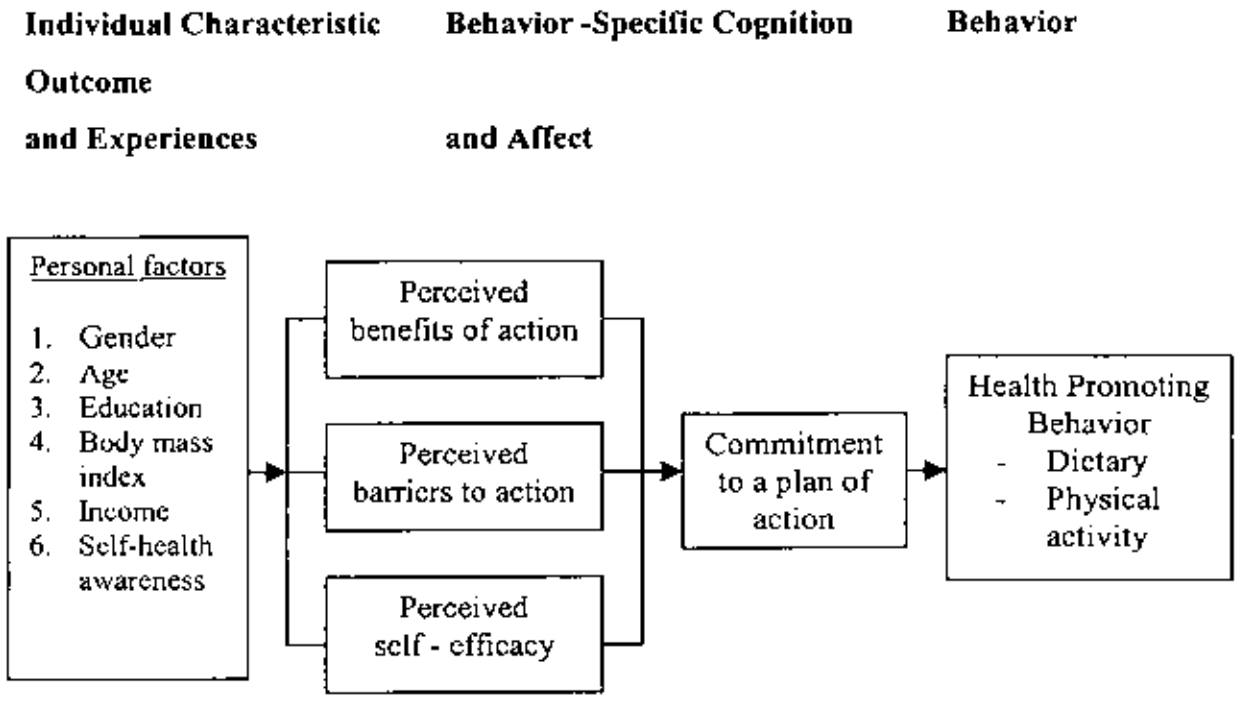

Figure 2.2: Framework of Prevention of Type 2 Diabetes for High-Risk People (Modified from Health Promotion in nursing practice, Pender,1996)

Health promotion and diabetes prevention were focused on activities that were easy to remember. Educating people basing on well-designed teaching plans would help making it easier for health education to be conducted successfully and achieve its objectives (Prapapenn Suwan, 1995). Pamphlets were distributed to participants for their further study which would stimulate them to review the content again resulting that they could practice and follow the instructions much better (Becker, 1974 quoted in Kularp Ratanasatjathum, 1998:18). Educating people *as a group* on diet and exercise helped arousing the interests of participants and creating interaction among them.

Consequently, they felt more relaxed to ask questions, which made them learn more knowledge and understand how to practice themselves better (VAN Hoozer L. et. al., 1987 quoted in Sumittra Sitthirit, 1999: 118-125). Physical exercise activities were arranged so that participants became acquainted to each other and had more interactions, which made them have more confidence to practice (Department of Physical Education, Guidebook of Exercise for Health: 95).

