CHAPTER III

METHODOLOGY

Research Design

The research design of this study was a cross-sectional descriptive study concerning knowledge, attitude, modifying factors, preventive health action and prevalence of Diabetes Mellitus among the population aged 30 years or older living in Wangkeeree Sub-District, Huai yot District, Trang Province.

Target Population

The population of this study consisted of 1,748 participants 30 years old or older living at Wangkeeree Sub-District, Huai yot District, Trang Province.

Sample Size

The sample size was calculated using the following W. G. Cochran, 1983 formula.

$$n = \frac{NZ^2pq}{d^2(N-1) + Z^2pq}$$

When:

n =   Sample size

N =   Total population   =   1,748

$$Z \quad = \quad \text{Standard statistical value, under normal distribution curve, with significant level at 5\% } (Z_{\alpha/2} = 1.96)$$

$$p \quad = \quad \text{Proportions of DM at Wangkeeree} = 0.0112$$

$$q \quad = \quad 1 - p = 0.9888$$

$$d \quad = \quad \text{Standard error rate} = 0.01$$

$$n \quad = \quad \frac{1.748 \, (1.96)^2 \, (0.0112) \, (0.9888)}{(0.01)^2 (1,748-1) + (1.96)^2 (0.0112) \, (0.9888)}$$

$$n \quad = \quad 342.33$$

According to the results of sample size calculations, the maximum size of the sample group was 343: therefore, the sample size for this study was at least 350 persons.

Sampling Techniques

The sample selection was conducted by using the systematic stratified sampling techniques.

Step 1 Sub-Districts level

There are 6 villages in Wangkeeree Sub-District. I chose three of them for my study by using Stratified simple process. These three villages I selected were Ban Wanglamti, Ban Wanglamner, and Ban Kovnnokva. There were a total of 872 persons.

Step 2 Village level

Due to the difference in number of the target population in each village, the calculation of the sample size in each village, therefore, varied upon the proportion of

such population living in each village itself. The calculation using the same formula as done in the sub-district level was as follows:

The number of the sample size in each village is the total sample size multiplied by the target population in each village divided by the total population of the three villages.

In conclusion, the number of target population from each village is shown in Table 3.1

Table 3.1 :   Number of the sample size.

Name of village	Total Population	Target population (≥30 years old)	Number sampled
Banwanglumti	534	216	87
Banwanglunner	1333	526	211
Bankovnnokva	296	130	52
Total	1748	872	350

