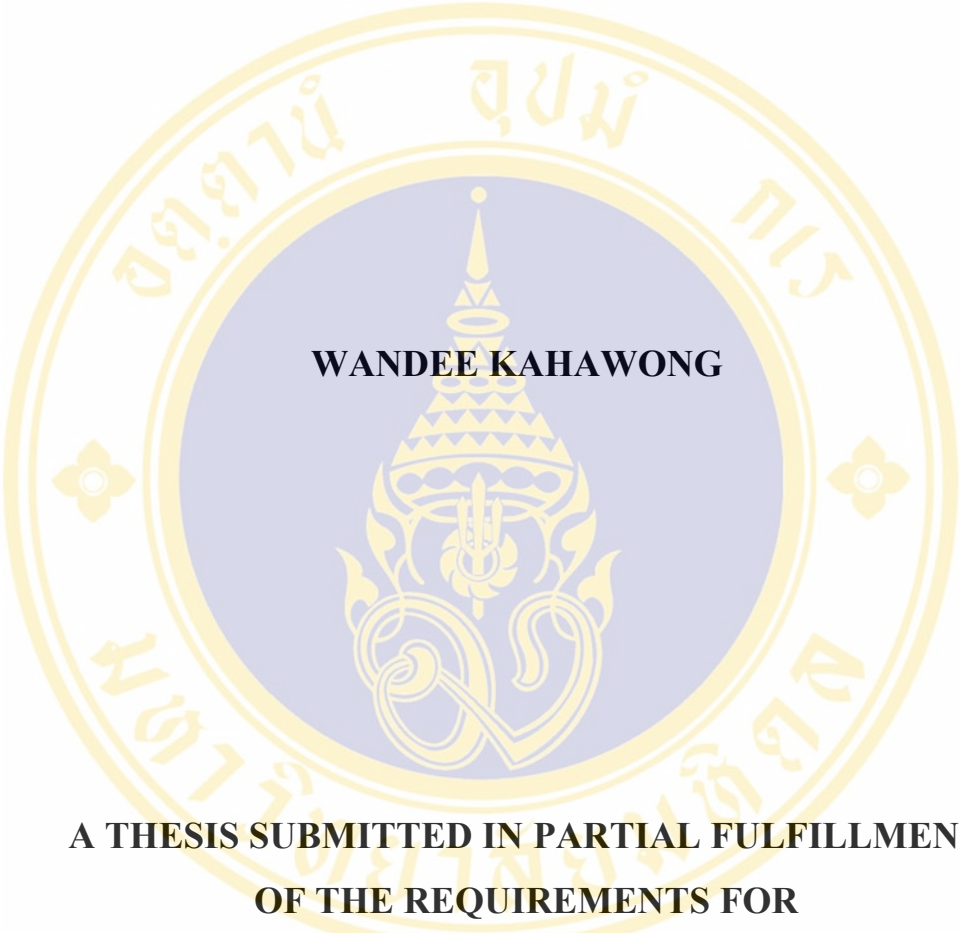


**NUTRITIONAL HEALTH-PROMOTING BEHAVIOR AMONG
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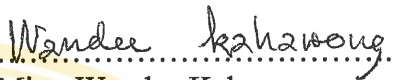
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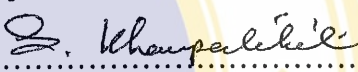
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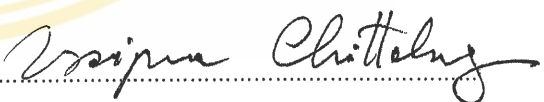
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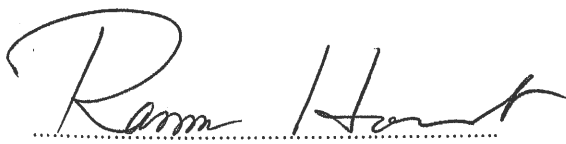

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Wandee Kahawong

NUTRITIONAL HEALTH-PROMOTING BEHAVIOR AMONG HYPERLIPIDEMIC WOMEN

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ABSTRACT

This descriptive research aimed to study the nutritional health-promoting behavior in hyperlipidemic women and related factors influencing their nutritional health-promoting behavior comprising age, body mass index, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy and social support. The Health Promotion Model of Pender (1996) was used as the conceptual framework for the study. The sample was composed of 263 women aged 30 years or older who were clinically diagnosed with plasma cholesterol and/or triglyceride at the level of 200 mg/ml or higher within the past year. These women had no underlying diseases that could have contributed to hyperlipidemia and who received medical service at three government hospitals in Songkhla Province. Data were collected with five questionnaires and interview method and were analyzed with the stepwise multiple regression analysis method.

The results demonstrated nutritional health-promoting behavior in hyperlipidemic women at a moderate level in both total scale and subscales. The sample reported that the highest score for nutritional health-promoting behavior subscales were the low- triglyceride diet and low- cholesterol diet. The lowest score was found in the subscale of low- sugar diet, followed by low- fat diet. Perceived self-efficacy and age had a positive correlation with nutritional health-promoting behavior whereas perceived health risks had a negative correlation. These three factors could predict the variation in nutritional health-promoting behavior at 38.60 percent ($p < .01$). Social support was found to have a negative correlation with nutritional health-promoting behavior subscale of the low- cholesterol diet. Perceived self-efficacy, age, perceived health risks and social support could explain the variation in nutritional health-promoting behavior subscale of the low- cholesterol diet at 27.20 percent ($p < .05$).

Referring to the results of this study, it is recommended that nurses in various settings such as outpatient departments, health promoting centers or work organizations should take interest in caring for hyperlipidemic women and help them improve nutritional health-promoting behavior, specifically in the aspect of low- sugar and low- fat diets. Nursing activities should be planned to enhance perceived self-efficacy in performing every aspect of nutritional health-promoting behavior among hyperlipidemic women.

KEY WORDS : HYPERLIPIDEMIC WOMEN/ HEALTH PROMOTING BEHAVIOR /NUTRITIONAL

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พฤติกรรมส่งเสริมสุขภาพด้านโภชนาการของสตรีที่มีไขมันในเลือดสูง (NUTRITIONAL HEALTH – PROMOTING BEHAVIOR AMONG HYPERLIPIDEMIC WOMEN)

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการของสตรีที่มีไขมันในเลือดสูงและปัจจัยที่เกี่ยวข้อง ได้แก่ อายุ ดัชนีมวลกาย ระยะเวลาที่ได้รับการวินิจฉัยว่ามีภาวะไขมันในเลือดสูง การรับรู้โอกาสเสี่ยงต่อการเกิดโรคและภาวะแทรกซ้อน ระดับการศึกษา การรับรู้สมรรถนะของตนเอง และแรงสนับสนุนทางสังคม ที่มีอิทธิพลต่อพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการของสตรีที่มีไขมันในเลือดสูง กลุ่มตัวอย่างเป็นสตรีที่มีระดับโคเลสเตอรอลและ / หรือ ไตรกลีเซอไรด์ในเลือดมากกว่าหรือเท่ากับ 200 mg/dl โดยได้รับการวินิจฉัยจากแพทย์ภายใน 1 ปี อายุตั้งแต่ 30 ปีขึ้นไป ไม่มีโรคประจำตัวใดๆที่ทำให้ไขมันในเลือดสูง และมารับการรักษาที่แผนกผู้ป่วยนอกในโรงพยาบาลของรัฐ 3 แห่งในจังหวัดสงขลา จำนวน 263 คน เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลเป็นแบบสอบถาม เก็บข้อมูลโดยการสัมภาษณ์ วิเคราะห์ข้อมูลโดยการวิเคราะห์ถดถอยพหุแบบขั้นตอน

ผลการศึกษาพบว่า สตรีที่มีไขมันในเลือดสูงมีพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการทั้งโดยรวมและรายด้านอยู่ในระดับปานกลาง โดยการปฏิบัติพฤติกรรมด้านอาหารที่มีไตรกลีเซอไรด์ต่ำและโคเลสเตอรอลต่ำมีคะแนนสูงสุด และด้านอาหารที่มีน้ำตาลต่ำมีคะแนนต่ำสุด รองลงมาคือ ด้านอาหารที่มีไขมันต่ำ ปัจจัยเกี่ยวกับการรับรู้สมรรถนะของตนเองในการปฏิบัติพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการและอายุ มีอิทธิพลทางบวก และการรับรู้โอกาสเสี่ยงต่อการเกิดโรคและภาวะแทรกซ้อนมีอิทธิพลทางลบ ปัจจัยทั้งสามประการสามารถอธิบายความแปรปรวนของพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการโดยรวมได้ร้อยละ 38.60 ($p < .01$) นอกจากนี้ยังพบว่า แรงสนับสนุนทางสังคม มีอิทธิพลทางลบต่อพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการในรายด้านอาหารที่มีโคเลสเตอรอลต่ำ โดยการรับรู้สมรรถนะของตนเอง อายุ การรับรู้โอกาสเสี่ยงต่อการเกิดโรคและภาวะแทรกซ้อนและแรงสนับสนุนทางสังคม สามารถอธิบายความแปรปรวนของพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการด้านอาหารที่มีโคเลสเตอรอลต่ำได้ร้อยละ 27.20 ($p < .05$)

ผลการวิจัยให้ข้อเสนอแนะว่า พยาบาลที่รับผิดชอบในหน่วยงานต่างๆ เช่น แผนกผู้ป่วยนอก ศูนย์ส่งเสริมสุขภาพและหน่วยงานต่างๆ ควรให้ความสนใจช่วยเหลือสตรีที่มีไขมันในเลือดสูง ให้สามารถปฏิบัติพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการทุกด้านได้ดีขึ้น โดยเฉพาะอย่างยิ่งด้านอาหารที่มีน้ำตาลต่ำและไขมันต่ำ และควรมีการจัดกิจกรรมการพยาบาลเพื่อพัฒนาการรับรู้สมรรถนะของตนเองในการปฏิบัติพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการทุกด้าน

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CHAPTER 1

INTRODUCTION

Background and Significance of the Study

Hyperlipidemia is a major public health issue in both developed and developing countries. It is a prominent risk factor for atherosclerosis, leading to the consequences of a variety of chronic illnesses, especially coronary heart disease, which has been the leading cause of death and disability in the adult population over the past decades (Allen & Xu, 1997: 497-509). Experts have long believed that there is a link between cholesterol and coronary heart disease, and recent data unequivocally show that a high blood cholesterol level is a potent risk factor for atherosclerosis and coronary heart disease (Herrmann, et al. in Baas, Ed., 1991: 23). The Framingham Heart Study also clearly established that high cholesterol is one component of the classic triad of coronary risk factors comprising the largest attributable risk: elevated cholesterol, smoking, and hypertension, of which the latter two were more common in men than women (Daly-Nee, et al. in Jairath, Ed., 1999: 7). These factors derive from unhealthy behaviors, such as consuming fatty foods.

Recent studies have shown that hyperlipidemia has been continuously on the increase. Currently, the most common nutrition problem in the United States is over-eating and the consumption of high levels of fat. This is due to the typical American diet consisting of over 35% fat, much of which is saturated animal fat with high levels of cholesterol (Malotte & Gilbert in Woods, et al., Eds., 1995: 664). Based on the current National Cholesterol Education Program (NCEP) definition of elevated serum cholesterol ≥ 200 mg/dl, an estimated 52% of American adults have elevated serum cholesterol, and 20%, or about 37.2 million, of American adults have levels of 240 mg/dl or above (Daly-Nee, et al. in Jairath, Ed., 1997: 7). This reflects an increased incidence of hyperlipidemia in the USA as well as the association between a high fat, high cholesterol, and high calorie diet with higher levels of serum cholesterol and/or triglyceride. There is also evidence that many of the 60 million US citizens who have elevated cholesterol levels pursue an unhealthy lifestyle with a poor diet and

inadequate exercise. This diet is typically high in calories, saturated fat, and cholesterol (Herrmann, et al. in Baas, Ed., 1991: 23).

In the southern part of Thailand, statistics from the Chemistry Laboratory Clinic of Songklanagarind Hospital indicated that the incidence of hyperlipidemia in women has been continuously increasing. As for out-patient departments, the number of hyperlipidemic women aged ≥ 18 years from all out-patient clinics increased from 4,471 cases in 1997, to 5,472 cases in 2000. In addition, the number of women with hypertriglyceridemia increased from 1,166 cases in 1997 to 1,189 cases in 2000 (Chemistry Laboratory Clinic, Songklanagarind Hospital, 2000). When considering only the Medical and General Medical Clinics in the three hospitals - Songklanagarind, Songkla, and Hat Yai - it was found that the number of hyperlipidemic women aged ≥ 18 years increased from 346 cases in 1997 to 517 cases in 2000 in Songklanagarind Hospital. It was also found that the number of hyperlipidemic women aged ≥ 18 years was 259 in 2000 in Songkla Hospital, and 440 in 2000 in Hat Yai Hospital, (Registrar & Statistics Office of Songklanagarind, Songkla, and Hat Yai Hospital, 2001).

This was consistent with the number of coronary heart disease patients in Songklanagarind Hospital, which also increased, especially among women. During the period 1996-1998, the number of women with coronary heart diseases aged ≥ 18 years was 51.66 to 52.29%, whereas the number of men with coronary heart disease aged ≥ 18 years was 47.71 to 48.84% (Registrar & Statistics Office, Songklanagarind Hospital, 1999).

Retrospectively, among the risk factors of myocardial infarction patients in Chulalongkorn, Hat Yai, Songkla, Songklanagarind, and Siriraj hospitals, hypercholesterolemia was the second highest risk factor of myocardial infarction patients (10 to 29%), while smoking was the highest (45%) (Grittayapong & Chaithiraphan in Pamonprawat, et al., Eds., 1998: 627).

In addition, the survey of Thai health status, from all of four regions during 1991-1992, found that in 13,515 cases of adults aged >15 years, 11.3% (1,507 cases) had high serum cholesterol (>200 mg/dl). Women had a greater prevalence of high serum cholesterol than men. The southern Thais had the highest cholesterol levels

with ≥ 240 mg/dl, compared with the other ones (Grittayapong & Chaithiraphan in Pamonprawat, et al., Eds., 1998: 628). This is consistent with a 5-year prospective study of conventional risk factors of coronary artery disease in 3,615 Shinawatra employees, which found that hypercholesterolemia was the second highest prevalence (21.1%), with physical inactivity being the first (76.3%). This study also found that most of the subjects were more likely to be women than men (65.7: 34.3%, respectively) (Bhuripanya, et al., 2000: 99-105). These findings confirm a higher prevalence of hyperlipidemia in women.

Currently, women's roles have changed from those of the past because of the influences of technological and communications developments, and globalization. Women increasingly work outside the home to provide or supplement the family income. However, for mothers, traditional family responsibilities, such as being wives, and housekeepers, persist. For this reason, changes in cultural food habits influence women's food consumption, which leads to a greater risk of hyperlipidemia in women.

First, they have to eat at least one meal per day outside the home, which causes them to consume a diet high in fat. Food-stores usually sell foods that are likely to be high in fat and cholesterol. Second, women have the primary responsibility for preparing food for their family members. Many studies have shown that, despite changes in gender roles and an increase in women's employment outside the home, women continue to take the primary responsibility for household tasks, including food selection and preparation (Schafer, et al., 1999: 794). Women usually select or prepare foods which most family members prefer, rather than for the greater benefit of the women themselves. Most of the foods are likely to be high in fat, such as fried or stir-fried foods. Third, it was found that women usually eat the rest of food, rather than omitting them. Fourth, it was found that women prefer to eat instant snacks and desserts, which are eaten between meals (Sirisampan, 1984: 103). These foods have a lot of sugar, leading to increased serum triglyceride. Fifth, the influence of values, advertisements, and nutritional information also affect women's food choices. Samittasiri et al. (1994: 61) found that working women in Bangkok are likely to eat a diet composed of low carbohydrate and high fat and protein, especially animal

protein. Finally, it was found that women who have stress in the workplace eat a high-fat and/or high-sugar diet to compensate for the stressors to make themselves feel better (Grogan, et al., 1997:19-31). Therefore, these changes in women's eating are more likely to be inappropriate and may finally lead to hyperlipidemia.

The association of elevated cholesterol and atherosclerosis has been supported by numerous research studies (Grundy in Shils, et al. Eds., 1999: 1200; Herrmann, et al., in Baas, Ed., 1991: 23; Malotte & Gilbert in Woods, et al., Eds., 1995: 662; Tanphaichitr, 1987: 1). A fivefold increase in the risk of developing coronary heart disease has been related to levels of blood cholesterol that exceed laboratory-designed reference values (Fair & Burke in Woods, et al., Eds., 1995: 735). The higher the plasma cholesterol level, especially the LDL cholesterol level, the greater the progression of atherosclerosis and the risk of coronary heart disease (Herrmann, et al., in Baas, Ed., 1991: 23).

As mentioned before, hyperlipidemia causes atherosclerosis, which has many consequences, including: peripheral vascular disease, cerebrovascular accident, sudden cardiac death, myocardial infarction, angina pectoris, heart failure, renal failure, etc. (Baxendale, 1992: 154). In middle-aged adults with mild hypercholesterolemia (total cholesterol 200-239 mg/dl; LDL cholesterol 130-159 mg/dl), the risk of coronary heart disease in the short term (5 to 10 years) is about 1.5 times that accompanying serum cholesterol levels in the desirable range. The long-term (30 to 40 years) risk is three to four times that associated with a desirable cholesterol level (Grundy in Shils, et al. Eds., 1999: 1201).

In most persons, several causative factors underlie mild hyperlipidemia, which can be divided into two main causes: controllable factors and non-controllable factors. Non-controllable factors include: 1) aging per se, 2) genetic factors, 3) age > 45 years in men or >55 years in women, and 4) sex, estrogen loss in menopausal women. The controllable factors include: 1) diets high in cholesterol and triglyceride, 2) diets high in cholesterol-raising fatty acids (saturated fatty acids and trans fatty acids), 3) increasing body weight, 4) underlying diseases that result in hyperlipidemia, such as diabetes mellitus, hypertension, etc., 5) some drugs, such as thiazide diuretics, beta-adrenergic blocking agents, 6) contraceptive drugs and estrogen hormone, and 7)

physical inactivity (Goanantakoon & Dansirikul, 1999: 9; Grundy in Shils, et al., Eds., 1999: 1204; Herrmann, et al., in Baas, Eds., 1991: 30).

However, although there are multifactorial causes influencing hyperlipidemia, most often, elevated serum cholesterol is caused by excessive dietary intake. This is due to cholesterol and triglyceride both being consumed through the dietary intake and being produced by the gut and the liver. Many studies have shown that a saturated fat and cholesterol diet raises total cholesterol and LDL cholesterol levels, whereas monounsaturated and polyunsaturated fat diets lower them (Rossi, et al., in Jairath, Ed., 1999: 110). This is because habitually high dietary intakes of saturated fat and cholesterol, beyond those needed for cell function, not only increase LDL cholesterol levels beyond the normal 7%, but also inhibit LDL receptor activity (Fair & Burke in Woods, et al., Eds. 1995: 736).

Therefore, prevention is a cornerstone of hyperlipidemia to prevent future consequences. Among hyperlipidemic women, dietary modification is an important approach in health promotion and health protection. Several studies have reported that dietary therapy is the first line of treatment for patients with elevated total cholesterol and LDL cholesterol levels, as well as for patients with other lipid and lipoprotein disorders. Together with other major lifestyle changes, a very aggressive low-fat diet has been shown to markedly lower total cholesterol and LDL- cholesterol levels and actually result in regression of atherosclerosis. The Step-One diet is generally recommended for the general population and at-risk groups to reduce the dietary intake of saturated fatty acids and cholesterol, and to promote weight loss in overweight persons. For those able to change from a typical American diet to a Step-One diet, and average total cholesterol lowering of 3 to 4% is expected (Rossi, et al., in Jairath, Ed., 1999: 118, 122).

