# MULTIDIMENSIONAL INDICATORS OF
# HEALTHY WOMEN IN REPRODUCTIVE AGE

**Angsana Boonthum**

**A Dissertation Submitted in Partial**

**Fulfillment of the Requirements for the Degree of**

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**School of Applied Statistics**

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# MULTIDIMENSIONAL INDICATORS OF HEALTHY
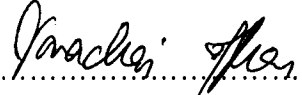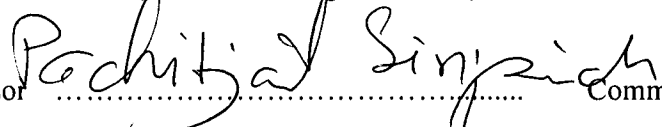# WOMEN IN REPRODUCTIVE AGE

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November 3, 2008

## สัญญาอนุญาตให้เผยแพร่วิทยานิพนธ์

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ฝ่ายหนึ่ง กับ สถาบันบัณฑิตพัฒนบริหารศาสตร์ โดย......................................
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เขต......................จังหวัด......................ซึ่งต่อไปในสัญญานี้เรียกว่า "ผู้รับอนุญาต"
อีกฝ่ายหนึ่ง คู่สัญญาทั้งสองฝ่ายได้ตกลงทำสัญญามีข้อความดังต่อไปนี้

## 1. ผลงานลิขสิทธิ์

ผู้อนุญาตเป็นเจ้าของลิขสิทธิ์งานวิทยานิพนธ์ เรื่อง....Multidimensional
Indicators of Healthy Women in Reproductive Age
ซึ่งสร้างสรรค์ โดย........................................ผู้อนุญาตรับรองว่า เป็นผู้สร้างสรรค์
งานขึ้นเอง

## 2. เงื่อนไขการอนุญาต

ผู้อนุญาต ตกลงให้ผู้รับอนุญาตใช้สิทธิดังต่อไปนี้

2.1 ผู้รับอนุญาตมีสิทธิเผยแพร่ต่อสาธารณชน ซึ่งงานวิทยานิพนธ์ตามข้อ (1)
เพื่อประโยชน์ในการวิจัย หรือศึกษา อันมิได้มีวัตถุประสงค์เพื่อหากำไร

2.2 ผู้อนุญาตอนุญาตให้ผู้รับอนุญาตใช้สิทธิตาม 2.1 เพื่อใช้ในห้องสมุด
และเครือข่ายอินเทอร์เน็ตของห้องสมุด สถาบันบัณฑิตพัฒนบริหารศาสตร์ รวมทั้งเครือข่ายอินเทอร์เน็ต
ของโครงการพัฒนาเครือข่ายห้องสมุดในประเทศไทย (ThaiLIS)

**3. การโอนสิทธิและ / หรือหน้าที่ตามสัญญานี้**

     ผู้อนุญาตและผู้รับอนุญาตไม่สามารถโอนสิทธิและหรือหน้าที่ ความรับผิดชอบ
ของตนตามสัญญาฉบับนี้ให้แก่บุคคลภายนอกได้ เว้นแต่จะได้รับความยินยอมเป็นลายลักษณ์อักษรจาก
อีกฝ่ายก่อน

**4. สิทธิของเจ้าของลิขสิทธิ์**

     ภายใต้บังคับแห่งสัญญาฉบับนี้   ผู้อนุญาตยังคงเป็นเจ้าของลิขสิทธิ์ในงาน
วิทยานิพนธ์ตามสัญญานี้ทุกประการ

     สัญญานี้ทำขึ้นเป็นสองฉบับมีข้อความถูกต้องครบถ้วน  คู่สัญญาได้อ่านและ
เข้าใจข้อความในสัญญาโดยตลอดดีแล้ว  จึงลงลายมือชื่อพร้อมทั้งประทับตรา (ถ้ามี) ไว้เป็นสำคัญต่อ
หน้าพยานและเก็บไว้ฝ่ายละหนึ่งฉบับ

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        ลงชื่อ _____ ผู้รับอนุญาต
          ( อัจฉรา สิทธิสมบูรณ์ )

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        ลงชื่อ _____ พยาน
          ( นางสาวริญุดา แสนทักษ์ )

# ABSTRACT

**Title of Dissertation**      Multidimensional Indicators of Healthy Women in
Reproductive Age

**Author**      Miss Angsana Boonthum

**Degree**      Doctor of Philosophy (Population and Development)

**Year**      2008

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The purposes of this study are: 1) to construct indicators of Healthy Women in Reproductive age covering the physical, mental, social, and spiritual dimensions appropriate to Thai lifestyle and Thai societal patterns 2) to describe indicators of the Healthy Women in Reproductive age in each dimension affecting their healthy condition, and 3) to examine the internal structure of various dimensions of the construct, Healthy Women in Reproductive age. A survey was conducted to collect data from women aged 13 to 49 years in urban and rural areas in the four regions of Thailand. The statistical technique used to analyze data was Structural Equation Modeling using by LISREL 8.52.

The results of the analysis indicated that the indicators could reflect the health status in the dimensions of physical, mental including social. In addition, it manifested the potential of how to be a healthy person, measured from healthy behaviors and good reproductive health. The confirmatory factor analysis results for the categorization of the indicator groups for the group of women aged from 13 to 18 years and 19 to 49 years yielded the following group of six dimensions: physical health, mental health, social health, health-promoting behavior, health risk behavior and reproductive health.

Structural equation modeling was employed to examine the theoretical models of the Healthy Women in Reproductive age construct. This study hypothesized that there are differences between adolescents and adult women in term of "Healthy in

Reproductive age". Thus, the analysis was divided into two models, one for adolescents and the other for adults. The model of adolescents aged 13-18 years was revised by measuring model fit using goodness of fit index (GFI= 0.96), adjusted goodness of fit index (AGFI= 0.95) and root mean square error of approximation (RMSEA = 0.029). The final model showed that social health had a direct positive effect on mental health ($\beta$=0.46, p<0.01); health promoting behavior had a positive effect on social health, health risk behavior had a negative effect on social health and reproductive health had a positive effect on mental health. The model of women in their reproductive years aged 19-49 years measured model fit using goodness of fit index (GFI= 0.96), adjusted goodness of fit index (AGFI= 0.95) and root mean square error of approximation (RMSEA = 0.038). The final model showed that social health had a direct positive effect on mental health ($\beta$=0.36, p<0.01); reproductive health had a positive effect on physical health mental health and social health; health promoting behavior had a positive effect on mental health, social health, and health risk behavior had a negative effect on social health.

These indicators would prove valid, reliable and useful if they were to be used by people in the community or the organizations in the community by modifying and supplementing some parts to suit the variable conditions and lifestyle of that particular community. However, further study should be conducted especially regarding the methods or mechanisms in developing mental dimensions, basic ethics, responsibility to society and self-discipline.

# ACKNOWLEDGEMENTS

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background and Importance of Problem

Until now, women comprise one-half of the population of society and represent its most valuable resource because they can give birth and generate the new population. In addition, women play important social and economic roles towards family and society. Women's roles and status have changed according to shifting power trends, and new movements incurring within our society. In terms of economic development, women play important roles in the production, supply, consumption, and allocation of human resources, including supporting the substitution of labor for men such as taking care of family members and household chores, allowing men to work. Moreover, women participate in direct labor production itself (Kanjanaaksorn, 1999: 119)

Women, thus, are the important target of social development and are affected by positive and negative developments because women perform several duties and responsibilities related to the quality of household members, especially in regard to women's health. Women's health is one of the most important issues related to the health of the national population. This is not only because of the fact that women are one-half of the national population but also because of their duties and participation in social development, namely, women are the foundation of the well-being and quality of life of the family, the fundamental unit of the society. Women are responsible for giving birth, taking care of and raising the family members. Currently, in the globalization era, women play important roles in generating income for the family, as men do, by working in the office or at home. This will also stimulate the economic productivity of the nation. Since women play many beneficial roles in society, as mentioned above, if women are unhealthy, they may affect the health of the national

population. The investment of the national population in any projects relevant to women's health shall be efficient and effective in terms of the development of the overall population.

An international meeting, regarding population and development was held in Cairo, Egypt in 1994 and addressed these population and development issues facing all the world's countries. The participants forged guidelines to formulate policies and operational plans consisting of 16 main topics, 4 of which are related to and focus on women in regard to gender equality, gender fairness, and the delegation of power to women. Regarding the topics of health, sickness, and death, women's health and maternal safety were viewed as important issues that every country needs to focus on, especially the topic of reproductive rights and reproductive health directly related to women's health (United Nations, 1994: 3-4).

The World Health Organization defined the word "Health" in 1948 as "…the state of complete physical, social and mental well-being and not merely the absence of disease or infirmity"(WHO, 1995: 1). In 1978, in the Alma-Ata, Declaration the document confirmed such a definition and certified that fundamental health strategies had been identified. It is further believed that health is holistic and entails well-being in every dimension of life. Thailand also relies on such definitions. Until the year 2000, Professor Dr. Prawes Wasee defined the meaning of health in terms of Buddhist wisdom expressing that "Health is the state of complete physical, mental, social, and spiritual well-being." He cited examples of physical well-being including strong, health, and energetic physical health without disease or disability. People who possess physical well-beings shall have sufficient economic stability, live without fear, and reside in a healthy environment. Mental well-being means joyful, happy, and energetic mental well-being. Such persons shall be merciful, sensitive, meditative, and intellectual; and feel the touch of the beauty in everything. They also must be generous. Social well-being means living together peacefully. The persons who have social well-being shall live within a warm family, strong communities, fair society, fraternity, peace, social democracy, and pleasant services. In addition, the service system shall include the social businesses. Spiritual well-being occurs when committing good faith, making merit or when the mind touches the virtuous nature of life in its highest items comprising sacrifice, dedication, mercy, access to the three

gems or access to God. It is true happiness with no hint of selfishness. It is the happiness incurred when human beings are self-transcending so human life is composed of freedom, relaxation, convenience, and delight. Such persons shall have deep and elaborate happiness. This is the top level of happiness that affects happiness in the other three dimensions. If human beings have no spiritual well-being, they will never encounter real happiness (Prawes Wasi, 2000: 4-6). This new concept of health has been accepted at the latest meeting of the National Health Act (13th Meeting) 11 February 2002. This meeting defined the word "Health" as the state of complete, holistic, and balanced physical, mental, social, and spiritual well-being and that health is not limited to the lack disease and disability (Subcommittee on Reviewing the Draft of the Thai National Health Act, 2002: 3).

Although the World Health Organization has provided a working definition of "health" for over 50 years, no clear indicators have been established. However, when the trend of being healthy becomes clearer due to the change of public health concerns, the relative health indicators must also be changed. Many countries such as The USA, Canada, and Scandinavian countries, etc., have started developing clearer and more specific health indicators, especially indicators of the state of complete physical, mental, and social well-being, and the longevity of healthy life. If such indicators are of high quality, it will reflect the actual problems and existing situation, making the plans for the public health development to be more efficient and directed towards attainable objectives.

At the same time, when discussing topics related to women's health, we generally think about issues relevant to reproduction, women's health during pregnancy, birthgiving practices, and family planning, perspectives that consider the roles, potential, and values of women related to reproductive quality only. Generally, the identification of the details of women's good health are based within both cultural values, social beliefs, and different technologies. Currently, the perspective of the roles, potential, and values of women within society are clearer. Thus, considerations towards women's health has changed to cover reproduction, roles, potential, and value of women as social shapers and developers because women can generate income, just as men can, by working in the office or at home. Therefore, concepts related to women's health are broader and women's health is viewed holistically resulting from

women's needs which are different from men's needs, starting from girlhood until becoming elderly. The holistic view of women's health will cover the issues of reproduction, sickness, and occupational health (Boonmongkol, Sunhajariya, and Ruangsorn, 1999: 19-21).

From the draft of the Thai National Health Act, Category 2, Right, Duties, and Health Security, Part 1, Rights of Health, Section 9, it clearly states that "Women's health is specific and sophisticated due to the reproduction system that affects holistic health throughout the life of women from birth until death. Thus, women's health shall be fostered and protected properly "(Subcommittee on Reviewing the Draft of the Thai National Health Act, 2002: 9). This reflects the position that Thai society now pays more attention to women's health concerns. At the same time, because concepts regarding the measurement of health status have changed, the identification of indicators to serve as measurement of women's health status shall be developed by emphasizing the creation of such indicators that are able to cover several dimensions: at individual, social, and holistic levels. These measurement indicators shall be appropriate to Thai lifestyle and societal patterns. Such indicators shall help us realize the characteristics of "Healthy Women at Reproductive Age" leading to new strategies for health promotion and more effective health system reform in the future.

## 1.2 Research Objectives

### 1.2.1 General Objective

To construct indicators of healthy women at reproductive age covering the physical, mental, social, and spiritual dimensions appropriate to Thai lifestyle and Thai societal patterns.

### 1.2.2 Specific Objectives

1) To describe indicators of the healthy women at reproductive age in each dimension affecting their healthy condition

2) To examine the internal structure of various dimensions of the construct

## 1.3  Benefits

1) Developing indicators that can be used for planning, monitoring, and evaluating the health service system and development of country's public health

2) Realizing the factors related to women's health that can be applied for health promotion activities for women at reproductive age.

## 1.4  Scope

The scope of the study includes the measurement of the positive health status in a group of women aged from 13 to 18 years and 19 to 49 years in urban and rural areas in Bangkok and the four regions of Thailand:  North, Northeast, Central and South.

## 1.5  Operational Definition

1) Healthy Women at Reproductive Age is defined as women at the ages between 13- and 49 years with complete physical, mental, social, and spiritual well-being, including environmental concerns affecting the state of health, namely, the family, educational institutes, businesses and communities that are of sufficient quality to support healthy conditions for women at reproductive age living in such an environment.

2) Gender comprises the social and cultural roles of men and women.  Such roles are learnt from birth.  The roles related to this study mean the duties and expectations from others as well as the expectations towards others.

# CHAPTER 2

# LITERATURE REVIEW

Regarding the study of the multi-dimensional factors of indicators of healthy women at reproductive age, the researcher aims to mention the health indicators of reproductive women and identify the factors influencing the healthy conditions by covering each dimension at the individual, social, and holistic levels. The researcher has reviewed the literature to identify the research framework as follows:

1. Health and determinants of health
2. Measurement of health status
3. Situation and factors identifying the health of women at reproductive age and the relevant research.

## 2.1 Health and Determinants of Health

### 2.1.1 Concept and Definition

The root of health in English means whole and another word, "Heal," means to make whole or to restore health. Each cultural group in society has different opinions towards health. The definition of each group reflects the goal of people in such groups, including the scope of considering the causes and factors affecting health and guidelines for restoring health back to the normal condition. Hence, the word "Health" is difficult to provide a complete definition for and when we look at the definition of this word from several sources, they are found to differ among one another. However, it does not mean that this word is incapable of being defined nor that it has no definition.

Since the meanings of health change over time, among cultures, and among possibilities of each group in the society, the definition of health can be classified into two main groups, namely, official definitions and lay beliefs.

The definition in the first group is identified and used by physicians or practitioners in public health arenas. This definition demonstrates the direction and goals of people in the health professions. It can be further classified into two main categories, namely, negative and positive terms.

Negative terms explain that health is the state of having no non-desirable characteristics. Such characteristics include disease and illness. Both words have different meanings. Disease is used when mentioning the condition when the body is abnormal or in pathology. It can be diagnosed, but persons who have such disease may not feel that they are sick. At the same time, persons who think they are sick may not have any diseases that can be diagnosed by the physicians because the sickness is the condition that individual feels towards him or herself such as anxiety, concern, pain, and distress. On the other hand, persons may be sick with or without diseases.

Regarding the positive terms, health consists of some desirable characteristics with different explanations such as health is the state of absolute well-being, according to the definition of the World Health Organization in the Charter of the World Health Organization in 1948 (WHO, 1948: 1) that health is "A state of complete physical, mental, and social well-being and not merely absence of disease and infirmity." If we rely on this definition, it is difficult to find anyone with good health. This definition believes that health is absolute as Rene Dubos proposed that health is the ability, meaning the strength and energy of the body, the immunity and ability to recover from sickness. In some cases, it means the mental strength to overcome several difficulties (Dubos, 1965: 348 – 351).

Another interesting definition is the definition given by Talcott Parsons, the sociologist. He proposed his definition of health in 1972 (Parsons, 1972: 117) that health is "The state of optimum capacity of an individual for the effective performance of the roles and tasks for which he has been socialized." Parsons paid attention to health using a normative approach, namely, that the healthy condition of any individual depends on the fact that he or she is in the proper condition according to the social norms or social expectation. If we rely on this definition, being healthy is so important to the society since the society will be in a smooth condition. However, the dispute is that if the individual is not in optimum capacity, the society may be damaged since the individual cannot efficiently demonstrate his or her role.

Several academics believe that health consists of various factors affecting the maximum personal potential of any individual (Seedhouse, 1986: 14 -16). These factors can be called foundations for achievement and can be classified into two groups, namely, common factors (food, water, shelter, access to news, skills and confidence) and different factors among individuals. In addition, several guidelines explain health. Some definitions are the identification of targets for the social conditions to support the ability of members to achieve healthy condition instead of directly explaining the characteristics of these healthy conditions.

During the past ten years, the concept about health expands the holistic view towards health and connects with the positive wellness of people (Edlin and Golanty, 1985: 5-13) as Gordon Edlin and Eric Golanty summarized the concept about health is that "Health is a way of life in which people seek positive wellness – a maximization of individual potentialities to make life as meaningful and harmonious as possible" (1985: 22). This reflects that health is the way of well-being. It is the personal potential to make life meaningful and harmonious. In addition, they proposed the spiritual dimension as a part of being healthy in addition to the definition of the World Health Organization (Edlin and Golanty, 1985:7, 19-21).

A meeting of World Health Organization executives in 1997 also proposed to adjust the definition of health by including the spiritual well-being and giving the definition of health in terms of change as follows (WHO, 1998:2): "Health is a **dynamic** state of complete physical, mental, **spiritual**, and social well-being, and not merely the absence of disease or infirmity." However, such a proposal is still under international dispute among countries with different religions, so the definition of the spiritual dimension has no complete conclusion to adjust the definition in the Charter of the World Health Organization in 1948 and the original definition is still maintained.

From the definition and concept about health as mentioned above, the researcher would like to indicate that health can be defined in various dimensions due to the perceptions of each group of people although the group of academics and professionals has no conclusions. This reflects that the health condition is a rather subjective term, namely, it is different according to each society and within the society, and the definition is different according to the group of individuals. In

addition to the fact that health is a subjective term, health is multidimensional and value-laden for each group, academics and ordinary people for example.

### 2.1.2  Determinants of Health

The concept and theory about the determinants of health start from the search for the cause of the changes of health, depending on the framework of the definition of health in each period.  For instance, during the period of the industrial revolution, health meant no sickness or diseases.  The measurement of health among populations at that time aimed at sickness and death.  During that period, Louis Pasteur proposed the Germ Theory to explain the disease process incurred by each individual in that diseases result from taking some specific factors into the body, namely, micro-organisms.  The germ theory led to the belief that all the diseases have only one cause.  Thus, people during that period tried to search for direct treatment for the micro-organisms that were the cause of the sickness or disease in order to protect human beings from diseases.  The development of vaccines and antibiotics are the successes of this concept, so many contagious diseases have decreased and such diseases have ceased to be the causes of people's death in the industrial society.  The concept of the germ theory affects the study of the cause of diseases by aiming at a single causative agent.

During the years 1880 to 1930, important changes occurred in Europe.  The urban areas were rapidly and broadly expanded.  The structure of the population was changed due to the rapid decrease in the mortality rate, especially the mortality rate of children and mothers.  European countries faced new health threats from chronic diseases and scientists at that time did not look for the cause of chronic diseases from a single causative agent.  Instead, the study of the cause of diseases then paid more attention to social and environmental causes of diseases.

2.1.2.1  Concept of the Proximate Determinants of Change in Health Conditions of the Population (Mosley and Chen)

Mosley and Chen (1984: 25 – 26) compared the study of the factors affecting the death of children in their social science and medical science research in that social science research focuses on the study of the relationship between economic and social factors and the pattern of children's deaths, the relationship between the

mortal condition and economic and social factors. The study considers multiple correlations to recognize the important economic and social factors affecting different mortal conditions, but medical factors that are the direct causes of the mortality are not considered. In terms of medical science research, it focuses on the biological processes of several diseases. Mosley and Chen proposed that social and medical science research helps promote the understanding of mortal conditions, especially the causes of mortality in children. Hence, Mosley and Chen proposed a proximate determinant framework in the study of children's mortal conditions as demonstrated in Figure 2.1.
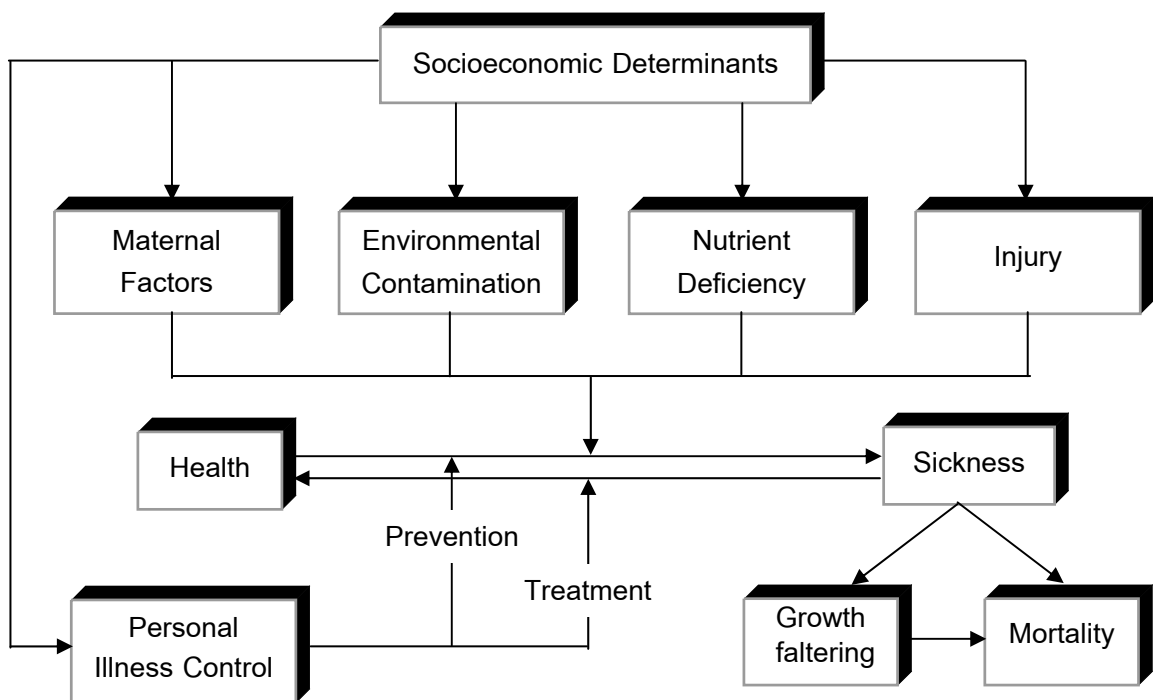


**Figure 2.1** Proximate Determinants Framework of the Change in the Population's Health Condition

**Source:** Mosley and Chen, 1984: 29.

Mosley and Chen (1984: 26-28) proposed that economic and social factors affect five groups of proximate determinants. These proximate determinants affect the mortal or health condition. The five groups of proximate determinants are:

1) Maternal Factors, namely, age, number of children, birth interval, etc.

2) Environmental Factors, such as air pollution that affects the respiration system

3) Malnutrition Factors, especially macro nutrients such as calories, protein, and vitamins

4) Injury Factors, for instance, physical injuries and toxic effects

5) Prevention and protection of diseases in each individual such as protection and treatment)

2.1.2.2. The Holistic Model

From the changes in the pattern of diseases, health academics realized that health is multidimensional, so it is quite difficult to apply only one framework to explain every dimension of health. Thus, people have attempted to propose the holistic model to explain the positive and negative sides of health. Blum proposed several fundamental factors identifying the health condition (Well-being Paradigms of Health) and then classified these factors into four groups, namely, human biological factors, environmental factors, life style factors, and health service system factors (Jones, Shainberg and Byer, 1980: 3-9; Blum, 1981: 14-18) as seen in the given example of Blum in Figure 2.2
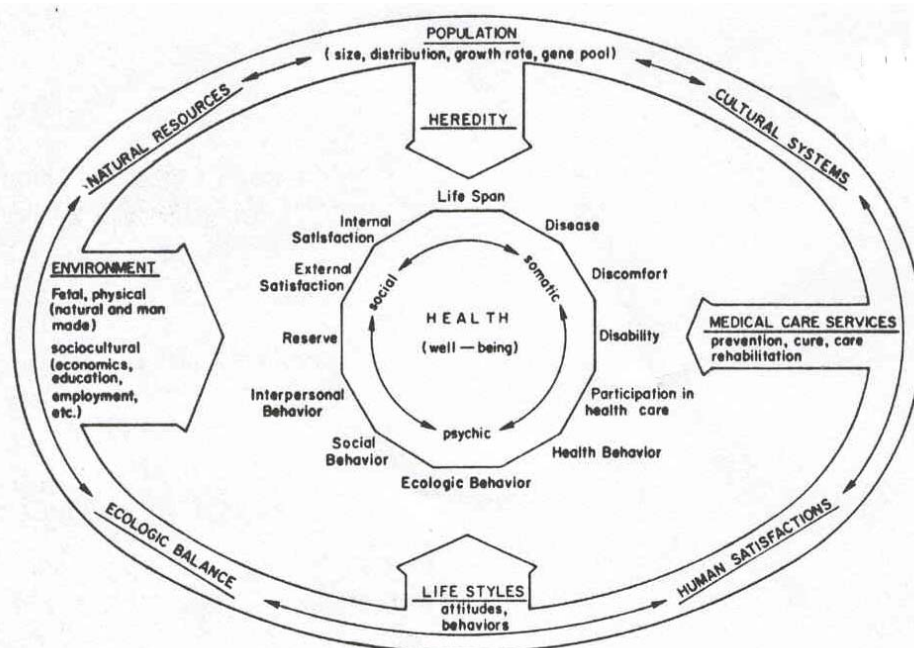


**Figure 2.2** Well-being Paradigms of Health
**Source:** Blum, 1981: 5.

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In Blum's figure, the width of the arrow demonstrates the weight of the importance of each factor affecting health when compared with other factors. In addition, each factor also affects the other factors via other components as seen in the figure, namely, population, cultural systems, mental health, ecological balance and natural resources.

   2.1.2.3  Concepts regarding Population, Economic and Social Conditions

     1)  Canada

     Later, most of the health frameworks still maintained the fundamental factors that identified the health conditions, and such frameworks have been changed according to the population group or the social condition, especially at the macro level. The economic and social factors are clearly separated from the environmental factors such as the educational system, employment status and income, etc. as given by the example from the Canadian Ministry of Health. The Ministry of Health in Canada (1999: 2-5) proposed a framework of the identification of health factors to serve as indicator so that when the projects or policies affect these factors, they will in turn affect health. The factors affecting the health condition can be classified into nine groups as demonstrated in Figure 2.3.
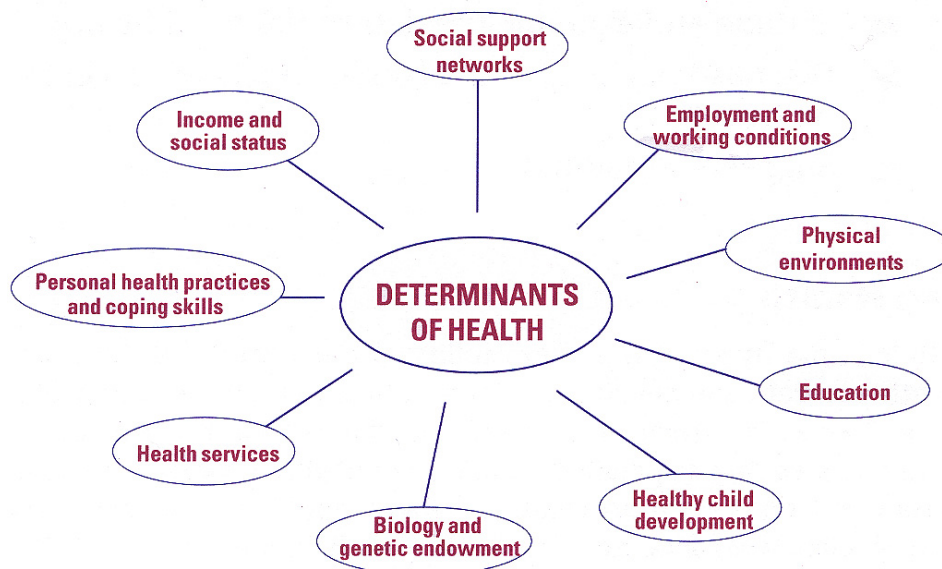


**Figure 2.3** Factors affecting the health condition (Case of Canada)
**Source:** Ministry of Health, 1999: 2.

The importance of various factors can be explained as follows.

(1) Income and social status

Several studies have indicated that a person's income and social status are important factors affecting the health condition. People who earn higher amounts of income tend to be healthier than people who earn less income even though both groups of people are in the health service system that operates on the principle of equality. In addition, some studies have indicated that if the income distribution in any society is fair, people in such a society will be healthier. This does not depend on the expenditure for the health services in each country.

(2) Education

Several reasons confirm that educational level relates to health status since the educational level affects employment, income, job security, job satisfaction and problem solving skills. People with higher education tend to better control the environment and are better able to access and understand news and information about health.

(3) Employment and Working Conditions

Employment and unemployment seriously affects the health condition. The unemployed tend to face mental pressure, be anxious, and have higher rates of sickness and of obtaining hospital treatment than the employed. However, the employed also face other factors affecting the health condition such as stress, risk, job insecurity, lack of career path, injuries and diseases from work related conditions.

(4) Physical Environment

A human beings' health depends on air, water, food, and shelter as the fundamental factors for the maintenance of health. Pollution is caused from human beings and such pollution affects sickness and leads to higher rates of injuries and premature death in the current situation.

(5) Biology and Genetic Endowment

The biological factors and mechanisms of the human body such as the growth, aging, maleness, femaleness, etc. also affect the health condition and leads to different diseases in each person. Several types of chemical

substances in the comtemporary environment also affect the change in genetic endowment.

(6)  Social Support Networks

Family, friends, and assistance among people in communities affect the health, help to reduce the stress and solve various problems. From the research, it has been found that people who socialize with a lot of people tend to have lower rates of premature death than people who have lower rate of social interaction.

(7)  Personal Health Practices and Coping Skills

Pleasing personal health practices and options help promote the health condition.  Eating a balance diet and regularly exercising are also beneficial and promote healthy conditions.  On the other hand, smoking, taking drugs and drinking alcoholic beverages may lead to several types of diseases.

(8)  Healthy Child Development

Evidence from various sources indicates that life from the time while developing in the womb until early childhood affects health status, quality of life, coping skills, and several types of abilities when reaching adulthood. For instance, the baby who has a low birth weight tends to face a higher risk of death, intellectual impairment, birth defects and disabilities, and a slower development than the baby who has a normal birth weight.  In addition, early childhood care also affects mental completeness and social relationship when during adolescence and adulthood.

(9)  Health Services

The health services that emphasize health promotion and disease control also affect the health of the population.  Such services include maternal and child care services, promoting immunity, early diagnosis, and providing education about risk factors, and several options for good health.

The framework developed by the Canadian Ministry of Health is advantageous in that it clearly classifies the factors affecting health to cover the physical-biological factors and the economic-social factors, so it is convenient to evaluate the health effects.  However, this framework is disadvantageous in that it does not present the relationships among the identified factors at various levels.