Step 3 First, bringing the name list of the population in the ≥30 years old group, as registered in house registrations. Then, conducting a systematic random sampling of the target population (≥30 years old) in each village by randomly selecting the target number until reaching the number calculated from the formula. However, when a person selected did not meet the selection criteria at that time, another subject was selected from the same village (Figure 3.1)
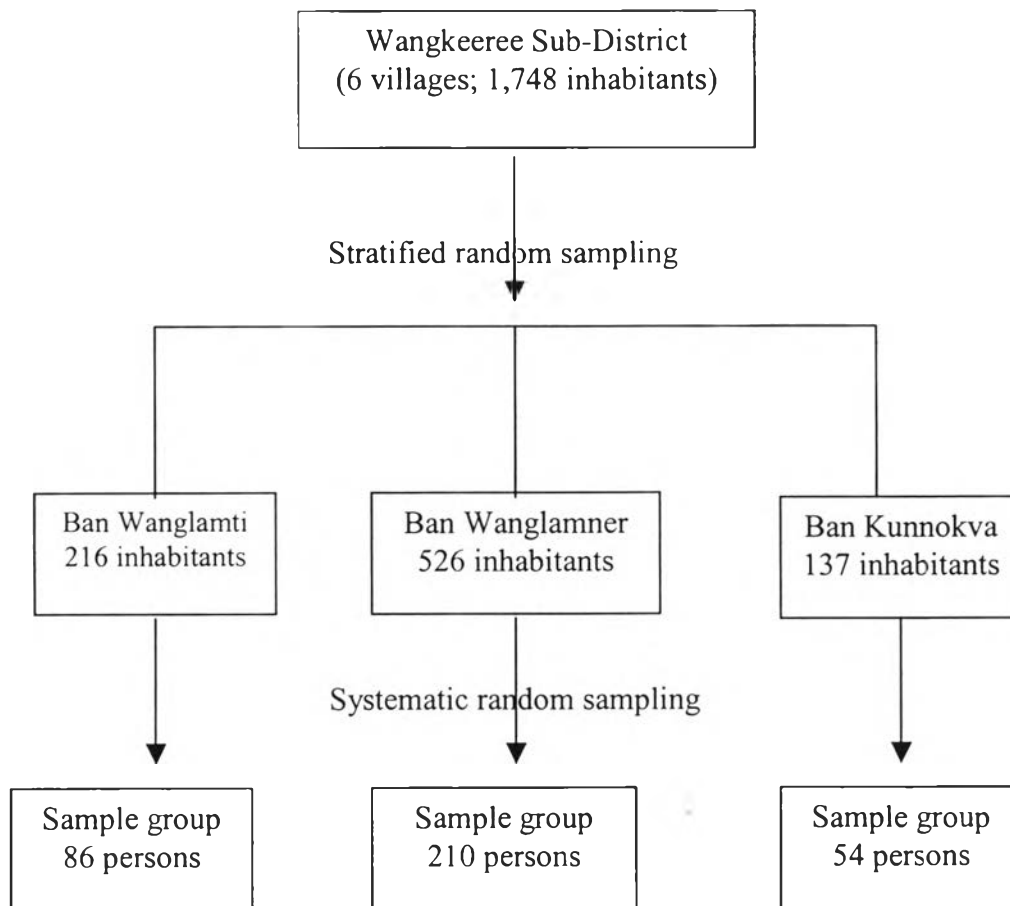
Figure 3.1 : Systematic stratified random sampling of the target population.

Exclusion Criteria

- Population was unresponsive.

- Population was no longer a resident of this village.

- Population was mentally or physically unable to respond.

Instrumentation

The instruments used to collect data were as follows:

Section 1 Questionnaire

1. Demographic Data

2. Knowledge of Diabetes Mellitus

3. Attitude towards preventive health action

4. Modifying factors of preventive action

5. Preventive health action

Section 2 Blood sugar level

Section I

1. **The Demographic Data Questionnaire** included age, gender, marital status, occupation, education, family history of DM, ailments, B.M.I., and date of last physical examination.

2. **The Questionnaire on Knowledge About Diabetes Mellitus** included three aspects of susceptibility, severity, and complications of preventive health action. The investigator derived questions on the questionnaire by using checklist questions and the multiple dichotomy method. It was coded on a 0 to 1 scale as follows:

Score Criteria

Correct response   1

Incorrect response   0

The explanation of the scores is as follows:

- A correct response mean the respondent considered the item was true.

- An incorrect response means the respondent considered the item was false.

Interpretation of scores

There were 15 questions in this section of the questionnaire, and the total scores ranged from 0 to 15 points. The classifications were applied from the criteria of educational evaluation in Sukothaitammatirat University, and the scores were classified into 3 levels. The half of scores, if the scores was on lower half, it is low level and if the scores was on over half score, it is fill on moderate and high level by half as follows:

- Low level   :   a score of 0 –7

- Moderate level   :   a score of 8 -11

- High level   :   a score of 12 –15

3. Questionnaire on Attitude towards Preventive Health Action included beliefs, failings, and thoughts about preventive health actions. This section covered each aspect of the attitude about preventive health action. There was a total of 10 questions that were composed of both positive and negative statements. The score criteria for this section is as follows:

	Positive	Negative
Absolutely agree	4	1
Agree	3	2
Disagree	2	3
Absolutely disagree	1	4

Meanings of the corresponding scale are as follows:

Absolutely agree	means all of the relevant statements correspond to the respondent's ideas or feelings.
Agree	means most of the relevant statements correspond to the respondent's ideas or feelings.
Disagree	means most of the relevant statements do not correspond to the respondent's ideas or feelings.
Absolutely disagree	means all of the relevant statements do not correspond to the respondent's ideas or feelings.