Dietary therapy for hyperlipidemic women is more specifically called “nutritional health-promoting behavior”. This is one essential aspect of the six dimensions of a health promoting lifestyle in the revised Health Promotion Model of Pender (1996), including: health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth, and stress management. Accumulating

evidence indicates that good eating patterns play a major role in preventing disease and increasing the capacity for energetic and productive living (Pender, 1996: 209).

Nutritional health-promoting behavior according to Pender (1996) refers to a wellness behavior approach directed towards increasing the level of well-being, self-actualization, and fulfillment of individuals. It is composed of the right choice of eating and meal patterns. However, Pender (1996) posited nutritional health-promoting behavior as a broad health behavior, which needs to be modified for the specific studied population. Thus, this study sought to elaborate and explain the concept of nutritional health-promoting behavior according to Pender (1996), as well as to investigate the factors influencing them.

To explain and predict individuals' behavioral outcomes, Rosenstock in Glanz, et al., Eds.(1990: 49) stated that both individual and socio-environmental factors should be targeted for health interventions. In addition, models of interpersonal health behaviors incorporating environmental factors are proposed to explain health behavior (Puttapitukpol, 2001: 4). Consequently, Pender's Health Promotion Model (1996) covers all of the variables for successfully explaining and predicting individuals' behavioral outcomes. The revised Health Promotion Model of Pender (Pender, 1996: 67) proposed that an individual's behavioral outcome is affected by two groups of variables, individual characteristics and experiences and behavior-specific cognitions and affect, which are considered to be of major motivational significance and to be a critical core for intervention. These variables have both direct and indirect effects on individuals' behavioral outcomes. In addition, this model emphasizes the active role of the client in shaping and maintaining health behaviors and in modifying the environmental context for health behaviors (Pender, 1996: 55).

Pender's Health Promotion Model has been widely used as a framework for research to explain and predict both overall and specific health-promoting lifestyles in various groups (Jinwattana, 1998; Patanavanichnun, 2000; Pender, 1990; Sinthanayothin, 2000; Somsap, 2000; Suwannaroop, 1999). For specific aspects of a health-promoting lifestyle, this model has been used in the health responsibility of pregnant adolescents (Puttapitukpol, 2001), exercise behavior (Chinuntuya, 2001; Saiseesub, 2000), nutritional promoting behavior of low income pregnant women

(Kittichotpanich, 2001), and the use of hearing protection among workers (Lusk, et al., 1994). The results of these studies show that Pender's Health Promotion Model have been used consistently as a useful guide for explaining and predicting health-promoting behaviors of the studied populations. Therefore, Pender's Health Promotion Model was selected as the conceptual framework for this study. However, some variables were selected for this study according to Pender's suggestion, that the factors to be included in any given study should be limited to the few that are theoretically relevant to explanation or prediction of a given target behavior (Pender, 1996: 68)

More specifically, in the category of behavior-specific cognitions and affect, the selected variables included: perceived self-efficacy and social support, because they were found to be important determinants for explaining and predicting health-promoting behaviors in many prior studies (Chinuntuya, 2001: 141-143; Kairoj, 1999: 54; Kittichotpanich, 2001: 170-171; Patanavanichnun, 2000: 96-97; Puttapitukpol, 2001: 104-105; Saiseesub, 2000: 70-71; Somsap, 2000: 62-63).

Moreover, in the category individual characteristics and experiences, the selected variables include: age, body mass index, duration of hyperlipidemia, perceived health risks, and education. Many prior studies have shown that these variables have been significantly associated with health-promoting behaviors in various groups (Chaisri, 1998: 81-82; Duffy, 1998: 361; Iemsawasdikul, 1998: 119; Inkoom, 1998: 71; Kittichotpanich, 2001: 166-167; Laohawiriyakamol, 1988: 81; Pender & Pender, 1986: 15-18; Pongkeaw, 1997: 74; Puttapitukpol, 2001: 105-106; Sampunyu, 1996: 110; Sinthanayothin, 2000: 82).

However, little research has been done to explain and predict nutritional health-promoting behavior in hyperlipidemic women. There is still a lack of knowledge offering an understanding of them. Therefore, studying nutritional health-promoting behavior, and the factors influencing them, leads to greater understanding of how and why these behaviors are, or are not, performed. The findings of this study could be used in developing nutrition guidelines for Thai hyperlipidemic women. The guidelines would lead to more successful nursing interventions in modifying or changing clients' behaviors from consuming unhealthy foods to consuming healthy

foods, which aims for the improved well-being of this at-risk group. In addition, the findings will expand the selected concept of Pender's Health Promotion Model (1996).

Research Questions

1. What is the nutritional health-promoting behavior of hyperlipidemic women?
2. To what extent do age, body mass index, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, and social support explain the variances in nutritional health-promoting behavior of hyperlipidemic women?

Purpose of the Study

1. To describe the nutritional health-promoting behavior of hyperlipidemic women .
2. To investigate whether age, body mass index, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, and social support can explain the variances in nutritional health-promoting behavior of hyperlipidemic women.

Conceptual Framework

This study is intended to test Pender's Health Promotion Model (Pender, 1996), which is a middle range theory developed to explain and predict health-promoting behavior. It explains that health-promoting behavior is a result of the interaction of persons and the environment in several dimensions, in order to maintain their well-being, fulfillment, and the self-actualization of the individual. The model was first developed by Pender in 1982, and revised in 1987 and 1996, respectively. The basic concept of the model derives from the Social Cognitive Theory of Bandura (1977, 1986), which explains the interrelationship of environmental, personal and behavioral elements. It also derives from the Expectancy-Value Theory of Feather (1982), which explains people's motives. It contends that people's health-promoting behaviors are a result of intellectual processes in interpretation and decision-making

given as information from the internal and external environments, and the response to the perception through behaviors. Moreover, behaviors are also a result of value expectancy or goals to be achieved.

Pender's Health Promotion Model includes individual characteristics and experiences, and involves two factors: 1) prior related behavior and 2) personal factors - biological, psychological, and sociocultural. In addition, the model involves behavior-specific cognitions and affect, which are considered of major motivational significance for practicing health-promoting behavior. This includes: 1) perceived barriers to action, 2) perceived benefits of action, 3) perceived self-efficacy, 4) interpersonal influences, 5) activity-related affect, and 6) situational influences. Finally, the model also includes behavioral outcome, which consists of: 1) commitment to a plan of action, 2) immediate competing demands and preferences, and 3) health-promoting behavior (Figure 1.1).

From this model, the researcher applied the theory of Fawcett (1995) to explain the causal relationships and factors affecting health-promoting behavior, which can be explained as a nursing hierarchy from the metaparadigm → philosophies → conceptual model → theories → empirical indicator, as shown in figure 1.2. The conceptual framework was developed as shown in figure 1.3, using Theory Testing and Theory Revision of Walker & Avant (1995) and the concept of Fawcett & Downs (1992) in deducting from middle range theory to reduce the abstract aspect of the theory, which can be proven through empirical methods. This can be explained in the relationships of the principal theoretical concept, subconcept, and empirical indicators.

From the principal theoretical concepts, the researcher selected the following sub-concepts for the study: 1) individual characteristics and experiences - personal factors including biological factors, such as age, body mass index and duration of hyperlipidemia, psychological factors, perceived health risks and sociocultural factors, education; 2) behavior-specific cognitions and affect - perceived self-efficacy in nutritional health-promoting behavior, and social support; and 3) behavioral outcome, nutritional health-promoting behavior. The personal factors have been found to have directly and indirectly influenced nutritional health-promoting behavior, as

mediated by behavior-specific cognitions and affect. In addition, behavior-specific cognition and affect directly influence nutritional health-promoting behavior as initiation and maintenance of eating behaviors that continually promote health. The details are as follows:

1. Behavioral Outcome

1.1. Health-promoting behavior: Pender (1987) explains that the positive practice of health behavior consists of health protection and health promotion. Health promotion derives from personal motivation of achieving the desire to increase well-being and actualize human health potential, whereas health protection is motivated by a desire to actively avoid illness, detect it early, or maintain functioning within the constraints of illness in order to achieve the stabilizing tendency. However, in the revised Health Promotion Model, Pender (1996) suggests that health-promoting behavior and health-protecting behavior are difficult to distinguish. Most people have integral combinations of the two behaviors that serve as motivations to practice health behaviors. The difference is that health-promoting behavior is concerned with the positive aspect of practicing and creating good health and well-being, whereas health-protecting behavior is concerned with avoiding illness or injury.

Pender continually developed and tested the instrument to assess health-promoting behavior. The latest conclusion on health-promoting behavior indicates that there are six elements constituting health-promoting behavior: 1) health responsibility, 2) physical activity, 3) nutrition, 4) interpersonal relations, 5) spiritual growth, and 6) stress management.

In this study, the researcher investigated only nutritional health-promoting behavior as this is an important controllable risk factor for hyperlipidemia in women.

1.2. Nutritional health-promoting behavior: Pender (1987, 1996) explained that nutritional health-promoting behavior consist of actions and perceptions of meal patterns and food choices that serve to maintain or enhance the level of wellness, self actualization, and fulfillment of the individual (Walker, et al., 1987). Later, Pender (1996) explained that nutritional health-promoting behavior involves food selection, food preparation and food consumption. A review of the Thai research literature revealed that nutritional health-promoting behavior was only part of several aspects of health-promoting behaviors that might be best assessed by

Pender's Health Promoting Lifestyle Profile I & II (Pender, 1987, 1996). Two research studies have focussed directly upon nutritional health-promoting behavior, and were quasi-experimental studies in elderly people. However, no studies focussed on nutritional health-promoting behavior among persons with hyperlipidemia. A study on coronary heart disease patients' health-promoting behaviors in general, found appropriate and inappropriate nutritional health-promoting behavior related to nutrition. A study of elderly people with coronary heart disease showed that the majority had an appropriate "good" status for nutritional health-promoting behavior (Inkoom, 1998).

On the other hand, Lueangchawaengwong (1998) found that, prior to the experiment, coronary heart disease patients ranked second lowest for their nutrition practices, compared with exercise, which was the lowest. After the experiment, all aspects of health-promoting behavior improved, except for interpersonal relations. The positive influencing factors in health promotion were found to be occupation, education, income, age, sex, marital status, body mass index, menopausal status, health belief, knowledge of health promotion, attitude toward health promotion, value of health promotion, information on health promotion from various media, perceived health status, perceived self-efficacy, interpersonal influences and social support (Hankittikul, 1996; Oumpram, 1998; Pattanavanichnun, 2000; Prakobsap, 1998; Sakbanditsakul, 1998; Sampanyu, 1996; Sittichai, 1997; Thamkanma, 1998; Therapongnapalai, 1998; Treesakunwatana, 1998; Konsanthia, 1998; Vongkesada, 1998).

The most frequently studied variables were age, level of education, income, perceived health status, perceived self-efficacy and social support. It was found that these variables could collectively explain 19.67%-53.97% of variance in health-promoting behavior (Sittichai, 1997; Ompram, 1998). In this study, nutritional health-promoting behavior is emphasized as it plays an important role and has an effect on the morbidity and mortality rates from coronary heart disease in hyperlipidemic women (Tanphaichit, 1987).

2. Behavior-specific cognitions and affect

There are six concepts related to behavior-specific cognitions and affect, but the researcher selected only two for this study:

2.1. Perceived self-efficacy refers to the judgment of personal capability to organize and execute a particular course of action. It was found that people who usually performed health behaviors were more confident of their ability. Perceived self-efficacy is different from outcome expectation. Outcome expectation is a judgment of the likely consequences, such as rewards, benefits, costs, etc. Perceived self-efficacy is a motivation for people to practice the targeted behavior frequently - the higher the perceived self-efficacy, the greater the frequency of performing the targeted behavior. It was reported that perceived self-efficacy and outcome expectation were significantly positively related to health promoting eating behavior (Purinthrapibal, 1998). The evidence showed that myocardial infarction patients with a low level of perceived self-efficacy did not have appropriate nutritional self-care behavior (Charoenwongvivat, 1995). Moreover, the studies of health-promoting behavior in general indicated that perceived self-efficacy had a positive relationship to health-promoting lifestyle (Vongkesada, 1998). It was also found that perceived self-efficacy and parity could explain health-promoting behavior in 29.6% of pregnant industrial workers (Pattanavanichnun, 2000).

2.2. Social support is an important interpersonal influence. Social support refers to psychosocial factors that affect people's lives. It involves interdependence, helping, exchange of opinions and feelings for each other. This influences health behavior and both physical and psychological health statuses. According to the literature review, Pender (1996) explained that social support involves four elements: emotional support, instrumental aid, informational support, and affirmation. This is in accordance with House's definition (1981). Essentially, social support has both direct and indirect influences on health-promoting behavior through commitment to a plan of action. It was found that social support had a positive relationship to general health-promoting behavior (Sakbanditsakul, 1998; Treesakunwatana, 1998). In addition, social support from husbands of teenage mothers and menopausal women could predict 19.67%-20.19% of health-promoting behavior in general (Prakobsap, 1998; Sakbanditsakul, 1998). It was also found that

perceived health status and social support from husbands was a good predictor, and could predict 30.78% of HIV-positive mothers' health-promoting behavior in general (Sittichai, 1997). In addition, Pringprud (1995) found that social support, level of education and perceived health status were the best predictors for explaining variances in self-care behavior of patients undergoing coronary artery bypass grafting. They could significantly explain 61.80% of the variance. However, the concept of social support has been defined and categorized in many ways. The term should be selected to best explain the studied group.

3. Individual characteristics and experiences

According to the revised Health Promotion Model, individual characteristics and experiences consist of prior related behaviors and personal factors: biological, psychological, and sociocultural. The concepts and factors to be studied are:

3.1. Age. Several studies have stated that age is one influencing factor for health-promoting behavior. In a study of 452 adults aged 18-88 years, it was found that elderly people had better health-promoting behavior in general and in specific areas of health responsibility, nutrition and stress management than young and middle aged people (Walker, et al., 1988). A study of teenage pregnant women indicated that age had a direct positive influence on health responsibility (Puttapitukpol, 2001). This is in accordance with the study of mid-life working women in Bangkok. It was found that women with good health behavior were older, had higher education, were married and had good health perceptions. Age, health perceptions, level of education and marital status accounted for 20.7% of the variance in health-promoting behavior (Sinthanayothin, 2000). In addition, a study of elderly people showed that age was significantly related to health-promoting behavior in general (Hankittikul, 1996).

Orem (1991: 238-241) explained that age had an influence on ability for self-care. It increased with age, to peak in mature adults, but it could reduce among elderly people. Increased age also had a positive relationship with health-promoting behavior because it increased the ability to understand themselves and others better and make better decisions, so increased age is related to better adaptation to the environment.

However, some studies produced opposite findings. For example, a study of fundamental factors, perceived health status and health-promoting behavior of hypertension patients indicated that there was no relationship between age and health-promoting behavior (Sampanyu, 1996).

3.2. Body mass index (BMI). Nutritional health-promoting behavior can be evaluated by nutritional outcome, using four different types of assessment tools: 1) anthropometric assessment includes computing the ratio of body weight to height or BMI as well as skin-fold thickness for comparison with standard values, 2) biochemical assessment can be conducted through blood or urine analyses to identify nutritional status, such as laboratory tests for serum cholesterol, triglycerides, and high-density lipoproteins, 3) clinical examination can detect physical signs in skin, muscular and skeletal systems, eyes, tongue, etc., which suggest malnutrition, 4) clients' current dietary patterns can be assessed by a record of everything eaten for 5 to 7 days during the week prior to their clinic appointment or home visit. The record can be kept on a food dietary form that allows the listing of the types of foods and amounts consumed during regular meals and snacks. The daily food choices are then compared with the established standard (Pender, 1996: 121-123).

BMI is an expression of body weight relative to height. It is calculated as weight (kg) divided by the square of height (m^2). In addition, BMI is often used to define grades of under-nutrition and obesity (Wasling, 1999: 1243). For the European BMI, the normal range for men and women is 18.5 to 24.9 kg/m^2 . Obesity can be classified into three levels: level 1 is 25 to 29.9 kg/m^2 , level 2 is 30 to 40 kg/m^2 and level 3 is more than 40 kg/m^2 (Leelahakul & Thaveeboon, Eds., 1998: 112-138; PongPaung, 1996: 94-120).

Currently, the Asian BMI can be classified as follows: 1) under weight (BMI < 18.5 kg/m^2), 2) normal weight (BMI = 18.5 to 22.9 kg/m^2), 3) overweight or pre-obese (BMI $\geq$ 23 kg/m^2), 4) obese I (BMI = 23 to 24.9 kg/m^2), 5) obese II (BMI = 25 to 29.9 kg/m^2), and 6) obese III (BMI $\geq$ 30 kg/m^2) (Komin, 2002: 38-39).

However, Keller & Thomas (1995: 159-160) stated that obesity and overweight are often used synonymously when there is an excessive storage of energy in the form of body fat, and is identified when a person is more than 20% over the

ideal body weight. The term “obesity” is applied to men whose body fat is >20% of body weight, and to women whose body fat is >30% of body weight. Overweight is defined as excess body weight, usually greater than 10% above ideal weight. Keller & Thomas (1995: 160) further stated that this excess in weight may not necessarily be body fat, but it usually is. The preferred method of determining obesity is by estimating the percent of body weight that is fat.

There is strong evidence showing the relationship between high BMI or obesity and health problems, especially coronary disease, because obesity links to hypercholesterolemia, hypertension, and poor blood glucose control in diabetes. Weight begins to influence coronary disease risk somewhere between a BMI of 25 and 30 and increases dramatically above a BMI of 30 (Wasling, 1999: 1243). Although weight-to-height ratios correlate highly with body fat and lean body tissue: excess fat tissue weight, excess weight can also include lean body mass or a large body frame.

The use of BMI has both advantages and disadvantages for assessing body fat. The advantages are the readily availability in population studies and ease of measurement. The disadvantage is that it does not distinguish between fat and non-fat tissues. Therefore, individuals with high BMI or overall obesity should be further examined for relative fatness and/or fat distribution. Because of the very low sensitivity of this measure, BMI should be viewed as a screening device and the results interpreted with caution and common sense (Keller & Thomas, 1995: 163).

In addition to obesity *per se*, the body shape of a person can influence the risk of developing coronary disease. Central obesity or the apple shape, poses greater health risk than femoral obesity or the pear, by contributing to metabolic syndromes, which include hyperinsulinemia, hypercholesterolemia and hypertriglyceridemia. It is possible for central obesity to occur with a healthy BMI between 20 and 25: this still requires a weight loss effort (Wasling, 1999: 1244).

3.3. Duration of hyperlipidemia. The duration of illness is a factor influencing adaptation, so that it possibly influences health behaviors. Persons usually waste time in their adaptation (Marino & Kooser, 1981: 56), because the individual’s reaction to stress is different, depending on the duration of illness. In the beginning state, individuals may not be confident of behaving for good health and may not be

completely aware of what they are facing. Once time passes, they learn to face the situation better, because the long time makes them learn to cope appropriately with stressors. At last, they develop self-care abilities and have more acceptance of change, which gives them more confidence in health practices (Saiseesub, 2000: 47). This is because, having health problems or chronic illnesses for a length of time makes a person learn to adjust and live with the abnormality, and thus have good health-promoting behavior, which is consistent with Orem (1985: 108-109), who stated that self-care capacity is developed from past experiences and that time is needed to develop an individual's capacity. Therefore, the longer the duration of an illness, the better the frequency of health practices. Many studies have shown that duration of illness is significantly positively associated with health-promoting behavior in various groups (Chaisri, 1988: 81-82; Sampunyu, 1996: 110). However, some studies have found that duration of illness is not significantly associated with health-promoting behavior (Homnan, 1996: 73; Inkoom, 1998: 78; Pongsomboon, 1996: 78; Pongkeaw, 1997: 89).