2) United States of America

In addition to the fact that social and economic factors are some of the most important factors in identifying the health condition of the population, the focus on the factors regarding the policies of health promotion is also another important element. Moreover, the attempt to present the relationships among the diverse factors at various levels such as the individual, community, and social levels, etc. to explain the framework in a multi-dimensional model has been more popular in the USA.

During the past ten years, the USA has attempted to develop the health of its population by identifying the goals to improve the quality and number of years in healthy life and to eliminate the health inequality related to gender, race, income level, education, etc. It starts from drawing the characteristics of healthy Americans and the factors affecting the health of people at the individual and community level within the framework of various factors affecting health as demonstrated in Figure 2 4.

Determinants of Health
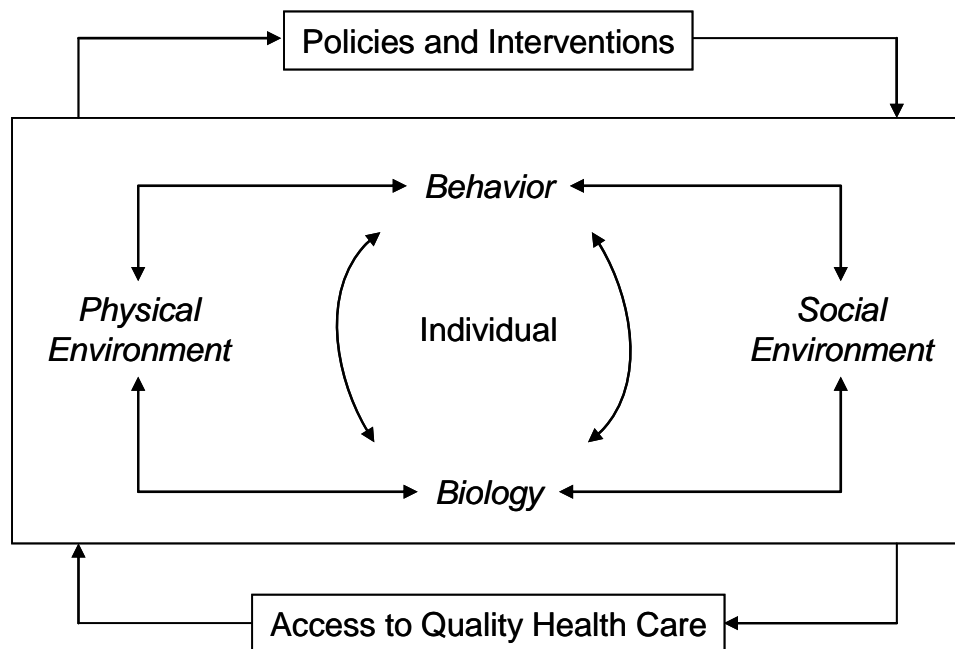


**Figure 2.4** Determinants (Factors) of Health

**Source:** US Department of Health and Human Services, 2000: 18.

Such a framework presents the influences of personal factors in terms of biological and behavioral factors. The biological expression and expression of personal behaviors also influences the physical environmental factors and social environmental factors. In addition, the public health policies and their implementation as well as access to quality health services also affect the health condition at the individual level (U.S. Department of Health and Human Services, 2000: 18-20).

## 2.2  Measurement of Health Status

The measurement of health status is the application of data and methods to realize the status or level of an individual's or a group's health and the factors affecting the health conditions at various levels to solve problems or further develop health conditions. In order to measure health status, it is necessary to understand the definition of health and coverage of an ividual's health conditions before expanding to the health of the community.

Due to the fact that the World Health Organization has provided a working defiinition of health since 1948, until the year 1998, people have attempted to include the aspect of spiritual health in the definition of health. However, no clear indicators have been developed for the measurement of spiritual health, so this definition has not yet become acceptable in the international arena. In Thailand, Professor Dr. Prawes Wasee (2000:4) gave the definition of health and health dimension that "Health is the state of complete physical, mental, social, and spiritual well-being." and the Steering Committee on the Thai National Health Development Plan (9th Issue) also accepts the development of spiritual health in the Thai National Health Development Plan (9th Issue) (2002: 6), but does not identify any clear indicators for the spiritual dimension.

Generally, the measurement of health status aims to:

1)  Plan, and develop health status, and solve health problems

2) Monitor and evaluate the health service system and health development plans

3) Prioritize the importance of health problems and allocation of funding

4)  Compare health conditions among population groups

5)  Evaluate medical treatments towards the health condition and the quality of patient lives

Therefore, in order to respond to such objectives, it is necessary to have health indicators to realize the changes incurred from the attempt to apply several methods, human resources, money, and proper technologies.  Since there are many objectives, it is significant to develop indicators that respond to such objectives (Murray, Salomon and Mathers, 2000: 3-4).  The indicators constructed shall be able to measure any item with validity, reliability, sensitivity, and specificity (Garcia and McCarthy, 2000: 10 - 11).

When considering the health of human beings in terms of their dynamic processes, it was determined that health consists of various phases according to the levels of health as follows.

1)  Healthy phase: There are several levels in this phase from the absence of sickness to excellent physical health, completeness and flexibility

2)  Phase of having some risks but no diseases

3)  Changing phase: There are some sicknesses or diseases in the body such as diseases in cells, abnormalities of hormones, problems in the excretion system, etc. but there are no unusual symptoms.

4)  Sick Phase

5)  Phase of Disability or Abnormality of the system and body due to sickness

6)  Phase of Death

The health condition and diseases are demonstrated in Figure 2.5.

**Health Condition and Diseases**



| Health Promotion | Prevention | Screening and promote treatment | Treatment | Rehabilitation | Protection from Death |

State of Completeness
- Physical
- Mental
- Social
- Spiritual

Group with Risk Factors

Group with Sickness but no Symptoms

Group with Diseases or Injuries

Group with Disabilities due to sickness

Death

Positive Health Status Indicators

Negative Health Status Indicators

**Figure 2.5** Demonstrates various levels of health condition in both positive and negative status, including the health status indicators in each level and intervention of health development.

### 2.2.1 Type of Health Status Indicators

2.2.1.1 Negative Health Status Indicators: Theses are widely accepted indicators consisting of:

1) Fetal Indicators

(1) Mortality in important age groups such as

Infant Mortality: This measurement is the number or rate, which means that the mortality of a child during the first year of his or her life. In the instance of rate, it is stated in terms of the mortality of the baby per 1,000 live births. The meanings of this indicator is not merely the measurement of the health of

status of the babies but it also reflects the quality of the public health services in the communities, the quality of people's lives, and their social and economic status.

Maternal Mortality is the mortality of women as a direct result of their pregnancy, abortion or puerperium. The measurement is represented by a ration of the number of cases to 1,000 live births or 100,000 live births. It has the same meaning as the rate of the infant's death since it reflects the quality of public health services, the quality of people's lives, the conditions existing in the communities, and the overall health status of the pregnancy.

Prenatal Mortality is the number or rate of death of babies who die during the first week after birth or fetal birth. Here, we use the period of pregnancy of at least 28 weeks and the rate is stated as number of cases per 1,000 total births, including fetal birth. Fetal death is that the period of pregnancy still unknown and unable to be counted. This rate demonstrates the quality of after-delivery services and the child's care, as well as the effectiveness of overall health services.

(2) Total Mortality: It is measured as a ratio of the number of cases to the population and can be classified by age, gender, and causes such as:

Total mortality in the total population

Gender-specific death

Age-specific death

Cause-specific death

This figure is given as the number or mortality rate via lung cancer, mortality rate via heart attack, or mortality rate via AIDS, etc.

When comparing the mortality rate among more than two population groups with different age structures as in the case where population A has more children and working people than the elderly, and most of the people in population B are elderly. Thus, the mortality rate in group B will be higher than that of group A due to the age of the majority people in the group, and not because of the different quality of public health services. Thus, it is necessary to adjust the structure of the population to eliminate the bias incurred from factors such as age structure by using any group as a standard population such as the world population, etc., and then

comparing the mortality rate after adjusting the structure of the population. This mortality rate shall be called the age-standardized or age-adjusted death rate. The rate of some kinds of diseases sometimes varies according to age such as cancer, heart attack, etc. If we would like to compare the mortality rate of these diseases between two population groups with different age structure, we must adjust the rate as mentioned above.

(3) Years of Life Lost (YLLs): This is the measurement of the impact of mortality by not counting the number of mortalities, but rather using the years of life lost due to the premature death. It is a measurement on the basis of the period of life lost due to premature death by comparing the average of any persons. The principle proposes that death at different ages indicates different levels of loss and such loss can be measured quantitatively at some extent in life years that have been lost at different ages such as if the average age of the population is 75 years, if any person dies at 25 years, he or she lost the life years of 75-25 or 50 years or that he or she lost the 50 years that he or she should be alive. This indicator emphasizes the seriousness of the disease, especially those diseases that may cause death in children or teenagers leading to the loss of a higher number of life years. Different types of life tables are used to compare according to the adjustment of the mortality plan. The method for calculating YLL can be classified as follows (Murray et al., 1999: 38-47)

Potential Year of Life Lost (PYLL): is the measurement of the number of life years lost from premature death by calculating from the specified year

Period expected Year of Life Lost (PEYLL): is the measurement of the number of life years lost from premature death by calculating from the periodic life table.

Cohort Expected Year of Life Lost (CEYLL): is the measurement of the number of life years lost from premature death by calculating from the cohort life table.

Standard expected Year of Life Lost (SEYLL) is the measurement of the number of life years lost from premature death by calculating from the West Level 26 Life Table.

2) Non-Fatal Outcome Indicators:  This can be classified into two types, i.e., morbidity and disability.

(1) Incidence is the number of diseases newly incurred in the population group during any period of time.  It is measured as the number of diseases or the ratio to the risk population group.  This measurement demonstrates the risk of diseases in the population group.

(2) Prevalence of disease:  It is the number of total diseases in the population group during any period of time such as one week or one year.  It includes new diseases, and the diseases occurring for a long time from which patients have not yet recovered.  This measurement demonstrates the number of diseases in the communities in order to prepare for proper medical services, but it does not tell the risk of diseases in any population group.

The measurement of diseases or sicknesses in the abovementioned may be related to age, gender and diseases like in the case of death.

(3) Seriousness of Disease

The case fatality rate/ratio is the measurement of mortality from any diseases in the group of all patients from such diseases.  The unit is given in percent such as the case fatality rate of rabies is 100% meaning that all the patients with this disease will die so this disease is serious.  If CFR is low, the seriousness is low.

(4) Disability due to sicknesses or accidents.  This measurement is the same as sickness, namely, it is the incidence or prevalence of such disabilities and may be analyzed according to the age, gender, or cause.

In addition to the measurement of the number of disabled persons, it can be measured in years or months of life lost due to disability (YLD).

3) Indicators for Risk Group

The risk condition is the physical and behavioral conditions that lead to higher opportunity of diseases in the risk group when compared to the non-risk group such as:

Physical:

      High insulin, cholesterol

      High blood pressure

      Stress or depression

      Malnutrition such as obesity or underweight

      Low birth weight

      Allergy / Asthma

Behavioral:

      Smoking

      Alcoholism

      Food intake

      Lack of exercise

      Promiscuity with no AIDS protection

      No protection when working, driving, or taking buses

The measurement of risk conditions shall is given in percentage of prevalence of the risk conditions or behaviors in the target population.

4) Summary Measure Indicators

Summary Measure Indicators are a mixture of mortality and sickness indicators given as a single indicator. It is the measurement at the population level to realize the burden of disease in the country. It reflects negative health status more completely than the measurement by only the mortality or sickness, especially in the case where the main causes of mortality and sickness are different. For instance, in the country where most mortality cases occur from non-contagious diseases such as heart attack, cerebrovascular disease, cancer, or accident but where diseases with lots of patients having low mortality cases are infectious diseases such as diarrhea, food poisoning, allergy, etc., it is difficult to decide which kinds of diseases are the priority public health problems, between diseases with high mortality cases or with high numbers of patients. The measurement of the burden of diseases is done by analyzing the number of years of life lost due to premature death and sickness, including the abnormalities from several types of sickness and uniting them into one indicator, namely, Disability Adjusted Life Years (DALYS). Therefore, this measurement shall be more accurate and cover wider ranges in terms of the overall conditions incurred

from the diseases of the population during any period of time and it can be used for prioritizing the importance of health problems (Field and Gold, 1998: 4-7).

5) Advantages and Disadvantages of Negative Health Status Indicators

Advantages:

They demonstrate health problems in terms of losses (death, sickness, disability)

It is important information for solving health problems and in reducing suffering among the population and used to evaluate the service system, especially the elements of disease treatment and protection

It is easy to find the information

It is easy to understand

Disadvantages:

The measurement is only one dimensional so there is no sufficient data for comprehensive health development, because the reduction of mortality and sicknesses does not mean that the population is healthy.

Some problems affect the quality and completeness of data in order to construct these indicators, especially the report of the cause of death.

2.2.1.2  Positive Health Status Indicators

Positive Health Status Indicators mean the measurement of health status other than the dimension of loss such as sickness or mortality because it is generally understandable that health does not mean only sickness but covers the potential of living with values towards themselves and their society.

Thus, the measurement of positive health status is the measurement that (Chatterji, Ustun, Sadana, Salomom, Mathers and Murray, 2002: 12-14).

They also do not measure nonsickness with disease, nor nondeath with several reasons, nor the condition of having or not having any risk conditions towards the disease.

They attempt to measure the ability or potential of components of the system within the body to recognize whether such components malfunction or not. Such abnormalities or inabilities may result from the sickness or accident from several

causes during the life cycle of each individual such as car accidents may make people become blind, but their movement and perception is still normal. Sometimes, such persons may feel depressed and impotent in the visual and mental domains, but other components may be normal.

The measurement of health status, in addition to the measurement of the function of each domain in the body may include the health valuation at each level of the health domains. The total outcome of the level of function of each domain after adjusting by health valuation at such a level is the health status of each individual. The value shall be between 0 and 1, 0 meaning the lowest level of health and 1 meaning being healthy.

**Level of Health**

**1** ↑

               **Healthy**

_____

               **Non-Healthy**

**0**
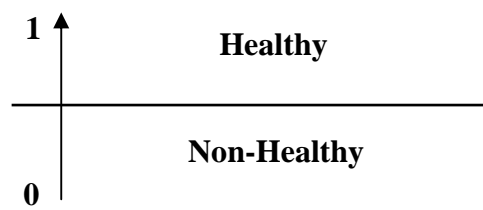
This measurement includes the healthy level and the abnormalities within the same domain of each system of the body.

The total outcome of the health status of each individual means the level or status of health of the community. Positive health status indicators have been developed for over 30 years, especially in European countries and The USA. It can be measured both at the individual and community level.

1) Heath Status Indicators (Individual Level)

By using the tools that measure multidimensional health domains and the health valuation at each level, the popular indicators are:

(1) HUI (Health Utility Index): Currently, the HUI has been developed to HUI 3 in order to be used as indicators for health-related quality of life by the University of McMaster in Canada. HUI 3 consists of two parts, namely, health states classification, and health state valuation. The data about health state valuation are obtained from surveys at the community level. HUI 3 classifies health status into six levels and eight domains, namely, vision, hearing, speech, ambulating, dexterity, emotion, cognition, and pain. The health status of each person is classified

according to their age, analyzed in each domain and the health state evaluation shall be conducted according to the level.  Then we find the average HUI score for each age group with the unit (the score) from 0 to 1, where 0 means death and 1 means the most complete state of health (Furlong et al., 1998: 1-3).

(2) The SF-36 (The Medical Outcomes Study Short Form 36) is the indicator of health-related quality of life developed from indicators in the study of the health insurance system in order to be applied to the study of the treatment outcomes of patients with chronic diseases or the evaluation of the quality of life after treatment.  This indicator consists of eight domains and 36 transactions, and can be classified into two summary measures, namely, physical health (PCS), composed of domains one to four and mental health (MCS), composed of domains five to eight as follows (Ware and Gandek, 1998 : 903 – 908):

Domain 1:  Physical function, consisting of ten issues

Domain 2:  Physical Role, consisting of four issues

Domain 3:  Bodily Pain, consisting of two issues

Domain 4:  General Health, consisting of five issues

Domain 5:  Vitality, consisting of four issues

Domain 6:  Social Functioning, consisting of two issues

Domain 7:  Emotional Role, consisting of three issues

Domain 8:  Mental Health, consisting of five issues

The range of scores is from 0-100, where 0 means the lowest quality of life and 100 means the best quality of life.

(3) WHO Health State Survey (2000) was conducted to ascertain the health status of the population in 57 countries.  The health domains are developed from the International Classification of Functioning Disability and Health (ICF) consisting of six domains as follows (Sadana et al. 2002: 1-2):

Mobility

Self-care

Usual activities

Pain and discomfort

Affect (Anxiety / Depression)

Cognition

In each domain, there are five levels of health such as movement, etc. Individuals were asked about the difficulties of movement and the answer is categorized among five levels, namely, no difficulties, slight difficulties, moderate difficulties, high difficulties, and cannot move.  Upon weighting the health valuation at various levels of every domain, the outcome is the health status of such individuals.

2) Population Health Status Indicators consisting of:

Life Expectancy means the number of years that the population expects to stay alive after birth or after various ages such as the longevity of males is 65 years meaning that the life expectancy of people who are males of the population in the country is 65 years or the expectation of people who make up the male population in such a country or community is supposed to have an average age of 65 years from birth.  However, the measurement of the average age or longevity is a quantitative measurement since it does not indicate the quality of life and healthy condition.

Healthy Life Expectancy is the measurement of the longevity of life after adjusting by the health status at various levels or the prevalence of disability (Robine, Romicu and Cambois, 1999: 181). Thus, the outcome is a clear longevity consisting of the time of healthy and non-healthy conditions.

The idea of health expectancy aas started by Sanders in 1964 and has been developed by Sullivan during 1970 (Sullivan, 1971: 347-353).  In 1984, the presentation of the model of health transition was demonstrated by the curve of survival regarding total survival, disability-free survival, and survival without disability chronic disease and led to the calculation of longevity with no disability or chronic diseases (WHO, 1984: 35) as in Figure 2.6.
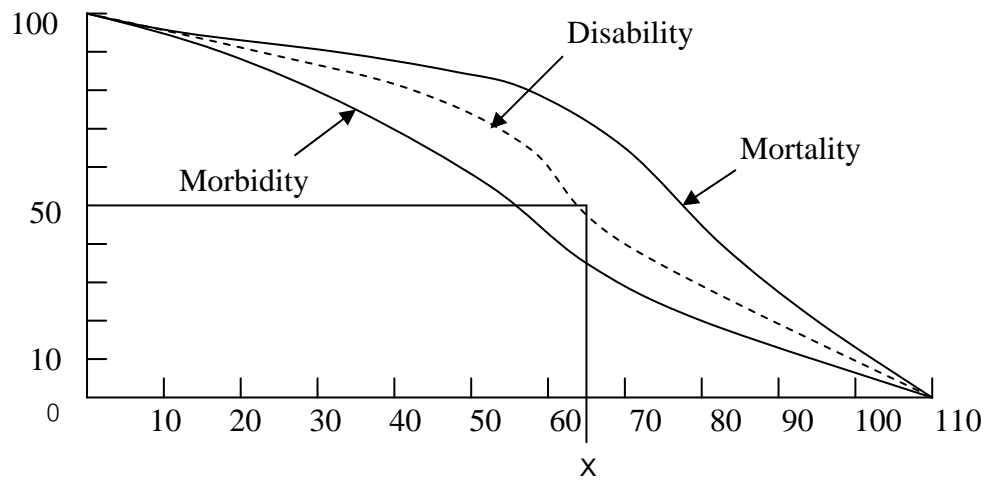
**Figure 2.6** General Model of Health Transition

**Source:** World Health Organization, 1984.

**Note:** X = age that 50% of this population group expects to stay alive with no disabilities

        With this model, we are able to measure the change of mortality, sickness and disabilities due to sicknesses and it leads to the study of health problems such as how diseases affect such changes.

        Several researchers have formed a group to develop the health expectancy model in many countries on behalf of REVES (the Re'seau Espe'rance de Vie en Sante') with the support from the World Health Organization and this group has developed the DFLE (Disability-free Life Expectancy) in order to be representative and used to measure the longevity in several countries. In 1976, Murray and Lopez developed Disability-adjusted Life Expectancy (DALE) and Disability-adjusted Life Years (DALYs), with a group of health researchers in European countries. Until now, the calculation of health expectancy has grown in approximately 49 countries in Asia, Japan being the pioneer followed by China, Indonesia, Korea, Malaysia, Burma, The Philippines, Sri Lanka and Thailand. In addition, in the World Health Report of the year 2000, health status among 191 countries in the world was compared using DALE (Mathers, Sadana, Salomon, Murray and Lopez, 2000: 3-11) and adjusted to be HALE (Health Adjusted Life Expectancy) in 2001 (Mathers et al., 2001 : 2-4).

All of them are the health expectancy indicators. Although all of them seem to have similar meanings and benefits, they are different in terms of their health status measurement. Some indicators use prevalence of disability and some use health state. In order to weight the health status at several levels, DALE uses 0 in the case of disability, and 1 in the case of no disability. However, other indicators such as DALE and HALE polychotomous or continuous valuation were used.

3) Advantages and Disadvantages of Positive Health Status Indicators

Advantages

It demonstrates the quality of people who are still alive.

It is proper for the country that has the population with longer life expectancy, and has rapid economic growth that may affect the people's health and quality of life.

It can be used for evaluating the health promotion system

It can be used as the fundamental indicator for health promotion of the future populations so such populations have a better quality of life in terms of physical, mental, social, and spiritual well-being

Disadvantages

The development of indicators is incomplete or invalid, especially concerning spiritual health

There is a need to generate the understanding about the indicators and concepts of the health status measurement because most of us are familiar with negative health status indicators.

The sources of data shall be developed in order to maintain a complete and qualified system.

## 2.3 Situation and Factors Affecting the Health of Women at Reproductive Age and Relevant Research Papers

In the past, when mentioning women's health, most people think about the aspect of women's health related to reproduction covering women's health during pregnancy, when giving birth, and family planning. These are perspectives that consider only the roles, potential, and values of women related to reproduction only. The identification of the details of women's health condition depends on a cultural basis and social beliefs, as well as different technologies. Currently, the perspective about the roles, potential, and values of women in society is clearer and more extensive. Hence, the consideration of women's health has been changed by covering reproduction, roles and potential, values of women as developers and creators of society, who earn income by working at the office or at home, as men do. Thus, the concepts about women's health are broader and women's health is perceived as a holistic view incurred from women's needs. This fact is different than the case of men. Women are perceived as being the girls until they become elderly and they are viewed from the perspective of reproduction, sickness, or occupational health problems.

### 2.3.1 Reproductive Health

The information taken from the United Nations (United Nations Population Funds, 2000: 3) according to the United Nations is that in every minute, our world has the following incidences:

380 women become pregnant,

190 of the 380 pregnant women did not plan or did not want to be pregnant,

40 women have abortions that are unsafe to their health

10 women become HIV infected,

1 woman dies away because of her pregnancy.

From the international meeting about population and development in Cairo, Egypt in 1994, reproductive health was defined as (the United Nations, 1994) "The state of complete physical, mental, and social well-being, not merely the absence of

disease or disability but covering life with satisfaction and safe sexual intercourse with the ability to give birth and the freedom to make decisions when giving birth." The outcome of this meeting was that 180 countries in the world proposed a 20-year project to protect the male and female population to have rights of reproduction and sexual intercourse, as well as family planning, and identified the vision in reproductive health as follows:

Every sexual intercourse should be free from coercion and infection.

Every pregnancy should be intended.

Every birth should be healthy.

Thailand is one of the countries that accepts the rights of reproductive health and defines the vocabulary and components of reproductive health as follows.

Reproductive Health means the state of physical and mental strength due to the complete reproduction processes of the male and female population throughout their lives and such people shall live in society with happiness and satisfaction with the following ten components:

1) Knowledge about family planning

2) Knowledge about maternal and child health care

3) Knowledge about AIDS protection

4) Knowledge about protection from cancer of the reproductive system

5) Knowledge about protection from abortion and complications during the pregnancy

6) Knowledge about protection from the infectious disease in the reproductive system

7) Knowledge about infertility

8) Knowledge about accurate and safe sexual education

9) Knowledge and understanding about adolescent health care

10) Knowledge and understanding about post-reproduction and elderly status

It was found that when considering the life cycle approach, reproductive health shall cover almost all of our lives starting with sexual development, sexual maturity, sexual intercourse, pregnancy, giving birth, and post-reproduction until

elderly. Many health problems occur throughout our lives and most of them could be efficiently protected. It is widely accepted that good reproductive health leads to healthy conditions for the male and female population and the increase of the country's and the world's productivity (Claeson et al., 2000: 8-10).

**2.3.2 Study and Research on Reproductive Health**

2.3.2.1 The Beginning of Reproductive Age

Menstruation concerns the change of the girl's body when she becomes an adolescent. The research and study of children who become adolescents has demonstrated that health conditions and children's nutrition are the main factors that hasten menstruation in the girls (Koprowski, Ross, Mack, Henderson and Bernstein, 1999: 11-12). This is an indication of the health of the female population in addition to ethnic factors. A survey of the health conditions in Thailand conducted from 1996-1997 studied information about women's health from 2,581 samples of the population from five regions. The information accumulated from the interviews was mostly regarding the health condition of women at reproductive age (Wiput Poolchareon and Chaiyos Kunanusonthi, 1998: 79-80) and showed that 95% of women in the labor force aged between 13 and 59 years had menstruation and 90% of women at aged between 13 and 24 years also had menstruation. The average age was almost the same as the median of the age with first menstruation, i.e., 14 years. When compared among regions, it was found that there were no differences and these data were almost the same as the data from the survey of the age with first menstruation in the female population group in various ages and ethnics (Europe, Asia, Australia, America, and Africa) from 18,997 female adolescents from 1979-1988 (Morabia and Costanza, 1988: 1195 – 1205). It has been shown that most of the women had their first menstruation when they were 14 years old but the median age was different among the various countries. During the age between 13 and 16 years, it was demonstrated that the age of first menstruation among Thai women was not different from that of other ethnic groups. The analysis of age at first menstruation has demonstrated that the group aged between 13 and 19 years had a lower average age of first menstruation than that of other groups and this fact complies with the study conducted by interviews with 15,598 female students in Bangkok from 1996 – 1997

Chompootaweep, Tankeyoon, Poomsuwan, Yamarat and Dusitsin, 1997: 427 – 433).
It was found that the average age at first menstruation of this group of students was
12.51 years. This information reflects that Thai women, who were born during the
past 20 years, had their first menstruation at a more rapid rate than women in earlier
times, so it demonstrates that growth and the beginning of the reproductive age among
Thai women has become more rapid. The interesting finding is that the population
group with a high level of income had a lower average age of first menstruation than
other groups and such differences were statistically significant meaning that the age at
first menstruation varies inversely with a higher level of income (Thai Health
Research Institute, 1998). In addition, some studies demonstrate that the group of
children who ate protein from meat had a lower average age at their first menstruation
than the group of children who ate vegetarian food for six months (Kissinger and
Sanchez, 1987: 475-478). Thus, the intake of protein during adolescents affects the
beginning of the reproductive age and the age at first menstruation reflects the health
condition and nutrition of the female population.

2.3.2.2 Sexual Intercourse

Sexual intercourse is an important behavior relevant to the factors
affecting the reproductive age. The change of physical and mental conditions due to
the change of sexual hormones and the social and cultural conditions identifies the
sexual relationship and the family establishment in labor group and affects sexual
expression, feelings, and sexual intercourse when becoming adolescents, as well as
the family pattern through the labor age. Regarding the age between 45 and 65 years,
sexual hormones tend to decrease their functions affecting the change of emotion and
physical condition when becoming elderly. In addition, in the current social condition,
sexual intercourse is a channel of transferring and disseminating various contagious
diseases such as venereal disease, hepatitis, AIDS, etc. This affects the reproductive
health of the labor population in the long run and sexual deviation in the labor age
population leads to physical and mental problems of people in society.

The age at first sexual intercourse reflects the reproductive activities of
the population group. The research outcome in foreign countries has demonstrated
that individuals tend to remember the age of the first sexual intercourse (Dunne,
Martin, Statham, Pangan, Madden, and Heath, 1997: 4-5). A survey conducted from

1996-1997 (Thai Health Research Institute, 1998: 80) found that the average age at first sexual intercourse among women was 21.3 years and the median was 20 years when considering the factors affecting the first sexual intercourse in women (Goodson, Evans and Edmundson, 1997: 150-154). It has been demonstrated that environmental and social conditions were the most important factors, followed by biological factors such as age, development or the beginning of the reproductive age. Thus, research to study cultural factors and the situation in Thai society helps identify appropriate social and public health policies to protect the population from risky behaviors in terms of sexual intercourse. Regarding the analysis of the trend of the change at age of first sexual intercourse for various age groups has clearly demonstrated that female adolescents, aged between 13 and 19 years had their first sexual intercourse at lower ages than the adolescents during the past 20 to 30 years for approximately 3-4 years.

The age at first sexual intercourse has been proved to result from several factors, i.e., genetic endowment due to the controlled substance of sexual behaviors within the brain (Miller, Pasta, MacMurray, Chiu, Wu and Comings, 1999: 48-52), the family environment, (Mott, Fondell, Hu, Kowaleski and Menaghan, 1996: 13-18), the social environment, use of drugs, culture and religion. Thus, the trend of change within Thai society reflects that the current Thai society is open to the opportunity to hasten teenagers to have their first sexual intercourse and when identifying the age of 18 years to be the criteria of first sexual intercourse at a too rapid rate. It was found that the female group who lives out of the municipality has earlier sexual intercourse than the female group in the municipality when compared with the criteria. It has been shown that the social environment is an important factor to hasten the first sexual intercourse. When considering economic and social status, it was found that women with low educational levels or levels of income have their first sexual intercourse when at a younger age than women with high education levels and levels of income. The analysis and comparison among various occupational groups found that female farmers and students have their first sexual intercourse when they are below 18 years of age at a lower rate than other groups.

From the survey of the health conditions in Thailand from 1996-1997 conducted by the Thai Health Research Institute (1998), found that 95.6% of the women had their first sexual intercourse with their husbands, 3.3% with their lovers

and 0.5% with their boyfriends. In addition, 5.9% of women living in Bangkok had sexual intercourse with more than one man (multiple partners) during the past year. This figure was higher than women living in other areas. When analyzing the population area, it was found that women living in the municipality had sexual intercourse with more than a man at a higher rate (3.5%) than women living in rural areas (0.8%) or odd ratio = 4.3 (95% CI = 1.86 – 0.96). This figure reflects that the social environment in urban areas supports multiple partners. In analyzing the multiple partner issues in each age group to consider the changing trends in each generation of the population (Birth Cohort), the highest proportion of women who had multiple partner behaviors was in the youngest group at approximately 11.1% and such a proportion decreases when the women get older. The discovery indicates that the teenage population group had rather high sexual risk and this fact complies with the studies in foreign countries because teenagers tend to be interested in and eager to participate in sexual activities. At the same time, teenagers also lacked appropriate knowledge and understanding on protecting themselves from any infectious diseases from sexual intercourse and in family planning. In addition, it was found that in the past year, single women were among the population group with highest proportion of multiple partner behaviors, followed by the divorced or widowed group. Moreover, it was found that women with higher educational levels tended to have multiple partners at a higher rate. A total of 25% of women, who are studying, tend to have multiple partners during the past year at a higher rate than women in other occupational groups.