Interpretation of scores

The total score of the attitude about preventive health action in this study ranged from 10 to 40 points. The averages scores were categorized into 3 levels. The half of scores, if the scores was on lower half, it is low level and if the scores was on over half score, it is fill on moderate and high level by half as follows:

- Low level : a score of 10-25

- Moderate level : a score of 26-32

- High level : a score of 33-40

4. The questionnaire on modifying factors to preventive action was derived by the investigator based on the conceptual framework of the Health Belief Model and from the literature review of related research. There were a total of 7 questions concerning cues to action including

mass media campaigns, advice from others, reminder postcards from physicians, illness of a family member or friend, and newspapers or magazines. There were a total of 3 questions concerning social support from a family member or friend about their eating behavior, exercise behavior and relaxation behavior. Each item was composed of 4 possible choices that the respondent could choose from that accurately corresponded to their real situation as follows:

Regularly received	4
Often received	3
Sometimes received	2
Never received	1

The meaning of each score was as follows:

Regular means the respondent received data more than 2 times within 3 months.

Often means the respondent received data 2 times within a 3-month period.

Sometimes means the respondent received data once within a 3-month period.

Never means the respondent never received the data

Interpretation of scores on the questionnaire of modifying factors to preventive health action

The total scores of modifying factors affects cues to action and social support in this study ranged from 10 to 40 points. The average scores were categorized into 3 levels. The half of scores, if the scores was on lower half, it is low level and if the scores was on over half score, it is fill on moderate and high level by half as follows:

- Low level : a score of 10-25

- Moderate level : a score of 26-32

- High level : a score of 33-40

5. The questionnaire on preventive health action was composed of 3 aspects concerning nutrition, physical activities, stress control and management. Each item was composed of 4 possible responses that the respondent could choose from that accurately corresponded to the real situation. There was total of 15 items that were composed of both positive and negative statements. The score for the section is as follows:

	Positive	**Negative**
Regularly practiced	4	1
Often practiced	3	2
Sometimes practiced	2	3
Never practiced	1	4

The meaning of each score is as follows:

Regularly means the respondent performed it on a daily basis or at every opportunity

Often   means the respondent performed it 3-5 times per week.

Sometimes   means the respondent performed it 1-2 times per week.

Never   means the respondent never performed the relevant behavior or activity.

Interpretation on scores questionnaire of preventive health action

The total scores of preventive health action in this study ranged from 15 to 60 points. The averages scores were categorized into 3 levels. The half of scores, if the scores was on lower half, it is low level and if the scores was on over half score, it is fill on moderate and high level by half as follows:

- Slightly appropriate   :   a score of 15-37

- Appropriate   :   a score of 38-49

- Highly appropriate   :   a score of 50-60

5.1 **Nutritional behavior:** This questionnaire consisted of 7 questions. There were 3 positive questions and 4 negative questions. The total score could range from 7 to 28 points. The interpretation of the average score was as follows:

- Slightly appropriate   :   a score of 7-18

- Appropriate   :   a score of 19-23

- Highly appropriate   :   a score of 24-28

5.2 Physical activity behavior: This questionnaire consisted of 4 questions. There were 4 possible responses. The total score could range from 4 to 16 points. The interpretation of the average score was as follows:

- Slightly appropriate   :   a score of 4-10
- Appropriate   :   a score of 11-13
- Highly appropriate   :   a score of 14-16