3.4. Perceived health risk is similar to perceived susceptibility or perceived vulnerability, which is mentioned in the Health Belief Model (Becker, et al., 1977: 27-46), one of the theoretical explanations for health protection. The Health Belief Model was proposed in the 1960s as a framework to explore why some people who are illness-free act to avoid illness, while others fail to take protective action. This model is derived from social-psychological theory, primarily the work of Lewin, who conceptualized that the life space in which an individual exists is composed of regions, some having negative valence, some having positive valence, and others being relatively neutral. Illnesses are conceived to be regions of negative valence that can be expected to exert a force moving the person away from the region. Health-protecting behaviors are strategies for avoiding the negatively valenced regions of illness and disease (Pender, 1996: 35). In this model, variables proposed as directly affecting the predisposition to act are: perceiving a threat to personal health and the conviction that the benefits of taking action to protect health outweigh the barriers that will be encountered. Beliefs about personal susceptibility and the seriousness of a specific disease combine to produce the degree of threat or negative valence of a

particular disease. Thus, perceived health risk is one of the important variables in health protection.

Perceived health risk or perceived susceptibility refers to an individual's own estimated subjective probability that he or she will encounter a specific health problem (Rosenstock in Glanz, et al., Eds.,1990: 30). It is also one component of perceived health status. If the individual considers himself weak or fatigued, he may conclude that he is highly susceptible to a specific health problem or to illness in general. For this perspective, healthy persons perceive that they themselves have a probability of being sick, whereas the diagnosed persons perceive that they themselves have high probability that the complications of severe illness may occur. In addition, a person may identify himself as part of a high-risk group, based on the incidence of a specific health problem within the general population. This factor is often related to age. It will undoubtedly affect his attitude toward preventive health services. Unfortunately, effective prevention must often begin well in advance of the peak period (Pender, 1975: 386). These perceptions influence persons to be more likely to engage in health-promoting and health-protecting behaviors. Tirrel & Hart (1980: 490) found that perceived susceptibility to complications was positively associated with exercise compliance in coronary disease patients.

3.5. Education. Educational level influences an individual's health behavior, because it reflects the individual's background of knowledge and skills. Highly educated persons were more likely to seek health-related information and have a better understanding of health education than those with lower educational levels. Pender (1975: 387) stated that some persons in higher educational or socioeconomic levels may be more aware of the whole range of preventive health alternatives available. They may also be more likely than persons in lower educational or socioeconomic levels to choose the most effective preventive health alternatives.

In addition, Pender (1982: 161) posited that persons with different education levels have the capacity to receive different knowledge and skills about self-care practices. Many studies have shown that education level is an important determinant of health-promoting behavior (Inkoom, 1998: 71; Kittichotpanich, 2001: 166-167; Muhlenkamp & Sayles, 1986: 336; Puttapitukpol, 2001: 105-106). For

example, Muhlenkamp and Sayles (1986: 336) found that education had a positive relationship with health promotion and health protection. Subjects with higher education were more likely to have higher levels of healthy behaviors, such as nutrition and exercise, than those with lower educational levels. In addition, Puttapitukpol (2001: 106) found that education had a significantly direct positive effect on the health responsibility of pregnant adolescents. It also had a significantly indirect positive effect on health responsibility, by affecting social support and perceived barriers. With higher levels of education, pregnant adolescents increased their levels of health responsibility and social support, but decreased the levels of perceived barriers. However, several studies have shown that education has no impact on health-promoting behavior in various groups (Iemsawasdikul, 1998: 117-119; Oumpram, 1998: 97; Patanavanichnun, 2000: 97-98; Somsap, 2000: 66).

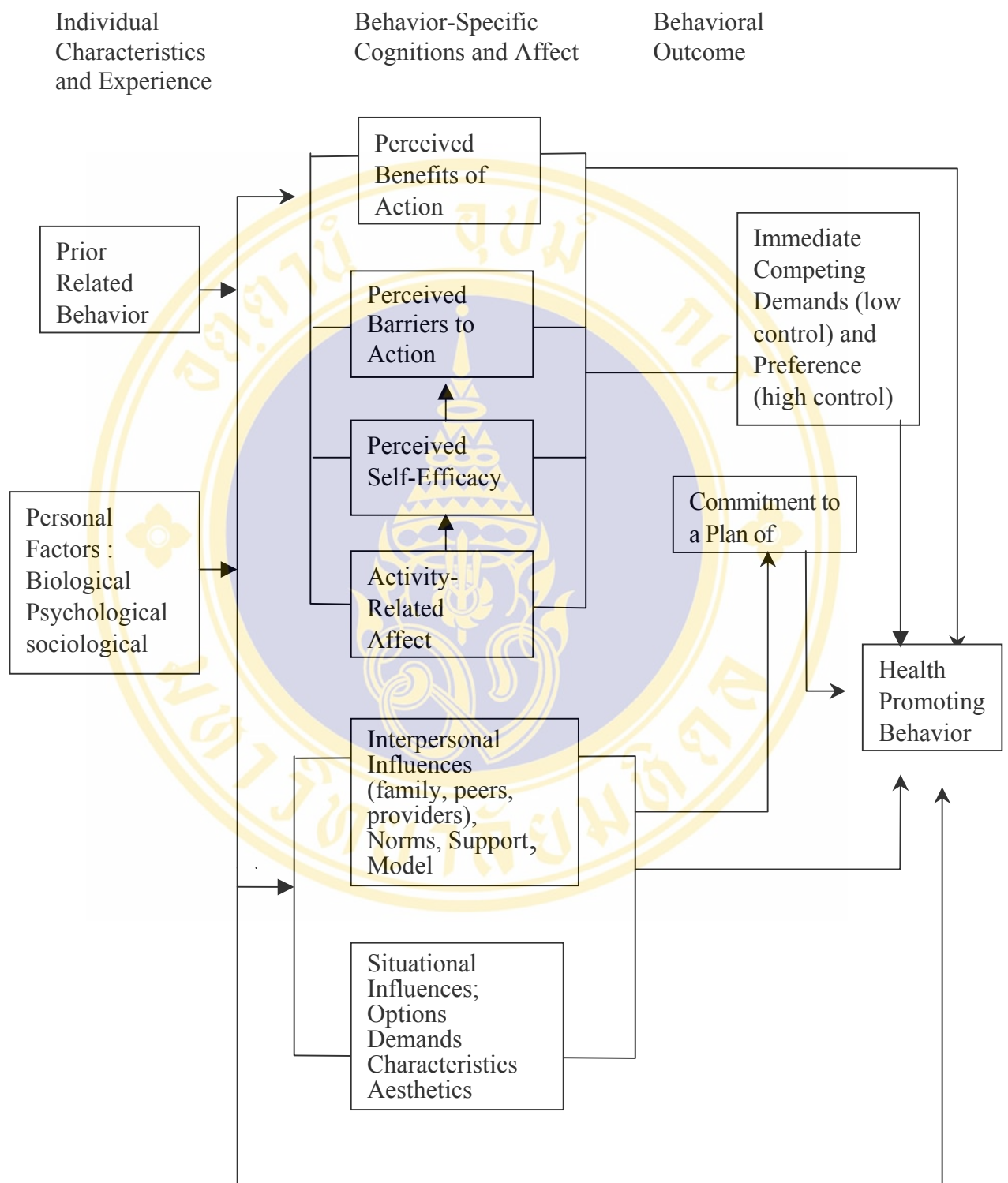


Figure 1.1 Revised Health Promotion Model. (Pender, 1996: 67)

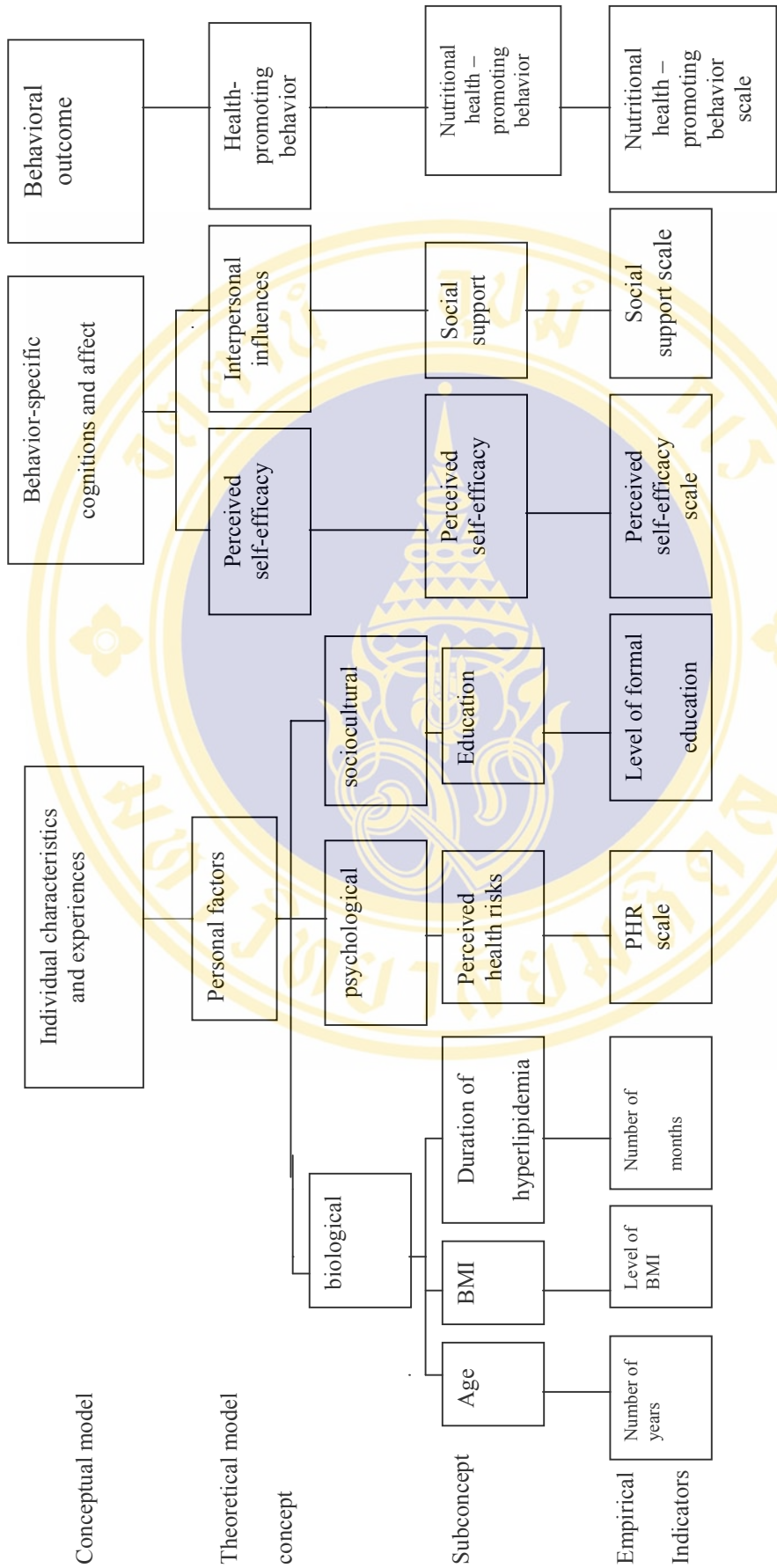


Figure 1. 2 : Conceptual-theoretical-empirical indicator structure of model of nutritional health-promoting behavior.

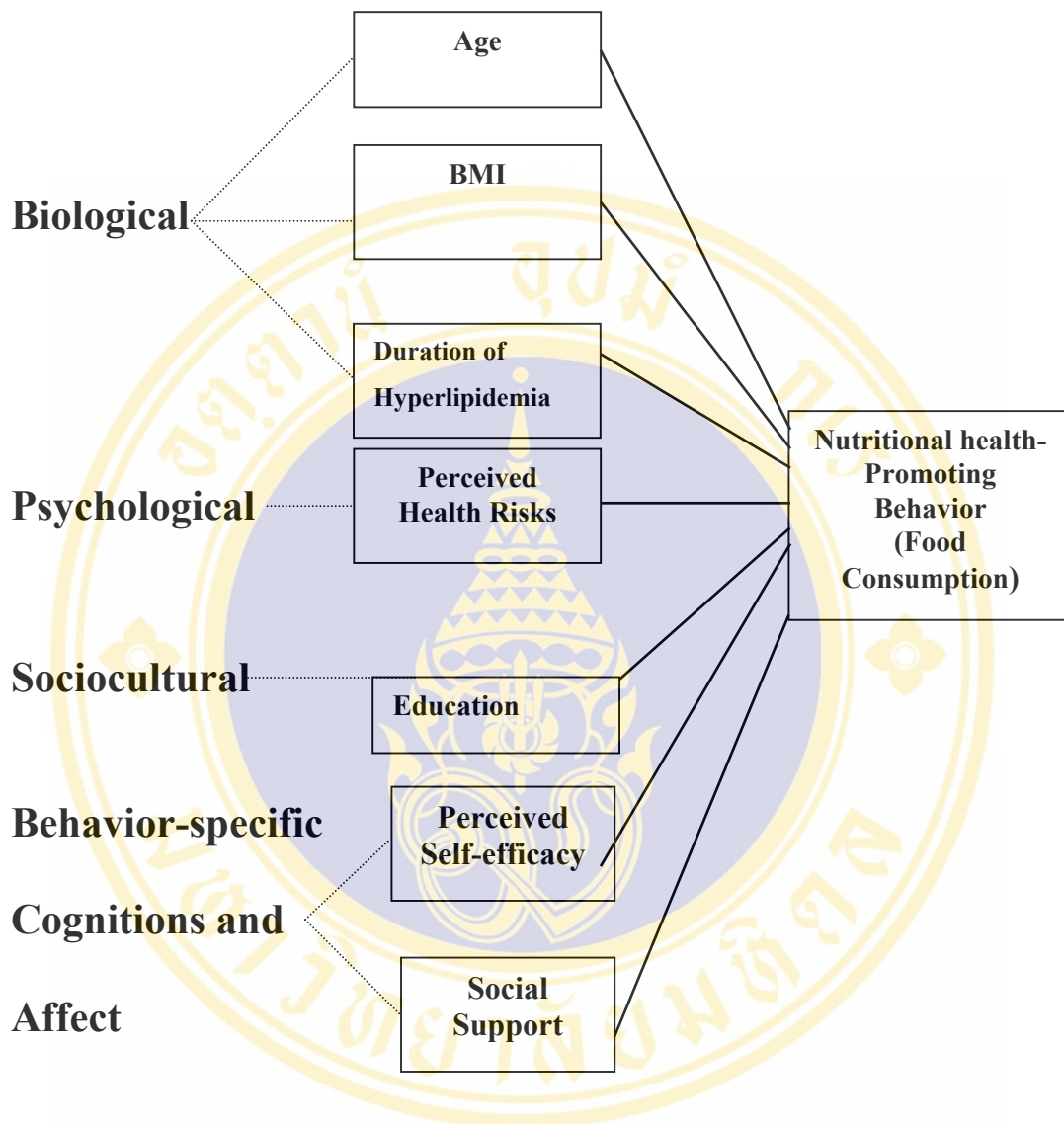


Figure 1.3 : The conceptual framework of the study demonstrates the relationships between age, BMI, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, social support, and nutritional health-promoting behavior in women with hyperlipidemia.

Hypothesis

Age, body mass index, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, and social support together can explain the variances in nutritional health-promoting behavior of women with hyperlipidemia

Scope of Study

The scope of this study includes nutritional health-promoting behavior, perceived health risks, perceived self-efficacy, and social support of women with hyperlipidemia who sought help from the Medical Clinic, General Medical Practice Clinic and Menopause Clinic at the Out-patient Department of Songklanagarind Hospital, Hat Yai Hospital and Songkla Hospital from September to December 2002.

Definition of Terms

Nutritional Health-Promoting Behavior

“Nutritional health-promoting behavior” refers to self-initiated actions or healthy eating behaviors that include low cholesterol diet control, low fat diet control, low triglyceride diet control, low sugar diet control, and high fiber diet practice, to maintain a normal level of serum lipid profiles and desirable weight. This includes healthy food consumption in terms of type, quantity, and frequency.

Nutritional health-promoting behavior is operationally defined as the total scores on the Nutritional health-promoting behavior Scale, developed by the researcher. The scale consists of seventeen items. The responses are frequencies of practice from routinely, frequently, sometimes, seldom, to never. The total score is calculated by summation of the scores for the 17 items, ranging from 17 to 85, with higher scores reflecting higher levels of nutritional health-promoting behavior.

Perceived Self-efficacy for Nutritional Health-Promoting Behavior

Perceived self-efficacy for nutritional health-promoting behavior refers to the level of confidence in the ability of women with hyperlipidemia to organize and execute specific tasks and behaviors related to nutritional health-promoting behavior.

Perceived self-efficacy for nutritional health-promoting behavior is operationally defined as the total scores in the Perceived Self-efficacy for Nutritional

health-promoting behavior Scale, developed by the researcher. The questionnaire consists of twenty-one items. A five-point Likert scale ranges from no confidence, little confidence, moderate confidence, high confidence and very high confidence. The total score is calculated by summation of the scores for the 20 items, ranging from 20 to 100, with higher scores reflecting higher levels of perceived self-efficacy for nutritional health-promoting behavior.

Social Support

Social support refers to the subjective feeling of belonging, of being accepted, loved, esteemed, valued, and needed for oneself, not for what one can do for others. This perception includes four broad types of supportive behaviors or acts (House, 1981: 13-40): 1) emotional support, 2) appraisal support, 3) informational support, and 4) instrumental support.

Social support is operationally defined as the total scores for the Social Support Scale developed by the researcher. The questionnaire consists of nineteen items. A five-point Likert scale ranges from strongly disagree, disagree, uncertain, agree and strongly agree. The total score is calculated by summation of the scores for the 19 items, ranging from 19 to 95, with higher scores reflecting higher levels of perceived social support.

Perceived health risks

Perceived health risk refers to an individual's subjectively estimated probability that he or she will encounter a specific health problem. This subjective feeling includes three categories of perceived susceptibility: 1) causes of health problem, 2) general health, and 3) complications of a health problem.

Perceived health risks is operationally defined as the total scores for the Perceived Health Risk Scale, developed by the researcher. The questionnaire consists of eleven items. A five-point Likert scale ranges from disagree, agree a little, moderately agree, highly agree and very highly agree. The total score is calculated by summation of the scores for the 11 items, ranging from 11 to 55, with higher scores reflecting higher levels of perceived health risks.

Body Mass Index

Body mass index refers to the ratio of weight (kilograms) and height (meters) to the power of two (Prathepasen, 1996: 30). Its operational definition is the digital number from calculation of weight (kilograms) divided by the square of height (m^2). The body mass index can be classified into six categories, according to the Asian BMI (Komin, 2002: 38-39): 1) underweight ($BMI < 18.5 \text{ kg/ m}^2$), 2) normal weight ($BMI = 18.5 \text{ to } 22.9 \text{ kg/ m}^2$), 3) overweight or pre-obese ($BMI \geq 23 \text{ kg/ m}^2$), 4) obese I ($BMI = 23 \text{ to } 24.9 \text{ kg/ m}^2$), 5) obese II ($BMI = 25 \text{ to } 29.9 \text{ kg/ m}^2$), and 6) obese III ($BMI \geq 30 \text{ kg/ m}^2$). The body mass index can also be classified into six categories, according to the European BMI: 1) under weight ($BMI < 18.5 \text{ kg/ m}^2$), 2) normal weight ($BMI = 18.5 \text{ to } 24.9 \text{ kg/ m}^2$), 3) overweight ($BMI \geq 25 \text{ kg/ m}^2$), 4) obese level 1 ($BMI = 25 \text{ to } 29.9 \text{ kg/ m}^2$), 5) obese level 2 ($BMI = 30 \text{ to } 34.9 \text{ kg/ m}^2$), and obese level 3 ($BMI \geq 35 \text{ kg/ m}^2$) (Leelahakul & Thaveeboon, Eds, 1998: 112- 138; PongPaew, 1996: 94-120).