2.3.2.3 Birth Control:

The survey on health conditions from 1996 -1997 (Thai Health Research Institute, 1998: 82) found that the overall birth control rate was 64.4% and the highest rate was in the north eastern region. A total of 67.8% of the women had birth control via fertilization, 37.1% took birth control pills, 26.4% used birth control injection, ring, and birth control hormones. From this report, it was found that the highest rate of birth control was among women at ages between 25 and 39 years at 75.4%, 60.4% was at age between 13-24 years and 52.6% was in women at the age over 40 years. When comparing with the survey of birth control conditions in Thailand during the same year, it was discovered that the percentages of women who used birth control methods among married women at the age between 15 and 44 years

was follows: c23.1% used birth control pills, 22.0% used sterilization, 16.4% used birth control injection, 3.2% used ring and 1.3% used birth control hormones. Although we cannot accurately compare the ratio since the methods used were different, the popularity among birth control methods was similar. The group, who reported that they did not use birth control, gave the reasons as follows: A total of 15% of the women would like to have more children, 18.9% thought that they will not be pregnant anymore, and 15.8% said that they were pregnant at the time of the interview. It was found that most of the birth control came from women and the use of birth control methods in women, such as pills, injection, birth control hormones, ring, etc. had lots of side effects, e.g., bleeding, feeling queasy, having melasma, stomachache, becoming fat, and itching in the birth canal (Sirinan Kittisuksathit and Sureeporn Punpuing, 1995).

2.3.2.4 Pregnancy:

Due to the success of the maternal and child health care programs in Thailand, more than 90% of pregnant women have been examined before giving birth and 88.6% of the pregnant women have been examined four times, so pregnant women are accurately treated (Siriporn Kunchana, Pornsinee Amorvichat and Nareluk Kunreok 1998: 41-45). The important health problem of pregnant women in the current situation is anemia since pregnancy causes several changes in physical conditions. In a normal pregnancy, the amount of hemoglobin, red blood cells, and hematocrit slightly decreases. Pregnant women with anemia may face problems in themselves and their children such as pregnant women may be easily infected, and encounter complications from the loss of blood when giving birth or after giving birth; the rate of the dangers and death of the mother increases, and premature birth may occur (Chanpen Chooprapawan, 2000: 56). The survey conducted by the Department of Health in 1996 found that 16.3% of pregnant women had anemia and 1.7% had HIV infection. From an examination of hemoglobin and hematocrit (Thai Health Research Institute, 1998: 90-92), it was found that 53.8% of women in Bangkok had anemia and 29.9% in the north eastern region. The information was not conclusive concerning the relationship between living in urban or rural areas and anemia. However, surveys in some areas have monitored the situation continuously after the years, 1992 to1996.

In addition, the 4th survey on food and nutrition conditions in Thailand by the Department of Health in 1995 studied the cause of anemia by surveying the nutrition of pregnant women and found that pregnant women got their calcium and iron at the ratio of 47.3% and 34.6% of the proper amount of intake, respectively and this figure was similar for both urban and rural areas. When considering each region, it was found that most pregnant women obtained the proper amount of nutrition, except for calcium and iron and women in the north eastern region obtained the lowest amount of calcium and iron at 36.4% and 50.5% the proper amount of intake. This remains one of the major causes of anemia in pregnant women living in the north eastern region.

2.3.2.5 Abortion:

Abortion may result from the mother's poor health condition or an undesirable pregnancy. Abortion to save the mother's life is not a big problem since it is done in the health center with appropriate methods and there are no serious health problems after the abortion. However, abortions for undesirable pregnancies usually use the inappropriate methods and the women in this group may risk abnormal bleeding, shock, swollen womb and other abnormalities of the reproductive system, and even death. The information from the Department of Health has mentioned that 12.8% of mothers died due to the unsafe abortion, a mortality rate of 5.6 persons per 100,000 live births. However, since most of the abortions performed are illegal, it is difficult to have accurate information regarding this problem. The studies in hospitals such as the study conducted in Rajvithee Hospital reported that physicians had to treat abnormal bleeding and placental complications from illegal abortions in 1993 for 566 women and most of these women were at the ages between 14 and 20 years (Raewadee Dumprapa, 1995: 2).

The survey of health conditions from 1996 to 1997 (Thai Health Research Institute, 1998: 84-85) investigated the experience with abortion from labor age women and found that Thai women had abortions at the rate of 19.3%. The samples in Bangkok had higher rates of abortion than other areas. When considering the age group of the population, it was found that the proportion of women who had abortions increased from 0.4% at ages between 13 an 19 years to 17.7% and 27.8% at ages between 20 and 34 years and 35 and 44 years, respectively. The highest rate was

among women at ages between 45 and 59 years at 30.3%. This demonstrates that one third of Thai women who were at 50 years of age had experience with abortion. Women with higher educational levels had a lower proportion of abortion experience than women with lower educational levels. Upon investigating the cause of abortion, it was found that 13.5% had a spontaneous abortion and 3.6% had an illegal abortion. In addition, it was discovered that abortion among populations living in the municipality was at a higher rate than in populations living out of the municipality (4.5% and 2.9%). When analyzing according to area, the highest proportion of abortion was from women living in Bangkok and the north eastern region. When considering spontaneous and illegal abortion according to age group, it was found that spontaneous abortion tended to be higher when people got older and the highest proportion of illegal abortion was at ages between 25 and 44 years and the proportion decreased when people got older. In terms of educational level, it was found that women with lower educational levels tended to have spontaneous abortion at a higher rate than women with higher educational levels but the ratio of illegal abortion was not different between the two groups. For the female population group who said that they had experience with abortion, most of them had an abortion once and the highest number of abortions was six times. From the analysis of the women who gave information about their abortion experience during the past year, it was demonstrated that women with high education levels had spontaneous abortion at the rate of 5.7% and illegal abortion at the rate of 1.8%. In addition, the study to analyze the abortion rate during the past year in order to obtain information about the rate of abortion during the one-year period, it was found that the rate of abortion among Thai women was at 8.4% per year, women in Bangkok and the southern region had an abortion rate of more than 10% per year and women in the northern region had the lowest rate of abortion. When comparing the abortion rate with other countries, the figure was similar and upon classifying the abortion rate in the past year according to age group, it was found that 2.1% of women at ages between 13 and 24 years had an abortion and women at ages between 25 and 39 years had a high rate of abortion at 15.6% while women aged between 40 and 59 years had a rate of abortion at 7.4%. An important fact is that one fifth of women who said they had an abortion experience had an illegal

abortion. The observation from this analysis was that women with higher levels of income had a higher rate of abortion than those with lower levels of income.

**2.3.3 Study and Research on Diseases Threatening the Health Conditions of Thai Women:**

From the report of women and health network that studied the cause of sickness and death, important problems threatening the health conditions of Thai women are reproductive health, violence, occupational health, use of drugs, and mental health.

2.3.3.1 Diseases threatening the Reproductive Health of Women:

The following reproductive health conditions proposed here excludes the issues relevant to the health conditions that are not in line with the natural life cycle of women as mentioned above, but the researcher will propose to study only reproductive tract infections.

1) Current Sexually Transmitted Diseases. More than 20 sexually transmitted diseases have been identified; the important ones are: gonorrhoea, syphilis, herpes, warts, AIDS, parasites, and Chlamydia. From a report of the Division of Epidemiology (Thailand. Division of Epidemiology, 1998), it was mentioned that the rate of sexually transmitted diseases tended to decrease every year, namely, 7.69 per 1,000 population in 1987 to 0.38 per 1,000 population in 1998 and the number of women doubled that of men. Women who were commercial sex workers tended to have sexually transmitted diseases at a higher rate than ordinary women and it was found that this group of women and women in labor force tended to have sexually transmitted diseases at a higher rate. In addition, the report stated that only 41.8% of women at reproductive age had knowledge about protection from sexually transmitted diseases, only 40 % knew that they should not be promiscuous and 65.8% knew that they should use a condom for every sexual intercourse with partners other than their own husband.

Regarding the AIDS situation among women, during the years 1993 to 1994, 42 studies were conducted about women and AIDS. Such reports started since the year 1992 and the most important target of the study was commercial sex workers, pregnant women and married women at reproductive age. The

information from the Ministry of Public Health mentioned that commercial sex workers tended to have higher rate of AIDS infection and such rates decreased during the years 1995 to 1996. At the same time, a higher number of commercial sex workers and pregnant women also reported AIDS infection. The report of AIDS patients from the year 1984 until 31 March 2000 discovered that 30,929 women were AIDS patients and the ratio of men to women was 3.5 to 1. The report found that the highest number of female patients was at ages between 25-29 years, followed by 20-24 years. The total of 3,144 female patients was lower than 15 years of age and 262 patients were higher than 60 years of age. This reflects the fact that AIDS tends to spread into the family and to the low risk group, namely, children and elderly females.

Infections from sexual intercourse can be protected by the use of condoms and a report in a group of women at ages between 13 and 59 years found that 83.4% of the samples believed that condoms should be used to protect themselves from AIDS, 76.7% believed that it should be used for birth control and 55.5% believed that it should be used to protect themselves from venereal disease. Analyzing the information according to age group, it was reported that 90.5% of women at ages between 13 and 24 years thought that the use of condoms can protect themselves from AIDS (Thai Health Research Institute, 1998). Such information indicates that public health promotions about the use of condoms for AIDS protection is effective in terms of giving knowledge at an excellent level, but suspicions remain about the application of such knowledge because the report found that although 92% of the 1,704 women answered that condom can protect themselves from AIDS, only 60% of this number used condoms when having sexual intercourse. In addition, the survey on people's health conditions from 1996 to 1997 revealed that only 59.1% of women permitted their partners to use condoms, 16.5% did not permit them to do so and 13.6% were not certain. Such findings reveal that their partners (husbands, lovers or friends) did not use a condom every time the women requested, especially among teenagers; male and female teenagers often do not use condoms when having sexual intercourse.

2) Cancer of the Reproductive System:

Cervical cancer is one of the most common cancers among women of labor age, followed by the breast cancer, ovary cancer, endometrial cancer,

placenta cancer, and others. When considering the four most common cancers in five large-sized provinces under the cancer registration center, it was found that the highest rate of cervical cancer, ovary cancer, and endometrial cancer was in Chiang Mai, and high breast cancer rates were found in Bangkok (Deerasame et al., 1999).

Although cervical cancer and breast cancer are the most common, they are cancers that can be completely treated if they are diagnosed early at the beginning phase. Women at the age above 35 years should obtain the examinations for cervical and breast cancer regularly. The survey on people's health condition from 1996 to 1997 (Thai Health Research Institute, 1998: 86-89) found that 40.3% of women underwent examinations for cervical cancer and 91.8% of them were normal. In the case of examining abnormalities of the breast, it was found that only 34.3% of women examined their own breast and 3.2% of them found abnormalities.

3) Hormone Replacement Since the Sixth International Congress on the Menopause in Bangkok 1990, Thai women at the age more than 45 years have taken hormone replacement to reduce any inconvenience from menopause and the Department of Health implements the policy to ask all the hospitals under the Ministry of Public Health to open their clinics to women in menopause in the year 2000. One of the clinic's services is the use of hormone replacement, so the rate of the use of hormone replacement among middle-aged women tended to increase as the policy was disseminated throughout the country. Although some report the advantages of the use of hormone replacements, that it can help reduce any inconvenience from the change of sexual hormones in the body during the menopause period, in the long-run, it can help protect from osteoporosis and coronary artery disease. Some studies report discrepancies such as it was found that women who continuously take hormone replacement over a long period of time tend to have cancer of the reproductive system and diseases of liver, gall bladder among others. Currently, there are no clear conclusions about the actual advantages and disadvantages of the use of hormone replacement for more than five years. Thus, the use of hormone replacement is another important issue that requires attention in the long-run, especially regarding the reproductive health of middle-aged and elderly women.

2.3.3.2 Violence against Women: After the international conference on population and development in Cairo, Egypt in 1994, the situation in 26 member countries was evaluated to gauge the urgent problems of the reproductive health issue and it was found that the problem about the expectation of gender roles is one of the important threats reflecting health problems among women in society such as issue about violence against women (United Nation, 2000: 4, 25). Important situations regarding violence against women in Thai society are as follows.

1) Sexual Violence. There have been some reports from the Foundation for Women that gathered the news from five newspapers, namely, Thai Rath, Daily News, Matichon, Kao Sod, and Siam Post during the year 1995. It found that there were 139 news articles on sexual violence, and 31% of them were about raping and killing, 19% of them about raping by gangs and killing. Within this figure, 40% of the victims were girls at ages lower than 15 and the people who committed this crime were fathers, stepfathers, relatives, teachers, supervisors, police, and others (Kritaya Archavanitkul, Churnrurtai Kanchanachitra, Wassana Im-em and Usa Lerdsrisuntad, 1995). Sexual violence is dangerous towards the physical and mental conditions of women, and news about this is reported almost everyday. The level of violence starts with obscenity up to raping and killing.

2) Discrimination against Women In terms of how sexual discrimination affects the health condition of women, the use of child labor is one of the most common. Some studies have found that girls enter the labor market at a lower age than boys and the proportion of girls in the labor market is higher than that of boys. Girls tend to receive lower wages than boys for the same jobs (Archavanitkul and Haxanon, 1991). This situation affects the emotion and mental conditions among girls.

3) Transnational Trafficking of Women. Many articles about the transnational trafficking of women appear in the news and research papers but the overall figure is still unknown. However, in the news, most of the women are young. The trafficking of women and sexual abuse seriously affects the mental conditions of such women. In addition, problems have surfaced about sexually transmitted diseases, especially AIDS, venereal disease, violent attacks and injuries to women. Moreover, some news articles have stated that the owner of brothels force women to take drugs

everyday so they could serve lots of guests per day and these drugs seriously affect their physical and mental conditions.

4) Family Violence Family violence can be classified into many types. It can be either the verbal (speech) or physical. It can occur within and outside the family. Thailand still lacks the overall data about this issue. The information available results from a study of a female population at ages between 15 and 49 years (Institute for Population and Social Research and Foundation for Women, 2000) in Nakhon Sawan and Bangkok. A total of 44% of married women have been physically or sexually abused by their husbands and such abused women attempt to commit suicide. However, 70% of the abused women did not want to ask for the assistance and it is interesting that men who committed the violence towards women have experienced violent episodes in the past. From this study, 57% of the men who were hit or attacked when they were children and 67% of men who were attacked by their parent, wife or lovers committed violence towards their wives or lovers.

2.3.3.3 Women's Mental Health:

Currently, women play more important roles in the economic system at both the family and community levels, but women also have to take on the traditional duties and responsibilities, so there are some conflicts in balancing gender roles and we have to accept that it is difficult to be successful in both roles at the same time. The number of women with higher educational levels tends to increase. In addition, NGOs play an important role in promoting women's roles and status to be stronger, so the expectation towards the women's roles as housewives will be changed. The fact is that when women have to work in the office, their roles at home tend to decrease or they need to find others to take on such roles instead. Moreover, the number of women successful in managerial roles in both public and private entities tends to increase, so in the future, women will play an important role in the management and identification of social policies. This situation is positive in terms of women's status but women have to face the stress from sexual competition. If women do not prepare themselves or lack problem solving skills, they may have mental health problems from the change and fluctuation of their roles, duties and responsibilities.

Some women may not obtain higher educational levels because of the economic situation or other causes, so they need to enter skilled and non-skilled labor

markets. Since Thailand's industries need to be developed, many laborers are required in the industrial market. In addition, some women have to enter the commercial sex industry and this group of women has to face exploitation from the society. If the social values in terms of gender inequality and the sexual abuse still exist, this group of women has to face stress and anxiety regarding job insecurity and work stress. The most important fact is that they have to face physical and mental suffering from the family and sexual abuse.

From the review of the reproductive health situation and several research papers, we can find the cause and risk factors affecting the risk behaviors of women at reproductive age, leading to reproductive health problems in Thailand and the protective factors as demonstrated in Figure 2.7.

**Risk Factors**
- Social values (Men are leaders and women are followers)
- Differences between gender
  - Men have more sexual freedom than women but no responsibilities
  - Men identify the sexual intercourse and women must follow and accept
  - Women have low power of negotiation
- Women with lower educational levels lack the knowledge about sex and sexual transmitted disease
- Other risk conditions
  - Poverty
  - Trafficking
  - Sexual temptation
  - No family planning / counseling for teenagers

**Risk Behaviors**
- Promiscuous behaviors among men both before and after marriage
- No protection: Do not use condoms regularly
- Sexual abuse
- Family violence
- Poor eating habits especially during pregnancy

**Reproductive Health Problems**
- Undesirable pregnancy, pregnancy in adolescents
- AIDS
- Other infectious disease on reproductive system
- Abortion and its outcomes
- Anemia during pregnancy
- Violence against women and children
- Cancer of reproductive system
- Women's mental health
- Elderly and Osteoporosis etc.

**Protective Factor**

**Men and Women**
- Equal Education and Occupational Opportunity
- Knowledge about sex, birth control and sexual transmitted disease
- Learning life skill
- Feelings that they have their own values and future
- Good sexual attitude, Responsibility to the sexual behaviors
- Proper Nutrition
- Regular exercise

**Government Policies**
- Women's Education and Occupational opportunity
- Protection of family violence and trafficking, and drugs

**Environment**
- Social value
- Equality between boys and girls
- Project for youths + cooperative network Warm family / No violence
- Health service: mothers and children, Adolescent clinic
- Good example such as from the country's leaders

**Figure 2.7** Reproductive Health Problem in Thailand, Risk Factors and Protective Factors

### 2.3.4 Health Status Indicators of Women in Reproductive Age

World Health Organization (WHO, 1993: 16-17) has proposed health status indicators of women in reproductive age

#### 2.3.4.1 Demographics

Language, race, or other ethnic divisions, literacy rates by gender and age, birth rates, death rates, infant mortality rates and life expectancy overall and for men and women; sex ratio at birth and at later ages are considered.

#### 2.3.4.2 Health Care System/Financing

The type of system (public-private-mixed); if a traditional care system exists and how widespread, whether integrated into "Western" system, any descriptions of traditional practices, especially as they affect women; if the PHC model used and if so, how; number of different kinds of health workers and number per capita, how they are distributed geographically (e.g. urban/rural difference); levels of expenditure, expenditure per capita, and any available information on spending by specific problems of regions are considered, as well as any pattern of lower expenditure on problems that are more often suffered by women?

#### 2.3.4.3 Health Service Utilization

These include the number of women receiving prenatal care, where babies are born, and any other basic coverage statistics, if possible by gender, rural-urban and region where relevant; clinic visit per capita, etc. Whether the essence and acceptability of service is an influence on the women's use of health services is considered.

#### 2.3.4.4 Educational Achievement for Women

The indicators take into account the male/female ratios at different levels of school; number of female graduates in advanced degrees and ratio to men.

#### 2.3.4.5 Economics

Other indicators include per capita income; degree of inequality of wealth; percent female headed households and income differential; percent of women and children in poverty in comparison with men; labor force participation rates for women compared with men; types of occupations where women are located, with special focus on agricultural sector, family  unpaid labor ; property ownership by

women; any legal or customary restrictions on women's economic participation; inheritance laws; welfare, pension, retirement schemes and degree of participation by women in them.

### 2.3.4.6 Family Structure

These indicators include marriage laws; percent married; age at marriage; customary bride price or dowry, arranged marriage; birth rate, average intervals between births, breastfeeding prevalence and duration; divorce rates, division of property and rights for children of divorce; what happens to windows-restrictions, rights, etc.

### 2.3.4.7 Sexuality

Regarding gender issues, the WHO proposes indicators such as female circumcision, multinational traditions; customary degree of restriction of movement of women and any differences by region, social class, or age; contraceptive laws and practice; abortion laws and practices, number of deaths from septic abortion; pornography; extent of commercial sex and crimination of women but not men, forced prostitution, etc.

### 2.3.4.8 Violence against Women

These include spouse abuse, rape, incest, women in prison

### 2.3.4.9 Women's Strengths

Women's political and social organizations, etc are considered.

### 2.3.4.10 Political Participation of Women

Other factors include whether the population votes for officials, percent of males, females who vote; number of the proportion of women in elected and appointed government offices; participation of women in national and region political parties and other organization; any women's political organizations and activities such as conferences, protests, etc. Also considered is whether women are in the military: if subject to draft; what roles they play in military.

**2.3.5 Framework of Multi-dimensional Factors of Healthy Women in Reproductive Age**

This study developed a conceptual framework by realizing the holistic health status (physical, mental, social, and spiritual well-beings) in cultural contexts and Thai society, including health problems and risk conditions in Thailand among women in reproductive age that can be protected by eliminating the risk factors or developing the protective factors. All of them can be used as fundamental development of the characteristics of healthy women at reproductive age and indicators with the definition of "Healthy Thai people" as follows.

"Women in reproductive age with the state of complete physical, mental, social, and spiritual well-beings with the absence of diseases or conditions that can be protected by the healthy behaviors" is included in the definition. They shall be the quality unit of the society with the potential for social development so the society they belong to becomes peaceful, prosperous, and is ready to healthily grow in every part of the life".

It shall be recognized that this definition does not mean only women in the current situation but such women shall be individuals or persons with other qualifications for the potential of the growth to be the healthy persons when they become older. Thus, in identifying the criteria of being women at reproductive age, it is necessary to use the following information as components for such criteria.

- Diseases or health problems during that age, especially diseases that can be prevented and the healthy people shall not be sick because of such diseases.

- Risk factors or causes of health problems in the context of Thai society

- Factors that can protect individuals or groups from such risk factors. They can be the qualifications of individuals such as problem solving skills, having objectives for their lives, pride in their own selves and protection from drug addiction or drinking alcoholic beverages.

- Important guidelines for health promotion that are proved to be efficient are demonstrated in the framework of "Development of Indicators of Healthy Women in Reproductive Age" (Figure 2.8).
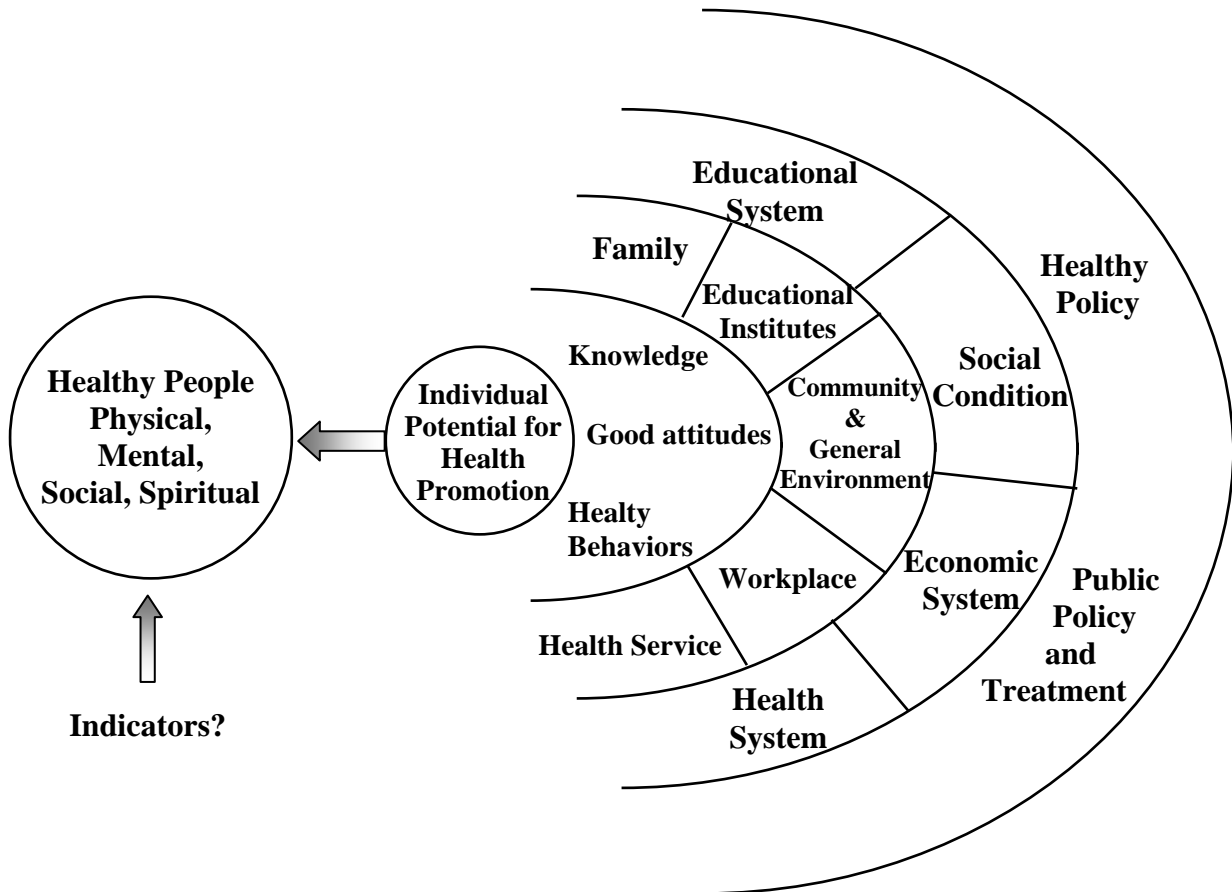
**Figure 2.8** Framework of Multi-dimensional Factors of Healthy Women in
Reproductive Age

# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1 Pattern of Research

This research was a survey study measuring the positive health status in a group of women aged between 13 and 49 years in urban and rural areas in the four regions of Thailand. Indicators will be constructed for healthy women at reproductive age that describe the factors in each dimension of women at reproductive age affecting the healthy condition to develop a model of indicators for healthy women at reproductive age.

## 3.2 Population and Sample

The population in this research were women aged between 13 and 18 years and 19 and 49 years in urban and rural areas in Bangkok and the four regions of Thailand.

### 3.2.1 Unit of Sampling

Two levels of units were used in the study. One was the individual in the family and the other was the community where the family resided.

3.2.1.1 Information of individuals living in the family was collected by interviewing the head of the family and family members who could answer the questions concerning health indicators.

3.2.1.2 Information of the community, where the family located, was collected by gathering data from secondary data and from survey.

### 3.2.2 Sampling

The sampling method of the survey was performed using stratified two-stage sampling. First, the group of provinces in each of the four regions and in Bangkok comprised the sampling frame. At this step, one province from each region was selected and classified according to the administrative system: within and out of the municipality as the primary sampling unit (ratio of the household "within the municipality" to "out of the municipality" was 1 to 4). For Bangkok, its areas were divided into communities and at this level 30 of them were randomly chosen.

At the subprovincial level, excluding Bangkok, three districts were selected from districts within the municipality and another three districts were selected from districts out of the municipality. Two blocks were selected from each of the three selected districts within the municipality while eight villages were selected from each of the three selected districts out of the municipality. These selected "blocks" and "villages" served as the secondary sampling units.

From selected "blocks" and "villages" except Bangkok, households and communities from the selected "blocks" and "villages" comprised the tertiary sampling units.
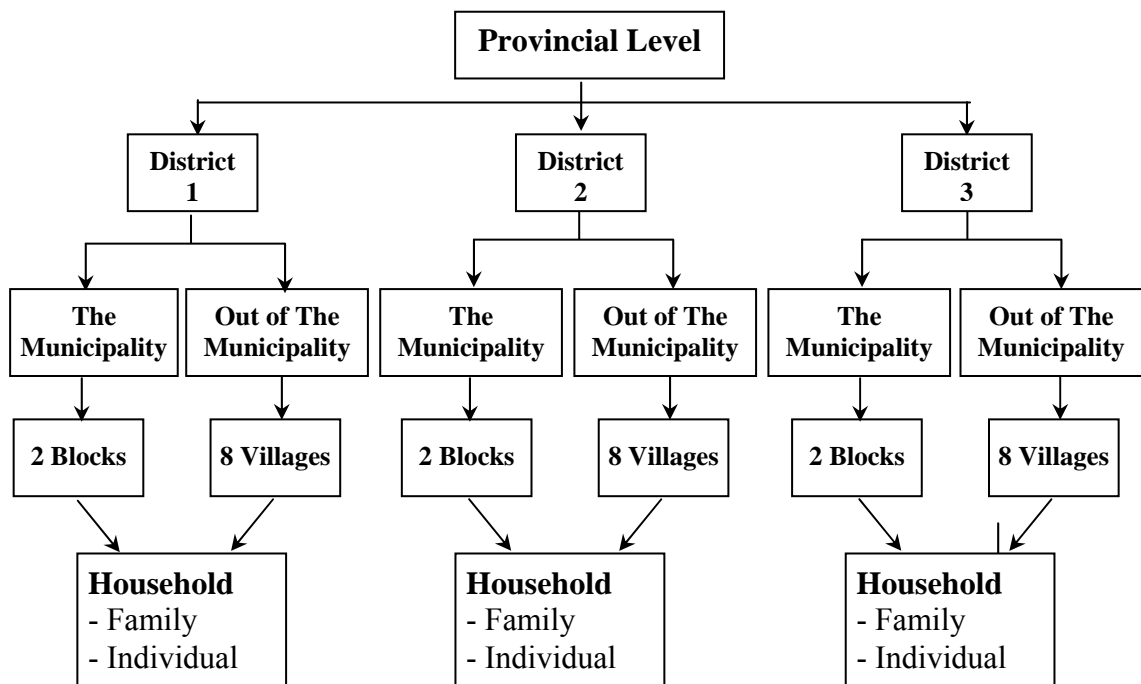