2.3.3 Intervention program

The planning process involved 4 steps.

Step 1 Developing a team

Staff in the Health Center and those in Panatnikhom Hospital had a meeting to develop and design coordinating mechanisms for a team of staff members involved in the process of patient referral from the Health Center. They also designed training programs for staff in each level. All staff in the Health Center of Tambol Rai Lug Thong attended a training program on December 20, 2001, organized by a group of experts from Panatnikhom Hospital on diabetic prevention, control and treatments, how to use Glucometer for checking blood sugar and patients referral process for treatments.

On December 25, 2001, public health volunteers were trained by a health team on diabetes and diabetes prevention, how to use the screening test, referral process and how to give advice about self-care prior to the blood test.

Step 2 Screening (December 2001 - January 2002)

This step was aimed to search for people at risk of diabetes who were over 40 years of age. Public health volunteers were responsible to proceed with the screening procedure. The screening test was applied from the one of the American Diabetes Association (ADA). (Figure 3) Risk factors consisted of obesity, lack of exercise, a history of diabetes during pregnancy (for women), a family history of diabetes, having high blood pressure and high cholesterol. This test was examined for validity by five credible experts. Out of 1,061 persons (over 40 years of age) screened, 441 were found to be at risk of developing diabetes. 219 of them had one risk factor, 146 had two risk factors, 55 had three risk factors and 21 had four or more risks for DM (Table 1). Health volunteers referred them to the Health Center to be checked for Fasting Blood Sugar, totaling 241 persons

After screening by measurement of FBS, 14 new cases of diabetes cases were identified and referred to a hospital for treatments. Their glucose levels were higher than 126 mg/dl (the diagnosis required confirmation by a second test). However, the glucose levels of 227 persons were less than 126 mg/dl. Staff asked 441 people who were found to be at risk whether they would like to participate in this program and 65 persons were interested in participating. However the number of persons who volunteered to join the activities throughout the program period was 49 participants (11%) and 392 non-participants (89%), 20% of non-participants had the ages ranged from 41-50 years, 22% of them had the ages ranged from 51-60 years, 19% of them ranged from 61-70 years and 30% were over 70 years. The genders of non-participants were distributed as 66% for females and 34% for males.

After the training was over, there were 14 more people who requested to participate in the program as well. They were welcomed to enroll but their data were not included in the data processing process.