This study proposed both Asian BMI and European BMI, because nowadays there is a debate of WHO expert consultation about interpretation of recommended BMI cut-off points for determining overweight and obesity in Asian populations.

Duration of Hyperlipidemia

Duration of hyperlipidemia is the length of time, in months, that hyperlipidemia has been diagnosed by a physician.

Age

Age is the participant's chronological age, taken from the participant's medical record and is confirmed by an identification card (if more than 6 months of a year had elapsed, a full year was added).

Education

Education is defined as the number of years of the highest education and is taken from the participant's statement.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this chapter is to review the literature that provides the substantive empirical background for this proposed research. It reviews the research pertinent to women with hyperlipidemia, health-promoting behavior, nutritional health-promoting behavior, food consumption behaviors of the southern Thais, dietary assessment, variables in the behavior-specific cognitions and affect category, i.e., perceived self-efficacy and social support, as well as the variables in the individual characteristics and experiences category, i.e., age, body mass index, duration of hyperlipidemia, perceived health risks, and education as previously mentioned in Pender's Health Promotion Model (Pender, 1996).

Description of Variables

Women with hyperlipidemia

Hyperlipidemia refers to high levels of serum lipids (cholesterol or triglyceride, or both) or of some plasma lipid profile, including very low-density lipoproteins (VLDL) and low-density lipoproteins (LDL). The plasma lipid profile is commonly measured by analyzing the three major classes of lipoproteins from the blood sample of a fasting individual, including VLDL, LDL, and high-density lipoprotein (HDL). So, the term hyperlipidemia or dyslipidemia is the common term for an abnormally high level of various lipids in the serum, for which specific terms are used, i.e., hypercholesterolemia, hyperlipoproteinemia, and hypertriglyceridemia according to the high blood levels of cholesterol, lipoprotein, and triglyceride, respectively. The levels of the measurement of a lipid profile from a blood sample, which is defined as hyperlipidemia, include total blood cholesterol (TC), LDL-cholesterol, triglyceride at levels of more than 200, 130, and 200 mg/-dl, respectively (Tanphaichitr, 1987: 6).

The significance of the three major lipoproteins is that LDL-cholesterol contains approximately 60 to 70% of total serum cholesterol (TC), and a high serum level is causally related to an increased risk of coronary heart disease. The HDL-cholesterol usually contains about 20 to 30% of total cholesterol, and the serum level is inversely correlated with the risk of coronary artery disease. The VLDL-cholesterol is largely composed of triglyceride and contains about 10 to 15% of total serum cholesterol. Therefore, the major component of the cholesterol is LDL-cholesterol, which is more precise and a preferable measure of risk. Total cholesterol level can also be used in the initial stages for evaluating coronary artery disease risk (Grodner, et al., 2000: 570).

Although several causative factors of hyperlipidemia in men and women are alike, women are more likely to have some additional factors inducing hyperlipidemia, including the food habits of eating snacks and desserts or being fond of nibbling between meals (Sirisumpan, 1984: 101-103) and being reluctant to throw away left-over food. Women often strictly economize, so that whenever they cook food themselves, they prefer to eat all of it rather than throw any away.

Women also use eating as a compensatory method for stressful events. A foreign study found that female executives used eating to compensate for daily stressors, so that they may forget them. Consuming high-calorie, high-fat foods like chocolate, cookies and ice cream as a response to stress are dietary behaviors many people use in an attempt to make themselves feel better (Rossi, et al. in Jairath, Ed., 1999: 124). This may be explained by the theory that stress causes a decrease in serotonin level in the brain relating to the emotions. Eating a carbohydrate diet would increase serotonin levels. It was also found that there was an association between serum cholesterol level and serotonin level. Women had lower serotonin levels than men. This made women eat large amounts of food, leading to obesity more frequently than men. Obese persons have a secretion of liver substances to stimulate increased serum triglyceride production (Chatuvorapat, 2002: 5).

According to Thai cultural norms, women have the major responsibility for preparing food for family members, although they increasingly work outside. Several studies found that women were likely to prepare foods that the family members preferred, rather than foods appropriate for themselves. These foods are more likely to

contribute to a high-fat and high-cholesterol diet, such as stir-fried and/or fried foods, seafood or oyster sauces, which make the foods more delicious. Schafer, et al. (1999: 787-796) found that wives contributed more to husbands' dietary quality than the husbands did themselves, and that the wives had the dominant status in food selection and preparation for the family. Similarly, the Framingham study showed that an elevated triglyceride level was an independent risk factor for women alone, as well as HDL-cholesterol as a more powerful predictor of coronary heart disease in women than in men (Gordon, et al., 1989: 8-15).

Finally, research data examining hyperlipidemia and risk factors for women remain limited. Most of the research on cholesterol and related diseases, such as coronary heart disease, often involved middle-aged men. Extrapolation of these findings to women has been questioned (Rich-Edwards, et al., 1995: 1758-1759). Women are biologically different from men; they have different hormones, different patterns of disease and health, and different responses to treatments and preventive strategies. In addition, women have unique risk factors and preventive strategies.

Reasons for the exclusion of women include (1) fear of teratogenicity; (2) increased variability caused by a woman's menstrual cycle, pregnancy and menopause, which complicate both design and data analysis as well as increasing cost; and (3) the false belief that sex-specific effects are unlikely to significantly influence treatment outcomes (Doyle & Hamilton in Jairath, Ed., 1999: 278-279). Additional research is needed to determine the generalizability of findings to women. Therefore, increasing the recruitment and empowerment of women through increased participation in research studies will help improve the standard of care that women receive. Women often have no abnormal signs and symptoms, although they have hyperlipidemia. Preventive strategies for risk factor modification would be most effective if young women were targeted for education and risk-factor modification. Although definitive evidence that lowering cholesterol levels reduced the risk of coronary heart disease in healthy women was lacking, observational data indicated that interventions to lower LDL-cholesterol levels and raise HDL-cholesterol levels would benefit women as well as men (Rich-Edwards, et al., 1995: 1758-1766).

Currently, the main causes of hyperlipidemia in either men or women may be classified by three major factors, i.e. nutrition or diet, genetic defects, and

metabolic conditions (Grundy in Shils, et al., Eds., 1999: 1201-1205; Porth, 1994: 361). These factors may cause an overproduction of serum LDL-cholesterol and/or triglyceride level or a defect in lipoprotein metabolism or clearance, leading to increased blood levels of LDL-cholesterol and/or triglyceride. An understanding of the factors influencing hyperlipidemia can serve as a basis for intervention.

1. Nutrition: dietary hyperlipidemia refers to hyperlipidemia resulting from unhealthy food consumption. For most persons, elevated serum cholesterol is caused by excessive dietary intake, including a high cholesterol diet from animal products, such as visceral organs, egg yolk, seafood, etc, forming a high cholesterol-raising fatty acid diet from saturated fatty acids and trans-fatty acid, and a high-calorie diet whether from fat, carbohydrate, or protein, which exceeds the body's requirements. Excess ingestion of cholesterol may reduce the formation of LDL receptors, and thereby decrease LDL removal. The fatty acids induce increments in total cholesterol levels that occur largely in the LDL fraction. High carbohydrate and alcohol intake lead to high triglyceride levels. High-calorie diets increase the production of VLDL, with triglyceride elevation and high conversion of VLDL to LDL-cholesterol. Therefore, diets that are high in triglyceride and saturated fatty acids increase cholesterol synthesis and suppress LDL receptor activity, leading to hyperlipidemia.

The association between a high-fat and high-cholesterol diet and the prevalence of hyperlipidemia has been found in many developed countries, such as the United States. The most common nutrition problems in the United States are overeating and the consumption of high levels of fat. In 1976 through 1980, 15% of adolescents were overweight, and there is some concern that this percentage is increasing. It has also been found that the typical American diet consists of over 35% fat, much of which is saturated animal fat with high levels of cholesterol. Surveys conducted in 1991 found that only 13% of high school students surveyed ate five or more serving of fruit and vegetables, while 31% reported eating three or more servings of foods typically high in fat (Malotte & Gilbert in Woods, et al., Eds., 1995: 664).

2. Genetic defects: primary hyperlipidemia refers to hyperlipidemia resulting from genetic defects. Genetic epidemiologists suggest that about 50% of the variation in cholesterol levels in the general population can be explained by polymorphism in

the genes influencing serum total cholesterol and LDL-cholesterol (Grundy in Shils, et al., Eds., 1999: 1202). Many types of primary hyperlipidemia have a genetic basis. There may be a defective synthesis of apoproteins, a lack of receptors, defective receptors, or defects in the handling of cholesterol within the cell, that are genetically determined. Because most of the circulating cholesterol is removed by receptor-dependent mechanisms, blood cholesterol levels are markedly elevated in people with this disorder (Porth, 1994: 361).

The result is a two- to three-fold increase in blood LDL-cholesterol levels. One person in 500 is found to suffer from this genetic disorder, which is called heterozygous familial hypercholesterolemia. A person has only half the number of LDL receptors, so that clearance of LDL-cholesterol from the circulation is impaired. Cholesterol levels are usually 250 to 500 mg/ dl. In contrast, in the homozygous individual (one in a million people) there is little or no LDL receptor activity, and plasma cholesterol levels are markedly elevated to about six times the normal range or equal to 700 to 1,200 mg/ dl (Fair & Burke in Woods, et al., Eds., 1995: 738-740; Rossi, et al. in Jairath, Ed., 1999: 112).

Familial hypertriglyceridemia is a heritable autosomal dominant disease, the mechanism of which is unclear. However, several studies have reported that increased serum triglyceride levels may result from overproduction or normal production of VLDL, with lower metabolism. Two to three persons in 1,000 are found with this type of genetic disorder. Serum triglyceride levels are usually 200 to 500 mg/ dl (Tanphaichitr, 1987: 12). Hyperlipidemia resulting from a genetic disorder is often manifested by a very high level of serum cholesterol and/or triglyceride, accompanied by a history of hyperlipidemia in family members, such as a mother, father, sister, or brother.

3. Metabolic conditions: secondary hyperlipidemia refers to hyperlipidemia resulting from metabolic conditions. Underlying metabolic diseases can induce hyperlipidemia, including hypertension; diabetes mellitus (type I); hypothyroidism; hypopituitarism; renal diseases, such as nephrotic syndrome, uremia, renal dialysis, renal transplantation, Cushing's syndrome, systemic lupus erythematosus; liver diseases, such as obstructive liver disease, biliary cirrhosis, and hematoma. Hypothyroidism is a common disease that decreases LDL-cholesterol metabolism.

Nephrotic syndrome increases the production of VLDL, leading to increased serum triglyceride levels. Cushing's syndrome changes increased VLDL to VLDL dysglobulinemia, which causes LDL-cholesterol to be captured, leading to hypercholesterolemia. Obstructive jaundice may increase hypercholesterolemia.

A number of drugs and hormones can also induce hyperlipidemia, including contraceptive steroids, diuretics, beta-adrenergic blocking agents, and estrogen hormones for menopausal women. Diuretics may increase serum LDL-cholesterol levels resulting from decreased metabolism of LDL-cholesterol (Fair & Burke in Woods, et al., Eds., 1995: 738; Tanphaichitr, 1987: 11-12).

Increasing body weight, and aging per se, also effect elevated serum cholesterol. The aging process is accompanied by delayed clearance of LDL-cholesterol from the circulation; presumably, the complex mechanisms regulating LDL receptor function become less efficient with aging. For example, hepatic disposal of cholesterol may be slightly retarded with aging, leading to increased hepatic cholesterol content. Alternatively, synthetic mechanisms for LDL receptors may become sluggish, causing decreased receptor expression and LDL catabolism. However, serum cholesterol levels do not rise progressively from middle age into old age. Most of the increase occurs between the ages of 20 and 50 years; thereafter, LDL-cholesterol levels reach a plateau or even decline somewhat. This suggests that external, controllable factors, such as weight gain, play critical roles in the age-related increase in cholesterol levels.

When considering obesity and the rise of serum cholesterol with aging, it was found that there was a strong correlation between changes in serum cholesterol concentrations and changes in body weight from young adulthood into middle age. Most weight gain in adults occurs between the ages of 20 and 50 years; during this same period, serum cholesterol concentrations rise. Although epidemiological studies have indicated that serum cholesterol levels rise with aging, even in persons who show little weight gain, those who gain more weight manifest greater increments in serum cholesterol.

The major influence of obesity on lipoprotein metabolism is upon the input pathway to induce overproduction of hepatic VLDL, which converts to LDL-cholesterol. Thus, it is not surprising that both VLDL and LDL-cholesterol levels rise

concomitantly with increasing obesity (Grundy in Shils, et al., Eds., 1999: 1202-1203). Several studies found that obesity among women was more prevalent than obesity among men (Grundy in Shils, et al., Eds., 1999: 1201; Murdaugh in Guzzetta & Dossey, Eds., 1992: 206-207; Newton & Froelicher in Woods, et al., Eds., 1995: 205-206). It is estimated that 25% of men and 27% of women in the United States are overweight and that 8% of men and 11% of women are severely overweight. It has also been found that hypercholesterolemia is more common in overweight individuals (Newton & Froelicher in Woods, et al., Eds., 1995: 205). One study reported that the degree of obesity may be an independent risk factor, especially in women (Murdaugh in Guzzetta & Dossey, Eds., 1992: 206).

Decreasing estrogen levels in postmenopausal women also influence and elevate LDL-cholesterol, and decrease HDL-cholesterol levels. Therefore, it can be concluded that women are more likely to have hyperlipidemia than men.

Hyperlipidemia is known as an important and modifiable risk factor related to health problems. The most common consequence of hyperlipidemia, in either women or men, is the promotion of atherosclerosis and the increased risk of coronary artery disease. The manifestations of coronary artery atherosclerosis include myocardial infarction, angina pectoris, sudden cardiac death, and congestive heart failure. Atherosclerosis in other major blood vessels can result in cerebrovascular accident, peripheral vascular disease, and renal failure (Cunningham, 1992: 154-155). The key elements in the development of atherosclerotic lesions are smooth muscle proliferation, connective tissue formation, and lipid accumulation. Although there are several theories to describe the cause and development of atherosclerosis, the response-to-injury hypothesis is the most widely accepted theory. It is believed that some form of injury occurs to the endothelium, resulting in structural or functional changes in the endothelial cells. The injury may result from several factors, such as chronic hypercholesterolemia, leading to chronic inflammatory response at the endothelial site of the artery.

Therefore, atherosclerosis is not a degeneration or an inevitable result of aging, but it is related to environmental factors, such as dietary food consumption. It is a response to injury that generates a protective fibroproliferative lesion. One cause of long-standing injury is chronically elevated low-density lipoproteins, also called

chronic hypercholesterolemia (Murdaugh in Guzzetta & Dossey, Eds., 1992: 199). For modifiable risk factors, two conditions must be established by epidemiological research. First, there must be a demonstrated relationship between the risk factor and the incidence of disease. Second, there must be epidemiological data demonstrating that reducing the risk factor reduces the incidence of outcomes related to the disease (Cunningham, 1992: 154).

The increment of risk for coronary artery disease is proportionally related to the elevation in serum LDL-cholesterol level. In fact, risk is compounded by progressively increasing serum LDL concentrations. Conversely, populations who have low serum LDL concentrations rarely develop coronary artery disease. Other coronary artery disease risk factors, cigarette smoking, hypertension, and diabetes mellitus, are relatively common (Grundy in Shils, et al., Eds., 1999: 1199-1200). The Multiple Risk Factor Intervention Study reported that the mortality from coronary artery disease increased when the plasma TC level was above 200 mg/ dl, and increased considerably when the plasma TC level was above 240 mg/dl (U.S. Department of Health and Human Service, 1993, cited in Rossi, et al. in Jairath, Ed., 1999: 109). Many intervention studies have shown that for every 1% decrease in TC, coronary artery disease risk is reduced by 2 to 3%, and high levels of HDL-cholesterol protect against coronary artery disease. For every 1 mg/ dl decrease in HDL-cholesterol, coronary artery disease risk increases 2 to 3%.

The National Cholesterol Education Program (NCEP) has defined desirable levels of lipids and lipoproteins to decrease coronary artery disease risk. For adult men and women over the age of 20, TC, LDL-cholesterol, and triglyceride should be below 200, 130, and 200 mg/ dl, respectively, while HDL-cholesterol should be above 35 mg/ dl. For patients with coronary artery disease, the optimal LDL-cholesterol level should be below 100 mg/ dl (Rossi, et al. in Jairath, Ed., 1999: 110).

According to the NCEP, hypercholesterolemia can be divided into three levels: 1) mild hypercholesterolemia, with TC ranging from 200 to 239 mg/ dl and LDL-cholesterol ranging from 130 to 159 mg/ dl, 2) moderate hypercholesterolemia, with TC ranging from 240 to 299 mg/ dl, and LDL-cholesterol ranging from 160 to 219 mg/ dl, and 3) severe hypercholesterolemia, TC is equal or more than 300 mg/ dl

and LDL-cholesterol is equal or more than 220 mg/dl (Grundy in Shils, et al., Eds., 1999: 1200).

The standard of care for patients with hyperlipidemia focuses on guidelines published by the NCEP in 1993, outlining the non-pharmacologic and pharmacologic treatment of hyperlipidemia (Wright, et al. in Murphy, Ed., 1997: 137-140). However, diet therapy or medical nutrition therapy is the first line, or the cornerstone, of treatment for patients with elevated TC and LDL-cholesterol levels, whether their causes come from nutrition or not (Rossi, et al. in Jairath, Ed., 1999: 117; Tanphaichitr, 1987: 15). This approach focuses on dietary and life-style modifications. The goal of treatment is to lower TC and LDL-cholesterol levels and to reduce excess body fat. If patients with hyperlipidemia strictly follow their health professionals' suggestions, the goal will be successfully attained within 4 to 8 weeks (Tanphaichitr, 1987: 15).

Evidence of the relationship between dietary intake, plasma cholesterol, and coronary heart disease has been steadily accumulating over the past three decades. Population studies have shown that countries with the highest incidence of coronary heart disease and elevated blood cholesterol levels also have high dietary intakes of saturated fatty acids. Conversely, Third World countries with a mean cholesterol level below 150 mg/ dl have a very low incidence of coronary heart disease and serum cholesterol. They also have diets low in total fat and saturated fatty acids. Metabolic ward studies also support the relationship between saturated fat consumption and plasma cholesterol. They have demonstrated that lowering fat intake can achieve as much as a 30% reduction in plasma cholesterol (Fair & Burke in Woods, et al., Eds., 1995: 741). It has also been found that saturated fatty acids in the diet can strongly influence cholesterol levels. Each 1% of saturated fat relative to caloric intake increases the cholesterol level an average of 2.8 mg/dl. Dietary cholesterol tends to increase LDL-cholesterol. On an average, each 100 mg/dl of ingested cholesterol raises the serum cholesterol 8 to 10 mg/dl (Porth, 1994: 362).

If normal plasma cholesterol levels are not achieved with dietary management, pharmacologic therapy is instituted. However, continued dietary management can reduce the drug dosage, lessening the occurrence of side effects (Murdaugh in Guzzetta & Dossey, Eds., 1992: 201). As a result, hyperlipidemia

patients who have no coronary artery disease or other diseases related to hyperlipidemia should try diet therapy or non-pharmacologic therapy for at least 6 weeks before a decision is made regarding the initiation of treatment with a lipid-lowering agent (Wright, et al. in Murphy, Ed., 1997: 140).

A two-step program, the Step-one and Step-two diet, is recommended and designed to progressively reduce the intake of saturated fat and cholesterol and eliminate excessive total calories. The Step-one diet is a guideline published by the NCEP as a consensus paper with definitive management guideline for all persons with normal or abnormal lipids. The report includes the following recommendations: 1) for adults aged 20 or older, with desirable total cholesterol levels (less than 200 mg/ dl), general dietary and risk factor education related to hyperlipidemia is recommended, 2) for persons with increased cholesterol levels (greater than 200 mg/ dl) diet therapy is the primary cholesterol lowering treatment.