**Figure 3.1** Sampling frame and sampling methodology in provinces excluding Bangkok

For Bangkok**,** thirty communities were randomly selected and 35 households were selected from each community.

```
┌─────────────────────┐
│    Sampling 30      │
│    communities      │
└─────────────────────┘
           │
           ▼
┌──────────────────────────────────────┐
│  Sampling 35 households per community │
└──────────────────────────────────────┘
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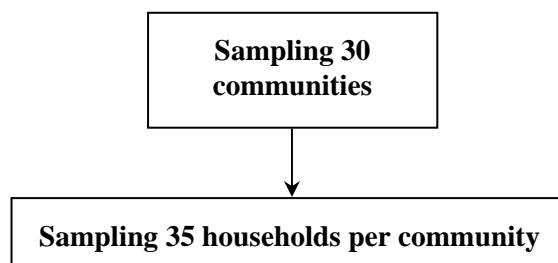
**Figure 3.2** Sampling frame and sampling methodology in Bangkok

From the above sampling methodology, Nan, Sa Kaew, Amnaj Chareon and Yala Provinces were selected as provinces included in the study. From the four provinces, districts were selected as shown below.

**Table 3.1** Selected provinces and districts in the study

| Provinces | Selected Districts |
|---|---|
| Nan | • Na-Noi, |
| | • Pua, |
| | • Chiang Karn |
| Sa Kaew | • Wang Nam Yean, |
| | • Wattana Nakorn, |
| | • Aranya Prades |
| Amnaj Chareon | • Patoom Ratchavongsa, |
| | • Sae Nang Ka Nikom, |
| | • Hua Tapan |
| Yala | • Raman, |
| | • Bunnang Sata, |
| | • Yaha |
| Bangkok | • 30 communities |

### 3.2.3 Size of Samples

This study was a part of the project on the study of indicators of Thai healthy people, supported by the World Health Organization and Health Systems Research Institute. Therefore, the size of the samples of this research depended on the calculation of the sample size from the main project. Personal households, which served as the tertiary sampling unit, were sampled at one percent of the total households in the area, equivalent to the size of the sample of the survey at the national level of the National Statistical Office. Thus the calculated number of sampling households in the five selected provinces totaled 4,200 households.

## 3.3 Procedures

### 3.3.1 Constructing Indicators of Healthy Women at Reproductive Age

Domestic and international data were gathered from the research and, classified into individual level. The important age group was determined to be the group of teenagers aged between 13 and 24 years and a group of adults aged between 25 and 49 years.

The indicators of healthy society included families, schools, workplaces, and communities at various levels.

### 3.3.2 Expert and Community Opinions

Opinions and recommendations from experts were collected in several areas gave about constructing indicators by:

3.3.2.1 Delivering documents to the experts to consider the indicators in each domain with the principle of selection, being namely, experts in medical biology during the selected periods of the life, in the social sciences, religion, public health, environment, psychology, social work, education, etc.

3.3.2.2 Adjusting the indicators according to the comments of the experts in each area to consider the overall indicators.

3.3.2.3 Studying the practicality, relevance and communicability by inviting representatives from various groups of the communities such as groups of women, teenagers, laborers, etc. Indicators were presented and the objectives of

measurement were explained, especially when the measurement was applied to society.

3.3.2.4 Summarizing all the recommendations and opinions and adjusting the indicators before testing their validity and reliability.


### 3.3.3  Testing the Validity and Reliability of the Indicators

Testing the validity and reliability of the indicators at the individual and community level was performed in communities with similar key characteristics to the areas that would be the study site.  The researchers sampled 200 families and interviewed the head of these families or their acquaintances who were familiar with them and could complete all the information requested concerning family members.

3.3.3.1 Test of Validity:

Testing the concurrent and construct validity was accomplished by examining the indicators constructed from the concepts and rules, then comparing the tools taken from other sources such as Thai Mental Health Indicators, EQ test of the Department of Mental Health and Health State Description of World Health Organization.  Using exploratory factor analysis to help classify and compare the original structure of the indicators, the researchers classified the outcome from the field survey, used the criteria of loading factor greater than 0.4 and found that the indicators could be successfully classified according to the criteria.

3.3.3.2 Test of Reliability:

The test of reliability was performed using the internal consistency method (Cronbach's Alpha's Coefficient) to obtain the index of association ($\alpha$) of each set, which was between 0.8-0.9, an acceptable level of reliability for the tools constructed by the researcher.

3.3.3.3 Data Processing and Analysis:

The outcome should be used for adjusting and developing the indicators of healthy women at reproductive age.


### 3.3.4  Preparation before the Field Survey

3.3.4.1 Contacting and coordinating with provincial public health offices was done to request their cooperation in the selection of the public health

officers to gather data and prepare for the training of research assistants and interviewers.

3.3.4.2  Training the research assistants and interviewers.

In each province, the researcher arranged a short training course of two or three days and distributed data collection manuals of the study to ensure a standardized and reliable data collection.  Every data collection form set of the indicators of healthy Thai people was designed to record the data as the data reader, and each complete set from each province should be submitted to be processed at the central office.  Thus, accurately completing the form by filling in the O was very important and the data collectors were trained to interview and record the data in various questionnaires and to examine the form sets every time before submitting the data via the data reader.

The training on the first day covered an explanation of the details of each questionnaire meaning how physical checkups would be performed such as how to measure the weight, height or waistline and to measure blood pressure.  The questionnaires and physical check-ups were different according to age group.  The training on the second day consisted of using the tools in the areas, summarizing and asking questions regarding problems using each set of tools and the methods of managing data collection in the area.

3.3.4.3  Sampling Selection Method of Families in the Field Survey.

When accessing the selected villages, the researcher started from the first house located at the entrance of the village and selected a family (household) by tossing a coin.  In heads, the first house was selected and if tails, the second house would be selected.  Then every other house located to the right of the initial house would be selected.  However, if the target house could not be identified, the researcher selected the next house.  When 35 houses were completely selected for the survey, the researcher stopped the household selection process in this village and moved to the next selected village and started by selected the first house again by coin toss.

3.3.4.4 Procedures for Data Collection according to the Questionnaire

Data collection according to the questionnaire from the sampled households began with an explanation of the research objectives, research

methodology, and benefits from the research to the head of the household. Then the household head would read the permission form. In case, the household head could not read, the research assistant would read and explain the form to the household head until the household head completely understood and signed the permission form. Then, data collection started.

In order to record the questions in the same way, the researcher identified the preliminary procedures as follows.

Use the black or blue pen (not pencil) to record and paint the O

Before surveying each village, the researcher identified the family identification number (FID) (7-digit number) for all 35 households according to the province, district, village and family codes.

Before interviewing or using every questionnaire set, the researcher filled in the family identification number on every questionnaire for each family.

The interviewer was also asked to fill in the interviewer's code on every questionnaire.

## 3.4  Variables in the Questionnaire

The indicators of healthy women at reproductive age and relevant factors were included in the analyses to classify the group of indicators in each domain as follows.

| Group of Indicators | Indicators / Measurement | Method of collection |
|---|---|---|
| 1. Good physical condition | - Normal body mass index | - Physical checkup |
| | - Waist scale | - Physical checkup |
| | - Ratio of waist to hip lower than 0.8 | - Physical checkup |
| | - Level of blood pressure | - Physical checkup |
| | - Ability to conduct daily activities | - Health State Description |
| | - No impotence | - Questionnaire |
| 2. Good Mental Health | - No stress / Pleasant mental health | - Questionnaire |
| | - Self Esteem | - Self Esteem Test |

| Group of Indicators | Indicators / Measurement | Method of collection |
|---|---|---|
| | - Thai Mental Health | - Thai Mental Health Test |
| | - Emotional  Quotient Index (EQ) | - EQ test |
| |   - Impulse-control | |
| |   - Empathy | |
| |   - Responsibility | |
| |   - Motivation, Goal setting | |
| |   - Decision making and problem solving | |
| |   - Interpersonal Relationships | |
| |   - Self-regard | |
| |   - Life satisfaction | |
| |   - Tranquility | |
| | **Additionally  for adolescents** | |
| | - Grade Point Averages (GPA) | - Questionnaire |
| | - Intelligence Quotient (IQ) | - TONI-3 Test |
| 3. Good Reproductive Health | - Accurate sexual attitudes towards their own sex, males and females | - Questionnaire |
| | - Gender equality | - Questionnaire |
| | - Knowledge about the change of physical systems when reproductive age begins | - Questionnaire |
| | - Knowledge about pregnancy and birth control | - Questionnaire |
| | - Knowledge about the sexually transmitted disease, protection and not being promiscuous | - Questionnaire |
| | - Protection from diseases such as using condoms | - Questionnaire |
| | - Using birth control methods if not ready to be pregnant | - Questionnaire |

| Group of Indicators | Indicators / Measurement | Method of collection |
|---|---|---|
| | - Obtaining maternal and child health care | - Questionnaire |
| 4. Good health promotion behaviors / No risk behaviors | - Taking care of dental health regularly | - Questionnaire |
| | - Washing hands before eating | - Questionnaire |
| | - Regularly exercising | - Questionnaire |
| | - Having proper eating habits | |
| |    - Eating three regular meals a day | - Questionnaire |
| |    - Eating food from the five nutrition groups | - Questionnaire |
| |    - Eating three servings or nine tablespoons of vegetables per day | - Questionnaire |
| |    - Eating fruits or drinking fruit juice | - Questionnaire |
| |    - Drinking at least six glasses of clean water | - Questionnaire |
| |    - Drinking milk or eating dairy products | - Questionnaire |
| |    - Not eating fast foods such as pizza or hamburgers | - Questionnaire |
| |    - Not eating carbonated beverages | - Questionnaire |
| |    - Not eating desserts or snacks between meals | - Questionnaire |
| | - Sleeping at least six hours per day | - Questionnaire |
| | - Not smoking | - Questionnaire |
| | - Not drinking alcoholic beverages | - Questionnaire |
| | - Not using of addictive substances (drugs) | - Questionnaire |
| | - Not having risky sexual behaviors that may lead to infection and sexual transmitted disease | - Questionnaire |
| | - Wearing a helmet when riding s motorcycle | - Questionnaire |
| | - Wearing seatbelts in a car | - Questionnaire |

| Group of Indicators | Indicators / Measurement | Method of collection |
|---|---|---|
| 5. Working properly and safely **(For women aged 19-49 years old only)** | - Working an average of no more than eight hours a day | - Questionnaire |
| | - Taking work breaks after working two days straight | - Questionnaire |
| | - Not having problems with shoulder aches or back aches caused by work | - Questionnaire |
| | - Working under risk-free conditions | - Questionnaire |
| | - Using of protective equipment when working under risky or life-threatening conditions | - Questionnaire |
| | - Receiving health examination services according to occupational risks | - Questionnaire |
| | - Using preventive measures when having health problems in order to avoid affecting other colleagues | - Questionnaire |
| 6. Realizing the roles and duties towards the family and society | - Paying attention to the family | - Questionnaire |
| | - Having rood relationship in the family | - Questionnaire |
| | - Not experiencing family violence, physical abuse or others among family members | - Questionnaire |
| | - Easily admiring the successes of others | - Questionnaire |
| | - Willing to share things | - Questionnaire |
| | - Respecting the age of majority | - Questionnaire |
| | - Being punctual | - Questionnaire |
| | - Keeping promises to others | - Questionnaire |
| | - Having knowledge about savings | - Questionnaire |
| | - Having good workplace relationships | - Questionnaire |
| | - Waiting in line to purchase goods or receive various services | - Questionnaire |
| | - Working dedicatedly for society | - Questionnaire |

| Group of Indicators | Indicators / Measurement | Method of collection |
|---|---|---|
| | - Having hobbies beneficial to themselves | - Questionnaire |
| | - Caring for the environment and maintaining public benefits | - Questionnaire |
| | - Work as volunteers in helping others | - Questionnaire |
| 7. Security in the life / Spiritual Trust | - Having career stability | - Questionnaire |
| | - Performing professions honestly | - Questionnaire |
| | - Having a sufficient amount of income | - Questionnaire |
| | - Having health insurance | - Questionnaire |
| | - Practicing and performing religious activities | - Questionnaire |
| | - Having friends or social networks | - Questionnaire |
| | - Living their lives or performing their occupations with honesty | - Questionnaire |

## 3.5 Data Analysis

The statistics used in this study are described below.

### 3.5.1 Descriptive Statistics

Data is presented in tables of frequency, percentage, mean, and standard deviation of all the quantitative data

### 3.5.2 Analytical Statistics

The study used Confirmatory Factor Analysis to analyze and classify the indicators in each domain and LISREL was used to develop measurement and structural models.

### 3.5.3 Programs for data analysis

SPSS for Windows version 13 and LISREL 8.52 were used for data analysis.
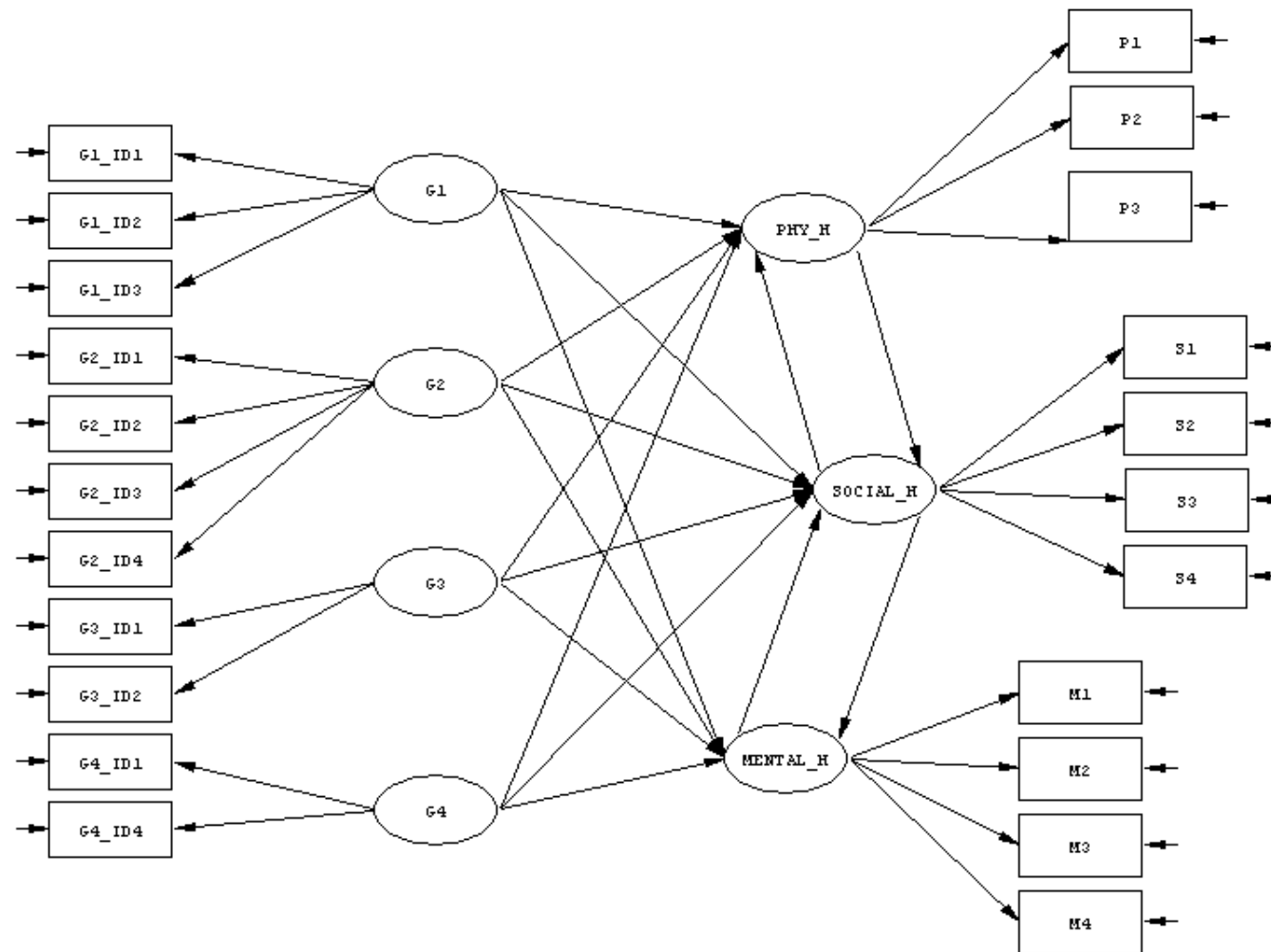
**Figures 3.3** Conceptual Framework

# CHAPTER 4

## DESCRIPTIVE RESULTS

### 4.1  Adolescents aged 13-18 years

#### 4.1.1  General data

The group of female adolescents, who were the subjects for this study, averaged 15.3 years in age with the following religious affiliations:  Buddhist (85.8%), Muslim (13.6%) and Christian (0.3%) with two hill tribe members who specified no religion.  In terms of marital status, most of the samples were single, 95.7% while 81.7% had obtained the highest level of mandatory education and three of the samples received no education at all due to mental disabilities or mental retardation.  A total of 6.4% of the female adolescents were employed in the following primary occupations:  agriculture (46.3%), workers, employees, or laborers (34.2%) and retailers of goods or various services (19.5%), with an average monthly income of 2,553 baht while most of the samples fell into the monthly income category of less than 2,500 baht.  In the area of physical and mental disabilities, 0.6% of the female adolescents were disabled, i.e., two had mental disabilities or were mentally retarded, one had a leg disability and one was deaf.  A total of 96.4% of female adolescents in the group were entitled to treatment (Table 4.1).

**Table 4.1** Demographics and General Data of Adolescents Aged 13-18 Years

| Demographics and General Data | Number | % |
|---|---|---|
| **Age** | | |
| 13-14 yrs. | 239 | 37.2 |
| 15-16 yrs. | 217 | 33.8 |
| 17-18 yrs. | 186 | 29.0 |
| Mean $\pm$ SD | 15.3 $\pm$ 1.7 | |
| **Religion** | | |
| Buddhist | 550 | 85.8 |
| Muslim | 87 | 13.6 |
| Christian | 2 | 0.3 |
| No religion | 2 | 0.3 |
| **Marital status** | | |
| Single | 563 | 95.7 |
| Married | 22 | 3.4 |
| Married but separated | 6 | 0.9 |
| **Highest Education** | | |
| No education | 3 | 0.4 |
| Elementary school | 223 | 34.7 |
| Junior high school | 302 | 47.0 |
| High school | 114 | 17.7 |
| **Occupation (only working persons)** | **(41)** | |
| Agriculture | 19 | 46.3 |
| Retailers of goods or various services | 8 | 19.5 |
| Laborers and related workers | 14 | 34.2 |
| **Income/month (baht) (only working persons)** | **(37)** | |
| $\leq$ 2,500 | 22 | 59.5 |
| 2,501-5,000 | 11 | 29.7 |
| 5,001-1,000 | 4 | 10.8 |
| Mean $\pm$ SD | 2,553 $\pm$ 2,136 | |

**Table 4.1** (Continued)

| Demographic and General Data | Number | % |
|---|---|---|
| **Disability** | | |
| None | 638 | 99.4 |
| Disabled | 4 | 0.6 |
| **Health Insurance** | | |
| Received | 567 | 96.4 |
| None | 21 | 3.6 |

### 4.1.2 Educational and intellectual data

Most of the adolescents aged 13-18 years old (84.5%) obtained education at the secondary education level, 6.3% obtained vocational education and 6.6% were already employed. As for the adolescents' grades, their mean score was 2.79 while the majority (61.5%) had grade point averages of 2.01-3.00, 29.9% had grade point averages of 3.01-4.00 and 8.6% had average grades that were lower than 2.0. When IQ was measured using the Test of Nonverbal Intelligence (TONI-3) model, it was found that the female adolescents had an average IQ of 92 with the majority (40.3%) falling within the normal range at 90-110 while 27.3% had IQ scores of 80-89, 20.3% had IQ scores that were poor and very poor, 8.4% had above average IQ scores at 111-120 and 3.8% had average IQ or much higher than average scores (Table 4.2).

**Table 4.2** Educational and Intellectual Data of Adolescents Aged 13-18 Years

| Educational and Intellectual Data | Number | % |
|---|---|---|
| **School attainment** | | |
| No formal education | 42 | 6.6 |
| Elementary level | 15 | 2.3 |
| Lower secondary level | 332 | 52.0 |
| Upper secondary level | 208 | 32.5 |
| Certificate of vocational education | 40 | 6.3 |
| Graduate level | 2 | 0.3 |

**Table 4.2**  (Continued)

| Educational and Intellectual Data | Number | % |
|---|---|---|
| **Grade (GPA)** | | |
| < 1.00 | 0 | 0.0 |
| 1.01- 2.00 | 48 | 8.6 |
| 2.01-3.00 | 343 | 61.5 |
| 3.01-4.00 | 167 | 29.9 |
| Mean $\pm$ SD | 2.79 + 0.54 | |
| **IQ Level** | | |
| Very Superior (>130) | 3 | 0.5 |
| Superior (121-130) | 21 | 3.3 |
| Above Average (111-120) | 54 | 8.4 |
| Average (90-110) | 259 | 40.3 |
| Below Average (80-89) | 175 | 27.3 |
| Poor (70-79) | 84 | 13.1 |
| Very Poor (<70) | 46 | 7.2 |
| Mean $\pm$ SD | 92.0 + 14.2 | |

### 4.1.3  Health Status

4.1.3.1  General Physical Health

With regard to the general physical health of female adolescents, it was found that 7% had the following chronic illnesses:  peptic ulcers (2.5%), allergies and asthma (2%), chronic headaches or migraines (1.1%), anemia (0.9%), hepatitis (0.5%) and heart disease (0.5%).  When asked about illness or injury during the past one month, it was found that 13.9% of the samples had been ill with respiratory disorders (8.4%).

The rate of injuries from motorcycle accidents was 0.8%.  From weight and height measurements, it was found that 52.5% of the women had a Body Mass Index (BMI) at a normal level (BMI=18.5-24.9) while 42.7% were lower than the normal level and 4.8% were higher than the normal level.  From blood pressure

measurements, it was found that 99.7% had systolic blood pressures at a normal level (<140 mmHg) while 0.3% were at the level of 140-159 mmHg. A total of 98.1% of the women had a diastolic blood pressure at normal levels (<90 mmHg) while 1.9% had blood pressure levels that were higher than normal (> 90 mmHg). In the area of dental and oral health, 48.4% received dental examinations from a dentist at least twice a year. When they were asked about overall dental health, it was found that 53.0% had no cavities, 25.2% had cavities that had been treated, 20.7% had cavities had been left untreated and 1.1% had both treated and untreated cavities. With regard to gum health, it was found that 4.8% experienced painful chewing, 10.9% always bled when brushing their teeth and 0.7% experienced both painful chewing and bleeding when brushing their teeth (Table 4.3).

**Table 4.3** Physical Health of Adolescents Aged 13-18 Years

| Physical Health Data | Number | % |
|---|---|---|
| **Chronic Diseases** | | |
| None | 578 | 90.0 |
| Type of Diseases | 64 | 10.0 |
| - allergic condition | 13 | 2.0 |
| - anemia | 6 | 0.9 |
| - peptic ulcers | 16 | 2.5 |
| - heart disease | 3 | 0.5 |
| - hepatitis | 3 | 0.5 |
| - chronic headaches | 7 | 1.1 |
| **Ill one month before interview date** | | |
| No | 553 | 86.1 |
| Yes | 89 | 13.9 |
| **BMI (WHO Standard)** | | |
| <18.5 | 273 | 42.7 |
| 18.5-24.9 | 336 | 52.5 |
| 25.0-29.9 | 23 | 3.6 |
| >=30 | 8 | 1.2 |
| Mean $\pm$ SD | $19.3 \pm 3.0$ | |

**Table 4.3**  (Continued)

| Physical Health Data | Number | % |
|---|---|---|
| **Systolic Blood Pressure** | | |
| Normal BP (<129 mmHg) | 617 | 96.1 |
| High-Normal BP (130-139 mmHg) | 23 | 3.6 |
| Mild Hypertension (140-159 mmHg) | 2 | 0.3 |
| **Diastolic Blood Pressure** | | |
| Normal BP (<84 mmHg) | 621 | 96.7 |
| High-Normal BP (85-89 mmHg) | 9 | 1.4 |
| Mild Hypertension (90-99 mmHg) | 11 | 1.7 |
| Moderate Hypertension (100-109 mmHg) | 1 | 0.2 |
| **Oral Health** | | |
| **Dental Exams with Dentists** | | |
| At least twice per year | 311 | 48.4 |
| Lower than twice per year/ None | 331 | 51.6 |
| **Dental Health** | | |
| No Cavities | 340 | 53.0 |
| Cavities that had been treated | 162 | 25.2 |
| Cavities that had not been treated | 133 | 20.7 |
| Cavities that had been treated and untreated | 7 | 1.1 |
| **Health of the Gums** | | |
| Normal | 537 | 83.6 |
| Painful chewing | 31 | 4.8 |
| Bleeding gums while brushing | 70 | 10.9 |
| Both painful chewing and bleeding gums | 4 | 0.7 |

4.1.3.2  Reproductive Health

The 13-18 year-old age group was at the age when they should be entering their reproductive years, or puberty, wherein the female adolescents exhibited obvious changes as they began to menstruate.  It was found that 92.5% of the female adolescents aged 13-18 years had already begun to menstruate whereas

most of them (65.8%) had their first menstruations at the age of 12-13 years old, with the average age for beginning menstruation being 12.9 years old. Half of the adolescents in the 13-18-year-old group were married. Of these, 44.4% had one child. Three of the 13 female adolescents with a child had given birth at the age of 15 years, four had given birth at age 16, 4 at age 17, and 2 at 18 years of age. None of the female adolescents were found to have had any miscarriage (Table 4.4).

**Table 4.4** Reproductive Health of Adolescents Aged 13-18 Years

| Reproductive Health Data | Number | % |
|---|---|---|
| **Menstruation** | | |
| Had | 594 | 92.5 |
| None | 48 | 7.5 |
| **First menstruations at the age** | | |
| 10 – 11 yrs. | 46 | 7.7 |
| 12 – 13 yrs. | 390 | 65.8 |
| 14 – 15 yrs. | 146 | 24.6 |
| 16 yrs. | 11 | 1.9 |
| Mean $\pm$ SD | $12.9 \pm 1.1$ | |
| **Number of children born** (married) | | |
| 0  person | 14 | 51.9 |
| 1  person | 12 | 44.4 |
| 2  persons | 1 | 3.7 |

Adolescents aged 13-18 years should be at the age having education on reproductive health in preparation for working years with good health. When asked regarding the management of sexual emotions, it was found that most of the male adolescents (66.1%) knew methods and could find solutions. Of these, 37.2% said they exercised or played sports, some engaged in other activities such as singing, meeting with friends, masturbating, and consulting with family members. When further asked about the potential outcome of unprotected sexual intercourse during adolescence, 87.3% of the teenagers said they were aware of this issue while 63.1%

knew about unwanted pregnancy and 35.5% knew about sexually transmitted diseases or AIDS.  For knowledge about sexually transmitted diseases, most were informed and able to state the names of the diseases.  Some indicated AIDS while a few indicated gonorrhea, and syphilis.  When the group was asked about preventive methods for specific sexually transmitted diseases, over 80% said they should use condoms when having sex, avoid promiscuous sexual behavior and avoid sexual intercourse before an appropriate age.

A total of 72.3% of the female adolescents had learned about birth control wherein most answered with birth control pills, condoms, injections, abstinence or counting safe days.  When asked regarding hazards to health in relation to teen pregnancy (mothers aged under 20 years), 41.6% of the female adolescents expressed that they were aware of the dangers of delivery, difficult delivery due to narrow pelvis, child disabilities and child rearing problems.  In terms of assessment of the level of knowledge regarding appropriate reproductive health, it was found that 64.1% of the female adolescents had knowledge regarding reproductive health at good and very good levels, and 9.5% of the female adolescents had no knowledge regarding reproductive health (Table 4.5).

**Table 4.5** Knowledge about Reproductive Health of Adolescents Aged 13-18 Years

| Knowledge about Reproductive Health | Number | % |
|---|---|---|
| **The management of sexual emotions** | **(640)** | |
| Unknown | 217 | 33.9 |
| Know | 423 | 66.1 |
| - Exercise or play sports | 238 | 37.2 |
| - Other activities such as singing | 152 | 23.7 |
| - Meeting with friends | 53 | 8.3 |
| - Masturbation | 23 | 3.6 |
| - Consulting with family members | 3 | 0.5 |

**Table 4.5**  (Continued)

| Knowledge about Reproductive Health | Number | % |
|---|---|---|
| **The potential outcome of unprotected sexual intercourse during adolescence** | | |
| Unknown | 81 | 12.7 |
| Know | 559 | 87.3 |
| - Unwanted pregnancy | 404 | 63.1 |
| - Sexually transmitted diseases or AIDS | 227 | 35.5 |
| - Social problem | 3 | 0.5 |
| **Knowledge about sexually transmitted diseases** | | |
| Unknown | 111 | 17.3 |
| Know | 529 | 82.7 |
| - AIDS | 516 | 80.6 |
| - Gonorrhea | 20 | 3.1 |
| - Syphilis | 8 | 1.3 |
| **Preventive methods for sexually transmitted diseases** | | |
| - Use condom | 420 | 83.0 |
| - Avoid promiscuous sexual behavior | 54 | 10.7 |
| - Avoid sexual intercourse before an appropriate age | 44 | 8.7 |
| - Unknown | 3 | 0.6 |
| **Knowledge about birth control** | | |
| Unknown | 177 | 27.7 |
| Know | 463 | 72.3 |
| - Condom | 168 | 36.3 |
| - Oral pill | 343 | 74.1 |
| - Injection | 49 | 10.6 |
| - Sterilization/IUD | 42 | 9.1 |
| - No sexual intercourse | 18 | 3.9 |
| - Count days from period | 5 | 1.1 |

**Table 4.5**  (Continued)

| Knowledge about Reproductive Health | Number | % |
| --- | --- | --- |
| **Health in relation to teen pregnancy (mothers aged under 20 years)** | | |
| Unknown | 374 | 58.4 |
| Know | 266 | 41.6 |
| - Difficult delivery due to narrow pelvis | 104 | 37.0 |
| - Other dangers of delivery | 157 | 55.9 |
| - Child disabilities | 12 | 4.3 |
| - Miscarriage / health of mother is not strong | 5 | 1.8 |
| - Cervical cancer | 3 | 1.1 |
| **Level of knowledge regarding appropriate reproductive health** | | |
| Very good | 136 | 21.3 |
| Good | 274 | 42.8 |
| Fair | 169 | 26.4 |
| None | 61 | 9.5 |

### 4.1.3.3  Health-related Behavior

For adolescents' health-related behavior, the interviewer divided the behaviors into four levels, i.e., routine behavior, often or frequent (4-6 days per week), sometimes (1-3 days per week), and never or not often wherein it was required that female adolescents with good health must practice behaviors that promote good health.  It was found that 60.3 % of the teenagers practiced health behavior in terms of personal hygiene as follows:  brushing teeth twice daily, in the morning and before bedtime, 50.9% washed their hands before eating, and 32.2% examined physical abnormalities and notified parents, 84.2% of the female adolescents cleaned their own genitals regularly, and 45.9% were able to relieve themselves of sexual drive by performing other activities on a regular basis.

In terms of health promotion, 39% of female adolescents exercised at least 30 minutes for three days a week on a regular basis, and half of the female adolescents slept at least eight hours a day. In terms of food consumption behavior to promote health, 59.3% had three regular meals a day, 28.6% had food from the five nutritional groups, 23% ate three servings or nine tablespoons of vegetables per day, 17.7% had fruits or fruit juices regularly, 39.4% drank at least six glasses of clean water regularly, only 18.3% drank milk or dairy products regularly, 51.5 % never had fast foods such as pizza or hamburgers, 13.6% never had carbonated beverages, and 9.5% never ate desserts or snacks between meals.

In terms of behaviors that threatened health, some of the female adolescents smoked cigarettes, but not regularly (96.4%), and did not drink alcohol or alcoholic beverages at all (91.7%). As for use of addictive substances (drugs), it was found that 98.6% of the adolescents never used drugs while inquiries about accident safety or prevention revealed that 25.6% of the female adolescents did not drive over the legal speed limit when riding or riding at the back of motorcycles and wore helmets at the rate of 13.5% when riding or riding behind on a motorcycle and 12.3% regularly wore seatbelts when driving or sitting in the front sear of a vehicle while 71.5% exercised caution when crossing streets, i.e., looking right and left before crossing (Table 4.6).

**Table 4.6** Percentage of Adolescents Aged 13-18 Years and Health-Related Behavior

| Health-Related Behavior | regularly | frequently | sometimes | Never |
|---|---|---|---|---|
| Brush teeth twice daily, in the morning and before bedtime | **60.3** | 23.8 | 15.0 | 0.9 |
| Wash hands before eating | **50.9** | 26.6 | 19.5 | 3.0 |
| Examine physical abnormalities and notify parents | **32.2** | 34.0 | 25.3 | 8.5 |
| Clean own genitals | **84.2** | 11.9 | 2.8 | 1.1 |
| Able to relieve themselves of sexual drive by performing other activities | **45.9** | 26.1 | 16.4 | 6.6 |
| Exercise at least 30 minutes three days a week | **39.0** | 30.0 | 24.4 | 6.6 |

**Table 4.6**  (Continued)

| Health-Related Behavior | regularly | frequently | sometimes | Never |
|---|---|---|---|---|
| Sleep at least eight hours a day | **47.0** | 28.3 | 17.5 | 7.2 |
| Eat three regular meals a day | **59.3** | 22.1 | 15.8 | 2.8 |
| Eat food from the five nutritional groups | **28.6** | 41.0 | 26.6 | 3.8 |
| Eat three servings or nine tablespoons of vegetables per day | **22.7** | 37.4 | 33.0 | 6.9 |
| Eat fruit or drink fruit juice | **17.7** | 36.3 | 42.4 | 3.6 |
| Drink at least six glasses of clean water | **39.4** | 33.8 | 23.7 | 3.1 |
| Drink milk or dairy products | **18.3** | 29.3 | 43.8 | 8.6 |
| Eat fast foods such as pizza or hamburgers | 2.5 | 7.2 | 38.8 | **51.5** |
| Eat carbonated beverages | 11.6 | 22.5 | 52.3 | **13.6** |
| Eat desserts or snacks between meals | 14.9 | 35.1 | 40.5 | **9.5** |
| Smoke cigarettes | 1.7 | 0.6 | 1.3 | **96.4** |
| Drink alcohol or alcoholic beverages | 0.6 | 0.5 | 7.2 | **91.7** |
| Use addictive substances (drugs) | 0.0 | 0.9 | 0.5 | **98.6** |
| Do not drive faster than speed limits as required by law (n=540) | **25.6** | 33.3 | 25.0 | 16.1 |
| Wear safety helmet when riding motor cycles (n=563) | **13.5** | 22.7 | 38.2 | 25.6 |
| Use safety belt when driving or sitting in the front seat of a vehicle (n=439) | **12.3** | 18.5 | 31.7 | 37.6 |