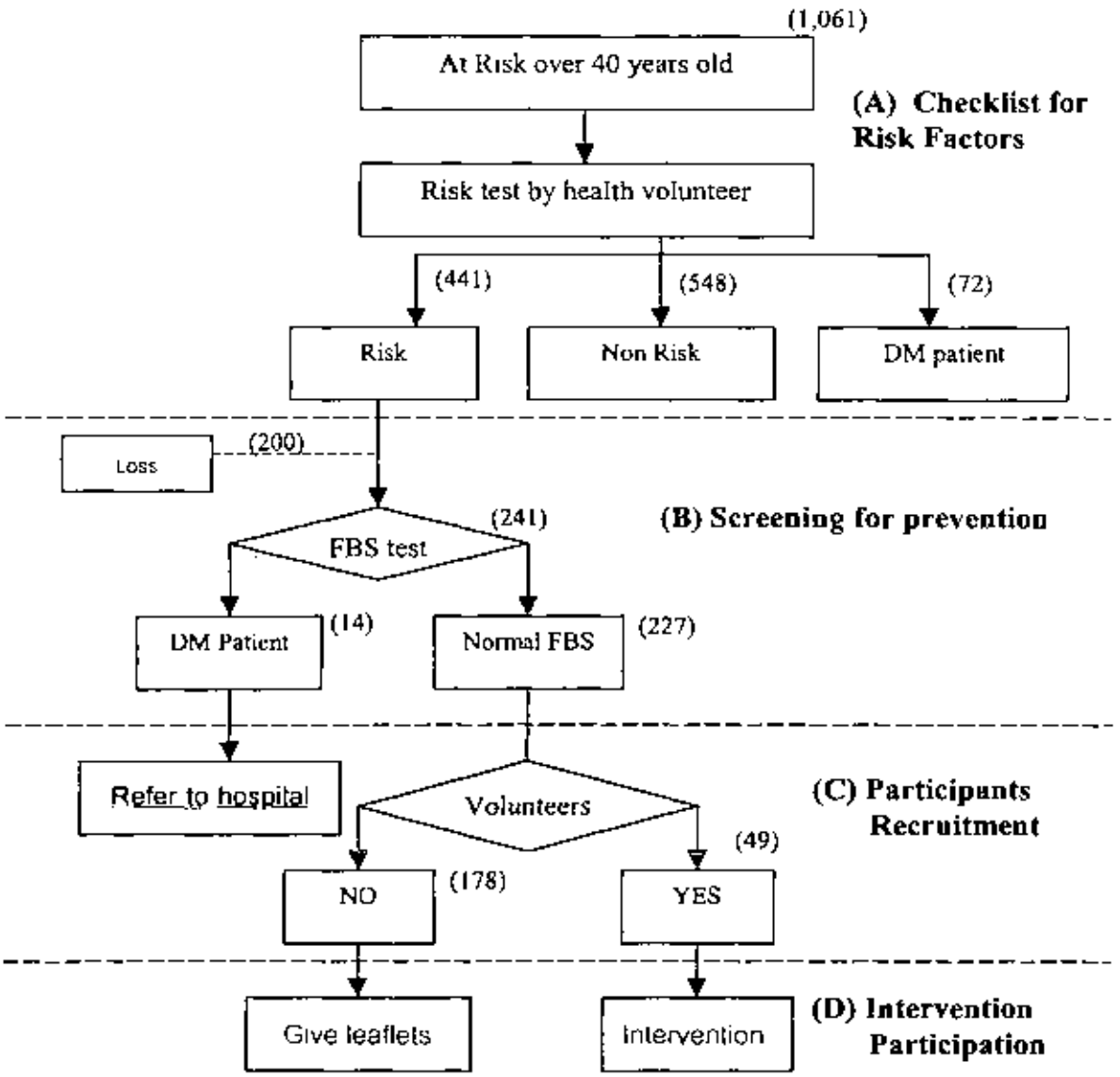

Figure 2.3: Screening high-risk Group of type 2 diabetes

The subjects who did not volunteer to participate in the project were educated with general oral and written information about diet and exercise (a two-page leaflet).

The subjects in the target group were given detailed advice about how to achieve goals of the intervention, which were weight reduction, decrease fat and saturated fat intakes, increase fiber intake (vegetable and fruits) and moderate exercise for at least 30 minutes per day, three time per week. For persons at risks who had volunteered, they also were measured for total cholesterol and received recommendations on the practice to prevent diabetes. They would be followed up for the diabetes prevalence after the end of program annually for five years.

Table 2.1: Risk factor of people over 40 years old in Tambol Rai lug thong (n=441)

Item	Female n (%)	Male n (%)	Total n (%)
Lack of exercise	204(46.3)	77(17.4)	281(63.7)
Age> 60	131(29.7)	57(12.9)	188(42.6)
Overweight (BMI>25)	137(31.0)	46(10.4)	183(41.5)
Hypertension	109(24.7)	53(12.0)	162(36.7)
Family history	62(14.1)	30(6.8)	92(20.9)
High Cholesterol	30(6.8)	13(2.9)	43(9.8)
Gestational diabetes	2(0.5)	0	2(0.5)
Total	299(67.8)	142(32.2)	441(100)

Step 3 Intervention

Two-stage activity was arranged for participants as follows;

Stage 1 Activities were organized for five consecutive days and it took two hours a day in the morning for each activity, from 9.00 to 11.00 hours. The following are details of each activity organized during January 21 - 25, 2002.