Drug treatment should be considered an adjunct to diet therapy. Only in the case of severe LDL-cholesterol levels (greater than 225 mg/ dl) that are unlikely to respond to diet therapy alone, or in the case of defined coronary heart disease should the 6-month period of diet therapy be shortened to a minimum of 3 months, and 3) at least 3 months of diet therapy are needed to establish a baseline of diet efficacy for the initiation and evaluation of drug therapy. It is important to convey to the patient that diet therapy is not a temporary diet, but a permanent, positive change in eating behavior (Herrmann, et al. in Baas, Ed., 1991: 35).

According to the Step-one diet, the recommended nutrition intake should be as follows: total fat, saturated fatty acids, polyunsaturated fatty acids, monounsaturated fatty acids, carbohydrate, and protein should be $\leq 30\%$, 8% to 10%, $\leq 10\%$, $\leq 15\%$, $\geq 55\%$, and about 15% of total calories, respectively. The other recommendations consist of a cholesterol diet of less than 300 mg/day and total calories to achieve and maintain desirable weight. For Thai people, total fat should be 24 to 26% of total calories, because the usual native Thai foods have lower fat composition compared with American foods (Pradipasen, 1995). The desirable daily calorie intake is 1,600 kcal/ day for women aged 25 to 60 years and over (Working Group on Food Based Dietary Guideline for Thai, 2001: 8).

Most persons with mild hypercholesterolemia in the United States exceed these recommendations in all categories. Reductions designed to achieve the goals of the Step-one diet can be expected to decrease serum LDL-cholesterol levels by about 10% (Grundy in Shils, et al., Eds., 1999: 1204). This design can be expected to decrease serum TC by about 3 to 14% and by about 25% for individuals who also lose weight (Rossi, et al. in Jairath, Ed., 1999: 122). Serum cholesterol levels need to be measured at 4 to 6 weeks and at 3 months after starting the Step-one diet. If the goals of therapy are not achieved by 3 months, the Step-two diet is implemented.

The Step-two diet further reduces the intake of saturated fatty acids to less than 7% of total calories, and the cholesterol intake to less than 200 mg/ dl. This approach consists of the following recommendations: total fat, saturated fatty acids, polyunsaturated fatty acids, monounsaturated fatty acids, carbohydrate, and protein of $\leq 30\%$, $< 7\%$, $< 10\%$, 10 to 15%, $\geq 55\%$, and 15% of total calories, respectively (Grundy in Shils, et al., Eds., 1999: 1208). The Step-two diet is used for persons with moderate hypercholesterolemia and patients with coronary heart disease. This approach represents an aggressive intervention, with saturated fat and cholesterol being reduced approximately 50% from the usual diet. These patients will benefit from nutrition counseling by a registered dietitian, which is beyond the scope of this study.

When compared with the average American diet, an average decrease in LDL-cholesterol of 5 to 18% or up to about 25% can be achieved in the Step-two diet. The average reduction in serum TC that is expected in patients who switch from the Step-one to the Step-two diet is an additional 3 to 7% depending on the degree to which saturated fat and cholesterol are restricted (Rossi, et al. in Jairath, Ed., 1999: 122). Cholesterol reduction can be achieved by diet therapy alone for many high-risk patients. If the goals of LDL-cholesterol reduction are met by diet modification, long-term monitoring is indicated (Murdaugh in Guzzetta & Dossey, Eds., 1992: 201).

The NCEP guidelines note that the Step-one diet involves reduction in the major and obvious sources of saturated fat and cholesterol, where as the Step-two diet requires careful attention to the whole diet. Its implication may also require the services of a nutritionally qualified professional (Fair & Burke in Woods, et al., Eds.,

1995: 742). Therefore, the Step-one diet is an appropriate diet therapy for whether the general persons or risky groups. For Thai people, although the Food Based Dietary Guideline for Thai (FBDG) is consistent with the Step-one diet of the NCEP, a more specific guideline is required for use with hyperlipidemic persons, to attain the goals of reducing serum TC, LDL-cholesterol, and triglyceride to desirable levels and maintaining a nutritionally sound eating pattern in the Thai context.

In conclusion, diet therapy is the cornerstone of management for persons with hyperlipidemia. It focuses on dietary and life-style modification, so that it is related to health-promoting behavior. Because it emphasizes the nutritional aspect of this behavior, the term nutritional health-promoting behavior is appropriately used and described as follows.

Health-Promoting Behavior

Dramatic changes in the health care system are increasingly shifting the roles and responsibilities of the professional nurse to that of health promotion (Puttapitukpol, 2001: 26). Pender (1987) explained that the positive practice of health behavior consists of health protection and health promotion. Health promotion derives from personal motivation, achieving the desire to increase wellbeing and to actualize human health potential, whereas health protection is motivated by a desire to actively avoid illness, detect it early, or maintain functioning within the constraints of illness in order to achieve stabilization. However, in the revised health promotion model, Pender (1996) suggests that health-promoting behavior and health-protecting behavior are difficult to distinguish. Most people have integral combinations of the two behaviors and they serve as motivation to practice health behaviors. The difference is that health-promoting behavior is concerned with the positive aspects of practicing and creating good health and wellbeing, whereas health-protecting behavior is concerned with the avoidance of illness or injury.

For women with hyperlipidemia, health-promoting behavior plays a major role in practice in order to eat healthily and prevent coronary artery disease.

Nutritional Health-Promoting Behavior

Good nutrition is important to the nurturance of health. Accumulating evidence indicates that eating patterns play a major role in preventing disease and in creating the capacity for energetic and productive living. Poor nutritional practices have been implicated as a major contributor to a variety of chronic diseases, particularly those with cardiovascular sequelae, such as hyperlipidemia, hypertension, and diabetes mellitus (Hatton, et al., 1996: 935). Thus, national dietary and food production policies should focus on promoting optimum nutrition among persons of all ages (Pender, 1996: 209-210). Many studies found that dietary factors played an important role in the pathogenesis of coronary disease (Koikkalainen, et al., 1999: 120; Wasling, 1999: 1239). There is strong evidence for a link between diet and atherosclerotic cardiovascular disease (Pender, 1996: 210). All of these factors leading to the causes of coronary disease, except cigarette smoking, are influenced by diet in some way (Pender, 1996: 222).

Hyperlipidemia is associated with food consumption, especially high levels of saturated fatty acids, so that it is a crucial risk factor for coronary disease, both for women and for men, particularly in middle-age. Although many factors influence hyperlipidemia, including genetics, drugs, diseases derived from disorders of the metabolism, such as diabetes mellitus, sedentary lifestyle, stress, sex hormones, etc., dietary intake plays an important role in the high association between patterns of hyperlipidemia and excessive consumption of fats. Therefore, modifications of the diet, factors that individuals can control, could play a significant role in reducing the level of hyperlipidemia. Addressing controllable risk factors, a high-fat diet can increase deposits of cholesterol and other lipids, with resultant cellular reactions, and thickening of the coronary artery walls and subsequent risk of myocardial infarction and sudden death (Pender, 1996: 211).

There is international consensus that coronary disease is linked to nutritional pattern throughout the life, with the ravages of risk manifest most frequently in middle-aged and older adults (Pender, 1996: 222). Cholesterol-lowering by dietary modification is a safe and effective approach not only for the prevention of hyperlipidemia or the primary prevention of coronary disease, but also for the

treatment or secondary prevention of this disease. Treatment of hypercholesterolemia is an important step in lowering the risk of coronary disease (Larosa, 1994: 6A-23S).

Dietary therapy or modification of the diet is always the first choice in the treatment of hyperlipidemia, while medication is the last, whenever dietary modification does not succeed (Larosa, 1994: 6A-19s-6A-24s; Walsh, 1995: 1152-1158). Several clinical trials have documented the effect of the dietary approach in significantly reducing total cholesterol. The range of cholesterol-lowering is about 7-15% (Khan, 1996: 385-387). For example, approximately 28% of Americans with elevated total cholesterol appeared to be respond to dietary cholesterol and saturated fat restriction with a 10-15% decrease in cholesterol. In London, the incidence of hypercholesterolemia responding to diet control appeared to be similar to that observed in Americans (Khan, 1996: 387). Therefore, improving the eating pattern by means of nutritional health-promoting behavior plays an important role in the management of hyperlipidemia in both women and men.

Nutritional health-promoting behavior has been mentioned in a variety of terms, such as nutritional promoting behavior referring to the food pattern and food intake, food consumption, etc. However, the specific term denoting the positive view was mentioned by Walker, et al.(1987,) and Pender (1996). From these perspectives, nutritional health-promoting behavior is one of the six dimensions of a health-promoting lifestyle: health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth and stress management (Pender, 1996: 134). Pender (1996: 229) categorized this dimension as the essential component of a health-promoting lifestyle, because the promotion of good nutrition is a critical concern in illness prevention and heath-promotion, and an important dimension of competent self-care and dependent care (Pender, 1996: 229).

In the context of health, lifestyle is defined as those discretionary activities with a significant impact on health status that are a regular part of one's daily pattern of living (Wiley & Camacho, 1980: 1-21). From this view, the definition of lifestyle does not specify any positive direction for health and it does not cover covert behaviors or cognitive and emotional aspects. More specific and appropriate for health, according to Walker, et al. (1987) and Pender(1996), "nutritional health-promoting behavior" refers to the way of life or personal habits, concerning the

frequency with which a person engages in each nutritional behavior for a wellness approach, with behaviors directed towards increasing the level of wellbeing, self-actualization, and fulfillment of the individual.

Nutritional health-promoting behavior consists of a multidimensional pattern of self-initiated actions and perceptions about the meal patterns and food choices that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual (Walker, et al., 1987: 77, 79). Pender (1996) discussed the composition of nutritional health-promoting behavior in terms of food selection, food preparation, and food consumption. However, the details of each component were not described, except in the measurement of health-promoting lifestyle profile II, which identifies types of food intake, such as low fat, low sweets, cereals, fruit, vegetables, milk, meat, and packaged food; meal pattern, and food labels (Walker, et al., 1987; Pender, 1996). These definitions and components of nutritional health-promoting behavior are consistent with the nutritional scientists' definition.

According to Suitor & Crowley (1984: 91), food habits refer to foodways or food patterns and food behaviors, which tend to be stable. Foodways refers to ways in which a distinct group selects, prepares, consumes, and otherwise reacts to and uses portions of the available food supply, whereas food behavior denotes the same kinds of activities, when carried out by an individual. Some studies of health-promoting behavior defined it as a wellness approach behavior, similar to Pender (1996), but they studied overall health-promoting behavior, not specifying only the nutritional aspect (Sinthanayothin, 2000: 11; Suwonnaroop, 1999: 30). The nutritional dimension is composed of meal patterns and the right consumption choices (Sinthanayothin, 2000: 11).

Another definition of nutritional health-promoting behavior was stated differently from those presented before. First, it referred only to the action or the practice or activities or habits of eating behaviors that served to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual (Iemsawasdikul, 1998: 7; Kraiwong, 1993: 7; Nakaphongse, 1996: 9-10; Pongkeaw, 1997: 8; Purinthrapibal, 1998: 10-11; Tammatisthan, 2000: 8). According to this definition, nutritional health-promoting behavior is composed of the type and quantity of food intake, and the frequency of practice, including health-seeking behavior in

nutrition, food selection, food preparation, food consumption, meal pattern and food labeling. Second, it refers to the overall expression of eating, including actions, thoughts, and feelings or knowledge, attitude and practice (Kanthamit, 1995: 8; Limtrakul, 1995: 6-7). Finally, it refers to actions or practices concerning healthy eating behavior, similar to the first group. The researcher divided it into two major components, food pattern composed of meal pattern, food selection, food preparation, and food consumption, and food intake, composed of dietary consumption (focused on the accurate quantity of calories in each category of food intake). These components are assessed by a 24-hour recall, food frequency questionnaire, and semi-quantitative food frequency questionnaire (Kittichotpanich, 2001: 15).

For the purpose of lowering cholesterol by diet, the NCEP provides two categories of approaches, the Step-one and the Step-two diet, as previously mentioned.

The issues mentioned above are consistent with the Food Base Dietary Guideline for Thai (FBDG), which was first presented to the Thai people in about 1999. The FBDG is a specific and salient strategy of the National Food and Nutrition Plan, in the 9th Economic and Social Developmental Plan, to achieve the goal of a society with good nutrition (Damapongsa, 2000: 99-102). The FBDG is also relevant to the dietary guidelines for Americans or Food Guide Pyramid, a guide to daily food choices. According to the FBDG and the cardioprotective diet, the food intake recommended should be as follows (Damapongsa, 2000: 99-102; Wasling, 1999: 1244-1247):

1. Complex carbohydrates. These consist of rice, pasta, bread, potatoes and cereals, and 8-12 ladles per day should be consumed. These foods provide bulk, vitamins, and minerals, and form an important part of the diet. They are naturally very low in fat. However, the way they are cooked and the foods they are eaten with (e.g., bread with a thick layer of butter), can significantly increase their fat content. A wide variety of products should be encouraged, especially the less-refined foods, as these are good sources of dietary fiber, such as whole-meal bread and whole-wheat pasta.

2. Vegetables. Four to 6 ladles per day should be consumed. There is evidence that a daily intake of 400 gm of fruit and vegetables (equivalent to five portions) or more helps reduce the risk of developing heart disease (Wasling, 1999:

1244).

3. Fruits. Three to 5 servings per day should be consumed. One portion of fruit is equivalent to one apple, orange or banana, one slice of large fruit or two smaller fruits, such as plums. It does not matter whether the fruits or vegetables are fresh, frozen, tinned or dried. People are encouraged to think about how they might include fruit or vegetables in every meal.

4. Milk. One to 2 glasses per day should be consumed. Dairy foods are excellent sources of calcium, vitamins, and minerals. However, because they can be high in fat, consumption of reduced fat versions should be encouraged, for example, skimmed or semi-skimmed milk, low-fat yogurt and lower fat cheeses.

5. Meat, fish and nuts. Six to 12 spoonfuls per day should be consumed. Small amounts of lean meat or chicken/turkey without skin are recommended, but meat products that are high in fat and salt, such as sausages, burgers and pies, should be discouraged. Fish should be consumed in place of meat as the main meal at least twice a week, especially oily fish, such as sardines, trout, or mackerel whether fresh, frozen or tinned.

Good cooking methods for fish include poaching; grilling; baking; and eaten coated in bread crumbs oven-baked or grilled. In addition, nuts are good sources of protein, fiber, vitamins, minerals, and antioxidants. Most nuts are high in fat but the types of fat they contain are mostly MUFA and PUFA. In the Adventist Health Study, (Fraser, et al 1992: 1416-1424), nut consumption was consistently found to protect against the risk of coronary disease in a dose-response manner. Unsalted nuts are acceptable as a replacement for meat or fish, but calories and fat may add up if eaten as an extra in the form of a snack (Wasling, 1995: 1245). Eggs are a good source of protein. They also contain dietary cholesterol. One or two eggs eaten in place of meat or fish is acceptable as part of a varied diet.

6. Fat, oils and sugar. It is advisable to restrict the usage of all fats and oils. A reduced fat spread that is rich in MUFA or PUFA and low in saturates for spreading on bread is recommended. For baking, a margarine that is low in saturated and trans fats is recommended. For frying, one should opt for oil rich in MUFA. Many of the oils labeled simply as “vegetable oil” contain a large amount of rape-seed oil. Fruit or

a starch-based alternative should be consumed as snacks rather than fatty and sugary foods, including biscuits, chocolate, cakes, puddings, pies, and pastry items.

Healthy eating does not mean “perfect eating” but the emphasis is on plenty of fruit, vegetables and starchy foods, in line with Mediterranean dietary habits, rather than the high-fat foods currently eaten. In addition, every meal should comprise a variety of foods.

To be useful to the general public and hyperlipidemia patients, the Step-one diet, the cardioprotective diet, and some items of FBDG for Thai should be translated into foods and directions for quantities and portion sizes to consume. Therefore, nutritional health-promoting behavior for hyperlipidemic persons consist of four categories: 1) decreasing high-cholesterol diet, 2) decreasing high-fat diet, 3) decreasing high-triglyceride diet, and 4) increasing -calorie diet. These behaviors can be classified into five subcategories, as follows:

1. Low cholesterol diet control is a restriction on the consumption of both the types and amounts of high-cholesterol foods in the diet. This restriction will further lower serum LDL-cholesterol level. Cholesterol is commonly found in every type of meat and animal product, egg yolk, visceral organs, especially the liver, and some types of seafood, such as squid and oysters. Keeping the intake of foods containing egg yolks low, using low-fat or fat-free milk products, and decreasing meat fats can cut the current cholesterol intake by one-third to one-half. (Grundy in Shils, et al., Eds., 1999: 1205). Therefore, it is advisable not to consume seafood, except for fish, such as roe, squid, shellfish, as well as visceral organs, such as liver, heart, intestine, and stomach. Only egg white should be eaten and foods or desserts made of egg yolk, such as Khai look-Kheor, Bua loi Khai-whan, Ba-chang or Tau-sor should not be eaten. Although eggs are a major source of protein, are economical, easily cooked and eaten, egg yolk is very high in cholesterol.

2. Low-fat diet control is a restriction on the consumption of both the types and amounts of high-fat diet. This refers to cholesterol-raising fatty acids that consist of saturated fatty acids plus trans fatty acids. About two-thirds of saturated fatty acids in the American diet comes from animal fat. Sources of animal fat include milk fat and meat fat. Milk fat is more hypercholesterolemic than meat fat because of its higher content of cholesterol-raising fatty acids. Hyperlipidemic persons should drink

not more than 1 glass a day of reduced fat or fat-free milk. In meat, there is a substantial amount of invisible fat, especially pork, which has more fat than any other meat. Fish is the lowest source of animal fat, having about 25% saturated fatty acids (Rungpisuttipong, 1999: 82). Fish is the most appropriate for hyperlipidemic persons, because it contains good quality protein, is easily digested, and is low in fat. Eating fish instead of red meat regularly helps reduce a high-fat diet.

The remaining saturated fatty acids come from animal skin; sausages; milk products, such as butter, cream, ice cream, and cheese; and vegetable fats. Tropical oils, including palm oil, coconut oil, and palm kernel oil have a very high saturated fatty acid content. It was found that they contain 50-90% saturated fatty acids, but no cholesterol. Eating lean meat on a regular basis not only provides a sufficient source of protein, but also reduces fat accumulation in the blood vessels and the body as a whole (Working Group on Food Based Dietary Guidelines for Thai, 1998: 15). Because of differences in the cuts and methods of preparation, not all types of red meat are as high in fat as dark meat poultry with skin. In general, removing the skin decreases the amount of total fat in a serving of chicken or turkey by 50%.

The choice of one single, versus multiple strategies, results in varying levels of dietary fat. Combinations of more than one technique, such as substituting lean meats and cheeses for higher-fat ones plus using skim milk instead of whole milk, can result in lowering total fat from 37% to about 30% in calories of women. Using additional fat-reduction techniques, such as substituting fat-modified products for higher-fat ones, could decrease total fat to less than 20% of calories, and calories could be reduced by as much as 350. Thus, extensive use of multiple fat-reduction techniques can significantly reduce the total fat and saturated fat contents of the diet. The goal for the general population is to decrease dietary saturated fatty acids by at least one-third (Grundy in Shils, et al., Eds., 1999: 1204; Rossi, et al. in Jairath, Ed., 1999: 122).

The other component of cholesterol-raising fatty acids is trans fatty acids, which come from turning liquid oils into solids, known as hydrogenation. This method sometimes causes the chemical makeup of PUFA to change. Trans fatty acids raise LDL-cholesterol to about the same extent as saturated fatty acids, but unlike saturated fatty acids, they also lower HDL-cholesterol. The main sources of trans fatty

acids in the diet is margarine, which is often used in producing bakery goods and snack foods. They are also contained in ruminant meat fats, milk fats, and dairy fats.