| Practices caution, i.e., look left and right before crossing the road | **71.5** | 22.7 | 5.2 | 0.6 |

4.1.3.4 Mental health and development

In terms of the mental health and development of teenagers in the emotional evaluation by interview questions, it was found that 32.4% expressed emotions according to their capability, 48.7% felt assured that parents, relatives and friends would be there when needed, 55.2% dreamt of having good futures such as having good occupations and families and 34-41% promoted emotional development regularly for each aspect  For example, adolescents performed activities associated with the religions they worshipped, e.g. Buddhists and Christians prayed, Muslims performed purification rites, in addition to religious ceremonies and cultural activities with their families, helped their friends or others without seeking reward and worked as volunteers helping others with no wish for compensation.  They also practiced mental fitness by means of meditation, yoga, Tai Chi at a rate of only nine percent. Furthermore, when asked about their beliefs about making merit by performing deeds and being punished for performing wrongful acts, female adolescents expressed this belief at 62.6 percent (Table 4.7).

**Table 4.7** Percentage of Adolescents Aged 13-18 Years by Mental Health and Development

| Mental Health and Development | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Express emotions according to their capability | 32.4 | 46.0 | 18.5 | 3.1 |
| Feel assured that parents, relatives and friends would be there when needed | 48.7 | 37.8 | 11.6 | 1.9 |
| Dream of having good futures such as having good occupations and families | 55.2 | 31.5 | 10.2 | 3.1 |
| Perform activities associated with the religions worshipped | 35.8 | 34.9 | 23.8 | 5.5 |
| Have additional religious ceremonies and cultural activities with families | 34.8 | 35.8 | 26.6 | 2.8 |
| Help friends or others without seeking reward | 41.5 | 39.1 | 17.5 | 1.9 |

**Table 4.7** (Continued)

| Mental health and development | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Work as volunteers in helping others with no wish for compensation | 31.0 | 39.6 | 22.7 | 6.7 |
| Practice mental fitness by means of meditation, yoga, or Tai chi | 9.1 | 18.5 | 42.5 | 29.9 |
| Held beliefs about making merit by performing deeds and being punished by performing wrongful acts | 62.6 | 23.6 | 10.3 | 3.5 |

4.1.3.5  Thai Mental Health Indicators

Using Thai mental health indicators, scoring and interpreting the results of the index according to criteria of the Department of Mental Health and the Ministry of Public Health (Apichai Mongkol and collegues, 2004), it was found that 43.5% of the female adolescents aged 13-18 years had similar mental health scores to those of Thai adolescents in general and 43.1% had better mental health scores than the Thai public in general, with an average score of 33.3 points (Table 4.8).

**Table 4.8** Thai Mental Health Indicators of Adolescents Aged 13-18 Years

| Scores | Number | % |
|---|---|---|
| $\leq 27$  (lower than the normal level) | 90 | 15.4 |
| 28-34 (the normal level) | 243 | 41.5 |
| 35-45 (higher than the normal level) | 252 | 43.1 |
| Mean $\pm$ SD | 33.3 $\pm$ 6.2 | |

4.3.1.6  Emotional Quotient

From the use of the emotional quotient evaluation model for teenagers, scoring and interpreting the results of emotional quotient in each aspect according to criteria of the Department of Mental Health, Ministry of Public Health, it was found that 61.3% had scores for impulse-control at a normal level while 33.7% had higher scores than the normal range, with the average score being 17.5 points.  This was higher than the average score surveyed by the Department of Mental Health (15.5 points).  In terms of empathy, 70.1% had scores for empathy within the normal range, with the average score being 17.8, lower than the average score surveyed by the Department of Mental Health (18.1 points).  In terms of responsibility, 76.6% had scores within the normal range, with the average score being 19.5 points, similar to the average score surveyed by the Department of Mental Health (19.3 points).

In terms of motivation, 79.9% had scores in the normal range and 16.7% had higher scores than the normal range, with the average score being 17.8 points, slightly higher than the average score surveyed by the Department of Mental Health (17.3 points).  With regard to decision making and problem solving, 80.7% had scores within the normal range, with an average score being 16.5 points, higher than the average score observed by the Department of Mental Health (16.1 points).  In the area of having relationships, most of the women (81.7%) had normal scores with the average score being 17.6 points, slightly above the average score observed by the Department of Mental Health (17.3 points).

In terms of self-regard, 79.6% had scores within the normal range with the average score being 11.8 points, higher than the average score surveyed by the Department of Mental Health (11.0 points).  In terms of life satisfaction, 82% had scores in the normal range with the average score being 18.0 points, lower than the average score surveyed by the Department of Mental Health (18.9 points).  With regard to emotional contentment and tranquility, 84.4% had scores in the normal range and 15.3% had scores lower than the normal range with the average score being 16.9 points, lower than the average score surveyed by the Department of Mental Health (17.8 points) (Table 4.9).

**Table 4.9** Number and Percentage of The Adolescents aged 13-18 Years by
Emotional Quotient Level

| Scores | Number | % |
|---|---|---|
| **Impulse-control** | | |
| ≤13 (lower than the normal level) | 31 | 5.0 |
| 14-18 (normal level) | 381 | 61.3 |
| ≥19 (higher than the normal level) | 209 | 33.7 |
| Mean ± SD | 17.5 ± 2.6 | |
| **Empathy** | | |
| ≤15 (lower than the normal level) | 101 | 16.3 |
| 16-20 (normal level) | 434 | 70.1 |
| ≥21 (higher than the normal level) | 84 | 13.6 |
| Mean ± SD | 17.8 ± 2.3 | |
| **Responsibility** | | |
| ≤15 (lower than the normal level) | 53 | 8.6 |
| 16-22 (normal level) | 474 | 76.6 |
| ≥23 (higher than the normal level) | 92 | 14.8 |
| Mean ± SD | 19.5 ± 2.6 | |
| **Motivating, Goal setting** | | |
| ≤13 (lower than the normal level) | 21 | 3.4 |
| 14-20 (normal level) | 496 | 79.9 |
| ≥21 (higher than the normal level) | 104 | 16.7 |
| Mean ± SD | 17.8 ± 2.7 | |
| **Decision making and problem solving** | | |
| ≤12 (lower than the normal level) | 26 | 4.2 |
| 13-19 (normal level) | 501 | 80.7 |
| ≥20 (higher than the normal level) | 94 | 15.1 |
| Mean ± SD | 16.5 ± 2.6 | |

**Table 4.9** (Continued)

| Scores | Number | % |
|---|---|---|
| **Interpersonal Relationship** | | |
| $\leq$13 (lower than the normal level) | 22 | 3.5 |
| 14-20 (normal level) | 507 | 81.7 |
| $\geq$21 (higher than the normal level) | 92 | 14.8 |
| Mean $\pm$ SD | 17.6 $\pm$ 2.6 | |
| **Self-regard** | | |
| $\leq$8 (lower than the normal level) | 20 | 3.2 |
| 9-13 (normal level) | 494 | 79.6 |
| $\geq$14 (higher than the normal level) | 107 | 17.2 |
| Mean $\pm$ SD | 11.8 $\pm$ 1.9 | |
| **Life satisfaction** | | |
| $\leq$15 (lower than the normal level) | 92 | 14.8 |
| 16-22 (normal level) | 514 | 82.8 |
| $\geq$23 (higher than the normal level) | 15 | 2.4 |
| Mean $\pm$ SD | 18.0 $\pm$ 2.6 | |
| **Tranquility** | | |
| $\leq$14 (lower than the normal level) | 95 | 15.3 |
| 15-21 (normal level) | 524 | 84.4 |
| $\geq$22 (higher than the normal level) | 2 | 0.3 |
| Mean $\pm$ SD | 16.9 $\pm$ 2.3 | |

### 4.1.4 Roles, duties, responsibilities and discipline toward family and society

Female adolescents were familiar with their roles, duties, responsibilities and discipline toward themselves and others, both within their families and in society at a moderate level. For example, they performed all of the activities of daily living by themselves without having to be reminded to do so at a rate of 31.6 percent and regularly showed respect when they met adults at 41.3 percent. With regard to discipline, female adolescents were regularly punctual, e.g., they went to class on time and kept appointments at 38.8 percent, waited in line to purchase goods or receive various services at 44.8 percent, participated with other adolescents in art, music or sports activities at 37.9 percent and regularly joined with family members to perform various activities at 34.4 percent.

In terms of practice toward others such as keeping promises made with other people, 35.5 percent of female adolescents were able to do so on a regular basis while 77.5 percent never used the belongings of a friend without permission. With regard to generosity, e.g., willingness to share things or snacks with friends, 44.6 percent of female adolescents were able to exhibit this personality trait while another 39 percent were able to verbally admire the successes of other people with ease. However, it was found that female adolescents refrained from fighting, using swear words or physically abusing their friends when they were angry at a rate of only 24.3 percent.

In terms of responsibility toward family and society, female adolescents had opportunities to help their parents, adult relatives or teachers perform various tasks or were assigned to help perform a particular task in the household on a regular basis at the rate of 51.8 percent. With regard to caring for the environment and maintaining public benefits on a regular basis, the performance rate was 32.1 percent while regularly setting aside a part of their daily allowance as a savings was performed at the rate of 19.1 percent (Table 4.10).

**Table 4.10** Percentage of The Adolescents Aged 13-18 Years by Roles, Duties, Responsibilities and Discipline toward Family and Society

| Roles, Duties, Responsibilities and Discipline | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Perform all the activities of daily living by themselves without having to be reminded | **31.6** | 43.2 | 21.8 | 3.4 |
| Show respect when meeting adults | **41.3** | 35.4 | 19.1 | 4.2 |
| Punctuality, e.g., attend class on time and keep appointments | **38.8** | 45.1 | 13.8 | 2.3 |
| Wait in line to purchase goods or receive various services | **44.8** | 36.6 | 15.8 | 2.8 |
| Participate with other adolescents in art, music or sports activities | **37.9** | 37.4 | 19.7 | 5.0 |
| Join with family members to perform various activities | **34.4** | 42.3 | 21.1 | 2.2 |
| Keeping promises made with others | **35.7** | 45.8 | 16.6 | 1.9 |
| Use the belongings of a friend without permission | 3.4 | 5.6 | 13.5 | **77.5** |
| Willing to share things or snacks with friends | **44.6** | 41.9 | 12.7 | 0.8 |
| Admire the successes of other people with ease | **39.0** | 45.2 | 14.4 | 1.4 |
| Use swear words or physically abuse their friends when angry | **24.3** | 36.6 | 26.1 | 13.0 |
| Help perform a particular task in the household on a regular basis | **51.8** | 36.8 | 9.8 | 1.6 |
| Care for the environment and maintain public benefits | **32.1** | 47.6 | 18.1 | 2.2 |
| Set aside a part of their daily allowance as a savings | **19.1** | 31.1 | 37.6 | 12.2 |

**4.1.5  Attitudes toward gender**

Adolescents' attitudes toward gender were part of the factors influencing their expression of male and female roles, and in taking responsibility for sexual behavior. From the questions on whether or not men should be the ones to take the initiative in showing that they liked a girl, female adolescents sometimes disagreed and sometimes agreed with this concept at a rate of 22.2 percent.  Half of the female adolescents disagreed with the idea of men having numerous sexual partners at the rate of 48.4 percent. A total of 19.6% of female adolescents disagreed that boys and girls had to play with different toys and 39.5% strongly agreed that men and women should be assigned to help with housework as well. A total of 44.9% of female adolescents disagreed with the idea that, if there was a financial necessity, men should receive higher education than women, and most female adolescents (64.6%), strongly agreed that men were responsible for pregnancies or sexually transmitted infections (Table 4.11).

**Table 4.11**  Percentage of Women Aged 13-18 Years by Attitudes toward Gender

| Attitudes toward Gender | really agree | rather agree | sometimes agree | disagree |
|---|---|---|---|---|
| Men should be the ones to take the initiative in showing that they like a girl | 45.9 | 31.9 | 15.5 | 6.7 |
| Men have numerous sexual partners | 15.0 | 17.5 | 19.1 | 48.4 |
| Boys and girls have to play with different toys | 27.8 | 26.3 | 26.3 | 19.6 |
| Men and women should be assigned to help with housework as well | 39.5 | 30.8 | 20.8 | 8.9 |
| If there was a financial necessity, men should receive higher education than women | 12.8 | 18.8 | 23.5 | 44.9 |
| Men are responsible for pregnancies or sexually transmitted infections | 64.6 | 19.9 | 10.0 | 5.5 |

### 4.1.6 View of Self-worth

From the experiment on adolescents' view of self-worth using the model adapted from the Rosenberg Self-Esteem Scale, it was found that the average score for the view of self-worth was 29.8, with 60% at a good level while 38.8% were at a very good level (Table 4.12). When considered in terms of individual items, it was found that the adolescents continued to worry about themselves. For example, 33.8% frequently agreed and totally agreed that there was nothing good about themselves and 27.6% agreed and totally agreed that they had nothing to be proud in about themselves (Table 4.13).

**Table 4.12** Number and Percentage of Adolescents Aged 13-18 Years by Self Esteem Scores

| scores | Number | % |
|---|---|---|
| Low (0-20 score) | 4 | 0.6 |
| Good (21-30 score) | 386 | 60.8 |
| Very good (31-40 score) | 245 | 38.8 |
| Mean $\pm$ SD | 29.8 $\pm$ 3.9 | |

**Table 4.13** Self Esteem Scale of The Adolescents aged 13-18 Years

| Self Esteem | strongly agree | agree | disagree | strongly disagree |
|---|---|---|---|---|
| On the whole, I am satisfied with myself. | 33.7 | 59.3 | 5.9 | 1.1 |
| At times, I think I am no good at all. | 3.6 | 30.2 | 45.5 | 20.7 |
| I feel that I have a number of good friends | 20.5 | 65.8 | 12.4 | 1.3 |
| I am able to do things as well as most others | 30.4 | 61.3 | 6.6 | 1.7 |
| I feel I do not have much to be proud of. | 3.1 | 24.5 | 48.5 | 23.9 |
| I certainly feel useless at times. | 3.1 | 17.8 | 43.7 | 35.4 |
| I feel that I'm a person of worth, at least on an equal plane with others. | 23.9 | 54.3 | 17.1 | 4.7 |
| I wish I could have more respect for myself. | 25.9 | 55.8 | 14.5 | 3.8 |
| All in all, I am inclined to feel that I am a failure. | 3.5 | 14.9 | 49.7 | 31.9 |
| I take a positive attitude toward myself. | 46.2 | 49.2 | 3.6 | 1.0 |

### 4.1.7 Health State Description

The Health State Description form developed by the World Health Organization was used to evaluate physical function and disability of the target population, giving importance to the organization of the components of health, namely various physical functions and structures and surrounding components that affect the population's state of well-being. The samples were directed to consider their physical state during the past 30 days by including both good days and bad days. When asked about difficulties, consideration was given to whether or not there were difficulties in the performance of routine activities during the past 30 days (read level of health evaluation to the interviewees or let them see). The term difficulty refers to the need for more effort to perform normal activity or to perform with discomfort, pain, slowness, or with changes occurring in the performance of normal activities. The evaluation was conducted during the past 30 days and the Health State Description was classified into five categories, i.e., no difficulty = 1, Mild = 2, moderate = 3, severe = 4 and extreme/cannot do = 5.

From the study of the state of health, it was found that 30.4% and 47.3% of the female adolescents evaluated their own overall health on the day of evaluation at very good and good levels while less than 2% evaluated their health as being bad and very bad (Table 4.14). When evaluated in terms of overall difficulty in the past 30 days, it was found that 46.5% had no difficulty in working or doing housework and 32.0% had little difficulty. In the area of mobility, 79.3% and 12.9% had no difficulty and little difficulty with mobility, respectively, while 60.8% and 42.2% had no difficulty and little difficulty with heavy exercise, respectively. In the area of self-care, 84.5% had no difficulty and 8.1% had little difficulty while 71.1% had no difficulty in performing various tasks to maintain self-care agency, and 13.5% and had little difficulty. In the area of pain and discomfort, 52.6% had no pain and 37.2% had little pain while 56.4% of the women were happy. In the area of intelligence, 47.9% had no difficulties in concentrating or memorizing while 32.9% had little difficulty, and 53.6% had no trouble in learning a new task while 29.4% had little trouble. In the area of interpersonal relationships, 60.0% had no difficulties in having relationships with other people or in participating in a general activity while 26.3% had little

difficulty, and 54.2% had no trouble in dealing with conflicts and stress with other people while 31.8% had little trouble.  In the area of sight, 2.5% of the female adolescents wore glasses or contact lenses.  In the group that wore glasses or contact lenses, 57.1% had no difficulty seeing and remembering the faces of people they knew across the street while 66.7% had no difficulty in seeing and providing details about objects placed at arm's length, or within reading range while the percentages for the group that didn't wear glasses or contact lenses were 80.8% and 83.3%, respectively.  With regard to sleeping and energy, 64.3% had no problems about sleeping, i.e., difficulty sleeping, frequent awakening in the night or waking too early while 23.2% had little difficulty and 50.9% had no feeling of sleep deficiency or lethargy during the day while 31.5% had little trouble.  In the area of feelings and emotions, 70.2% had no feelings of sadness or depression, 21.9% had little difficulty in this area, and 61.2% had no worries or depression while 28.8% had minor trouble in this area (Table 4.15).

**Table 4.14**  Percentage of Adolescents Aged 13-18 Years by overall Health on The Day

| Overall Health | Very good | Good | Moderate | Bad | Very Bad |
|---|---|---|---|---|---|
| In general, how would you rate your health today? | 30.4 | 47.3 | 20.6 | 1.0 | 0.7 |

**Table 4.15**  Percentage of Adolescents Aged 13-18 Years by overall Health in the Last 30 Days

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Overall Health** | | | | | |
| How much difficulty did you have with work or household activities? | 46.5 | 32.0 | 18.0 | 3.0 | 0.5 |

**Table 4.15**  (Continued)

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Mobility** | | | | | |
| How much difficulty did you have with moving around? | 79.3 | 12.9 | 6.8 | 0.5 | 0.5 |
| How much difficulty did you have in vigorous activities, such as running three km (or equivalent) or cycling? | 60.8 | 24.2 | 12.2 | 2.0 | 0.8 |
| **Self Care** | | | | | |
| How much difficulty did you have with self-care, such as washing or dressing yourself? | 84.5 | 8.1 | 5.3 | 1.6 | 0.5 |
| How much difficulty did you have in taking care of and maintaining your general appearance | 77.1 | 13.5 | 6.8 | 2.1 | 0.5 |
| **Pain and Discomfort** | | | | | |
| How many of bodily aches or pains did you have? | 52.6 | 37.2 | 8.9 | 0.5 | 0.8 |
| How much bodily discomfort do you have? | 56.4 | 29.0 | 12.5 | 1.6 | 0.5 |
| **Cognition** | | | | | |
| How much difficulty did you have with concentrating or remembering ? | 47.9 | 32.9 | 16.8 | 1.6 | 0.8 |
| How much difficulty did you have in learning a new task? | 53.6 | 29.4 | 15.3 | 1.2 | 0.5 |
| **Interpersonal Activities** | | | | | |
| How much difficulty did you have with personal relationship or participation in the community? | 60.0 | 26.3 | 11.2 | 1.8 | 0.7 |

**Table 4.15** (Continued)

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| How much difficulty did you have in dealing with conflicts and tensions with others? | 54.2 | 31.8 | 11.5 | 2.0 | 0.5 |
| **Vision (wear glasses or contact lenses) (289)** | | | | | |
| How much difficulty did you have in seeing and recognizing a person you know across the road (i.e., from a distance of about 20 meters)? | 57.1 | 4.8 | 23.8 | 9.5 | 4.8 |
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | 66.7 | 19.0 | 9.5 | 4.8 | 0.0 |
| **Vision (don't wear glasses or contact lenses) (2840)** | | | | | |
| How much difficulty did you have in seeing and recognizing a person you know across the road (i.e., from a distance of about 20 meters)? | 80.8 | 11.9 | 6.3 | 0.7 | 0.3 |
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | 83.3 | 10.2 | 5.1 | 0.9 | 0.5 |
| **Sleep and Energy** | | | | | |
| How much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night or waking up too early in the morning? | 64.3 | 23.2 | 10.7 | 1.3 | 0.5 |

**Table 4.15**  (Continued)

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| How much of a problem did you have due to not feeling rested and refreshed during the day (e.g. feeling tired, not having energy)? | 50.9 | 31.5 | 14.0 | 2.3 | 1.3 |
| **Affect** | | | | | |
| How much of a problem did you have with feeling sad, low or depressed? | 70.2 | 21.9 | 6.3 | 1.3 | 0.3 |
| How much of a problem did you have with worry or anxiety? | 61.2 | 28.8 | 8.2 | 1.3 | 0.5 |

## 4.2  Women in their reproductive years aged 19-49 years old

### 4.2.1 General information

Most of the women in their reproductive years were in the 35-49-year age group wherein the average age was 35.5 years old, 85% were Buddhist, 14.2% were Muslim, 0.6% were Christians and 0.6% were hill tribe females who had no religion but believed in the spirits of their ancestors.  With regard to marital status, 71.3% were married and still living with their spouses, 10.9% were married but living separately from the spouses, 11.6 were single, 3.9% were widowed and 2.2% were divorced, 12.8% of the females were heads of their family, 34.6% had junior secondary school education, 3.6% had no formal education, 48.5% of the females had occupation in the field of agriculture, 18.3% were employees or laborers, 15.5% were merchants, 4.2% were employees of government enterprises and 13.5% were unemployed. 86.5 of the women had average monthly incomes of 3,585 baht while half of the women in their reproductive years had average monthly incomes of less than 2,500 baht, 1.2% of the reproductive women had physical disabilities, most of which concerned legs and walking, followed by disabilities associated with fingers,

toes, arms and hands, blindness and sight, mental retardation, paralysis, hearing, cleft lip, cleft palate and 97.5% were eligible for treatment (Table 4.16).

**Table 4.16** Demographic and General Data of Women in Their Reproductive Years Aged 19-49 Years Old

| Demographic and General Data | Number | % |
|---|---|---|
| **Age** | | |
| 19-24 yrs. | 364 | 11.9 |
| 25-34 yrs. | 969 | 31.7 |
| 35-49 yrs. | 1727 | 56.4 |
| Mean $\pm$ SD | $35.5 \pm 8.2$ | |
| **Religion** | | |
| Buddhist | 2593 | 85.0 |
| Muslim | 433 | 14.2 |
| Christian | 19 | 0.6 |
| No religion | 6 | 0.2 |
| **Marital status** | | |
| Single | 359 | 11.6 |
| Married | 2204 | 71.3 |
| Married but Separated | 336 | 10.9 |
| Divorced | 68 | 2.2 |
| Widowed | 122 | 3.9 |
| **Status in family** | | |
| Head of the family | 392 | 12.8 |
| Wife | 1836 | 60.2 |
| Offspring | 662 | 21.7 |
| Kin/daughter-in-law | 158 | 5.2 |
| Other | 1 | 3.1 |

**Table 4.16** (Continued)

| Demographic and General Data | Number | % |
|---|---|---|
| **Highest Education** | | |
| None | 111 | 3.6 |
| Elementary school | 1885 | 61.8 |
| Junior high school | 436 | 14.3 |
| High school | 332 | 10.9 |
| Graduate level | 287 | 9.4 |
| **Occupation** | | |
| Unemployed/housewife | 413 | 13.5 |
| Agriculturalist | 1479 | 48.5 |
| Shop and Market retailer | 471 | 15.5 |
| Government/enterprise employee | 127 | 4.2 |
| Laborers and Related Worker | 558 | 18.3 |
| **Income/month (Baht) (only working person)** | (2631) | |
| $\leq$ 2,500 | 1331 | 50.6 |
| 2,501-5,000 | 894 | 34.0 |
| 5,001-10,000 | 282 | 10.7 |
| 10,001-15,000 | 79 | 3.0 |
| 15,001-20,000 | 28 | 1.1 |
| > 20,000 | 17 | 0.6 |
| Mean $\pm$ SD | $3,585 \pm 3,782$ | |
| **Health Insurance** | | |
| Receive | 2975 | 97.5 |
| None | 76 | 2.5 |

**Table 4.16**  (Continued)

| Demographic and General Data | Number | % |
|---|---|---|
| **Disability** | | |
| No | 3014 | 98.8 |
| Disabled | 37 | 1.2 |
|     - Amputation, part of leg | 11 | 0.4 |
|     - Amputation, part of toe/finger | 3 | 0.1 |
|     - Amputation, part of hand | 4 | 0.1 |
|     - Blindness | 2 | 0.1 |
|     - Mental retardation | 3 | 0.1 |
|     - Paralysis | 2 | 0.1 |
|     - Hearing impairment | 6 | 0.2 |
|     - Cleft lip or palate | 2 | 0.1 |

### 4.2.2 Health-related data

#### 4.2.2.1  General physical health

With regard to the general physical health of the women in their reproductive years aged 19-49 years, it was found that 18.4% of the women had chronic diseases.  Most were associated with hypertension at the rate of 3.1%, followed by the subsequent significant diseases:  peptic ulcer at 2.8%, asthma at 2.3%, cardiovascular diseases at 2.1%, allergies at 1.8%, diabetes at 1.7% and thyroid disease and goiter at 1.1 % (Table 4.17).

From general physical examinations measuring weight and height, it was found that the BMI of the women were at normal levels (BMI=18.5-24.9) at the rate of 65.4%, above average at 19.7%, and obese at 5.6%.  From the results of measuring the waist and hips of the women it was found that the rate for the waist-hip proportions was within the normal range (no more than 0.8) for 36.9% of the women. Furthermore, blood pressure measurements at the time of the interview, revealed that reproductive age women had a systolic blood pressure within the normal range (<140 mmHg) at 93.7% while the diastolic blood pressure was within the normal range

(<90 mmHg) at 90.2% and women who had a systolic blood pressure of over 140 mmHg, or diastolic blood pressure exceeding 90 mmHg was at 11.7%.

　　　　With regard to the dental health of the women in their reproductive years, it was found that the women had dental exams with dentists at least twice per year at the rate of 34.2%. Furthermore, when asked about dental exams in general, it was found that 42.9% of the women had cavities while 26.3% of the women had cavities that had been treated and 31.1% had cavities that had not been treated. The findings regarding the health of the gums revealed that 12.4% of the women experienced painful chewing, 8.2% always had bleeding gums while brushing and 0.6% of the women experienced both painful chewing and bleeding gums and had 28 usable teeth and up at the rate of 80.3%. In summary, good dental health for the women in their reproductive years means no cavities, no gum problems and at least 28 usable teeth at the rate of 35.4% while women who had no cavities, no gum problems and had 28 usable teeth and had their mouths examined by a dentist at least twice per year was at the rate of only 10.5%, as shown Table 4.17.

**Table 4.17** Physical Health of Women in Their Reproductive Years Aged 19-49 Years

| Physical Health Data | Number | % |
|---|---|---|
| **Chronic Diseases** | (3315) | |
| None | 2705 | 81.6 |
| Type of Diseases | 610 | 18.4 |
| - hypertension | 104 | 3.1 |
| - peptic Ulcer | 92 | 2.8 |
| - asthma | 76 | 2.3 |
| - cardiovascular diseases | 70 | 2.1 |
| - allergic condition | 59 | 1.8 |
| - diabetes | 57 | 1.7 |
| - thyroid disease and goiter | 38 | 1.1 |
| - chronic headache | 31 | 0.9 |
| - low blood pressure | 25 | 0.8 |
| - Thalassemia/ Anemia | 19 | 0.6 |
| - The nervous system and mental disorder | 17 | 0.5 |

**Table 4.17** (Continued)

| Physical Health Data | Number | % |
|---|---|---|
| - Hepatitis | 13 | 0.4 |
| - HIV/AIDS | 6 | 0.2 |
| - Other | 59 | 1.8 |
| **BMI (WHO Standard)** | | |
| <18.5 | 308 | 9.3 |
| 18.5-24.9 | 2163 | 65.4 |
| 25.0-29.9 | 653 | 19.7 |
| >=30 | 185 | 5.6 |
| Mean $\pm$ SD | $23.0 \pm 3.9$ | |
| **Waist Hip Ratio** | | |
| <0.80 | 1217 | 36.9 |
| 0.81-1.00 | 2045 | 62.1 |
| >1.00 | 32 | 1.0 |
| **Systolic Blood Pressure** | | |
| Normal BP (<129 mmHg) | 2736 | 82.8 |
| High-Normal BP (130-139 mmHg) | 361 | 10.9 |
| Mild Hypertension (140-159 mmHg) | 140 | 4.2 |
| Moderate Hypertension (160-179 mmHg) | 19 | 0.6 |
| Severe Hypertension (>180 mmHg) | 47 | 1.5 |
| Mean $+$ SD | $116.26 \pm 13.16$ | |
| **Diastolic Blood Pressure** | | |
| Normal BP (<84 mmHg) | 2895 | 87.6 |
| High-Normal BP (85-89 mmHg) | 86 | 2.6 |
| Mild Hypertension (90-99 mmHg) | 235 | 7.1 |
| Moderate Hypertension (100-109 mmHg) | 42 | 1.3 |
| Severe Hypertension (>110 mmHg) | 45 | 1.4 |
| Mean $+$ SD | $74.68 \pm 9.72$ | |
| **Blood Pressure > 140/90 mmHg** | 352 | 11.7 |

**Table 4.17**  (Continued)

| Physical Health Data | Number | % |
|---|---|---|
| **Oral Health** | | |
| **Dental exams with dentists** | | |
| At least twice per year | 1133 | 34.2 |
| Lower than twice per year/ No | 2182 | 65.8 |
| **Health of the Teeth** | (3313) | |
| No Cavities | 1422 | 42.9 |
| Cavities that had been treated | 869 | 26.3 |
| Cavities that had not been treated | 999 | 31.1 |
| Cavities that had been treated and untreated | 23 | 0.7 |
| **Health of the gums** | | |
| Normal | 2578 | 77.8 |
| Painful chewing | 410 | 12.4 |
| Bleeding gums while brushing | 305 | 8.2 |
| Both painful chewing and bleeding gums | 20 | 0.6 |
| **Number of usable teeth** | | |
| More than and equal 28 teeth | 2662 | 80.3 |
| Lower than 28 teeth | 653 | 19.7 |
| **Summary of good dental health** | | |
| No cavities, no gum problems and at least 28 usable teeth | 1172 | 35.4 |
| No cavities, no gum problems and had 28 usable teeth and had their mouths examined by a dentist at least twice per year | 349 | 10.5 |

4.2.2.2 Reception of Health Services

Regarding the reception of health services for reproductive age women during the past year, it was found that hospital treatment with weight, height and blood pressure measurements were the services most often received.

In the area of receiving health related services during the past year of women in their reproductive years, it was found that nursing treatment, weight and height measurements, and blood pressure measurements were the greater part of the health services they received (more than 80%). These services were followed by urine tests, tests for blood-glucose levels and screening for cervical cancer and breast cancer. Blood-cholesterol tests along with eye and ear examinations continued to be found at a low level (Less than 20%). With regard to family planning, 64.4% of the women in their reproductive years received suggestions about family planning while 59.6% received family planning services and 54.1% received suggestions about sex education, marital problems or family life (Table 4.18).

**Table 4.18** Number and Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Health Services

| Reception of Health Services | Number | % |
|---|---|---|
| Weight and height measurement | 2692 | 81.2 |
| Blood pressure measurement | 2656 | 80.1 |
| Urine test | 1427 | 43.0 |
| Blood-glucose test | 1040 | 31.4 |
| Blood cholesterol test | 659 | 19.9 |
| Eye and ear examination | 600 | 18.1 |
| Screening for cervical cancer | 1288 | 38.9 |
| Screening for breast cancer | 908 | 27.4 |
| Treatment | 2924 | 88.2 |
| Receive suggestions about family planning | 2136 | 64.4 |
| Receive family planning services | 1975 | 59.6 |
| Receive suggestions about sex education, marital problems or family life | 1795 | 54.1 |