Day 1:

Staff summarized risk factors of each participant based on the screening test and recorded it on a book which was distributed to each participant individually in order that each of them knew about his/her own health status. Unavoidable factors; gender, age, genetics, obesity and avoidable factors; dietary and lack of exercise were listed in the individual book (Supawan Manosuthorn, 1999) so that they could make plans to change their behaviors to avoid risky conditions and the staff informed them about agendas of the next days. Their blood pressures were taken and recorded.

Day 2:

Health educators from Panatnikhom Hospital provided information basing on teaching plans about diabetes; such as, its degree of seriousness, benefits of diabetes prevention, etc. Participants received leaflets on diabetes so they could study and go over it at home.

Day 3:

A dietician gave a lecture on food that the group should be control, the appropriateness and obstacles of diet control, as well as the questioning – answering session. The dietician also demonstrated how to prepare a meal and

gave recommended recipes which participants could prepare in their daily lives. Leaflets about dietary were distributed to participants for them to study and go over it.

Day 4:

A physical lecture on aerobic exercise to prevent diseases was given emphasizing degree of rigor, duration and frequency. The exercise VDO on Thai folk dancing from four regions, which was simple and easy for Thais was used. (Office of Health Promotion, Department of Health, Ministry of Public Health, 2001) The speaker recommended the guide of practice that people must exercise as well as control the food at the same time. People may choose exercising methods alternately as appropriate. They may be dancing / exercising to Disco music, exercise Yoga or by jogging. There was a demonstration of aerobic exercising to music. The participants was asked to exercise simultaneously as the preparation for further exercises.

Day 5:

Staff and participants had a group meeting to make agreements about practices with the purpose to change behaviors. This activity was planned in accordance with a concept that individuals would change their behaviors if he/she was involved in process to solve his / her problems and to set his/her goals (Prapapen Suwan, 2000: 51). In addition, self-efficacy was the theory of internal behavior modification which consisted of faith in one' s own capability

and the expectation of the result (Bandura, 1977 quoted in Sompotch Eamsuphasit, 1997: 58).

Stage 2 Began right after the end of the first stage. (25 January 2002-25 April 2002)

Physical activity:

Participants exercised about 40 minutes everyday from Monday to Friday for three months at the front of Health Center of Tambol Rai Lug Thong and they were required to attend the exercise at least three times per week. American Diabetes Association has recommended 20 to 45 minutes of aerobic exercise at least three time a week. In addition, Office of Health Promotion, Ministry of Public Health also suggests people to exercise at least 20-30 minutes a day for at least three days a week., which is good for health. The researcher was the leader in the exercise in order to increase interaction and confidence in the group (Guidebook of Exercise for Health: 95-113) Aerobics is the most efficient exercise which improves capacity of oxygen consumption. It is also good for lung, heart and blood vessels and it can burn glucose and fats. (Sek Akranukrong ,1997; 27)

Nutrition demonstration:

Nutrition demonstration for health was organized once a month. Participants were divided into 6 groups (8 persons in each group). Each group brought food that they had prepared and presented about them in terms of (a)

type of food and preparation techniques and (b) benefits and nutrient values of the food. This activity was conducted with the assistance and guidance of the dietician and staff who added additional advice on the accuracy of the meal that they brought. This would revive the memory of participants of what they had learned and that they could apply it in their practice, which could be noticeable. As a result, they could remember the information much better (Gagne, 1974 quoted in Kunlaya Thongtot, 1998 :70).

Staff used mind-mapping technique to write down the ingredients and benefits of all foods on posters and displayed them for each group to review and take the knowledge to apply in their real food preparations at home.

First month (25 February 2002):

Each group brought the foods and presented together as a team about benefits and nutritional values of each food. Staff gave instruction about the tastes of the foods emphasizing on sweetness and oiliness, and the right kinds of foods in order to prevent the accumulation of sugar and fat. The foods they brought were various, for examples, steamed / boiled rice, tofu soup, fried soya noodles, chilly sauce in lemon juice, mango spicy salad and Thai spicy soup of mixed vegetables (Gang Liang).