To promote a low fat diet, biscuits, cakes, confectionery, pastry items and foods containing partially hydrogenated oils/fats should be eaten only occasionally (Grundy in Shils, et al., Eds., 1999: 1204-1205; Wasling, 1999: 1242). Thus, to reach the goal of lowering a high-fat diet, it is advisable not to consume foods containing animal skin and/or fatty meat, such as chicken skin, duck skin, pork belly, and medium fat beef. Foods eaten should be neither Thai fast foods with high fat, such as Khao man kai, Khao mok kai, Khao ka-moo, Khao moo-krob and Khao na pet nor Western fast foods, such as sandwiches, hot dogs, and hamburgers.

This approach also includes a restriction of cooking methods that produce hyperlipidemia, by using unsaturated fatty acids instead of saturated fatty acids. Unsaturated fatty acids have linoleic acid, which can decrease both serum cholesterol and triglyceride levels. There are two kinds of unsaturated fatty acids in the diet, including polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA). The PUFA consists of two types: n-6 PUFA and n-3 PUFA. When substituted for saturated fatty acids, n-6 PUFA reduces both LDL and HDL-cholesterol levels. Thus, diets should not provide more than 6.5% of energy as n-6 PUFA. The rich sources of n-6 PUFA are corn, safflower, sunflower, soybean, sesame, and cottonseed oil. The other one, n-3 PUFA, is found in fish and fish oil. Two important types of the n-3 PUFA are EPA (eicosapentaenoic) and DHA (docosahexaenoic), which are found in sea fish, such as tuna and salmon. The n-3 series of PUFA do not affect blood cholesterol significantly but they reduce plasma triglyceride by decreasing VLDL synthesis (Fair & Burke in Woods, et al., Eds., 1995: 742; Grodner, et al., 2000: 573; Wasling 1999: 1240-1242).

When substituted for saturated fatty acids, MUFA should be eaten, rather than PUFA. This is because MUFA reduces only LDL-cholesterol and not HDL-cholesterol, and there is no theoretical risk with high dietary intakes, as seen with PUFA. The rich sources of MUFA are olive, peanut, canola, rapeseed, and bran oils. A diet high in MUFA is enjoyed by Mediterranean countries, which traditionally have a very low incidence of coronary heart disease. This involves eating plenty of fruits, vegetables, pulses, nuts, cereal products, olive oil, fish, and only small amounts of

meat and dairy foods. The Mediterranean diet also does not contain the amounts of animal fat, margarine, cakes, sweets, biscuits, and manufactured foods that are characteristic of the British diet. A recent International Consensus Statement by the European Commission (Wasling, 1999: 1242) advocates the Mediterranean diet and a MUFA-rich oil because of its beneficial effects on health. Although oil, such as olive oil, canola oil, and soybean oil, produce a favorable lipoprotein pattern compared with saturated fatty acids, too much of these oils can provide excess calories (Grundy in Shils, et al., Eds., 1999: 1205). Eating not more than 5 teaspoons of oil per day is a recommendation for persons who receive 1,600 kcal/day (Working Group on Food Based Dietary Guidelines for Thais, 2001: 18).

It is advisable to consume foods cooked with vegetable oils, such as soybean, corn, and bran oils. Conversely, foods cooked with animal fat, such as chicken fat and lard, foods cooked with palm oil and/or coconut milk, and foods cooked with butter or margarine, such as cakes and cookies, should not be consumed. It is also advisable to control the amount of saturated fatty acids consumed strictly, by eating foods cooked by boiling, steaming, or grilling. These methods yield less fat than foods cooked by frying, such as fried chicken, Hoi Tord, and Pa-tong-ko.

3. Low triglyceride diet control is a restriction on the consumption of both the types and amounts of high triglyceride in the diet. There are many sources of a high triglyceride, including high-fat foods, sweetened foods, alcoholic beverages, sweet beverages, heavy sweet fruits, and high-starch foods. These foods increase the production of serum triglyceride levels and total calories. It has been found that Thai women, rather than men, prefer to eat snacks or desserts, as previously mentioned. Fatty and sugary foods are rich in triglyceride, so that fruits should be eaten instead of a daily intake of snacks with every cup of tea, and/or coffee, such as chocolate, cakes, and puddings.

It has also been found that most foods that are eaten on a daily basis, either as a main dish or dessert, contain sugar. Additional sugar is usually added to food cooked as a condiment instead of monosodium glutamate, in order to make the food more delicious. Thus, sugary foods in the diet should be limited. One should obtain no more than 10% of total food energy from sugar or should consume no more than 40-55 gm or 3 to 4 tablespoons per day (Working Group on Food Based Dietary

Guidelines for Thai, 2001: 48). For this reason, the long-term eating of sugary foods induces an increase in serum triglyceride levels.

The other appropriate eating behaviors, to achieve the goal of restricting high-triglyceride in the diet, include not drinking alcoholic beverages, such as alcoholic spirits, beer, and wine because they stimulate the production of triglyceride. Sweet beverages, such as carbonated beverages, sweet drinks or iced coffee should also not be consumed. Eating very sweet desserts, such as chocolate, banana in syrup, Thong-yip, Thong-yodd should be avoided, while consumption of high-starch foods, such as bread, potatoes, rice, and pasta should be limited. Fruits eaten should be non-sweet fruits, such as guava, orange, or Malay-apple, instead of heavy sweet fruits, such as durian, jackfruit, sapodilla, longan, and rambutan. Maintaining a moderate intake of vegetable oils will help to sustain a relatively low level of triglycerides and a high level of HDL-cholesterol (Grundy in Shils, et al., Eds., 1999: 1205).

4. Low-sugar diet control is a restriction on the consumption of both the types and amounts of high sugar in the diet. The sources of high sugar foods include soft drinks, desserts, toffee, jelly, candies, heavy sweet fruits, syrup and sugar added to tea, coffee, as well as other beverages. It has been found that sweetened condensed milk has more sugar than cakes, ice cream, or carbonated beverages (Samittasiri, et al., 39-40, 48). These foods increase the production of serum triglyceride as well as excessive amounts of energy. It is advisable to drink sugar-free drinks instead of sweet beverages, such as carbonated beverages, sweet drinks, or iced coffee. If people find cutting out sugar difficult, it can be substituted by choosing squashes or fizzy drinks which are appropriate to the diet versions or the “no added sugar” versions (Wasling, 1999: 1247).

The other appropriate eating behaviors to achieve the goal of restricting high-sugar foods, include avoidance very sweet desserts, such as chocolate, banana in syrup, Thong-yip, Thong-yodd, and avoidance of heavy sweet fruits, such as durian, jackfruit, or rambutan. These foods can be substituted by non-sweet fruits, including guavas, oranges, Malay-apples.

5. High-fiber diet practice is an emphasis on consuming large amounts of fiber. The chemical definition of dietary fiber is non-starch polysaccharide or NSP. There are two types of NSP: insoluble and soluble. Both play a part in healthy eating,

although only soluble NSP has a role in decreasing hyperlipidemia. Soluble NSP can help lower LDL-cholesterol and blood glucose (Wasling, 1999: 1242). The sources of high fiber foods are vegetables, fruits, and cereals, such as unpolished rice, whole wheat, and oats. Fiber in these foods, especially soluble fiber, not only prevents the absorption of cholesterol, but also eliminates it from the body, leading to a decrease in serum cholesterol levels.

Vegetables often contain insoluble fiber, whereas fruits have both insoluble and soluble fiber. Vegetables and fruits are generally low in calories. Consequently, eating a wide variety of vegetables and fruits on a regular basis is one way to reduce the risk of obesity and coronary heart disease. Recent research also shows that beta-carotene and vitamin C in vegetables and fruits can prevent fat from depositing in the blood vessels. Some fruits and colored vegetables are rich sources of beta-carotene, including papaya, ripe mango, carrot, pumpkin, etc. Rich sources of vitamin C are green-leafy vegetables and fresh fruits, such as guava, green mango, rose apple, banana, pineapple, and orange.

Hyperlipidemic persons should avoid eating some fruits that are very sweet and high in sugar content, such as durian, jackfruit, sapodilla, longan and rambutan (Working Group on Food Based Dietary Guidelines for Thais, 1998: 11-12). It is also advisable to eat at least 4 ladles of whole vegetables each day. Non-sweet fruits, such as guava, orange, and Malay-apple should be eaten regularly, especially after meals or as a snack. It does not matter whether the fruit or vegetable is fresh, frozen, tinned, or dried. The appropriate amount of these fruits is 3 to 5 portions per day. One portion of fruit is equivalent to one apple, orange, banana, or one slice of large fruit, which consists of 6-8 small pieces.

To understand factors related to nutritional health-promoting behavior in hyperlipidemic women, a holistic approach is required, to identify and describe factors influencing these behaviors. Eating behaviors are sophisticated and result from the linkage of several perspectives. They can be classified into two major views: a scientific view and a social view. The scientific view focuses on nutrition, which involves the nutrients, and decreasing a high-cholesterol, high-fat, high-triglyceride, and high-calorie diet.

The social view focuses on behaviors related to food consumption. This view maintains that individuals' actions are associated with their contexts, which consist of social and cultural aspects. The social aspect involves the group of persons with whom the individual has associated to take action. The cultural aspect involves the modeling of actions that the group of persons has identified for the action of the members. Thus, individuals' actions are dependent on, and associated with, those of others, and are done as the groups determine (Srilaong, 1999: 26). According to the sociocultural view, food consumption refers to cultural food habits composed of knowledge, beliefs, values, rules, equipment, and procedures (Saihu, 1984:13-22). Food consumption is something indicating companionship, feelings of warmth, security, confidence, and harmony of the family and social members (Foster & Anderson, 1978: 268-269). This leads to the classification of foods into four types: cultural super-foods, prestige foods or status foods, body image foods, and physiological group foods (Yoddamnerm, 1985: 73-75).

The psychological aspect is another of the social views, which consists of the motivation and attitude to food consumption. It involves the individual's affect. Hongwiwat (1985: 92) reported that an individual's food selection involves both sociocultural and psychological factors. These factors are combined to form important determinants of nutritional health-promoting behavior. Thus, it is necessary to integrate these two perspectives in order to explain nutritional health-promoting behavior. One perspective alone cannot completely explain these behaviors.

Glanz & Mullis (1988: 395-397) reported that many social, cultural, economic, environmental, physiological and psychological factors contribute to the development, maintenance, and change of dietary patterns. No single factor or set of factors has been found to adequately account for why people eat as they do. Similarly, Suitor & Crowley (1984: 96) reported that food behavior and food habits are influenced by many factors, including physiological factors, such as the state of physical development, state of health; psychological factors, such as body image, coping mechanisms; sociocultural factors, such as traditions, food ideology, superstitions, religion; and environmental factors, such as food supply, cost of food, facilities for preparing and storing food, time available for food preparation, media.

These factors influence individual food preferences and at length lead to food behavior.

Moreover, these perspectives are consistent with Pender's view (1996: 214-219), which stated that eating behaviors are an integral part of an individual and family lifestyle. Thus, a wide variety of factors influence overt eating behavior. These factors can be classified as follows:

1. Genetic- biologic factors. It is found that several new peptides have been identified that play a role in regulation energy expenditure, appetite, and metabolic factors. The recent discovery found that gene may influence to overeating in obese person and taste preference. Biological changes, such as the aging process, have a marked effect on eating behavior. A progressive loss of taste buds results in decreased sensitivity to sweet and salty tastes. Consequently, most elderly are more likely to consume a highly sweet diet, such as desserts and sweet fruits (Kraiwong, 1996: 82), which places them at greater risk of obesity and diabetes mellitus, which may lead to hyperlipidemia. A decrease in basal metabolic rate with aging has also been associated with a decrease in caloric intake.

2. Psychological factors. Evidence shows that increased knowledge of proper nutrition by itself does not necessarily improve eating habits. Thus, motivation and other psychological factors must be addressed among persons of all ages if healthy nutritional practices are to become a reality for a larger portion of the population. For example, perceiving many benefits from good dietary practices encourages individuals to select foods that are high in fiber, and low in sodium and food additives. In addition, a positive self-concept creates a psychological climate that encourages persons of all ages to take care of themselves and watch what they eat, because they place a high value on their own health and wellbeing.

3. Socio-cultural factors. Family food preparation and eating behaviors influence the dietary habits of family members. For example, false beliefs may contribute to an unhealthy diet, such as using whole milk instead of skim milk for the person with hyperlipidemia. Other factors affecting eating behavior include socioeconomic status, and ethnic and cultural backgrounds.

4. Environmental factors. These can have positive or negative effects on eating behaviors, especially food selection. For example, food labeling - improved

labeling can assist individuals and the family to make healthier food choices. Learning by active decision-making about food selection is one way to increase nutrition awareness among youth. The other is convenience food, which constitutes 60% of the American diet. Unfortunately, such foods are frequently high in fat, salt, and refined carbohydrates and low in dietary fiber and important nutrients. In addition, vending machines often sell only foods high in fats and highly refined sugars. Other factors affecting healthy eating behavior include eating out, seasonal variations, ease of preparation, attractiveness of prepared foods, and food additives.

In conclusion, nutritional health-promoting behavior are influenced by multifactorial factors, including physiological, psychological, sociocultural, and environmental factors. A holistic approach is required to explain factors related to these behaviors. This leads to the provision of guidelines for dietary modification as a treatment for hyperlipidemia in women.

Food Consumption Behaviors of the Southern Thais

As mentioned above, environmental and sociocultural factors, including beliefs, local traditions and cultural backgrounds, and religion, strongly influence food consumption behaviors, which are a reflection of human lifestyles. In each society, food consumption behaviors may be different or appear to be different. The southern part of Thailand is bounded by the east and west coasts, so that it is abundant with seafood, such as shellfish, squid, fish, etc. Seafood, other than fish, is high in cholesterol. Many studies have found that the southern Thais often consume seafood (Chaichana, 1997: 7; Kraiwong, 1993: 99; Naka, 1999: 165-168). For example, Kraiwong (1996: 99) reported that most of the elderly in Songkhla Province ate seafood 6 to 7 days per week. Similarly, the pilot study of the researcher in 22 cases of southern Thai women with hyperlipidemia found that the precedence of seafood consumed by the subjects was crab (91%), shrimp (77%), cockles (73%) and squid (68%)

Southern Thais can be classified into three groups depending on their race and religion: 1) Thai-Chinese, 2) Thai-Buddhist, and 3) Thai-Muslim. The southern Thais thus consume a mixture of Chinese food, Thai food and Muslim food. For Chinese food, it was found that the Thai-Chinese group liked to consume a high-fat

diet and most cooked food by means of stir-frying or frying, in which a lot of oil was used. Many years ago, people used to simmer glossy white pork to produce lard for cooking and to produce fried pork skin for eating as a seasoning, or for use in vegetable stews and/or stir-frying vegetables rather than pork or chicken. Currently, lard is still used in restaurants and homes because fresh lard has a pleasant smell and increases appetite (Tammastithan, 2000: 20). Kraiwong (1996: 99) reported that most of the elderly consumed pork 3 to 5 days per week in the forms of Khao ka-moo (rice with pork leg and gravy), pork belly foods, and Tom moo palo (pork boiled in 5-spices). They cooked their food by stir-frying or frying 3 to 5 days per week and consumed food cooked with coconut or palm oil and/or lard 6 to 7 days per week. In addition, the study of Chaichana (1997: 7) found that most of the subjects (16.67%) liked to eat pork with medium fat and pork leg. Nearly half of them (42.86%) often used palm oil, lard and coconut milk for cooking. More than half of the subjects (35.71%) drank tea, coffee and Ovaltine with sweetened condensed milk for breakfast with Kanom-crok (coconut custard cakes), Kanom khao-niao (sweet glutinous rice with egg/coconut/shrimp topping), and 4 to 10 pieces of Pa-tong-ko (deep-fried Chinese donut) every day.

The Thai-Muslims' eating behaviors are greatly affected by their religious beliefs. The most important rules are not to eat pork or drink alcohol or soft drinks. In Muslim society, it was found that Thai-Muslims consumed a high fat diet more than Thai-Buddhists, and consumed vegetables and fruits less than Thai-Buddhists. Most food was cooked with coconut oil and animal fat. Thai-Muslims liked to eat Khao mok kai (chicken cooked in curry powder and rice), Khao man kai (rice cooked in chicken broth and topped with steamed chicken meat with fat), and fried sweets made with eggs. Moreover, the cooking method of the Thai-Muslims consisted of frying or dipping their food in flour and then frying. Thai-Muslim desserts are mainly made with coconut milk, eggs and flour (Pratoomsil, et al., 1986: 125; Sang-Gassanee, 2000: 12-17). Therefore, the kind of food and the process of cooking can affect healthy eating behaviors, and may increase serum cholesterol and triglyceride levels.

Thai-Buddhists eat polished rice as the main dish and the dishes that accompany the rice are often rich in flavor, with spicy, sour or salty tastes. Famous southern foods include Kaeng tai plaa (fish jungle curry), Kaeng som (sour soup), and

Budu (fermented salted sardines)(Kraiwong (1993: 99). Naka (1999: 165-168) also reported that most of the elderly in a Thai village in southern Thailand liked to eat beef in coconut curry, Kaeng som plaa, fried fish, Budu, and Nam prik (hot fermented shrimp paste with vegetables). In addition, the southern Thais use coconut milk to make other curries, such as pork chicken/shrimp/fish curries. The southern Thai foods known for high in cholesterol are Kaeng prik of small fish and (duck) egg curry, while the other ones with high fat and saturated fatty acid are beef masaman curry and chicken curry with banana stem(Thai Rath,2002: 7).

Moreover, it was found that the southern Thais consumed more fish (Pratoomsil, et al.,1986: 126). Chaichana (1997:7) also reported that most of the subjects with hypercholesterolemia consumed protein from pork, chicken, visceral organ and seafood. The majority of the subjects also preferred to eat vegetables more than fruits and preferred sweet fruits over non-sweet fruits. Similarly, the pilot study of the researcher with 22 cases of southern Thai women with hyperlipidemia found that the sweet fruits most consumed were rambutan (96%), grapes (86%), and jackfruit (82%).

However, the basic southern Thai foods are Kanom jeen (noodles) and polished rice, eaten as main dishes (Pratoomsil, et al., 1986: 125). The lipid quantities and the composition of Thai food per serving have shown in table 2.1 and table 2.2 (Pradipasen,1996: 108-110; Tungkanakul, et al.,1994: 190-200).