### 4.2.2.3 Reproductive Health

For the group of women in their reproductive years aged 19-49 years old at the time of the study, it was found that the lowest age for first menstruation was 9 years with the average age for first menstruation being 14.4 years. For women who were married, widowed, divorced or separated, 94.6% had children with most of the women having one to two children at the rate of 69.3% with the average number of children being two in nearly half of the group of women who already had children. The ages at which the women had their first children ranged from 20-24 years at the rate of 47% with the average age for having the first child being 22 years. The abortion rate was 16.7% with single abortion at a rate of 13.3%, two abortions at 2.7 and three abortions and up at 0.7%. These miscarriages were spontaneous abortions with natural causes at 74.3%, intentional abortions at 12.5, accidents that were not intentional such as work and falls at 11.5% and chronic diseases or illness that caused abortion at 1.7%. Women in their reproductive years had entered menopause at the rate of 4.8% with the average age for menopause being 43.4 years due to natural causes brought on by age for the most part at 77.1% and due to other causes such as hysterectomy at 22.9%. Those women had no menopausal symptoms at the rate of 57.0% while others experienced symptoms, but did not feel that their lives were disrupted at 35.4% and still others experienced symptoms that disrupted their daily lives at 7.6%. Finally, those women had hormone therapy after having entered menopause at the rate of 13.9% (Table 4.19).

**Table 4.19** Number and Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Reproductive Health Data

| Reproductive Health Data | Number | % |
|---|---|---|
| **First menstruations at the age** | (3304) | |
| 9 – 10 yrs. | 22 | 0.7 |
| 11 – 12 yrs. | 381 | 11.5 |
| 13 – 14 yrs. | 1246 | 37.7 |
| 15 – 16 yrs. | 1259 | 38.1 |
| $\geq 17$ yrs. | 396 | 12.0 |
| Mean $\pm$ SD | $14.4 \pm 1.7$ | |

**Table 4.19** (Continued)

| Reproductive Health  Data | Number | % |
|---|---|---|
| **Number of children-born** (married) | (2911) | |
| 0 | 157 | 5.4 |
| 1 – 2  persons | 2016 | 69.3 |
| 3 – 4  persons | 660 | 22.7 |
| 5 – 6  persons | 65 | 2.2 |
| $\geq$ 7 persons | 13 | 0.4 |
| Mean $\pm$ SD | 2.02 $\pm$ 1.09 | |
| **Age at first birth** | (2753) | |
| 13 – 19  yrs. | 821 | 29.8 |
| 20 – 24  yrs. | 1295 | 47.0 |
| 25 – 29  yrs. | 481 | 17.5 |
| 30 – 34  yrs. | 119 | 4.3 |
| $\geq$35  yrs. | 37 | 1.4 |
| Mean $\pm$ SD | 21.9 $\pm$ 4.1 | |
| **Number of Abortions** | (2903) | |
| No | 2417 | 83.3 |
| Once | 386 | 13.3 |
| Twice | 79 | 2.7 |
| $\geq$3 times | 21 | 0.7 |
| Mean $\pm$ SD | 0.2 $\pm$ 0.5 | |
| **Cause of abortion** | (513) | |
| Spontaneous abortions | 381 | 74.3 |
| Intentional abortions | 64 | 12.5 |
| Accident such as work and falls | 59 | 11.5 |
| Illness | 9 | 1.7 |
| **Menopause** | (3315) | |
| Yes | 158 | 4.8 |
| No | 3157 | 95.2 |

**Table 4.19** (Continued)

| Reproductive Health Data | Number | % |
|---|---|---|
| **Age of menopause** | | |
| < 40 yrs. | 24 | 15.3 |
| 40 – 44 yrs. | 43 | 27.4 |
| 45 – 49 yrs. | 90 | 57.3 |
| Mean + SD | 43.4 ± 5.0 | |
| **Cause of menopause** | | |
| Natural caused | 121 | 77.1 |
| Other causes such as hysterectomy | 36 | 22.9 |
| **Menopausal symptoms** | | |
| No | 90 | 57.0 |
| Have, did not feel that lives were disrupted | 56 | 35.4 |
| Have, that disrupted their daily lives | 12 | 7.6 |
| **Hormone therapy** | | |
| Receive | 22 | 13.9 |
| No | 138 | 86.1 |

Reproductive aged women aged 19-49 years have reached an age where they should possess knowledge and readiness for reproductive health. When the women were asked about dealing with sexual desires, it was found that 66.1% of the women were able to handle their feelings wherein most of the women answered that they found a means of exercising or playing sports at the rate of 31.6%, followed by finding other activities such as singing, going out to meet friends, masturbating, praying, meditating, performing Islamic purification rituals and working. When asked about the potential outcomes of having unprotected sexual relations, 88.0% of the women were aware of the potential effects wherein nearly half of the women stated unwanted pregnancies and sexually-transmitted diseases, or AIDS. Regarding knowledge about sexually-transmitted diseases, most of the women were aware and capable of naming sexually-transmitted diseases wherein 80% of the women mentioned AIDS. Few of the women named gonorrhea, syphilis and bubo.

Furthermore, when further inquiry was made in the group, who were able to name sexually-transmitted diseases and preventive methods for potential sexually-transmitted diseases, most of the women mentioned using condoms during sexual intercourse at a rate of 72.5%, followed by abstinence from sexual promiscuity, infidelity and avoidance of premature sexual activity.

The reproductive aged women possessed knowledge of birth control at the rate of 91.5% wherein most of the women recognized the method of using birth control pills, followed by contraceptive injections, condoms, cervical rings and acupuncture while most of the women in their reproductive years answered that they used birth control pills, condoms, contraceptive injections, hysterectomy, IUD, Norplant, counting "safe" days (rhythm method) and external ejaculation. When the women were asked about health hazards if they become pregnant at a young age (under 20 years), the women were aware at the rate of 47.8% wherein most of them perceived difficult deliveries due to a narrow cervix, poor maternal health, easy abortion and disabilities or problems with the baby.

In summary, when the women's knowledge of reproductive health as appropriate for women in their reproductive years was assessed by levels, it was found that the women possessed knowledge regarding reproductive health at a good and very good level at the rate of 68.4%. In terms of high risk sexual behavior, the married reproductive women had sexual relations with other people other than their spouses within the past year at a rate of 0.9% wherein the women always used condoms at 29.6%, sometimes used condoms at 29.6% and didn't use condoms at all at 40.8%. As for the 7.1% single women who had had sexual relations during the past year, 22.7% always used condoms while 27.3% sometimes used condoms and 50% never used condoms (Table 4.20).

**Table 4.20** Number and Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Knowledge about Reproductive Health

| Knowledge about Reproductive Health | Number | % |
|---|---|---|
| The management of sexual emotions | (3312) | |
| Unknown | 1122 | 33.9 |
| Know | 2190 | 66.1 |
| - Exercise or play sports | 1045 | 31.6 |
| - Other activities such as singing | 798 | 24.1 |
| - Meet with friends | 529 | 16.0 |
| - Masturbate | 132 | 4.0 |
| - Pray, meditate, perform Islamic purification rituals | 4 | 0.1 |
| - Work | 10 | 0.3 |
| - Do nothing | 7 | 0.2 |
| The potential outcome of unprotected sexual intercourse during adolescence | | |
| Unknown | 397 | 12.0 |
| Know | 2915 | 88.0 |
| - Unwanted pregnancy | 1892 | 42.9 |
| - Sexually transmitted diseases or AIDS | 1456 | 44.0 |
| - Social problem | 3 | 0.1 |
| - Education problem | 3 | 0.1 |
| Knowledge about sexually transmitted diseases | | |
| Unknown | 485 | 14.6 |
| Know | 2827 | 85.4 |
| - AIDS | 2756 | 83.2 |
| - Gonorrhea | 154 | 4.7 |
| - Syphilis | 61 | 1.8 |
| - Bubo | 5 | 0.2 |

**Table 4.20**  (Continued)

| Knowledge about Reproductive Health | Number | % |
|---|---|---|
| Preventive methods for specific sexually transmitted diseases | | |
|      - Use condom | 2402 | 72.5 |
|      - Avoid promiscuous sexual behavior | 335 | 10.1 |
|      - Avoid sexual intercourse | 57 | 1.7 |
|      - Unknown | 32 | 1.0 |
| Knowledge of birth control | | |
|      Unknown | 282 | 8.5 |
|      Know | 3030 | 91.5 |
|        - Oral pill | 2245 | 67.8 |
|        - Injection | 870 | 26.3 |
|        - Condom | 597 | 18.0 |
|        - Sterilization | 269 | 8.1 |
|        - IUD | 192 | 5.8 |
|        - Norplant | 91 | 2.7 |
|        - Safe period | 22 | 0.6 |
| Health relation to teen pregnancy | | |
|      Unknown | 1732 | 52.2 |
|      Know | 1583 | 47.8 |
|        - Dangers of delivery | 832 | 25.1 |
|        - Difficult delivery due to narrow pelvis | 746 | 22.5 |
|        - Miscarriage / health mother is not strong | 55 | 1.7 |
|        - Child disabilities | 42 | 1.3 |
| Level of knowledge regarding reproductive health | | |
|      Very good | 787 | 23.8 |
|      Good | 1472 | 44.6 |
|      Fair | 848 | 25.6 |
|      None | 197 | 6.0 |

4.2.2.4 Health-related behavior

With regard to the health behaviors of the women in their reproductive years aged 19-49 years in terms of personal hygiene, it was found that the ratio of brushing teeth was at least twice daily wherein 63.9% brushed regularly before going to sleep and in the morning and 66.2% washed their hands regularly before meals. Furthermore, in the area of reproductive health, 82.7% always cleaned their genitals. In the case of the group that was already married, 64.0% had normal sexual relations with no problems.

In terms of health-promoting behavior, 29.7% of the samples exercised regularly at least 30 minutes each time, three days per week while 40.1% had physical activity for at least 150 minutes per week. Half of the women in their reproductive years slept at least eight hours per day. In the area of eating nutritious foods, 68.2%, or most of the reproductive women regularly consumed 3 three meals each day while 35.6% ate from all of the five nutritional groups, especially with regard to consuming three servings or nine tablespoons of vegetables regularly, 21.9% regularly consumed fruits or fruit juices and 60.7% regularly consumed at least six cups of water, but only 11.4% regularly drank milk.. As for food that posed a risk toward good health, 66.0% of the reproductive aged women consumed fast foods such as pizza and hamburgers while 27.3% never drank carbonated beverages and 32.5% never ate extremely sweet or salty foods.

In the area of health-threatening behaviors, some of the reproductive aged women smoked, but not regularly, and another 94.3% never smoked. A total of 80.7% drank liquor or any alcoholic beverages for a standard of no more than two cups per day, 96.3% did not use addictive substances or drugs. As for protective behavior for safety from traffic accidents, 40.7% of reproductive women did not drive faster than the legal speed limit while only 32.7% regularly wore helmets when driving or riding a motorbike, 24.4% regularly wore seat belts when driving or sitting beside the driver and 78.6% regularly practiced caution when crossing streets, e.g., looking left and right (Table 4.21).

**Table 4.21** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Health-Related Behavior

| Health-Related Behavior | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Brush teeth twice daily, in the morning and before bedtime | 63.9 | 20.0 | 12.9 | 3.2 |
| Wash its hands to have the food first | 66.2 | 20.6 | 10.8 | 2.4 |
| Clean own genitals | 82.7 | 14.1 | 2.6 | 0.6 |
| Normal sexual relations with no problems | 64.0 | 25.4 | 8.0 | 2.6 |
| Exercise at least 30 minutes for three days a week | 29.7 | 26.6 | 25.2 | 18.5 |
| Physical activity for at least 150 minutes per week | 40.1 | 30.6 | 21.3 | 8.0 |
| Sleep at least eight hours a day | 51.2 | 27.6 | 13.6 | 7.6 |
| Eat three regular meals a day | 68.2 | 19.3 | 9.6 | 2.9 |
| Eat food from the five nutritional groups | 37.0 | 37.2 | 22.7 | 3.1 |
| Eat three servings or nine tablespoons of vegetables per day | 35.6 | 37.2 | 22.8 | 4.4 |
| Consume fruits or fruit juices | 21.9 | 30.6 | 42.2 | 5.3 |
| Drink at least six glasses of clean water | 60.7 | 23.7 | 11.8 | 3.8 |
| Drink milk or dairy products | 11.4 | 17.3 | 43.8 | 27.5 |
| Eat fast foods such as pizza or hamburgers | 1.6 | 4.1 | 28.3 | 66.0 |
| Eat carbonated beverages | 5.4 | 11.8 | 55.5 | 27.3 |
| Eat extremely sweet or salty foods | 7.3 | 17.5 | 42.7 | 32.5 |
| Smoke cigarettes | 2.1 | 1.5 | 2.1 | 94.3 |
| Drink alcohol or alcoholic beverages | 2.1 | 1.8 | 15.4 | 80.7 |
| Use addictive substances (drugs) | 1.4 | 0.9 | 1.4 | 96.3 |
| Do not drive over the legal speed limit (n=2564) | 40.7 | 23.3 | 17.1 | 18.9 |
| Wear helmet when riding on a motorcycle (2964) | 32.7 | 23.3 | 29.1 | 14.9 |

**Table 4.21** (Continued)

| Health-related Behavior | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Use safety belt when driving or sit in front seat (n=2238) | 24.4 | 19.9 | 23.4 | 32.3 |
| Practice caution when crossing streets, e.g., look left and right | 78.6 | 17.0 | 3.6 | 0.8 |

4.2.2.5  Occupational Safety Behavior

A total of 46.4% of women in their reproductive years already had regular work and worked at an average of no more than eight hours a day, but 34.7% had break times from work after working two days straight. A total of 19.2% never had problems with shoulder aches or back aches caused by work. A total of 40.6% worked under risk-free conditions without life-threatening health and safety risks while 22.7% had regular use of protective equipment when working under risky or life-threatening conditions.  Only 9.3% of the reproductive women received health examination services according to occupational risks, and 19.4% used preventive measures when having health problems in order to avoid affecting other colleagues (Table 4.22).

**Table 4.22** Percentage of Women In Their Reproductive Years Aged 19-49 Years Old by Safety Occupational Behavior

| Safety Occupational Behavior | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Work at an average of no more than eight hours a day | 46.4 | 27.9 | 17.9 | 7.8 |
| Break times from work after working two days straight | 34.7 | 34.2 | 23.5 | 7.6 |
| Problems with shoulder aches or back aches caused by work | 19.2 | 27.3 | 37.1 | 16.4 |
| Worked under risk-free conditions | 9.3 | 16.5 | 33.6 | 40.6 |

**Table 4.22** (Continued)

| Safety Occupational Behavior | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Use protective equipment when working under risky or life-threatening conditions | 22.7 | 22.1 | 27.0 | 28.2 |
| Receive health examination services according to occupational risks | 9.3 | 15.1 | 27.7 | 47.9 |
| Use preventive measures when having health problems in order to avoid affecting other colleagues | 19.4 | 27.6 | 26.2 | 26.7 |

4.2.2.6 Mental health and development

On the evaluation of the women's mental health and development it was found that 31.1% of the reproductive aged women regularly had conversational activities with their own network groups while 28% had entertaining personal hobbies, 37.4% practiced religious activities such as praying for Buddhists and Christians, and  purification rituals for Muslims, and 38.6% joined in religious ceremonies and cultural events with families, 42.2% helped friends or other people without expecting any reward, 32.8% performed volunteer work to help others without reward, 11.6% practiced meditation training such as sitting to meditate, yoga, Tai Chi etc.  When asked about the belief that performing good deeds made merit and performing wrongful deeds brought evil, 68.8% of the reproductive aged women always maintained this belief (Table 4.23).

**Table 4.23** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Mental Health and Development

| Mental health and development | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Have conversational activities with your network groups | **31.1** | 34.4 | 25.8 | 8.7 |
| Have entertaining personal hobbies | **28.0** | 36.0 | 24.8 | 11.2 |
| Perform activities associated with the religions worshipped | **37.4** | 32.5 | 24.8 | 5.3 |
| Have additional religious ceremonies and cultural activities with families | **38.6** | 35.8 | 22.2 | 3.4 |
| Help friends or others without seeking reward | **42.2** | 38.6 | 16.7 | 2.5 |
| Work as volunteers in helping others with no wish for compensation | **32.8** | 35.3 | 21.6 | 10.3 |
| Practice mental fitness by means of meditation, yoga, or Tai Chi | **11.6** | 13.0 | 30.2 | 45.2 |
| Believe in making merit by performing deeds and being punished by performing wrongful acts | **68.8** | 21.7 | 7.2 | 2.3 |

**4.2.2.7 Thai Mental Health Indicators**

From the use of the condensed version of the Thai Mental Health Indicators to distribute scores and translate the value results of the index according to the regulations of the Department of Mental Health, Ministry of Public Health (Apichai Mongkon and colleagues, 2004), it was found that most of the women in their reproductive years (48%), had better mental health scores than ordinary Thai people while another 40% were equal to ordinary Thai people and 11.5% had lower mental health scores than ordinary Thai people with an average score of 34.2 points (Table 4.24).

**Table 4.24** Number And Percentage of Women in Their Reproductive Years Aged 19-49 Years Old By Level of Mental Health Indicators

| Scores | Number | % |
|---|---|---|
| ≤27 (lower than the normal level) | 358 | 11.5 |
| 28-34 (the normal level) | 1261 | 40.5 |
| 35-45 (higher than the normal level) | 1497 | 48.0 |
| Mean ± SD | 34.2 ± 5.8 | |

4.2.2.8 Emotional Quotient

From the use of the evaluation form of emotional intelligence quotient for the 19-49-year old age group to provide scores and translate the resulting values of emotional quotient in each area according to the criteria of the Department of Mental Health , Ministry of Public Health, it was found that 57.9% of the women had normal scores for impulse-control while 38.3% had above average scores, with the average score being 17.8 points, more than the average scores observed by the Department of Mental Health (15.6 points).  In the area of caring for others, 65.3% had normal scores of empathy, with the average score being 17.8 points, slightly less than the average score observed by the Department of Mental Health (18.5 points).  In the area of responsibilities, 79.5% had normal scores with the average score being 19.7 points, close to the average scores observed by the Department of Mental Health (20.0 points). In the area of motivation, 76.8% had normal scores with the average score being 18.2 points, slightly less than the average score observed by the Department of Mental Health (18.8 points).  In the area of decision-making and problem-solving, 76.8% had normal scores with an average score of 17.1 points, lower than the average score observed by the Department of Mental Health (18.1 points).  In the area of having relationships, 81.8% had normal scores with an average score of 17.6 points, close to the average score observed by the Department of Mental Health (17.8 points). In the area of self pride, 79.7% had normal scores with an average score of 12.0 points, close to the average score observed by the Department of Mental Health (12.1 points).  In the area of life satisfaction, 72.4% had normal scores with an average score of 18.1 points, lower than the average score observed by the Department of

Mental Health (19.4 points).  Finally, in the area of peace of mind, 72.4% had normal
scores with an average score of 17.1 points, lower than the average score observed by
the Department of Mental Health (19.2 points) (Table 4.25).

**Table 4.25** Number and Percentage of Women in Their Reproductive Years Aged 19-
49 Years Old by Domain of Emotional Quotient

| Domain of Emotional Quotient | Number | % |
|---|---|---|
| **Impulse-control** | | |
| $\leq$13 (lower than the normal level) | 120 | 3.8 |
| 14-18 (normal level) | 1848 | 57.9 |
| $\geq$19 (higher than the normal level) | 1225 | 38.3 |
| Mean $\pm$ SD | 17.8 $\pm$ 2.7 | |
| **Empathy** | | |
| $\leq$15 (lower than the normal level) | 631 | 19.8 |
| 16-20 (normal level) | 2085 | 65.3 |
| $\geq$21 (higher than the normal level) | 477 | 14.9 |
| Mean $\pm$ SD | 17.8 $\pm$ 2.5 | |
| **Responsibility** | | |
| $\leq$16 (lower than the normal level) | 382 | 12.0 |
| 17-23 (normal level) | 2536 | 79.5 |
| $\geq$24 (higher than the normal level) | 273 | 8.6 |
| Mean $\pm$ SD | 19.7 $\pm$ 2.6 | |
| **Motivating, Goal setting** | | |
| $\leq$15 (lower than the normal level) | 536 | 16.8 |
| 16-22 (normal level) | 2454 | 76.8 |
| $\geq$23 score (higher than the normal level) | 204 | 6.4 |
| Mean $\pm$ SD | 18.2 $\pm$ 2.6 | |
| **Decision making and problem solving** | | |
| $\leq$14 score (lower than the normal level) | 591 | 18.5 |
| 15-21 (normal level) | 2454 | 76.8 |
| $\geq$22 (higher than the normal level) | 264 | 8.3 |
| Mean $\pm$ SD | 17.1 $\pm$ 2.9 | |

**Table 4.25**  (Continued)

| Domain of Emotional Quotient | Number | % |
|---|---|---|
| **Interpersonal Relationship** | | |
| ≤14 (lower than the normal level) | 334 | 10.4 |
| 15-21 (normal level) | 2612 | 81.8 |
| ≥22 (higher than the normal level) | 248 | 7.8 |
| Mean ± SD | 17.6 ± 2.6 | |
| **Self-regard** | | |
| ≤9 (lower than the normal level) | 249 | 7.8 |
| 10-14 (normal level) | 2546 | 79.7 |
| ≥15 (higher than the normal level) | 399 | 12.5 |
| Mean ± SD | 12.0 ± 2.0 | |
| **Life satisfaction** | | |
| ≤15 (lower than the normal level) | 472 | 14.8 |
| 16-22 (normal level) | 2622 | 82.1 |
| ≥23 (higher than the normal level) | 98 | 3.1 |
| Mean ± SD | 18.1 ± 2.5 | |
| **Tranquility** | | |
| ≤15 (lower than the normal level) | 870 | 27.3 |
| 16-22 (normal level) | 2311 | 72.4 |
| ≥23 (higher than the normal level) | 9 | 0.3 |
| Mean ± SD | 17.1 ± 2.3 | |

**4.2.3 Roles, duties, responsibilities and discipline toward family and society**

The reproductive years mark the age when people must know their roles, duties and responsibilities while practicing discipline toward themselves and others, both in the family and in society. In terms of familial roles, duties and responsibilities such as regular attention to family members, participation in various activities with people in the family, helping in raising and teaching younger relatives and having good relationships with people in the family, the study found that the reproductive aged women had regular practice at the rate of approximately 49-63%, while 36.2% did not insult verbally or physically abuse family members when they were angry, and 69.7% evaluated themselves as being faithful to their spouses. In the area of saving, it was found that only 26.3% regularly set aside part of their income to save money.

As for the roles, duties and responsibilities that were routinely practiced toward other people, it was found that approximately 42-49% of the reproductive women had good interactions with colleagues, easily admired the successes of others and were willing to share things with friends or other people while 82.8% never used the personal property of other people without permission and 45.2% kept promises to others. In the area of self-discipline, 36.6% of the women kept schedules, e.g., kept appointments and 45.8% waited in line to make purchases or receive services and 44.5% of the women helped take care of the environment and public property regularly (Table 4.26).

**Table 4.26** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Roles, Duties, Responsibilities and Discipline

| Roles, Duties, Responsibilities and Discipline | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Pay attention to family members | 62.1 | 29.5 | 7.3 | 1.1 |
| Participate in various activities with people in the family | 49.3 | 35.9 | 12.7 | 2.1 |
| Help in raising and teaching younger | 59.7 | 26.8 | 9.5 | 4.0 |
| Relatives and having good relationships with people in the family | 63.2 | 29.7 | 5.9 | 1.2 |

**Table 4.26**  (Continued)

| Roles, Duties, Responsibilities | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Do not insult verbal or physically abuse in expressing to family members | 36.5 | 31.7 | 22.5 | 9.3 |
| Are faithful to their spouses | 69.7 | 11.2 | 3.5 | 15.6 |
| Set aside part of their income to save money | 26.3 | 27.5 | 28.0 | 18.1 |
| Have good interactions with colleagues | 49.6 | 39.5 | 8.4 | 2.5 |
| Easily admire the successes of others | 45.5 | 39.4 | 13.4 | 1.7 |
| Willing to share things with friends or other people | 42.3 | 40.1 | 16.4 | 1.1 |
| Use the personal property of other people without permission | 4.2 | 6.0 | 7.0 | 82.8 |
| Keep promises to other people | 45.2 | 41.1 | 11.9 | 1.8 |
| Keep schedules, e.g. ,appointments | 36.6 | 43.2 | 18.4 | 1.8 |
| Wait in line to make purchases or receive services | 45.8 | 36.2 | 14.6 | 3.4 |
| Help take care of the environment and public property | 44.5 | 40.6 | 13.3 | 1.6 |

### 4.2.4  Positive Attitudes toward Gender

The positive attitudes toward the gender roles of reproductive aged women are a part of factors affecting expressions and responsibility in sexual behavior, including having influence toward the attitudes of children and adolescents in the family. Therefore, the inquiries about positive attitudes toward gender roles were considered as positive and negative criteria as follows:  A total of 88.2% thought that men had to be responsible for pregnancies or infections when they had sex with women.  When asked about choosing the sex of babies, 36% of the reproductive women thought that they wanted boys more than girls. In terms of child-rearing, more than half (66.2%) thought that boys and girls must play with different toys and 71.3% thought that boys

and girls should be assigned to help with housework as well. However, when asked if there was a financial necessity, 40.8% agreed that men should receive higher education than women and half of the reproductive women disagreed with the attitude that adolescents' learning about sex education could lead to premature sexual activity.

With regard to attitudes toward domestic responsibilities such as taking care of children or doing routine housework, e.g., sweeping the house, mopping the floor, doing laundry or washing dishes, the reproductive aged women were in agreement at rates of 62.4% and 69.4% agreed that repairing things in the house, e.g., changing light bulbs, was the women's responsibility. In the area of attitudes toward social gender roles, 60-70% of the reproductive women agreed that the role of social leader should belong to men as detailed in Table 4.27.

**Table 4.27** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Attitudes toward Gender

| Attitudes toward Gender | really agree | rather agree | sometimes agree | disagree |
|---|---|---|---|---|
| Men should be the ones to take the initiative in showing that they like a girl | 61.1 | 27.1 | 8.0 | 3.8 |
| Men have numerous sexual partners | 16.5 | 19.5 | 22.8 | 41.2 |
| Boys and girls have to play with different toys | 35.7 | 30.5 | 23.0 | 10.8 |
| Men and women should be assigned to help with housework as well | 39.1 | 32.2 | 19.3 | 9.4 |
| If there is a financial necessity, men should receive higher education than women | 20.6 | 20.2 | 19.8 | 39.2 |
| Men are responsible for pregnancies or sexually transmitted infections | 22.0 | 25.5 | 27.8 | 24.7 |
| Child care is the women's responsibility | 37.1 | 25.3 | 16.9 | 20.7 |
| Doing routine housework is the women's responsibility | 45.5 | 23.9 | 14.4 | 16.2 |
| Repairing things in the house, e.g., changing light bulbs is the women's responsibility | 4.9 | 8.1 | 21.2 | 65.8 |

**Table 4.27**  (Continued)

| Attitudes toward Gender | really agree | rather agree | sometimes agree | disagree |
|---|---|---|---|---|
| Heads of community should be men | 38.5 | 21.6 | 17.1 | 22.8 |
| Heads of subdistrict should be men | 37.4 | 20.5 | 16.7 | 25.4 |
| District-chief officers or provincial governorห should be men | 44.4 | 20.0 | 15.2 | 20.4 |
| The Prime Minister should be a man | 49.3 | 18.9 | 13.0 | 18.8 |

### 4.2.5  Life stability

Puberty is the age when life should be stabilized in order to prepare readiness for building a family with a healthy state.  According to studies, it has been found that only 38.1% of women at the age of puberty had career stability while 73.1 % had health and safety insurance and only 31.5% had sufficient income for personal and family expenses.  For current occupation, 78.4 % were found to be honest, and when the samples were asked to estimate whether or not they regularly carried out their lives or occupations with honesty and without taking advantage of others or cheating, 60.4% answered in the affirmative (Table 4.28).

**Table 4.28**  Percentage of Women In Their Reproductive Years Aged 19-49 Years Old by Life Stability

| Life Stability | regularly | frequently | sometimes | never |
|---|---|---|---|---|
| Career stability | 38.1 | 31.4 | 18.1 | 12.4 |
| Health and safety insurance | 73.1 | 20.3 | 3.7 | 2.9 |
| Have sufficient income for personal and family expenses | 31.5 | 32.4 | 27.0 | 9.1 |
| Current occupation is honest | 78.4 | 15.9 | 3.6 | 2.1 |
| Carry out lives or occupations with honesty and without taking advantage of others or cheating | 60.4 | 27.5 | 6.8 | 5.2 |

### 4.2.6 Health State Description

From one study on the health state of women aged 19-49 years, particular consideration was paid to physical state during the past 30 days, including both good and bad days. Furthermore, when questioned about difficulties, the past 30 days were considered regarding the average difficulty while performing the activity. When the scales were read and shown to the respondents, it was found that the reproductive aged women assessed their overall health on the day of the interview at excellent and good levels at rates of 25.4% and 44.3%, respectively while 4.2% of the women assessed their health as being poor and very poor (Table 4.29). When the women were asked to assess their overall difficulty during the past 30 days, it was found that the women experienced difficulty at work and at home at rates of 48.3% and minor difficulty at 29.7%.

In terms of mobility, 74.8% had no difficulty moving and 16.6% had slight difficulty moving. 57.4% had no difficulty exercising heavily, and 25.4% had only slight difficulty. In terms of self-care, 85.2% had no difficulty and 8.8% had slight difficulty while 81.5% had no difficulty performing tasks that maintained self-care agency and 11.5% had slight difficulty. In terms of pain and discomfort, 30.9% had no physical pain while 49.8% had slight physical pain and 47.4% were content. In terms of intelligence, 48.1% had no difficulty concentrating or memorizing while 34.1% had slight difficulty and 52.8% had no difficulty learning new tasks while 31.5% had slight difficulty. In terms of interpersonal activity, 64.8% had no difficulty having relationships with other people or participating in collective activities while 22.3% had slight difficulty and 60.2% had no difficulty dealing with conflicts and tension with other people and 28.8 had slight difficulty. In terms of visibility, 9.2% of the women aged 19-49 years wore glasses or contact lenses and 56.4% of the group that wore glasses or contact lenses had no difficulty seeing and remembering faces of acquaintances from across the street while 47.1% had no difficulty seeing and providing details about things placed at arm's length or within reading range while 79.4% of the group that did not wear glasses or contact lenses had no difficulty seeing and 76.3% had minor eyesight problems. In terms of sleeping and energy, 51.8% had no problems sleeping, i.e., difficulty falling asleep or frequently awakening in the middle of the night or waking too early, and 30.6% had minor problems while 48.3%

had no feelings of sleep deficiency and feelings of not being refreshed during the day while 34.9% had slight problems. In terms of emotions and feelings, 71.9% had no feelings of sadness or depression and 21.4% had slight feelings while 58.9% had no anxiety or distress and 31.3% had slight feelings (Table 4.30).

**Table 4.29** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Overall Health on The Day

| Overall Health | Very good | Good | Moderate | Bad | Very Bad |
|---|---|---|---|---|---|
| In general, how would you rate your health today? | 25.4 | 44.3 | 26.1 | 3.5 | 0.7 |

**Table 4.30** Percentage of Women in Their Reproductive Years Aged 19-49 Years Old by Overall Health in The Last 30 Days

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Overall Health** | | | | | |
| How much difficulty did you have with work or household activities? | 48.3 | 29.7 | 19.0 | 2.4 | 0.6 |
| **Mobility** | | | | | |