Second month (25 March 2002):

Phanat Nikhom Hospital was contacted in advance to request permission and arrange for a study visit of today. This visit was made to the wards to learn

about patient cares inside and to study cases who did not prevent and control themselves and become ill with diabetes and suffered its complications, in order to create and increase awareness about the Diabetes Mellitus among participants. The demonstrating foods were presented at this visit with additional instructions from an invited nutritionist. Healthy foods presented were unpolished rice, Thai sour soup (without coconut milk), native spicy fish soup; plain soup of mixed vegetables, chilly sauce with lemon juice and assorted fresh fruits.

Third month (25 April 2545):

Each group rotated to prepare foods and present their cooked food alternately with other to seek comments. They all ate those foods together thereafter as a way to create interactions and strengthen relationship. At the same time, additional instructions were given about food preparing / cooking methods in daily life. The foods they cooked were steamed / boiled rice, fried tiny fish (Plaa Gratak), mango chilly sauce, spicy fish soup, ground fish meat and Thai spicy soup of mixed vegetables.

Step 4 Monitoring

1. Participants met once a month to make a list of finished activities and obstacles of eating food, changes of dietary, degree of difficulty and easiness of diet control and exercise activities and obstacles. They were asked to propose ideas, correct and make agreements for them to follow later.
2. Participants were requested to fill in a questionnaire to follow up their knowledge three months after the training and a review session be

organized for better memorization (Chaiyaporn Witchawoot quoted in Kalaya Thongtot, 1998: 69).(April ,2002)

3. Participants were monitored in the aspect of continuity of exercise once a month, by records of blood pressure, body weight and the number of exercise participation (in exercise recorded).

2.4 Activity with Timetable

Table 2.2: Timetable and activities

Activities	12/01	1/02	2/02	3/02	4/02	5/02	6/02	7/02	8/02	9/02	10/02	11/02
1. Activities Step 1 1.Set up teams of staff and volunteers.	-											
Step 2 1. Screening high-risk group 2. Admitting patients through referral process to check FBS 3. Inviting target group to the participate in project	-	-										
Step3 Intervention Stage 1 5 days Stage 2 Training program - Training on exercises - Meals preparation once a month for 3 months		-	-	-	-							
Step 4 Summarize problems as a group Follow-up on knowledge Follow-up on the continuity of exercise												
2. Evaluation 1) Knowledge - pre-post test in target group of stage 1 (5 days) - follow up in target group after three months		-			-							
2) recording changes of health such as body weigh, blood presser												
4) recording changes of FBS,CHL							-					
5) Follow-up the exercise after the end of the training program.												
6)Follow-up the diabetes prevalence after the end of the training program annually for five years												
7) Record benefits of program								-				
3.Analysed the data												
4. Report writing												

2.5 Problems

The following problems were found in this study.

1. Training

Some participants were unable to attend all 5 days of the training. They were not assessed for data but allowed to join the activities. Senile participants always had reading problems, therefore, their problem of answering question in the questionnaires was solved by reading them out to them, letting them choose answers and writing down the answers for them.

2. Exercises

The dusty condition at exercising areas was quite a problem. When a large number of people exercised together, in particular, the dusts were blown up from the ground due to exercising movements. To solve this problem, they were divided into groups and exercised separately at places convenient to them. These excises were monitored and supervised at their respective places once a week. The Tambon Administration Organization (TAO) of Railugthong also improved the areas by laying concrete cement on the floor to make it more convenient to use.

For the exercise, Public Health Volunteers (PHVs) were exercising leaders as the replacements, 1-2 leaders in each group, in order that they could take turns. This had favored the continuity of the exercises, preventing any gaps that might happen when the leaders were absent or occupied.

3. Foods

When mango and jackfruit were in the season, it was hard for members to control their foods. They gained weight or could not bring it down. Therefore, they had to find solution for such control by doing exercise together and making mutual commitment, trying to control themselves more by choosing appropriate food menu.