Table 2.1 Lipid quantities of Thai foods (Pradipasen, 1996: 108-110)

Food item	Equivalent food	Quantity	Lipid quantity (gram)
- Hoy Tord	- fried mussel with egg and mung bean sprout	1 dish	40
- Khao ka-moo	- rice with pork leg and gravy	1 dish	40
- Kuay-teaw pad-thai	- stir-fried rice noodles mixed with egg	1 dish	35
- Khao mok kai	- rice cooked with curry powder and chicken	1 dish	25
Khao rad kai pad bai ka-phrao	- rice stir-fried with chicken and holy basil leaves	1 dish	25
- Khao klook kapi	- rice mixed with shrimp paste, sweet pork, and shredded omelet	1 dish	25
- Yen-ta-fo	- rice noodles with fish ball, swamp cabbage, red sauce and soup	1 dish	15
- Khao tom moo/kai/plaa	- rice porridge with pork/chicken/fish	1 dish	10
- Thai omelet	- fried egg	1 egg	25
- Fried pork/fish	- fried pork/fish	1 piece	15
- Coconut curry	- curry of stir-fried meat mixed with coconut cream	1 dish	12
- Steamed egg	- steamed egg	1 egg	10
- Tod man plaa	- fried minced fish, snake bean and seasoned curry	1 piece	5

Table 2.1 Lipid quantities of Thai foods (Pradipasen, 1996: 108-110) (continued)

Food item	Equivalent food	Quantity	Lipid quantity (gram)
- Kanom-khao-niao	- sweet glutinous rice with egg/coconut/shrimp topping	1 piece	5
- Pa-tong-ko (Chinese doughnut)	- fried minced canap	1 piece	8
- Gluay buad-che	- Banana in coconut milk	1 small cup	5

Table 2.2 Approximate composition of Thai foods per serving (Tungkanakul, et al., 1994: 190-200)

Food item	Weight (gram)	Energy (kcal)	Fat (gram)	Cholesterol (mg)
- Khao man kai (chicken with rice cooked in chicken broth)	307.44	607.22	31.70	37.26
- Khao moo-daeng (fresh ham on rice)	319.60	486.78	12.88	40.62
- Khao moo-tord (rice with pork)	337.39	468.33	9.34	43.22
- Khao rad kaeng kheaw wahn kai (chicken green curry on rice)	348.22	451.05	10.20	42.55
- Kuay-teaw pet (rice noodles with duck)	413.23	370.05	21.28	54.22
- Guay-jab (wide rice noodles with pork, intestine, heart)	467.04	362.56	13.78	151.69
- Bamii look-chin plaa si moo (wheat noodles with fish ball, pork)	430.14	312.80	10.50	47.23

Table 2.2 Approximate composition of Thai foods per serving (Tungkanakul, *et al.*, 1994: 190-200) (continued)

Food item	Weight (gram)	Energy (kcal)	Fat (gram)	Cholesterol (mg)
- Kuay-teaw sen yai look-chin plaa (wide rice noodles with fish ball, swamp cabbage)	439.72	296.05	11.56	55.32
- Bamii look-chin neua wua (Beef ball noodles)	401.40	266.05	5.14	29.98
- Kanom jeen nam-yaa (fermented rice noodles with curried fish sauce)	311.08	226.84	6.72	14.50

For the southern Thais consuming Thai fast food, the findings of Tungkanakul, et al. (1994: 190-200), was found that Khao man kai was the highest in calories (607.22 kcal); the second highest was Khao moo-daeng (486.78 kcal) and the third Khao moo-tord (468.33 kcal). The reason Khao man kai had the highest energy was that chicken fat is added in the process of cooking the rice. For the high-fat group, Kuay-teaw pet had the highest energy from fat (51.76%), the second highest was Khao man kai (46.98%) and the third was Kuay-teaw sen yai look chin plaa (35.07%). For the high-cholesterol group, Guay-jab had the highest cholesterol (151.69 mg) because the dish consists of a variety of pork viscera, which are high in cholesterol. The second highest in cholesterol was Kuay-teaw sen yai look chin plaa (55.32 mg) and the third was Kuay-teaw pet (54.22 mg). Kanom jeen nam-yaa (noodles with mild fish curry) was the Thai fast food with the lowest energy from protein, fat and cholesterol (Table 2.2).

However, when considering the calorie distribution, it was found that the energy from fat of most Thai foods comprises not more than 30% of total energy, except for Kuay-teaw pet, Khao man kai, Kuay-teaw sen yai look chin plaa, and Guay-jab (34.21%). Energy which was distributed from protein ranged from 14.16% (Khao man kai) to 26.21% (Khao rad kaeng kheaw wahn kai) and the average was 21.08%. Finally, Energy which was distributed from carbohydrate ranged from

27.87% (Kuay-teaw pet) to 63.66% (Khao moo-tord)(Piboonniyom & Puwastien, 2000: 74).

Table 2.3 Approximate composition of franchised fast food per serving (Tungkanakul, et al., 1994: 190-200).

Food items	Weight (gram)	Energy (kcal)	Fat (gram)	Cholesterol (mg)
Pizza	231.96	594.22	24.24 (36.71%)	67.57
Hamburger (Big Mac)	211.78	579.60	35.71(55.45%)	83.74
Sandwich (chicken)	159.66	484.30	26.71 (49.64%)	80.14
Fried chicken (breast)	106.87	302.37	17.44 (51.91%)	91.97
Doughnut	61.67	242.68	9.64 (35.75%)	50.47
Grilled chicken (breast)	87.07	143.12	5.56 (34.96%)	84.27

* Percentage (%) is energy from fat calculated from total energy.

For the southern Thais consuming western fast food, the study of Tungkanakul, et al. (1994: 190-200) found that pizza had the highest energy (594.22 kcal) because it is composed of ingredients high in cholesterol and saturated fatty acids, such as Italian sausage, bacon, minced meat and pork, shrimp, squid and mussel. Hamburger had the second highest energy content (579.60 kcal) but it had higher energy from fat than pizza (55.45%) because it is composed of minced fatty meat and mixed with bacon, which is high in both protein and fat. The third highest energy content was the sandwich (484.30 kcal), which had less protein and fat than hamburger and pizza. However, the chicken sandwich had more cholesterol than the average of hamburger and pizza, because it is composed of minced chicken skin mixed with meat, bread and butter, and condensed salad cream (Table 2.3).

Fried and grilled chicken were high in cholesterol, but grilled chicken had less fat and cholesterol than fried chicken. Doughnuts had the second lowest energy content (242.68 kcal), but a higher cholesterol content than pizza and hamburger, at 100 gram. This is a result of the composition of the doughnut, which is made of high carbohydrate, such as flour, eggs, fresh butter, and fresh milk. Therefore, it was found that western fast foods had higher fat (43.87%) and higher protein (24.28%) than

Thai foods, except for the doughnut, which had only 5.74% protein energy (Piboonniyom & Puwastein, 2000: 72-74).

In addition, southern Thai foods include many kinds of high-cholesterol foods, as shown in table 2.4

Table 2.4 Cholesterol quantities in Thai foods (Goanantakoon, 2001: 16-20; Tonphaichitr, 1987: 17).

Type of food (100 gram)	Cholesterol (mg)	Type of food (100 gram)	Cholesterol (mg)
- Chicken liver	336	- Duck meat and skin	76
- Pork liver	364	- Shrimp meat	150
- Beef liver	218	- Oyster	231
- Chicken heart	157	- Cockle	195
- Chicken gizzard	197	- Mussel	148
- Pork pancreas	283	- Crab meat	101
- Beef stomach	712	- Squid	286
- Chicken breast	63	- Mackerel	76
- Chicken meat and skin	70	- Egg	214
- Chicken skin	93	- Egg yolk	1250
- Lean pork	49	- Roe	>300
- Pork leg	66	- Butter	250
- Pork skin	34	- Cheese	90-113
- Lard	89	- Milk	14
- Sausage	71	- Ice-cream (fat 10%)	40
- Lean beef	55		

In summary, the relationship between the food consumption behaviors and hyperlipidemia of the southern Thais is due to the many kinds of foods consumed that consist of high fat, high cholesterol and/or high triglyceride, which increase serum cholesterol and triglyceride levels.

Dietary Assessment

The aims of dietary assessment are to determine the received nutrients and food patterns of individuals, groups of persons and the population of the country, in order to provide the adjustment of appropriate or inappropriate dietary intakes leading to diet-related chronic diseases, especially coronary disease. There are many types of dietary assessment methods and none is perfect. In addition, each method has both strengths and limitations or weaknesses. However, the choice of the most appropriate dietary assessment tool depends on the objective of the research, which may involve many factors. Questions that must be answered in evaluating which dietary assessment tool is most appropriate for a particular research study include: Is information needed about foods, nutrients, other food constituents, or specific dietary behaviors? Is the average intake of a group or the intake of each individual needed?; Is absolute or relative intake needed?; What level of accuracy is needed?; What time period is of interest? and, What are the research constraints in terms of money, time, staff and respondent characteristics? (Thompson & Byers, 1994: 2250s-2251s). However, the main dietary assessment methods can be classified according to the following categories (Bubpha, 1997; Thompson & Byers, 1994: 2245s-2250s).

1. Current or prospective dietary assessment method

This is a prompt daily dietary record of all foods and beverages eaten, including type, composition, and portion size over a period of days. This can be classified into two subcategories.

1.1 Estimated Food Record or Diet Diary. The respondent records the foods and beverages and the amounts of each consumed over a period of days. Quantities are estimated in household measures (such as cups, tablespoons), or estimated using models, pictures, or no particular aid. Typically, no more than 3 or 4 consecutive days are included. The respondent must be trained in the level of detail needed to describe adequately the foods, amounts consumed, including the name of the food (brand name, if possible), preparation methods, recipes and portion sizes. Nutrient intakes are calculated using food composition data. This method is used to assess actual or usual intakes of individuals. Data are used for diet counseling and statistical analysis involving correlation and regression for nutritional research.

The strengths of this method are providing more accurate portion sizes of food eaten previously, including providing quantitatively accurate information on food consumed during the recording period, decreasing the problem of omission, and more fully describing of food eaten.

The limitations of this method include requiring the literate respondent, increasing incomplete records, resulting from fatigue of more days of records, lacking of necessary data resulting from records only once per day, providing a bias resulting from recording foods as they are eaten can affect both the types and quantities of food eaten, and taking longer time frames resulting in a higher burden and lower co-operation.

1.2 Weighing Food Record. All food consumed over a defined period is weighed by the subject, care-taker, or assistant. Food samples may be saved individually, or as a composite, for nutrient analysis. Alternatively, nutrient intakes are calculated from food composition data. This method is used to assess actual or usual intakes of individuals, depending on the number of measurement days.

The strength of this method is to provide the most accurate food consumed. The limitations include time consuming; requiring literate, motivated, and willing participants, being expensive, and providing a bias resulting from changing their usual eating pattern to simplify weighing.

2. Retrospective dietary assessment method

This is a dietary recall of the food patterns for all foods and beverages eaten in the past, by means of interview or using a questionnaire. This can be classified into four subcategories.

2.1 Diet History. The interview method consists of a 24-hour recall of actual intake, plus information on overall usual eating pattern, followed by a food frequency questionnaire to verify and clarify initial data. Usual portion sizes are recorded in household measures. Nutrient intakes are calculated using food composition data. It is used to describe usual food and/or nutrient intakes over a relatively long time period, which can be used to estimate prevalence of inadequate intakes. Such information is used for national food policy development, food fortification planning, and to identify food patterns associated with inadequate intakes.

The strengths of this method include providing usual meal patterns and detail of food intake for a long time rather than intakes for a short time and appropriately using for illiterate respondent. The limitations include time consuming, depending on the respondents' memory and the skill of the interviewer, and inappropriately using for unusual meal pattern or seasonal food intake.

2.2 24-hour Dietary Recall. The subject or care-taker recalls food intake in the previous 24 hr in an interview. Quantities are estimated in household measures using food models as memory aids and/or to assist in quantifying portion sizes. Nutrient intakes are calculated using food composition data.

The strengths of this record include assessing average usual intakes of a large population; using for international comparisons of relationship of nutrient intakes to health and susceptibility to chronic disease; being inexpensive, easy, quick, and low burden; and using with illiterate individuals.

The limitations include the results depending on the memory of the respondent and the skill of the interviewer, increasing the problem of omission resulting from single 24- hour recalls or foods consumed infrequently, and requiring a large coverage of respondents to identify the quantities of food eaten.

2.3 Food Frequency Questionnaire (FFQ). This uses a comprehensive list of specific food items to record intakes over a given period (day, week, month, year). A record is obtained by interview, or self-administered questionnaire.

The strengths of this record include providing the easy, rapid, low respondent burden and high response rate; being less expensive and using well with large populations; and decreasing a bias of response. It is also used to identify the specific food, especially diet related disease such as coronary disease, hypertension, diabetes mellitus, etc.

The limitations include providing more crude data compared with the other method, being impossible to identify the quantities of the entire food eaten because the list is partially of food consumed and inappropriately using with a large number of respondents who have different eating patterns. The pressure on the respondent also increases according to the larger number of food items

2.4 Semi-quantitative Food Frequency Questionnaire (SFFG).

Food Frequency Questionnaire can be semi-quantitative when subjects are asked to quantify usual portion sizes of food items, with or without the use of food models. This method is designed to obtain qualitative, descriptive data on usual intakes of foods or classes of foods over a long period. It is useful in epidemiological studies for ranking subjects into broad categories of low, medium, and high intakes of specific foods, food components or nutrients, for comparison with the prevalence and/or mortality statistic of specific disease. It can also identify food patterns associated with inadequate intake of specific nutrients.

The strengths of this method include being less expensive, less time consuming, and low respondent burden; using to identify the specific food, especially diet related disease; and identifying the risky persons. The limitations include providing less detailed data, inappropriately using with the respondent who have a variety of eating patterns, and being impossible to measure a short time of change in eating pattern.

Variables in the Behavior-Specific Cognitions and Affect Category

In the Health Promotion Model, the variables within this category are the primary motivational mechanisms for the acquisition and maintenance of health-promoting behaviors (Pender, 1987: 60). Therefore, these variables are a critical core for guiding nursing intervention.

Perceived self-efficacy

According to Bandura's social cognitive theory, human agency is situated in the reciprocal determinism model, where personal attributes, behaviors, and environmental factors act as interacting determinants of each other, as shown in Figure 2.1 (Puttapitukpol, 2001: 39).

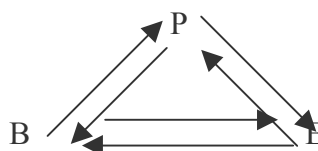


Figure 2.1 Schematization of relations among the three classes of determinants: triadic reciprocal determinism (B = behavior, P = cognitive and other personal factors, E = environment) (Bandura, 1997: 6).

Self-efficacy, as defined by Bandura (1997: 21), is one's subjective judgment of one's personal capacity to organize and execute a particular course of action. It is concerned not with the skills one actually has, but with judgments of what one can do with whatever skills one possesses. Perceived self-efficacy is a judgment of one's ability to accomplish a certain level of performance, whereas an outcome expectation is a judgment of the likely consequence (e.g., benefits, costs) such behavior will produce, as shown in Figure 2.2

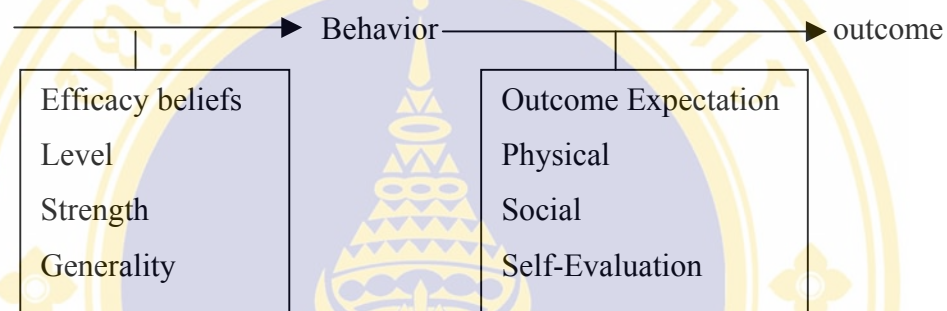


Figure 2.2 Distinction of the concepts of Efficacy Belief and Outcome Expectation (Bandura, 1997: 22)

Self-efficacy judgements are specific to behaviors and the situations in which they occur. People are not self-efficacious in general, rather that sense of efficacy is tied to particular domains of functioning. Perceived self-efficacy consists of three dimensions: level, strength, and generality, as follows (Bandura, 1997: 42-43; Maibach & Murphy, 1995: 37-50):

1. Level or magnitude reflects perceived capability as measured against task demands at various level of challenge to successful performance. It is established by assessing self-efficacy for increasingly difficult behavioral enactment and/or under conditions of increasingly severe impediments to performance.

2. Strength refers to the judgment certainty one has of one's ability to perform a specific task. Strength of perceived self-efficacy is not necessarily related to choice behavior in a linear fashion. A threshold of efficacy strength may be required even to attempt a course of action; efficacy strength in excess of this threshold should have a linear relationship with success of the behavioral attempts (Bandura, 1977). The stronger the sense of personal efficacy, however, the greater the

perseverance and the higher the likelihood that the chosen activity will be performed successfully (Bandura, 1997: 43).

3. Generality refers to the degree to which efficacy beliefs are positively related, either within a behavioral domain, across behavioral domains or across time. However, the generality dimensions require different methods of assessment. Bandura (1997: 43) stated that generality can vary on a number of different dimensions, including the degree of similarity of activities, the modalities in which capabilities are expressed (behavioral, cognitive, affective), qualitative features of situations, and the characteristics of the persons toward whom the behavior is directed. These are needed to reveal the pattern and degree of generality of people's beliefs in their efficacy. All those constituting the generality have not received adequate attention in health promotion research. Most efficacy instruments often measure only the level and strength dimensions (Maibach & Murphy, 1995: 45).

Perceived self-efficacy influences health-promoting behavior by three basic processes of personal change: the adoption of new behavior patterns, generalized use under different circumstances, and maintenance over time (Bandura, 1997: 279). An analysis of the studies reported that perceived self-efficacy is the strongest cognitive factor and that is a most powerful variable in explaining health-promoting behavior in the Pender's Health Promotion Model (Pender, 1987, 1996). Pender (1996: 70) also stated that perceived self-efficacy motivates health-promoting behavior directly by efficacy expectations, and indirectly by affecting perceived barriers and commitment or persistence in pursuing a plan of action.

Perceived self-efficacy is proposed as influencing perceived barriers to action by higher efficacy, resulting in lowered perception of barriers to the performance of the target behavior. Individuals who have a strong belief in their capabilities will approach the difficulties of health-promoting behavior as challenges to be mastered, not to be avoided.

Several studies indicate that perceived self-efficacy is an important factor positively influencing both for specific and overall health-promoting behaviors for various groups of women, such as middle aged women with hypertension, low income pregnant women, pregnant industrial workers, and pregnant adolescents, respectively

(Kairoj, 1999: 43; Kittichotpanich, 2001: 169; Patanavanichnun, 2000: 96-97; Puttapitukpol, 2001: 103-104).

From the nutrition perspective, the evidence showed that myocardial infarction patients with a low level of perceived self-efficacy did not possess appropriate nutritional self-care behaviors (Charoenwongvivat, 1995). However, there have been few studies of perceived self-efficacy in health-promoting behaviors, and need more empirical support. It was also found that there have been no studies in women with hyperlipidemia. This study, therefore, complies with the concepts of Pender (1996) and Bandura (1997), because both are supported by more empirical studies.

Social support

Social support is one of the essential components in the interpersonal influence factor of Pender's Health Promotion Model (1996). Interpersonal influences include norms (expectations of significant others), social support (instrumental and emotional encouragement), and modeling (vicarious learning through observing others engaged in a particular behavior). These three components have been shown to affect an individual's predisposition to engage in health-promoting behaviors in a number of health-related studies. For this reason, individuals vary in the extent to which they are sensitive to the wishes, examples, and praise of others. Thus, given sufficient motivation, individuals are likely to undertake behaviors for which they will be admired, socially reinforced and which will cause them to be assimilated with others or not alienated (Pender, 1996: 71).

The concept of social support emerged, seemingly out of nowhere, during the 1970s and has been studied by various disciplines, such as anthropology, epidemiology, psychology, and other biomedical, behavioral and social sciences. The predominant interest derived from the social-psychological field and was introduced into the scientific community only 20 years ago by Caplan (1974), Cassel, (1976), and Cobb (1976). The interesting point in the concept of social support began in the mid-1970s with the publication of a review article by Cassel (1975), and Cobb (1976) which described the harmful effects of social isolation or low social integration on health outcome (Norbeck, 1981: 86). Since then, social support has assumed a primary and integral role in the literature on health behavior, such as the social

context of health, illness, and mortality, and more recently, it has become integrated into the literature on compliance and caregiver burden (Hupcey, 1998: 304). In addition, social support serves as a major psychosocial variable in health-related research (Cassel, 1976; Cobb 1976). Several studies have found that social support plays an important role in protecting health, preventing hazard behaviors or changing unhealthy behaviors, such as reducing smoking and alcohol consumption, as well as promoting healthy behaviors, such as improving diet or exercise patterns (Cohen & Syme, 1985: 6; Pender, 1996: 266). As a concept, social support has been defined and measured differently in studies that have investigated the effect of social support on health outcome or wellbeing. Although there are areas of agreement regarding definitional aspects of social support, no single definition is completely agreed. However, the vast literature on social support can be organized and summarized into four major definitional categories (Dimond & Jones, 1983: 235-238).