| How much difficulty did you have with moving around? | 74.8 | 16.6 | 7.4 | 1.1 | 0.1 |
| How much difficulty did you have in vigorous activities, such as running three km (or equivalent) or cycling? | 57.4 | 25.4 | 13.2 | 2.2 | 1.8 |
| **Self Care** | | | | | |
| How much difficulty did you have with self-care, such as washing or dressing yourself? | 85.2 | 8.8 | 5.0 | 0.8 | 0.2 |

**Table 4.30** (Continued)

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| How much difficulty did you have in taking care of and maintaining your general appearance | 81.5 | 11.5 | 5.6 | 1.0 | 0.4 |
| **Pain and Discomfort** | | | | | |
| How many of bodily aches or pains did you have? | 30.9 | 49.8 | 16.4 | 2.5 | 0.4 |
| How much bodily discomfort did you have? | 47.4 | 37.5 | 13.0 | 1.9 | 0.2 |
| **Cognition** | | | | | |
| How much difficulty did you have with concentrating or remembering things? | 48.1 | 34.1 | 16.2 | 1.5 | 0.2 |
| How much difficulty did you have in learning a new task? | 52.8 | 31.5 | 13.8 | 1.5 | 0.4 |
| **Interpersonal Activities** | | | | | |
| How much difficulty did you have with personal relationship or participation in the community? | 64.8 | 22.3 | 11.4 | 1.1 | 0.4 |
| How much difficulty did you have in dealing with conflicts and tensions with others? | 60.2 | 28.8 | 8.7 | 1.8 | 0.5 |
| **Vision (wear glasses or contact lenses) (289)** | | | | | |
| How much difficulty did you have in seeing and recognizing a person you know across the road (i.e., from a distance of about 20 meters)? | 56.4 | 24.2 | 15.6 | 3.5 | 0.3 |

**Table 4.30** (Continued)

| Health State in The Last 30 Days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | 47.1 | 31.1 | 15.9 | 3.8 | 2.1 |
| **Vision (don't wear glasses or contact lenses) (2840)** | | | | | |
| How much difficulty did you have in seeing and recognizing a person you know across the road (i.e., from a distance of about 20 meters)? | 79.4 | 13.2 | 6.0 | 1.0 | 0.4 |
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | 76.3 | 14.6 | 7.5 | 1.1 | 0.5 |
| **Sleep and Energy** | | | | | |
| How much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night or waking up too early in the morning? | 51.8 | 30.6 | 14.5 | 2.7 | 0.4 |
| How much of a problem did you have due to not feeling rested and refreshed during the day (e.g., feeling tired, not having energy)? | 48.3 | 34.9 | 13.8 | 2.6 | 0.4 |
| **Affect** | | | | | |
| How much of a problem did you have with feeling sad, low or depressed? | 71.9 | 21.4 | 5.6 | 0.9 | 0.2 |
| How much of a problem did you have with worry or anxiety? | 58.9 | 31.3 | 8.0 | 1.5 | 0.3 |

# CHAPTER 5

# RESULTS OF MODEL TESTING

## 5.1 Model testing for healthy women aged 13-18 years

### 5.1.1 Modification of Model for Women aged 13-18 Years

The structural equation modeling (LISREL) was employed in testing the theoretical models for the group of women aged 13-18 years. Indicators were calculated by summing up the scores of all of the 62 items with Maximum Likelihood Estimates. The variables used for the confirmatory factor analysis to categorize the indicator groups were as stated in chapter 3.

From the conceptual framework, the developed indicators for healthy women were categorized into six groups: good physical condition, good mental health, good reproductive health, good health promotion behaviors and no risk behaviors, realizing the roles and duties towards the family and society and last, security with life and spirituality.

The results of confirmatory factor analysis to test the linearity for structure validity of the latent variables in the six groups show that the simulation of the measurement from the six groups did not fit the data, so the model was adjusted to fit the data by redividing the indicators. The indicators for physical health, mental health and reproductive health were not changed, while the indicators for realizing the roles and duties towards the family and society and security in the life and spiritual were combined and renamed as social health. The indicators for health promotion behaviors and no risk behaviors were separated into two groups as health promotion behaviors group and health risk behaviors group. The adjustment of the model followed the conceptual framework as well as the statistical value, the indicators for each dimension for healthy women aged 13-18 years are shown in Table 5.1.

**Table 5.1** Indicators of The Model for Women aged 13-18 Years by Dimension

| Dimension | Indicators |
|---|---|
| Physical health | |
| | BMI |
| | Systolic blood pressure |
| | Diastolic blood pressure |
| Mental health | |
| | Self-esteem |
| | Impulse-control |
| | Empathy |
| | Motivation, Goal setting |
| | Tranquility |
| Social health | |
| | Work as volunteers in helping others with no wish for compensation |
| | Willing to share things |
| | Keeping promises to others |
| | Caring for the environment and maintaining public benefits |
| | Being punctual |
| Reproductive health | |
| | Knowledge about the management of sexual emotions |
| | Knowledge about pregnancy and birth control |
| | Gender equality |
| Health promotion behaviors | |
| | Taking care of dental health regularly |
| | Physical activity for at least 150 minutes per week |
| | Eating food from the five nutrition groups |
| | Drinking at least six glasses of clean water |
| | Wearing a helmet when riding a motorcycle |

**Table 5.1**  (Continued)

| Dimension | Indicators |
|---|---|
| Health risk behaviors | |
| | Eating fast foods such as pizza or hamburgers |
| | Smoking |
| | Drinking alcoholic beverages |

**5.1.2 Fit Indices of the Model for Women aged 13-18 years**

The overall model fit of these measurement models was evaluated using the following criteria similar to an evaluation of the structural model fit.  Indicators of the overall fit of the model with the data used in this study were that:

The Goodness-of Fit Index (GFI) is a measure of the relative amount of variance and covariance in the sample data that is jointly explained by sample data.  If the model possesses a good fit, then the value is usually above 0.9.  The GFI for this model was strong (GFI= 0.95. The Adjusted Goodness of Fit Index (AGFI) adjusts the number of degrees of freedom in specified model.  If the model possesses a good fit, then the value is usually above 0.8.  The AGFI for this model was 0.94 meaning the model is strong.  The comparative fit index (CFI) was used to compare the fit of one model with the fit of another.  The Normed Fit Index (NFI), Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI) use a basic comparison by which to assess the hypothesized model.  Most researchers suggest that NFI, NNFI and CFI values of 0.9 or better indicate a good fit.

The Incremental Fit Index (IFI) addresses the issue of parsimony and sample size that are known to be associated with NFI.  Like all the other normed fit indices, a value > 0.90 indicates an acceptable fit to the data. The Root Mean Square Residual (RMR) is a measure of the average of the fitted residuals and can only be interpreted in relation to the sizes of the observed variances and covariances in the sample.  In a well-fitting model the value of the RMR should be 0.1 or less. The Root Mean Square Error of Approximation (RMSEA) is sometimes used as a measure of discrepancy per degree of freedom.  The RMSEA was used to determine the parsimonious fit of the

model, and a value of less than 0.05 indicates a good fit with a value between 0.05 and 0.08 showing a moderate.

The overall goodness-of-fit this model indices are also listed in Table 5.2, the value of the goodness-of-fit index (GFI = 0.96) is satisfactory since it is larger than the threshold value of 0.90. The value of the adjusted goodness-of-fit index (AGFI = 0.95) is satisfactory and meaning the model is strong. The values of the normed fit index (NFI=0.94), non-normed fit index (NNFI=0.95) and comparative fit index (CFI=0.96) indicated a strong comparative fit for the model. The value of Incremental Fit Index (IFI = 0.96) indicated an adequate fit to the data. The value of the root mean square residual (RMR=0.18) indicated a fairly fitting model. The value of the root mean square error of approximation (RMSEA = 0.029) was smaller than the value of 0.05, which indicates a better model fit. The Chi-square value ($\chi$2), 349.00 with 237 degrees of freedom, was significant (p =0.00), which indicates a non-model fit. This may be partly due to the sample size in this study being greater than 200 (Table 5.2).

**Table 5.2** Fit Indices of The Model for Healthy Women in Aged 13-18 Years

| Fit Index | Value | Ideal Value |
|---|---|---|
| Chi-Square = 346, d.f. = 237 | p-value < 0.01 | p-value > 0.05 |
| Goodness of Fit Index (GFI) | 0.96 | >0.9 |
| Adjusted Goodness of Fit Index (AGFI) | 0.95 | >0.8 |
| Normed Fit Index (NFI) | 0.94 | >0.9 |
| Non-Normed Fit Index (NNFI) | 0.95 | >0.9 |
| Comparative Fit Index (CFI) | 0.96 | >0.9 |
| Incremental Fit Index (IFI) | 0.96 | >0.9 |
| Root Mean Square Residual (RMR) | 0.18 | <0.1 |
| Root Mean Square Error of Approximation (RMSEA) | 0.029 | <0.5 |

### 5.1.3 Structural model of healthy women aged 13-18 years

The measurement models of healthy adolescents (13-18 years) tested revealed good factor loadings and the percentage of variance in each item was adequately accounted for by its latent construct. None of the fit indices were acceptable in the initial structural model resulting in a modified model based on both the statistical evidence and prior knowledge. The final model showed that social health had a direct positive effect on mental health ($\beta=0.46$, $p<0.01$), health promoting behavior had a positive effect on social health ($\gamma=0.72$, $p<0.01$), health risk behavior had a negative effect on social health ($\gamma=-0.14$, $p<0.05$) and reproductive health effect on mental health ($\gamma=0.18$, $p<0.01$) (Table 5.3).

**Table 5.3** Maximum Likelihood Estimates of Models for Women Aged 13-18 Years

| Parameters | Coefficients | t-value |
|---|---|---|
| $\beta_{12}$ | 0.06 | 0.79 |
| $\beta_{13}$ | -0.10 | -0.86 |
| $\beta_{23}$ | **0.46** | 4.46 |
| $\gamma_{14}$ | -0.01 | -0.08 |
| $\gamma_{15}$ | 0.03 | 0.30 |
| $\gamma_{16}$ | 0.00 | 0.01 |
| $\gamma_{24}$ | **0.18** | 2.71 |
| $\gamma_{25}$ | 0.16 | 1.56 |
| $\gamma_{26}$ | -0.06 | -1.16 |
| $\gamma_{34}$ | 0.00 | 0.03 |
| $\gamma_{35}$ | **0.72** | 8.38 |
| $\gamma_{36}$ | **-0.14** | -2.03 |

**Note:** 1 = Physical health, 2 = Mental health, 3 = Social health, 4 = Reproductive health, 5 = Health promotion behaviors and 6 = Health risk behaviors
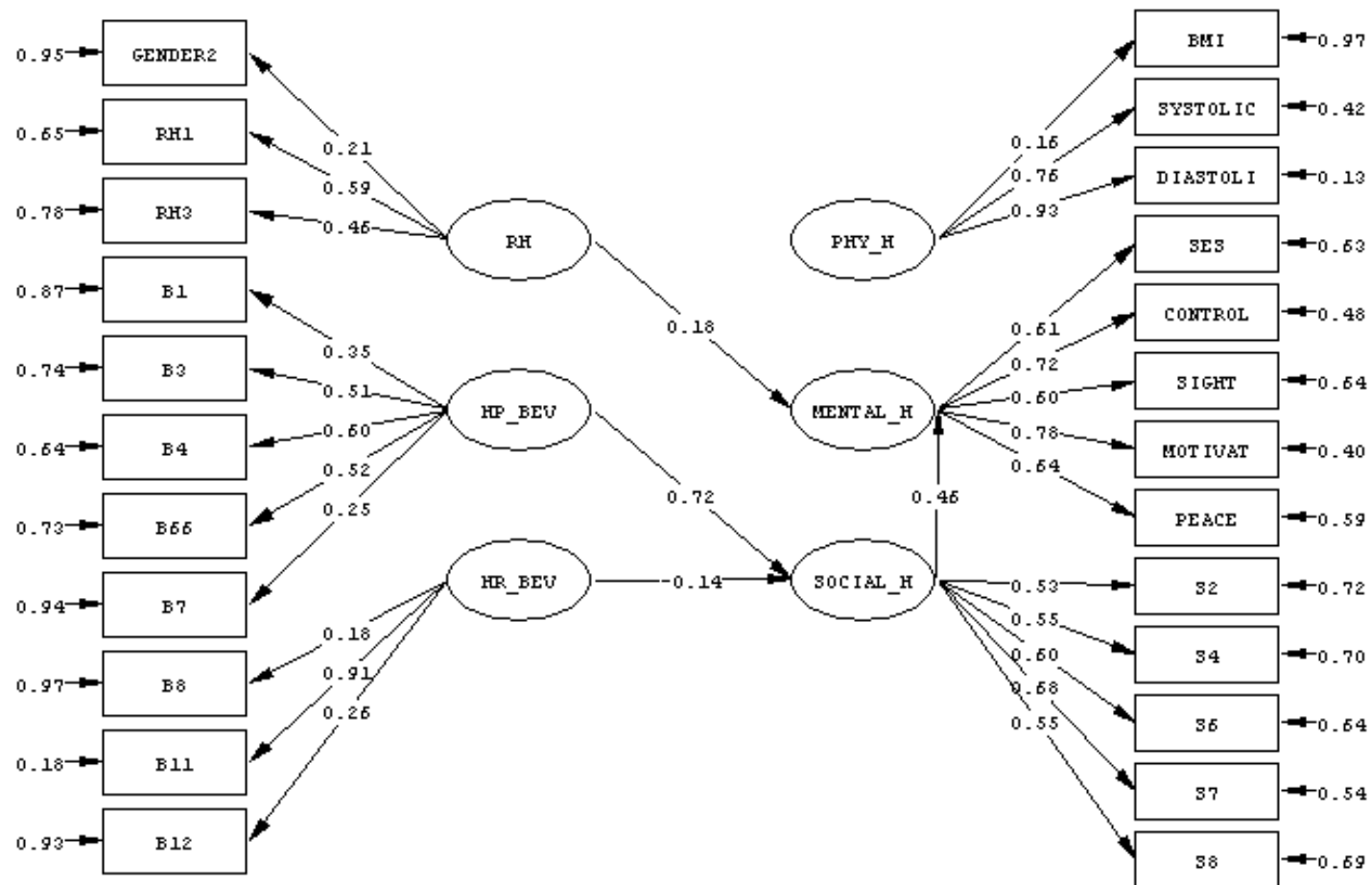
**Figure 5.1** Multidimensional indicators model of healthy women aged 13-18 years

## 5.2  Model testing for healthy women aged 19-49 years

### 5.2.1 Modification of Model for Women aged 19-49 Years

Structural equation modeling (LISREL) was employed in testing the theoretical models for the group of women in their reproductive years aged 19-49 years old.  Indicators were calculated by summing up the scores of all of the 66 items with Maximum Likelihood Estimates.  The variables used for the confirmatory factor analysis to categorize the indicator groups were as stated in chapter 3.

From the conceptual framework, the developed indicators for healthy women were categorized into seven groups: good physical condition, good mental health, good reproductive health, good health promotion behaviors and no risk behaviors, working properly and safely, realizing the roles and duties towards the family and last, society and security in the life and spiritual.

The results of confirmatory factor analysis to test the linearity for structure validity of the latent variables in the seven groups show that the simulation of the measurement from the seven groups did not fit the data; the model was adjusted to fit to the data by redividing the indicators.  The indicators for physical health, mental health and reproductive health were not changed, while the indicators for realizing the roles and duties towards the family and society and security in the life and spiritual were combined and renamed as social health.  The indicators for health promotion behaviors and no risk behaviors were separated into two groups as:  health promotion behaviors group and health risk behaviors group and the "working properly and safely" group combining with health promotion behaviors and health risk behaviors group.  After the adjustment of the model following the conceptual framework as well as the statistical value, the results from the final modified model showed the best fit with the indicators in each dimensions as shown in Table 5.4.

**Table 5.4** Indicators of The Model for Women aged 19-49 Years by Dimension

| Dimension | Indicators |
|---|---|
| Physical health | |
| | Waist |
| | Systolic blood pressure |
| | Diastolic blood pressure |
| Mental health | |
| | Impulse-control |
| | Empathy |
| | Motivation, Goal setting |
| | Self-regard |
| | Tranquility |
| Social health | |
| | Paying attention to the family |
| | Work as volunteers in helping others with no wish for compensation |
| | Willing to share things |
| | Waiting in line to purchase goods or receive various services |
| | Keeping promises to others |
| | Caring for the environment and maintaining public benefits |
| | Having career stability |
| | Living their lives or performing their occupations with honesty |
| Reproductive health | |
| | Knowledge about the management of sexual emotions |
| | Responsibility in child care |
| | Responsibility in routine housework |
| | Gender equality |

**Table 5.4**  (Continued)

| Dimension | Indicators |
|---|---|
| Health promotion behaviors | |
| | Taking care of dental health regularly |
| | Physical activity for at least 150 minutes per week |
| | Eating food from the five nutrition groups |
| | Wearing a helmet when riding a motorcycle |
| Health risk behaviors | |
| | Smoking |
| | Drinking alcoholic beverages |

### 5.2.2 Fit Indices of the Measurement Model for females aged 19-49 years

The overall goodness-of-fit model indices are also listed in Table 5.2, the value of the goodness-of-fit index (GFI = 0.96) is satisfactory since it was larger than the threshold value of 0.90.  The value of the adjusted goodness-of-fit index (AGFI = 0.95) was satisfactory and meaning the model is strong.  The value of normed fit index (NFI=0.94), non-normed fit index (NNFI=0.95) and comparative fit index (CFI=0.96) indicated a strong comparative fit for the model. The value of Incremental Fit Index (IFI = 0.96) indicated an adequate fit to the data.  The value of root mean square residual (RMR=0.18) indicated a fairly fitting model.  The value of the root mean square error of approximation (RMSEA = 0.038) was smaller than the value of 0.05, which indicated a better model fit.  The Chi-square value ($\chi 2$), 1346.96 with 284 degrees of freedom, was significant (p =0.00), which indicated a non-model fit.  This may be partly due to the sample size in this study being greater than 200 (Table 5.5).

**Table 5.5** Fit Indices of The Model for Healthy Women aged 19-49 Years

| Fit Index | Value | Ideal Value |
|---|---|---|
| Chi-Square = 1346.96, d.f. = 284 | p-value < 0.01 | p-value > 0.05 |
| Goodness of Fit Index (GFI) | 0.96 | >0.9 |
| Adjusted Goodness of Fit Index (AGFI) | 0.95 | >0.8 |
| Normed Fit Index (NFI) | 0.94 | >0.9 |
| Non-Normed Fit Index (NNFI) | 0.95 | >0.9 |
| Comparative Fit Index (CFI) | 0.96 | >0.9 |
| Incremental Fit Index (IFI) | 0.96 | >0.9 |
| Root Mean Square Residual (RMR) | 0.13 | <0.1 |
| Root Mean Square Error of Approximation (RMSEA) | 0.038 | <0.5 |

### 5.2.3  Structural model of healthy women aged 19-49 years

The measurement models of healthy women (19-49 years) tested revealed good factor loadings and the percentage of variance in each item was adequately accounted for by its latent construct. None of the fit indices were acceptable in the initial structural model resulting in a modified model based on both statistical evidence and prior knowledge. The final model showed that social health had a direct positive effect on mental health ($\beta=0.36$, $p<0.01$); reproductive health had a positive effect on physical health ($\gamma=-0.07$, $p<0.01$), mental health ($\gamma=0.16$, $p<0.01$) and social health ($\gamma=-0.06$, $p<0.01$); health promoting behavior had a positive effect on mental health ($\gamma=0.21$, $p<0.01$), social health ($\gamma=0.61$, $p<0.01$), and health risk behavior had a negative effect on social health ($\gamma=-0.06$, $p<0.05$) (Table 5.6).

**Table 5.6** Maximum Likelihood Estimates of Models for Women in Aged 19-49
Years

| Parameters | Coefficients | t-value |
|---|---|---|
| $\beta_{12}$ | 0.01 | 0.41 |
| $\beta_{13}$ | -0.03 | -0.69 |
| $\beta_{23}$ | **0.36** | 8.91 |
| $\gamma_{14}$ | **-0.07** | -3.14 |
| $\gamma_{15}$ | -0.02 | -0.49 |
| $\gamma_{16}$ | 0.04 | 1.64 |
| $\gamma_{24}$ | **0.16** | 7.39 |
| $\gamma_{25}$ | **0.21** | 5.13 |
| $\gamma_{26}$ | -0.05 | -1.92 |
| $\gamma_{34}$ | **-0.06** | -2.42 |
| $\gamma_{35}$ | **0.61** | 14.54 |
| $\gamma_{36}$ | **-0.06** | -1.97 |

**Note:** 1 = Physical health, 2 = Mental health, 3 = Social health, 4 = Reproductive
health, 5 = Health promotion behaviors and 6 = Health risk behaviors
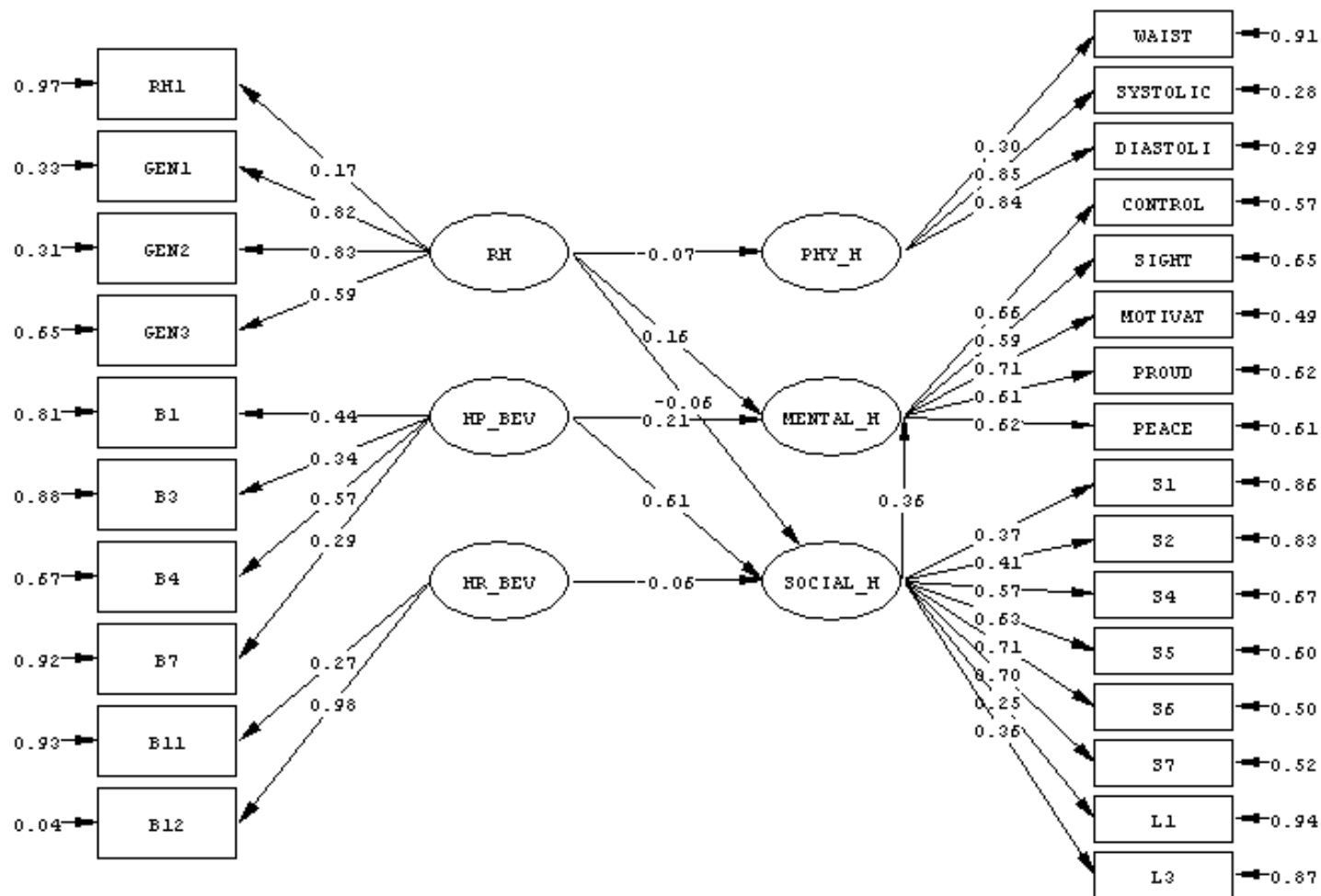
**Figure 5.2** Multidimensional indicator model of healthy women in their reproductive years aged 19-49 years

**Note:** Name label of variables

| | NAME LABEL | |
|---|---|---|
| | 13-18 years | 19-49 years |
| Physical health | PHY_H | PHY_H |
|   Waist | | Waist |
|   Body mass index (BMI) | BMI | |
|   Systolic blood pressure | Systolic | Systolic |
|   Diastolic blood pressure | Diastolic | Diastolic |
| Mental health | MENTAL_H | MENTAL_H |
|   Self-esteem | SES | |
|   Impulse-control | CONTROL | CONTROL |
|   Empathy | SIGHT | SIGHT |
|   Motivation, Goal setting | MOTIVAT | MOTIVAT |
|   Self-regard | | PROUD |
|   Tranquility | PEACE | PEACE |
| Social health | SOCIAL_H | SOCIAL_H |
|   Paying attention to the family | | S1 |
|   Work as volunteers in helping others with no wish for compensation | S2 | S2 |
|   Willing to share things | S4 | S4 |
|   Waiting in line to purchase goods or receive various services | | S5 |
|   Keeping promises to others | S6 | S6 |
|   Caring for the environment and maintaining public benefits | S7 | S7 |
|   Being punctual | S8 | |
|   Having career stability | | L1 |
|   Living their lives or performing their occupations with honesty | | L3 |

|  | NAME LABEL | |
| --- | --- | --- |
|  | 13-18 years | 19-49 years |
| Reproductive health | RH | RH |
| Knowledge about the management of sexual emotions | RH1 | RH1 |
| Knowledge about pregnancy and birth control | RH3 | |
| Responsibility in child care | | GEN1 |
| Responsibility in routine housework | | GEN2 |
| Gender equality | GENDER2 | GEN3 |
| Health promotion behaviors | HP_BEV | HP_BEV |
| Taking care of dental health regularly | B1 | B1 |
| Physical activity for at least 150 minutes per week | B3 | B3 |
| Eating food from the five nutrition groups | B4 | B4 |
| Drinking at least six glasses of clean water | B66 | |
| Wearing a helmet when riding a motorcycle | B7 | B7 |
| Health risk behaviors | HR_BEV | HR_BEV |
| Eating fast foods such as pizza or hamburgers | B8 | |
| Smoking | B11 | B11 |
| Drinking alcoholic beverages | B12 | B12 |

# CHAPTER 6

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 6.1 Summary

This research was a part of Healthy Thais Indicator Development Project, which defined the dimension and indicator differences according to age group and factors influencing health status in each age group. The age groups employed in this project were classified according to the cutoff point at 19 years, which was the lowest age for employees. Consequently, the participants in this project were divided into two groups: 1). 13-18 years as representative of the "adolescent group" and 2). 19-59 years as representative of the "employee group." In each age group, the development of indicators in each dimension was performed based on theory that each group differed according to age group as well as factors influencing health status in each age group of Thai people. The information from women at reproductive age was separately analyzed by these two age groups, 13-18 years and 19-49 years.

This research emphasized the construct indicators of Healthy Women in Reproductive age covering the physical, mental, social, and spiritual dimensions appropriate to Thai lifestyle and Thai societal patterns. This survey study included the measurement of positive health status in two groups of women aged from 13 to 18 years and 19 to 49 years in urban and rural areas in Bangkok and the four regions of Thailand. Indicators were constructed for Healthy Women in Reproductive age to describe the factors in each dimension of these women affecting the healthy condition in order to develop the model of indicators for healthy women in reproductive age. The following summary statements can be made regarding the findings of the study.

The studied female teenager group, 13-18 years of age, had an average age of 15.3 years. Most were single and at high school age. The main occupation was agriculture, and the average intelligence quotient (IQ) was 92. On the general health

of these female teenagers, it was found that 7% had chronic diseases. Half of the teenager group had a body mass index within normal level and 96% had normal blood pressure. It was found that half of the group had oral problems. The average age of the group that started having menstruation was 13 years old. Half of the teenagers were married and had children. A third still lacked knowledge about reproductive hygiene appropriate for this age. In regard to daily life style health behavior, only one half of the teenagers had suitable health behaviors, e.g., proper diet and beverage intake, and body cleansing and hygiene practices. It was found that risk behaviors still existed such as speeding regularly, not wearing a safety helmet while riding a motorcycle, and not using a safety belt while sitting in the car front seat. Regarding the emotion quotient (EQ), items with low scores were sympathy with others, life satisfaction and mental serenity. For the items concern for responsibility and discipline to the family and society, e.g., conducting daily responsibilities timely without coercion, paying respect to the elderly, being punctual, queuing patiently, environmental conservation, being frugal, etc., very few of the studied teenage group practiced all these. Less than half of the studied group still had the attitude that the roles of males and females were unequal. More than 70% of the female teenagers assessed their health at good and very good levels.

Reproductive females aged 19-49 were 35 years old on average. A total of 11% were single, and 13% were heads of their households. One third had education higher than primary school, most worked in agriculture and trade sectors and the average income was 2,500 baht. A total of 18% of the studied reproductive group had chronic diseases, mainly high blood pressure, diabetes, stomach ulcer, allergy, chronic headache and heart disease. The study found 63% had normal BMI. 89% had normal blood pressure and only 10% had good oral health, and that they had regular oral exams less than the national standard. On reproductive hygiene, 17% used to have abortion, which was mostly intentional. Their knowledge about reproductive mechanism was fair. Regarding health behavior on disease prevention, problems were identified as only a few practiced for example, exercising at least 30 minutes three times a week; eating vegetable and fruits; refraining from speeding; and using a safety belt while driving. From the survey of the Thai National Statistical Office from

2004 to 2006, it was found that health behavior on health promotion of the women was low (Thai National Statistical Office, 2004, 2005 and 2006).

Working behaviors that posed risk included a low rate in using protection and low rate of regular check-ups according to the risk of the work. Concerning psychological condition, when assessed based on the mental health measurement of Thais (short version), it was found that 90% of both males and females scored the same or better than general people. Women had lower scores compared to men. Regarding the emotion quotient (EQ), the parts that had scores lower than normal were responsibility, life satisfaction, mental serenity, decision making and problem solving. In addition, problems about the feeling of life stability, especially current career and income, whether sufficient for their own and families were revealed. Only 30% thought they had financial stability, routine activities and development of mental health status such as recreational activities among their own group, hobbies, religious practice, mental exercise, e.g,. meditation, voluntary work or helping others without expecting reward. Less than half of women at reproductive age followed these practices regularly. In regards to responsibilities to themselves, families and societies, such as not using abusive words or acts with the family members when angry, not having an affair, being frugal, queuing patiently, preserving the environment, and being punctual, less than half practiced regularly. Women 19-49 years of age still accepted some attitude about the inequality of females and males. Only a quarter assessed their health to be in at good and very good levels.

From the conceptual framework, the developed indicators for healthy women aged 13-18 years were divided into six groups: good physical condition, good mental health, good reproductive health, good health promotion behaviors and no risk behaviors, realizing the roles and duties towards the family and society and last, feeling secure in life and spirituality.

The results of confirmatory factor analysis to test the linearity for structure validity of the latent variables in six groups show that the simulation of the measurement from the six groups did not fit to the data, so the model was adjusted to fit the data by reclassifying the indicators. The indicators for physical health, mental health and reproductive health were not changed, while the indicators for realizing the roles and duties towards the family and society and security in life and spirituality

were combined and renamed as social health. Indicators for health promotion behaviors and no risk behaviors were separated into two groups, health promotion behavior and health risk behavior groups.

The model of healthy women aged 13-18 years was adjusted following the stated conceptual framework as well as the statistical value. The revised model fit was measured using goodness of fit index (GFI= 0.96), adjusted goodness of fit index (AGFI= 0.95), normed fit index (NFI=0.94), non-normed fit index (NNFI=0.95), comparative fit index (CFI=0.96), and root mean square error of approximation (RMSEA = 0.029). The indicators for healthy women aged 13-18 years are shown below.

Physical health

Body mass index (BMI)

Systolic and diastolic blood pressure

Mental health

Self-esteem

Impulse-control

Empathy

Motivation, Goal setting

Tranquility

Social health

Work as volunteers in helping others with no wish for compensation

Willing to share things

Keeping promises to others

Caring for the environment and maintaining public benefits

Being punctual

Reproductive health

Knowledge about the management of sexual emotions

Knowledge about pregnancy and birth control

Gender equality

Health promotion behaviors

      Taking care of dental health regularly

      Physical activity for at least 150 minutes per week

      Eating food from the five nutrition groups

      Drinking at least six glasses of clean water

      Wearing a helmet when riding a motorcycle

Health risk behaviors

      Eating fast foods such as pizza or hamburgers

      Smoking

      Drinking alcoholic beverages

The final model showed that social health had a direct positive effect on mental health ($\beta$=0.46, $p<0.01$); health promoting behavior had a positive effect on social health ($\gamma$=0.72, $p<0.01$) and physical health ($\gamma$=0.16, $p<0.01$); health risk behavior had a negative effect on social health ($\gamma$=-0.14, $p<0.05$), and reproductive health had a positive effect on mental health ($\gamma$=0.18, $p<0.01$).

For women aged 19-49 years, indicators were added from the characteristics of factors and situations influencing a healthy status as well as working property and safety and classified in seven groups. The simulation of the measurement from the seven groups did not fit the data, so the model was adjusted to fit to the data by redivided the indicators into six groups similar to women in the age group 13-18 years by combining the "working properly and safely" group with the health promotion behavior and health risk behavior groups.

The revised model fit was measured using the goodness of fit index (GFI= 0.96), adjusted goodness of fit index (AGFI= 0.95), normed fit index (NFI=0.94), non-normed fit index (NNFI=0.95), comparative fit index (CFI=0.96) and root mean square error of approximation (RMSEA = 0.038).

The indicators for healthy women in the age group 19-49 years are shown as below.

Physical health

    Waist

    Systolic and Diastolic blood pressure

Mental health

    Impulse-control

    Empathy

    Motivation, Goal setting

    Self-regard

    Tranquility

Social health

    Paying attention to the family

    Work as volunteers in helping others with no wish for compensation

    Willing to share things

    Waiting in line to purchase goods or receive various services

    Keeping promises to others

    Caring for the environment and maintaining public benefits

    Having career stability

    Living their lives or performing their occupations with honesty

Reproductive health

    Knowledge about the management of sexual emotions

    Responsibility in child care

    Responsibility in routine housework

    Gender equality

Health promotion behaviors

    Taking care of dental health regularly

    Physical activity for at least 150 minutes per week

    Eating food from the five nutrition groups

    Wearing a helmet when riding a motorcycle

Health risk behaviors

    Smoking

    Drinking alcoholic beverages

The final model showed that social health had a direct positive effect on mental health ($\beta=0.36$, $p<0.01$); reproductive health had a positive effect on physical health ($\gamma=0.07$, $p<0.05$) and mental health ($\gamma=0.16$, $p<0.01$); health promoting behavior had a positive effect on mental health ($\gamma=0.21$, $p<0.01$), social health ($\gamma=0.61$, $p<0.01$), and health risk behavior had a negative effect on social health ($\gamma=-0.06$, $p<0.05$).

## 6.2 Conclusion

The study, in addressing its specific aims, drew several conclusions as follows:

From the above studied indicators it was found that most women at reproductive age still did not have health status up to the good health standard level, especially in the dimensions of mental state, emotional state and mental development. Though most of the physical dimensions would continue to develop along with age and maturity, the trend towards increase of illnesses was revealed. This was in line with the basic health promotion behavior which aimed to prevent major diseases, i.e, non-communicable diseases such as coronary diseases, obesity, diabetes, high blood pressure, cancer and accidents. It was found that only a majority of the population (less than 50%) regularly practiced these behaviors. Conversely more risky behaviors such as consumption of fast food among teenagers was identified. This was in line with the survey on food and diet of the Thai population in 2003-2004 by the Department of Health, Ministry of Public Health, 2005. Regarding the EQ dimension, more so among teenagers, it was reflected that they were intelligent but needed more positive mental and emotional states and to feel more content and happy. This is an important issue for Thai teenagers. A 2005 survey of the emotional and behavioral epidemiology of Thai children and teenagers showed that 5.1%, or 687,798 Thais aged 6-18, experienced an "irregular level" of mental and behavioral disorders, such as anxiety, depression, suicidal tendencies, childishness, misbehavior, law breaking, aggression, and sexual problems. These disorders, for which psychologists or mental health experts were consulted, were found mostly in young girls (Churnrurtai