5.3 Stress management behavior: This questionnaire consisted of 4 questions. There were 4 possible responses. The total score could range from 4 to 16 points. The interpretation of the average score was as follows:

- Slightly appropriate   :   a score of 4-10
- Appropriate   :   a score of 11-13
- Highly appropriate   :   a score of 14-16

Section 2

Self-monitoring of Blood Glucose (SMBG) by Accu-Chek Advantage. A random plasma glucose test measures the amount of glucose in the blood at any given time. The test does not require fasting (abstaining from eating for a specified length of time) and therefore can be done at any time. A random glucose value of greater than or equal to 200 mg/dl (milligrams per deciliter) indicates a diagnosis of diabetes.

The quality of Instruments

The quality of the instrument was tested and the validity and reliability is as follows:

Validity

In order to clarify the content, and appropriateness of the language of the questionnaires, five experts participated in editing, and clarifying the understanding. The experts included three health professionals, one nurse, and one physician. The questionnaire was modified with their comments and recommendations.

Reliability

After the revision and improvements in the questionnaire, instrument pilot testing determined the reliability. Knowledge reliability was calculated by the Kuder-Richardson formula (KR-21). Attitude and practice reliability was calculated by the coefficient alpha formula and the results of the calculated reliability for each instrument.

The detail are shown in Table 3.2.

Table 3.2 :   The instruments were tested twice

Questionnaire	Reliability	
	First Time	Second Time
Knowledge		
- Susceptibility	0.2661	0.9347
- Complication	0.5875	0.8484
- Preventive action	0.7850	0.9145
Attitude	0.4209	0.7702
Modifying factor action	0.8473	0.8516
Preventive action		
- Nutrition	0.2564	0.6146
- Physical activity	0.7757	0.9065
- Stress management	0.3753	0.5996

Remark: The second test was administered to insure reliability.

Data Collection

The investigator collected the data by herself. The steps are described as follows:

1. The letter of permission obtained from the Faculty of Graduate Studies, The College of Public Health, Chulalongkorn University was presented to the Director of the Huaiyod Health District and the Director of Wangkeeree Health Center.

2. After receiving permission, the investigator introduced myself and explained the research objectives and procedures to the Village Chief.

3. The investigator selected the samples by the systematic stratify sampling technique according to the inclusion criteria and then the data was collected by home visit.

4. The investigator met with the populations and asked for their participation in this study. When they agreed, the investigator started to interview them using approximately 20 minutes per person with the following steps.

   - The investigator introduced herself, educated the person on the objectives and procedures of this study, the time it would take for the interview, and their rights in making their decision to withdraw or participate in this study without any effect on their care or treatment.

   - After informed consent was given, the investigator explained to the population how to clearly answer the questionnaire. After finishing, the investigator checked the data for completeness.

   - Finally a check of their blood sugar level using Accu-Chek Advantage was made.

5. The investigator answered questions and gave advice on issues they did not understand and then thanked them for their cooperation.

Protection of Human Subjects

The data collection procedure in this study encompassed the protection of human subjects. The investigator explained the purposes of this study to the subjects and asked for their permission to collect data and used the informed consent from them

to confirm that the subjects had volunteered. The subjects were assured that all of their information would remain confidential and their identity would not be revealed. There were no known risks in participation and the subjects had the right to participate or not to participate and the right to withdraw from this study at anytime, even after they started to answer the questions. The withdrawal would not affect them in any way.

Data Analysis and Statistic

The interview questionnaire was coded by using the SPSS statistical software package. The critical significant level was set at 0.05. The statistics used for data analysis were as follows:

1. **Descriptive statistics**: Frequencies, percentage, mean and standard deviation were used to analyze the demographic data, the score of blood sugar level, knowledge level, attitude level, modifying factor level, and preventive health action in each item and overall.

2. **Inferential statistics**: Chi-square test was used to examine the association among knowledge level, attitude level, modifying factors level, and preventive health action by Chi-square.