Kanchanachitra et al. 2007: 24). In addition, it was found that the older adolescents had a higher tendency to use force to resolve conflicts. Within families, violence was condoned to resolve problems including its use on pregnant teens. These data were in line with data at the national level revealing that violence in communities was increasing especially against women and children.

The above studied indicators were found to be capable able of reflecting the health status in physical, mental and social dimensions. In addition, it could be manifested at the potential level concerning how to be a healthy person, measured from healthy behavior and good reproductive health. This part focused on positive feelings and thoughts that favored protection from important social problems in the nation such as violence, illegal drugs, alcohol, cigarettes and unplanned sexual intercourse. It could be seen that these indicators were suitable to measure dimensions at the personal level, enabling us to know which dimensions were still not up to the standard. This could help in the development effective solutions and intervention strategies.

From the model development of indicators for healthy women in age groups 13-18 years as well as 19-49 years, the most appropriate model consisted of six groups of indicators. The spiritual dimensions of both groups had were changed to social dimensions because the questions for self assessment were of a similar nature and the model was had a fit. When dividing health-related behaviors into behaviors for health promotion and risk behaviors, the model for each behavior fit more suitably than combining behaviors. The indicators for working properly and safely among women aged 19-49 years demonstrated a low power for grouping. Because a strong relationship was revealed between health-related behaviors and social health, the questions on health behavior were combined with health-related behaviors and the characteristics of work were combined with the social health group.

From models for women at reproductive age in both groups, it was found that social health dimensions held positive relations with mental health dimensions while physical health dimensions and mental health had no relation to social health dimensions. The explanations for this finding might be because the indicators for physical health were the instruments for measuring physical signs and symptoms such as blood pressure and body mass index.

When consider the indicators in each dimension, it was found that indicators for measuring blood pressure were similar among both groups of women, BMI was suitable for adolescents and waist measurement was suitable for use in women aged 19-49 years who were mostly thin.

The indicators for mental health were different between the two age groups because the emotional growth usually is affected by life experiences. The indicators that could similarly explain both groups were impulse-control, empathy, motivation and tranquility, while indicators for self-esteem was suitable for the age group 13-18 years, and Self-regard was suitable for the age group 19-49 years. More indicators for social health were identified in the age group 19-49 years than the age group 13-18 years including career stability and performing occupation with honesty, without taking advantage of others or cheating. It was noticed that the indicator for being punctual was suitable for the age group 13-18 years but not for the age group 19-49 years, while paying attention to the family and waiting patiently in line to purchase goods or receive various services was suitable for the age group 19-49 years but not for the age group 13-18 years.

Among indicators for health promotion behavior, the indicators for taking care of dental health regularly, physical activity, eating food from the five nutrition groups and wearing a helmet when riding a motorcycle were suitable for both age groups and the indicator for drinking at least six glasses of clean water was suitable for the age group 13-18 years. Among indicators for health risk behavior, smoking cigarettes and drinking alcoholic beverages were suitable for both age groups while the indicator for eating fast foods was found suitable for the age group 13-18 years. Among indicators for reproductive health, indicators for knowledge about the management of sexual emotions and gender equality were suitable for both age groups.

## 6.3 Recommendations

These indicators at the personal level were found suitable to assess the health promotion structure of women at reproductive age in different areas to measure success in terms of the changes in health status of people in the communities. It could be seen that the indicators could be separated in defined groups such as physical

health measurement, health behavior measurement, risky behavior measurement, mental and emotion measurement, etc. In the analysis, no single method could be identified to achieve s summary measure that could identify quantitative health status as one main objective of the use of the indicators was to measure which health dimensions were lacking. That could lead to identifying an effective problem-solving method. The summary measure could not identify characteristics of the problems which could produce clear solutions. It therefore, was not useful in problem solving. For example, some health promotion behaviors still need further development such as personal hygiene, hand washing, teeth brushing, the consumption of fruits and vegetables, physical activity, etc. Thus to improve the health of adolescents the data from these indicators could be used to target the dimensions the health project could aim to develop.

These indicators would be valid, reliable and useful to people in the community or the organizations in the community by modifying and supplementing some parts to suit with the diverse conditions and lifestyle of a particular community. That could be beneficial in assessing health status at presence or they could be used to develop good health in each age group or environment.

Furthermore, the results from questionnaires constructed from these indicators also found that many indicators might be at a low confidence level. This might be due to the nature of indicators which performed subjective evaluation, so it is suggested to increase such confidence by conducting long-term studies among women in many age groups to measure the validity or predictive validity regarding health status and to study the relation between personal characteristics and health status at present and in future to explore the health status impact between environmental factors and personal health status, mental health, social and mental development in adolescents, women in active reproductive life, women with menopause or the elderly.

It is recommended a further study be conducted focusing on the methods or mechanism in developing the mental dimension, basic ethics, responsibility toward society, self-discipline, security in life and spirituality.

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**APPENDIX**

# Questionnaire of Adolescents aged 13-18 years

**A. General data and Health status data**

A1. Age …...…….. Years

A2. Sex ☐ Male ☐ Female

A3. Study class ……………………………. School Name ………………………….

GPA (last year) ……………………...

A4 Weight (present) …………… km. Height (present) ...……........... cm.

A5. Waist ………..… Inches Hip ………….. Inches

A6. Systolic blood pressure ………… mmHg

Diastolic blood pressure ………… mmHg

A7. Chronic diseases ☐ No

☐ Yes, to specify ………………………………….

A8. Ill during 1 month before interview's date

☐ No

☐ Yes, to specify ………………………………….

A9. Health of the teeth and gum

9.1 Dental was exams least twice per year by dentists

☐ Receive ☐ No receive

9.2 Teeth ☐ No Cavities

☐ Have cavities that had been treated

☐ Have cavities that had not been treated

9.3 Gum ☐ Normal

☐ Painful chewing

☐ Bleeding gums while brushing

☐ Both painful chewing and bleeding gums

**A10. Health State Descriptions**

**Overall Health**

The first questions are about your overall health, including both your physical and your mental health.

| Overall Health | Very good | Good | Moderate | Bad | Very Bad |
|---|---|---|---|---|---|
| In general, would you rate your health today as | | | | | |

Overall in the last 30 days, how much difficulty did you have with work or household activities? **1.** None **2.** Mild **3.** Moderate **4.** Severe **5.** Extreme/ Cannot do

Now I would like to review different functions of your body. When answering these questions, I would like you to think about the last 30 days, taking both good and bad days into account. When I ask about difficulty, I would like you to consider how much difficulty you have had, on an average, in the past 30 days, while doing the activity in the way that you usually do it. By difficulty I mean requiring increased effort, discomfort or pain, slowness or changes in the way you do the activity. Please answer this question taking into account any assistance you have available.

(**Read and show scale to respondent).**

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Overall Health** <br><br> How much difficulty did you have with work or household activities? | | | | | |
| **Mobility** <br><br> How much difficulty did you have with moving around? <br> How much difficulty did you have in vigorous activities, such as running 3 km (or equivalent) or cycling? | | | | | |

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Self Care** How much difficulty did you have with self-care, such as washing or dressing yourself? How much difficulty did you have in taking care of and maintaining your general appearance | | | | | |
| **Pain and Discomfort** How much of bodily aches or pains did you have? How much bodily discomfort did you have? | | | | | |
| **Cognition** How much difficulty did you have with concentrating or remembering things? How much difficulty did you have in learning a new task? | | | | | |
| **Interpersonal Activities** How much difficulty did you have with personal relationship or participation in the community? How much difficulty did you have in dealing with conflicts and tensions with others? | | | | | |
| **Vision (wear glasses or contact lenses)** How much difficulty did you have in seeing and recognizing a person you know across the road (i.e. from a distance of about 20 meters)? | | | | | |
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | | | | | |

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Vision (don't wear glasses or contact lenses) (2840)** How much difficulty did you have in seeing and recognizing a person you know across the road (i.e. from a distance of about 20 meters)? How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | | | | | |
| **Sleep and Energy** How much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night or waking up too early in the morning? How much of a problem did you have due to not feeling rested and refreshed during the day (e.g. feeling tired, not having energy)? | | | | | |
| **Affect** How much of a problem did you have with feeling sad, low or depressed? | | | | | |
| How much of a problem did you have with worry or anxiety? | | | | | |

**B. Reproductive Health**

B2.1 Did you have menstruated?

  ☐ Yes (go to No. B2.2)   ☐ No (go to No. B2.3)

B2.2 First menstruations at the age …………………… years

B2.3 Did you ever-married?

  ☐ Yes      ☐ No (go to No.2.8)

B2.4. Did you have children ever-born?

  ☐ Yes, mumber of all children …………… persons

  ☐ No (go to No. B2.6)

B2.5 Age at first birth ………………years

B2.6. Did you ever abortion?

  ☐ Yes, mumber of Abortion …………… times

  ☐ No (go to No. B2.8)

B2.7 Cause of abortion

  ☐ Spontaneous abortions

  ☐ Intentional abortions

  ☐ Other, to specify……………………………………..……………

**Knowledge about Reproductive Health**

B2.8 Do you known method management of sexual emotions?

  ☐ Unknown

  ☐ Exercise or play sports  ☐ Other activities such as singing

  ☐ Meeting with friends  ☐ Masturbation

  ☐ Other, to specify……………………………………..……………

B2.9 Do you known the potential outcome of unprotected sexual intercourse during

 adolescence?

  ☐ Unwanted pregnancy ☐ Sexually transmitted diseases or AIDS

  ☐ Other, to specify……………………………………..……………

B2.10 Do you known about sexually transmitted diseases?

      ☐ Unknown

      ☐ Know, to specify ………………………………………………………….

      Preventive methods for specific sexually transmitted diseases,

      such as …………………………………………………………..


B2.11 Do you known methods of birth control?

      ☐ Unknown

      ☐ Know, to specify ………………………………………………………….


B2.12 Do you known health is relation to teen pregnancy (mothers aged less than 20 years)

      ☐ Unknown

      ☐ Difficult delivery due to narrow pelvis    ☐ Dangers of delivery

      ☐ Other, to specify…………………………………………..……………

## C. Live style, Attitude and behavior

I would like you to consider how often you have the activity or behavior, on an average, in the past 1 month. Please check (√) then:

4 = routine behavior, regularly (everyday)

3 = quite true, frequently (4-6 days per week)

2 = sometimes (1-3 days per week)

1 = not true , Never

NA= ไม่เข้าข่าย

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| **C1. Health-related behavior** | | | | | |
| Brushing teeth twice daily, in the morning and before bedtime | | | | | |
| Wash its hands to have the food first | | | | | |
| Examine physical abnormalities and notified parents | | | | | |
| Clean your own genitals | | | | | |
| Able to relieve yourselves of sexual drive by performing other activities | | | | | |
| Exercise at least 30 minutes for 3 days a week | | | | | |
| Sleep at least 8 hours a day | | | | | |
| Eat 3 regular meals a day | | | | | |
| Eat food from the 5 nutritional groups | | | | | |
| Eat 3 servings or 9 tablespoons of vegetables per day | | | | | |
| Eat fruits or fruit juices | | | | | |
| Drink at least 6 glasses of clean water | | | | | |
| Drink milk or dairy products | | | | | |
| Eat fast foods such as pizza or hamburgers | | | | | |
| Eat carbonated beverages | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| Eat desserts or snacks between meals | | | | | |
| Smoke cigarettes | | | | | |
| Drink alcohol or alcoholic beverages | | | | | |
| Use of addictive substances (drugs) | | | | | |
| Does not drive faster than speed limits as required by the law | | | | | |
| Wears safety helmet when riding motor cycles | | | | | |
| Using safety belt when driving or sit in front seat | | | | | |
| Practices caution i.e. looks to the left and right before crossing the road | | | | | |
| **C2. Mental health and development** | | | | | |
| Expressed emotions according to their capability | | | | | |
| Feel assured that parents, relatives and friends would be there when needed | | | | | |
| Dream of having good futures such as having good occupations and families | | | | | |
| Perform activities associated with the religions you worshipped | | | | | |
| Addition to religious ceremonies and cultural activities with your families | | | | | |
| Help friends or other people without seeking reward | | | | | |
| Work as volunteers in helping others with no wish for compensation | | | | | |
| Practice mental fitness by means of meditation, yoga, Tai chi | | | | | |
| Belief about receiving good things by performing deeds and being punished by performing wicked acts | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| **C3. Roles, duties, responsibilities and discipline toward family and society** | | | | | |
| Perform all of the activities of daily living by yourselves without having to be reminded | | | | | |
| Show respect when they met adults | | | | | |
| Punctuality e.g. they went to class on time and kept appointments | | | | | |
| Wait in line to purchase goods or receive various services | | | | | |
| Participate with other adolescents in art, music or sports activities | | | | | |
| Join with family members to perform various activities | | | | | |
| Keeping promises made with other people | | | | | |
| Use the belongings of a friend without permission | | | | | |
| Willingness to share things or snacks with friends | | | | | |
| Admire the successes of other people with ease | | | | | |
| Using swear words or physically abusing their friends when they were angry | | | | | |
| Help perform a particular task in the household on a regular basis | | | | | |
| Caring for the environment and maintaining public benefits | | | | | |
| Setting aside a part of their daily allowance as a savings was performed | | | | | |
| **C4. Attitudes toward Gender** | | | | | |
| Men should be the ones to take the initiative in showing that they like a girl | | | | | |
| Men having numerous love partners | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| Boys and girls had to play with different toys | | | | | |
| Men and women should be assigned to help with housework as well | | | | | |
| If there is a financial necessity, men should receive higher educations than women | | | | | |
| Men were responsible for pregnancies or sexually transmitted infections | | | | | |

## C5. Rosenberg Self Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree = 4, agree with the statement = 3, disagree = 2 and strongly disagree = 1.

| Self Esteem | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| On the whole, I am satisfied with myself. | | | | |
| At times, I think I am no good at all. | | | | |
| I feel that I have a number of good | | | | |
| I am able to do things as well as most | | | | |
| I feel I do not have much to be proud of. | | | | |
| Certainly feel useless at times. | | | | |
| I feel that I'm a person of worth, at least on an equal plane with others. | | | | |
| I wish I could have more respect for | | | | |
| All in all, I am inclined to feel that I am a failure. | | | | |
| I take a positive attitude toward myself. | | | | |

## Questionnaire of Women in their reproductive years aged 19-49 years old

**A. General data and Health status data**

A1. Age ….....…….. Years

A2. Sex ☐ Male ☐ Female

A3 Weight (present) …….……… km. Height (present) ...…............ cm.

A4. Waist ……….…… Inches Hip ….……….. Inches

A5. Systolic blood pressure ………… mmHg

   Diastolic blood pressure ………… mmHg

A6. Chronic diseases ☐ No

               ☐ Yes, to specify ………………………………….

A7. Health of the teeth and gum

   7.1 Dental was exams least twice per year by dentists

          ☐ Receive ☐ No receive

   7.2 Teeth ☐ No Cavities

          ☐ Have cavities that had been treated

          ☐ Have cavities that had not been treated

   7.3 Gum ☐ Normal

          ☐ Painful chewing

          ☐ Bleeding gums while brushing

          ☐ Both painful chewing and bleeding gums

   7.4 Number of usable teeth

          ☐ More than and equal 28 teeth

          ☐ Lower than 28 teeth

A8. Receiving health related services during the past year

| Reception of health services | Received | No Received |
|---|---|---|
| Weight and height measurement | | |
| Blood pressure measurement | | |
| Urine test | | |
| Blood-glucose test | | |
| Blood cholesterol test | | |
| Eye and ear examination | | |
| Screening for cervical cancer | | |
| Screening for breast cancer | | |
| Treatment | | |
| Receive suggestions about family planning | | |
| Receive family planning services | | |
| Receive suggestions about sex education, marital problems or family life | | |

## A9. Health State Descriptions

### Overall Health

The first questions are about your overall health, including both your physical and your mental health.

| Overall Health | Very good | Good | Moderate | Bad | Very Bad |
|---|---|---|---|---|---|
| In general, would you rate your health today as | | | | | |

Overall in the last 30 days, how much difficulty did you have with work or household activities? **1.** None **2.** Mild **3.** Moderate **4.** Severe **5.** Extreme/ Cannot do

Now I would like to review different functions of your body. When answering these questions, I would like you to think about the last 30 days, taking both good and bad days into account. When I ask about difficulty, I would like you to consider how much difficulty you have had, on an average, in the past 30 days, while doing the activity in the way that you usually do it. By difficulty I mean requiring increased effort, discomfort or pain, slowness or changes in the way you do the activity. Please answer this question taking into account any assistance you have available.

(**Read and show scale to respondent).**

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Overall Health**<br><br>How much difficulty did you have with work or household activities? | | | | | |
| **Mobility**<br><br>How much difficulty did you have with moving around?<br>How much difficulty did you have in vigorous activities, such as running 3 km (or equivalent) or cycling? | | | | | |

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Self Care**<br><br>How much difficulty did you have with self-care, such as washing or dressing yourself?<br>How much difficulty did you have in taking care of and maintaining your general appearance | | | | | |
| **Pain and Discomfort**<br><br>How much of bodily aches or pains did you have?<br>How much bodily discomfort did you have? | | | | | |
| **Cognition**<br><br>How much difficulty did you have with concentrating or remembering things?<br>How much difficulty did you have in learning a new task? | | | | | |
| **Interpersonal Activities**<br><br>How much difficulty did you have with personal relationship or participation in the community?<br>How much difficulty did you have in dealing with conflicts and tensions with others? | | | | | |
| **Vision (wear glasses or contact lenses)**<br><br>How much difficulty did you have in seeing and recognizing a person you know across the road (i.e. from a distance of about 20 meters)? | | | | | |
| How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | | | | | |

| Overall health in the last 30 days | None | Mild | Moderate | Severe | Extreme/ Cannot do |
|---|---|---|---|---|---|
| **Vision (don't wear glasses or contact lenses)**<br>How much difficulty did you have in seeing and recognizing a person you know across the road (i.e. from a distance of about 20 meters)?<br>How much difficulty did you have in seeing and recognizing an object at arm's length or in reading? | | | | | |
| **Sleep and Energy**<br>How much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night or waking up too early in the morning?<br>How much of a problem did you have due to not feeling rested and refreshed during the day (e.g. feeling tired, not having energy)? | | | | | |
| **Affect**<br>How much of a problem did you have with feeling sad, low or depressed? | | | | | |
| How much of a problem did you have with worry or anxiety? | | | | | |

## B. Reproductive Health

B1. First menstruations at the age …………………… years

B2. Did you ever-married?

☐ Yes                    ☐ No (go to No. B7.)

B3. Did you have children ever-born?

☐ Yes,  number of all children …………… persons

☐ No (go to No. B5.)

B4. Age at first birth ………………years

B5. Did you ever Abortion?

☐ Yes,  number of Abortion …………… times

☐ No (go to No. B7.)

B6. Cause of abortion

☐ Spontaneous abortions

☐ Intentional abortions

☐ Other, to specify…………………………………………..……………

B7. Are you Menopause, present?

☐ Yes, (go to No. B8.)          ☐ No, (go to No. B12.)

B8. Age of menopause …………………… years

B9. Cause of menopause

☐ Natural caused

☐ Other causes such as hysterectomy to specify to specify to

specify …………………………………………

B10. Did you received Hormone therapy

☐ ได้                    ☐ ไม่ได้

B11. Do you have menopausal symptoms?

☐ No

☐ Have, did not feel that lives were disrupted

☐ Have, which disrupted their daily lives

**Knowledge about Reproductive Health**

B12. Do you known method management of sexual emotions?

    ☐ Unknown

    ☐ Exercise or play sports    ☐ Other activities such as singing

    ☐ Meeting with friends    ☐ Masturbation

    ☐ Other, to specify……………………………………..……………

B13. Do you known the potential outcome of unprotected sexual intercourse during

  adolescence?

    ☐ Unwanted pregnancy  ☐ Sexually transmitted diseases or AIDS

    ☐ Other, to specify……………………………………..……………

B14. Do you known about sexually transmitted diseases?

    ☐ Unknown

    ☐ Know, to specify …………………………………………………….

    Preventive methods for specific sexually transmitted diseases,

    such as …………………………………………………..

B15. Do you known methods of birth control?

    ☐ Unknown

    ☐ Know, to specify …………………………………………………….

B16. Do you known health is relation to teen pregnancy (mothers aged less than 20

years)

    ☐ Unknown

    ☐ Difficult delivery due to narrow pelvis    ☐ Dangers of delivery

    ☐ Other, to specify……………………………………..……………

## C. Live style, Attitude and behavior

I would like you to consider how often you have the activity or behavior, on an average, in the past 1 month. Please check (√) then:

4 = routine behavior, regularly (everyday)

3 = quite true, frequently (4-6 days per week)

2 = sometimes (1-3 days per week)

1 = not true , Never

NA=

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| **C1. Health-related behavior** | | | | | |
| Brushing teeth twice daily, in the morning and before bedtime | | | | | |
| Wash its hands to have the food first | | | | | |
| Cleanse your own genitals | | | | | |
| Normal sexual relations with no problems | | | | | |
| Exercise at least 30 minutes for 3 days a week | | | | | |
| Physical activity for at least 150 minutes per week | | | | | |
| Sleep at least 8 hours a day | | | | | |
| Eat 3 regular meals a day | | | | | |
| Eat food from the 5 nutritional groups | | | | | |
| Eat 3 servings or 9 tablespoons of vegetables per day | | | | | |
| Eat fruits or fruit juices | | | | | |
| Drink at least 6 glasses of clean water | | | | | |
| Drink milk or dairy products | | | | | |
| Eat fast foods such as pizza or hamburgers | | | | | |
| Eat carbonated beverages | | | | | |
| Eat extremely sweet or salty foods | | | | | |
| Smoke some cigarettes | | | | | |
| Drink alcohol or alcoholic beverages | | | | | |
| Use of addictive substances (drugs) | | | | | |
| Did not drive over the legal speed limit | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| Wearing helmet when ride or travel motorcycle | | | | | |
| Using safety belt when driving or sit in front seat | | | | | |
| Practiced caution when crossing streets e.g. looking left and right | | | | | |
| **C2. Safety occupational behavior** | | | | | |
| Work at an average of no more than 8 hours a day | | | | | |
| Break times from work after working 2 days straight | | | | | |
| Problems with shoulder aches or back aches caused by work | | | | | |
| Worked under risk-free conditions | | | | | |
| Use of protective equipment when working under risky or life-threatening conditions | | | | | |
| Receive health examination services according to occupational risks | | | | | |
| Use preventive measures when having health problems in order to avoid affecting other colleagues | | | | | |
| **C3. Mental health and development** | | | | | |
| Have conversational activities with your network groups | | | | | |
| Have entertaining personal hobbies | | | | | |
| Perform activities associated with the religions you worshipped | | | | | |
| Addition to religious ceremonies and cultural activities with your families | | | | | |
| Help your friends or other people without seeking reward | | | | | |
| Work as volunteers in helping others with no wish for compensation | | | | | |
| Practice mental fitness by means of meditation, yoga, Tai chi | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| Belief about receiving good things by performing deeds and being punished by performing wicked acts | | | | | |
| Belief about receiving good things by performing deeds and being punished by performing wicked acts | | | | | |
| **C4. Roles, duties, responsibilities and discipline toward family and society** | | | | | |
| Attention to family members | | | | | |
| Participation in various activities with people in the family | | | | | |
| Helping in raising and teaching younger | | | | | |
| Relatives and having good relationships with people in the family | | | | | |
| Did not insult verbal or physically abuse in expressing to family members | | | | | |
| Being faithful to their spouses | | | | | |
| Set aside part of their income to save money | | | | | |
| Good interactions with colleagues | | | | | |
| Easily admire the successes of others | | | | | |
| Willing to share things with friends or other people | | | | | |
| Use the personal property of other people without permission | | | | | |
| Keep promises to other people | | | | | |
| Keep schedules e.g. appointments | | | | | |
| Wait in line to make purchases or receive services | | | | | |
| Help take care of the environment and public property | | | | | |
| **C5. Attitudes toward Gender** | | | | | |
| Men should be the ones to take the initiative in showing that they like a girl | | | | | |
| Men having numerous love partners | | | | | |
| Boys and girls had to play with different toys | | | | | |

| Item | 4 | 3 | 2 | 1 | NA |
|---|---|---|---|---|---|
| Men and women should be assigned to help with housework as well | | | | | |
| If there is a financial necessity, men should receive higher educations than women | | | | | |
| Men were responsible for pregnancies or sexually transmitted infections | | | | | |
| Child care is women's responsibility | | | | | |
| Doing routine housework is women's responsibility | | | | | |
| Repairing things in the house e.g. changing light bulbs is women's responsibility | | | | | |
| Head of community should belong to men | | | | | |
| Head of sub-district should belong to men | | | | | |
| District-chief officer or provincial governor should belong to men | | | | | |
| Prime Minister should belong to men | | | | | |
| **C6. Life Stability** | | | | | |
| Career stability | | | | | |
| Health and safety insurance | | | | | |
| Have sufficient income for personal and family expenses | | | | | |
| Current occupation is honest | | | | | |
| Carry out your lives or occupations with honesty and without taking advantage of others or cheating | | | | | |

# BIOGRAPHY

**NAME**                                    Angsana Boonthum

**ACADEMIC BACKGROUND**          B.Sc. (Public health) Major in
                                              Community Health  in 1986
                                              M.Sc. (Epidemiology) Mahidol
                                              University, Thailand in 1992

**PRESENT POSITION**                 Assistant Professor  Faculty of Public
                                              Health, Mahidol University

**EXPERIENCES**                        Assistant Dean for Information
                                              Technology Faculty of Public Health,
                                              Mahidol University, Thailand in 1998-
                                              2000
                                              Consultant AIDCAP: Database of
                                              Bangkok Metropolitan Administration
                                              AIDS. Prevention and Control Program
                                              in 1996-1997
                                              Field Coordinator Health Examination
                                              Survey in Bangkok in 1996-1997
                                              Sanitarian Nonthai Community Hospitals,
                                              Nakon Ratchasima province, Thailand in
                                              1986-1993