First, support is defined as relational provisions. Weiss(1974:17-26) conceptualized social support as relational provisions combining six dimensions of social support: 1) attachment or intimacy, which provides people with a sense of security and place. A lack of attachment results in emotional isolation and loneliness; 2) social integration, which provides people with opportunities to share concerns and exchange services. The absence of social integration may result in social isolation; 3) opportunity for nurturance, which provides for people taking responsibility for each other, such as a child, and consequently they will have a sense of being needed. Lack of this type of relationship may give rise to a sense of meaninglessness in life; 4) reassurance of worth, which provides people with a sense of being valued as individuals and in social roles. Lack of reassurance of worth may result in a low regard for oneself and a sense of uselessness; 5) sense of reliable alliance, which assures people that they can rely on continuing assistance from others, especially kin relations, regardless of reciprocity of affection or support. A sense of vulnerability and abandonment may result if this relationship is missing; and 6) obtaining guidance, which provides emotional and information support. The absence of this kind of relationship may result in hopelessness. However, this list omits material aid and services. Subsequently, Brandt & Weinert (1981: 277-280) conceptualized the definition of social support according to Weiss (1974), into five dimensions: intimacy,

social integration, nurturance, worth and assistance, including informational, emotional, and material help. In addition, nurturance has more emphasis on giving than receiving support.

In this view, nurturance allows people to give, and receive substantial mutual support, reflecting a reciprocal process of social support. However, Tilden (1985: 201) argued that the category of nurturance that Weiss (1974) proposed was specified as the care-taking of a child. Therefore, this would be true in the case of young parents but not necessarily of others, such as those in late adulthood caring for an aged parent. The category of alliance with bloodline kin may also be situation-related. In addition, factor analysis of the Personal Resources Questionnaire (PRQ, part 2) revealed three factors: Intimacy/Assistance, Integration/Affirmation, and Reciprocity.

Second, support is defined as information. Cobb (1976: 300-313) conceptualized social support as information leading one to believe that he or she is cared for and loved, esteemed and valued, and part of a network of communication and mutual obligation. Cobb (1976: 300-313), like Weiss (1974), did not consider tangible or material aid to be a component of social support. However, Cobb (1979) explicitly distinguished social support into three categories: 1) instrumental support or counseling; 2) active support or mothering; and 3) material support or goods and services.

Third, support has been defined as a structure. Ritter(In Gochman, Ed., 1988:152) defined social support as structure consisting of a specific set of linkages among a defined set of individuals that can be of use to understand the social behavior of persons involved. This view emphasizes the structure of the social network as an indicator of the availability of social support opportunities. The structure includes four categories: 1) size; the number of people with whom the individual maintains some social contact, including those contacts that are renewable in case of need; 2) density; the extent to which the members of an individual's social network know and contact one another independently of the individual; 3) homogeneity of membership; the extent to which network members share social attributes such as age, sex, social class, social values and life styles; and 4) dispersion of membership; the ease with which network members can make face-to-face contact. However, it is necessary to consider

the interaction properties of the network in order to perceive the quality of the relationships.

Finally, support is defined as interaction, summarized into three dimensions: 1) content; which refers to the meanings that individuals give to their relationships, such as feedback that encourages self-esteem; 2) directedness; which refers to the amount of mutual sharing or reciprocity; and 3) intensity; which refers to the strength of the bond between two people and their willingness to forego other considerations in carrying out the obligations of their relationship.

Other interesting definitions and measures of social support, such as that of Kahn & Antonucci (1980: 267), propose the term "convoy" to denote the set of significant people with whom the individual gives or receives social support. They also defined social support as interpersonal transactions containing one or more of the following: 1) affect; which refers to the expression of liking, love, admiration, or respect; 2) affirmation; which refers to the expression of agreement or acknowledgment of the appropriateness or rightness of some act, statement, or point of view; and 3) aid; which refers to the provision of direct aid or assistance including things, money, information, advice, time or entitlement.

Schaefer, et al. (1981, 1982) defined social support as an evaluation or appraisal of whether, and to what extent, an interaction or relationship is helpful. In this view, social support is composed of three sub-concepts: 1) emotional support; which refers to attachment, reassurance, a sense of being able to rely on and confide in another person that leads to a feeling of being cared for or loved; 2) informational support; which refers to advice in solving problems and feedback about how one is behaving or performing; and 3) tangible support; which refers to direct aid and giving of material supplies or services. This definition is concise and the sub-concepts tend to be distinct. However, a weakness of the definition may be a tendency toward shallowness or superficial treatment of a concept too complex to be subsumed into three sub-concepts. This criticism could also apply to Kahn & Antonucci (1980) (Tilden, 1985: 201).

House (1981: 13-40) made an important contribution to the definition of social support in two ways. First, he structured the issue definition as: Who gives what to whom regarding which problems? Second, he reviewed the definitions of

social support in the literature, noting the range of aspects, the common themes, and the points of divergence. House (1981) offered a four-part definition of social support that subsumed all sub-concepts of other definitions: 1) emotional support; which involves the provision of empathy, caring, love and trust, including a sense of esteem, affect trust, concern and listening. Emotional support has the strongest and most consistent relationship with health status; 2) instrumental support; which involves the provision of tangible aid and services that directly help the person in need, including aid-in kind, money, labor, time, modifying the environment; 3) informational support; which involves the provision of advice, suggestions, directives and information that the person can use in coping with personal and environmental problems; and 4) appraisal support; which involves only the transmission of information, rather than the affect involved in emotional support or the aid involved in instrumental support. However, the information involved in appraisal support is relevant to self-evaluation, which social psychologists have termed social comparison, including affirmation, feedback and social comparison.

Moreover, House (1981) notably emphasized that emotional support is the most important type in buffering stress and facilitating health. In other words, it has both direct and indirect effects on health. This term was reflected in Gottlieb's "emotionally sustaining behavior", Cobb's entire term "social support", Kahn & Antonucci's "affect and affirmation", Schaefer, et al.'s "emotional and information support", and what Caplan described as "mobilized psychological resources".

Therefore, it appears that no single definition is completely agreed upon by theorists in this field. However, the region of most agreement is that social support can be summarized into four areas (Dimond & Jones, 1983: 238):

First, communication of positive affect. In a supportive relationship, the principals have a sense of warmth, of caring, of expressed concern; they know that others believe in them and respect them; there is feedback that encourages self-esteem and affirms or endorses one's behavior or one's attributes. Second, social integration. It is supportive to belong, to have membership of groups, to have opportunities for exchange with others, to share common experiences, to know that there are others who will come to one's aid in time of need. Third, instrumental behavior. The provision of material or tangible aid is a component of support. Finally, reciprocity or

directedness in interactions is conceptualized as a factor in the continuance of supportive interactions and in the mutual satisfaction of such transactions. It has been suggested that the likelihood that human needs will be met is related to both the structure and function of social networks (size, density, homogeneity, intensity, dispersion and strength of the ties).

In addition, social support generally has two aspects: structural or social networks, which are most often used to refer to the structures existing among a set of relationships, such as their density, homogeneity, or range. Functional refers to the functional content of relationships performed by significant others, such as the degree to which the relationships involve flows of affect or emotional concern, instrumental or tangible aid, and information. However, the functional aspect of social support is used most frequently, rather than the structural form. The functional aspect can be summarized into two categories. The first is perceived social support or the cognitive aspect, which has most frequently been examined in the literature to measure the availability of support, or a person's general perception or belief that people in their social network would provide assistance in times of need. The second is received or enacted support or the behavioral aspect, which refers to the actual support that others provide to an individual in various forms, such as emotional or financial support. Moreover, many studies found that perceived social support was more likely to be relevant to health outcomes than actual received social support.

In conclusion, social support is a basic human need defined operationally in various ways. The two main common factors are some forms of emotional and informational support. Social support is considered to be person-environment interactions that decrease the occurrence of stressors, buffer the impact of stress, and decrease physiologic reactivity to stress. In addition, social support is a reciprocal process and an interactive resource that provides comfort, assistance, encouragement, and information. It also fosters successful coping and promotes satisfying and effective living. The amounts and types of social support needs vary across the life span and in a given situation.

According to Pender (1996), social support refers to the subset of social interactions that are supportive. It is usually much smaller than the social network. Each individual is a node in the social network and each exchange is a link. Social

support, rather than social networks, is considered to be more directly related to health and wellbeing. Social support can be defined as the subjective feeling of belonging, of being accepted, loved, esteemed, valued, and needed for oneself, not for what one can do for others. Pender (1996) stated that important dimensions of social support to consider when assessing a client are the source, the function it serves, and the intimacy characteristics of the relationship. In this view, social support is conceptualized into four dimensions. Emotional support refers to the provision of encouragement or empathy that may help an individual to cope in depressing circumstances, whereas informational support may be more useful in assisting an individual to understand how to relate effectively with his or her peers. Instrumental support refers to the provision of assistance with specific tasks, such as the preparation of nutritious meals or the transport of children to recreational activities. Finally, affirmation refers to the provision of helping individuals to realize their own strengths and potentials (Pender, 1996: 257). Therefore, the types of social support according to Pender (1996) seem similar to the perspective of House (1981), who defined social support in four dimensions, as previously mentioned.

From Pender's perspective, the functions of social support groups, in promoting and protecting health, can be conceptualized in four ways: 1) creating a growth-promoting environment supportive of health-promoting behaviors, self-esteem, and high-level wellness; 2) decreasing the likelihood of stressful life events; 3) providing feedback or confirmation that actions are leading to anticipated and socially desirable consequences; and 4) buffering the negative effects of stressful events through influencing the interpretation of events and emotional responses to them, thus decreasing their illness-producing potential (Figure 4) (Pender, 1996: 259).

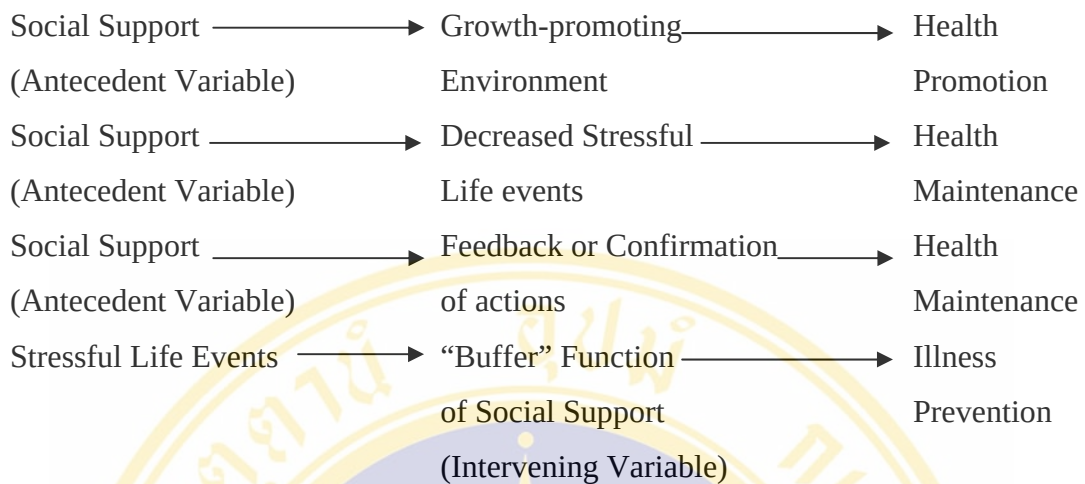


Figure 2.3 Possible impact of social support on health status (Pender, 1996: 259)

Pender (1996: 257-259) identified the sources of social support groups relevant to health into five categories: 1) natural support system, which refers to the family member groups. In most instances, the family maintaining the support group, in order to provide appropriate support, must be sensitive to the needs of family members, establish effective communication, respect the unique needs of members, and establish expectations of mutual help and assistance. However, the family can both enhance and/or decrease coping ability of the individual; 2) peer support systems, which consist of people who function informally in meeting the needs of others. These individuals make contacts easily and enjoy being involved with other people, to share experiences of major impact in their own lives and achieve successful adjustment and growth, such as the health-food enthusiast or the widow; 3) organized religious support systems, which constitute the sharing of a common value system, a common set of beliefs about the purpose of life, traditions of worship, and a set of guidelines for living, in order to help ourselves and others achieve full personal potential; 4) organized support system of care-giving or helping professionals, which consist of care-giving or helping professionals with a specific set of skills and services to offer clients. However, it was found that these sources of social support are rarely considered by clients. The reasons may be the limitation of the relationship between client and provider, which is only one-way, from the providers to the clients, not two-way; and 5) organized support systems not directed by health professionals, which

include voluntary service groups and mutual help groups. They provide assistance to individuals who are in need, or for some reason are unable to provide services for themselves.

Hyperlipidemic women are vulnerable groups because hyperlipidemia is one of the major risks for coronary disease, which has been the highest category cause of death from all causes for several decades. Therefore, they are in a stressful health transition period. In addition, these women are more likely to need high motivation and reinforcement to change and maintain their behavior, especially healthy eating behavior, which requires a great deal of personal control to avoid or to decrease the habitually unhealthy eating behavior through nutritional health-promoting behavior, such as avoiding a high-fat diet and a high-calorie diet, as well as increasing complex carbohydrate and fiber. Moreover, these women are more likely to require feedback or confirmation on the appropriateness or otherwise of their behaviors. Thus, the supports from significant others, especially a family member, closest relative or friend are important to them in achieving the goal of health and well-being.

Although there is evidence that social support is positively associated with health-promoting behavior, not all types of support are equally effective in changing and maintaining behavior. In other words, only some types of support serve as crucial indicators for them, or there should be a match between what is needed/wanted and what is given (Thoits, 1995: 64-67).

Several studies have shown that high levels of social support are associated with the performance of preventive health behaviors. Davine & Sandstrom (1996:580-584) found that perceived social support for healthful eating was positively associated with fat avoidance among Danish women aged 30 to 40 years. McIntosh ,et al.(1995: 219-230) also found that women who receive a greater amount of companionship from their social networks are more likely to report red meat reductions because of friends or relatives influences. Similarly, Muhlenkamp & Sayles (1986) found that perceived social support was significantly correlated with lifestyles measured in six areas of positive health practices: nutrition, exercise, relaxation, safety, substance use, and health promotion.

In two studies of health-promoting behavior in Thai people, it was found that social support had a positive relationship with general health-promoting behavior

(Sakbanditsakul, 1998; Treesakunwatana, 1998). Furthermore, social support from husbands of teenage mothers and menopausal women could predict 19.67 to 20.19% of health-promoting behavior in general (Prakobsap, 1998; Sakbanditsakul, 1998). It was also found that social support from husbands and perceived health status was a good predictor, and could predict 30.78% of HIV-positive mothers' health-promoting behavior in general (Sittichai, 1997). In addition, Pringprud (1995) found that social support, level of education and perceived health status were the best predictors in explaining variances in self-care behavior in patients undergoing coronary artery bypass grafting. Together, they could significantly explain 61.80% of variance.

However, other studies found that men and women were different in perceived social support and social networks. Women tended to have smaller networks than men, but women exhibited greater investment and intimacy in their relationships (Thoits, 1995: 65).

Unfortunately, studies were limited in their examination of the influence of social support on health-promoting behavior and its interaction with other predictor variables in hyperlipidemic women. More research is required to investigate further health-promoting behavior in hyperlipidemic women, especially their nutrition.

Variables: Individual Characteristics and Experiences

According to the revised Health Promotion Model, these consist of prior related behavior and personal factors: biological, psychological, and sociocultural. The concepts and factors to be studied are:

Age. Orem (1991: 238-241) stated that age influences the capacity for self-care because personal maturation and organic, psychic, and intellectual functioning vary with the stages in the human development life cycle (Puttapitukpol, 2001: 48-49). Capacity increases directly with increasing age and is at a maximum in adults. On the other hand, it decreases in the elderly. Several studies have stated that age is one factor influencing health-promoting behavior. In a study of 452 adults aged 18-88 years, it was found that elderly people had better health-promoting behavior in general and in specific areas of health responsibility, nutrition and stress management, than young and middle-aged people (Walker, et al., 1988). In addition, a study of teenage pregnant women indicated that age had a direct positive influence on health

responsibility (Puttapitukpol, 2001). This is in accordance with the study of mid-life working women in Bangkok. It was found that women with good health behavior were older, had higher education, were married and had good health perceptions. Age, health perceptions, level of education and marital status accounted for 20.7% of the variances in health-promoting behavior (Sinthanayothin, 2000). A study of elderly people also showed that age was significantly related to health-promoting behavior in general (Hankittikul, 1996).

In contrast, some studies produced contradictory findings. For example, a study of fundamental factors, perceived health status and health-promoting behavior of hypertension patients indicated that there was no relationship between age and health-promoting behavior (Sampanyu, 1996). Orem (1991: 238-241) explained that age had an influence on self-care efficacy. It increased with age, to peak in mature adults, but it could reduce among elderly people. Moreover, increased age had a positive relationship with health-promoting behavior because it improved individuals' abilities to understand themselves and others, and improved their decision-making. Therefore, they were better adapted to their environment.

Body mass index (BMI). Nutritional health-promoting behavior can be evaluated by nutritional outcome, which consists of four different types of assessment tools: 1) anthropometric assessment includes computing the ratio of body weight to height or BMI as well as skin-fold thickness for comparison with standard values; 2) biochemical assessment can be conducted through blood or urine analyses to identify nutritional status, such as laboratory tests for serum cholesterol, triglycerides and high-density lipoproteins; 3) clinical examination can detect physical signs in the skin, muscular and skeletal systems, eyes, tongue, etc., which suggest malnutrition; 4) clients' current dietary patterns can be assessed by a record of everything eaten for 5 to 7 days during the week prior to their clinic appointment or home visit. The record can be kept on a food dietary form that allows the listing of the types of foods and amounts consumed during regular meals and snacks. The daily food choices are then compared with the established standard (Pender, 1996: 121-123).

BMI is an expression of relative weight, of body weight relative to height. It is calculated as weight (kg) divided by the square of height (m)². BMI is often used to define grades of under-nutrition and obesity (Wasling, 1999: 1243). For European

BMI, the normal range for men and women is 18.5 to 24.9 kg/m². For obesity, it can be classified into three levels: level 1 is 25 to 29.9 kg/m², level 2 is 30 to 40 kg/m² and level 3 is more than 40 kg/m² (Leelahakul & Thaveeboon, Eds., 1998: 112-138; PongPaew, 1996: 94-120).

Currently, for Asian BMI, the normal range for men and women is 18.5 to 22.9 kg/m². A BMI equal to, or more than, 23 kg/m² is called overweight and a BMI ranging from 23 to 24.9 kg/m² is called pre-obese. Obesity can be classified into three levels: level 1 or obesity is equal or more than 25 kg/m², level 2 or moderate obesity is 25 to 29.9 kg/m², and level 3 or severe obesity is equal or more than 30 kg/m² (Komin, 2002: 38-39).

However, there is a debate of WHO expert consultation about interpretation of recommended BMI cut-off points for determining overweight and obesity in Asian populations, as mentioned before. There is also a consideration of WHO expert consultation whether population-specific cut-off points for BMI are necessary. The consultation also agreed that the WHO BMI cut-off points should be retained as international classification. The consultation identified further potential public health action (23.0, 27.5, 32.5, and 37.5 kg/m²) along the continuum of BMI, and proposed methods by which countries could make decision about the definition of increased risk for their population (WHO expert consultation, 2004 : 157-163).

In addition, a number of studies in Asian population had used the Asian BMI to identify overweight and obesity. For example, a study of Singh, et al. (1998 :165-173) defined overweight as a BMI more than 23 kg/m².

Keller & Thomas (1995: 159-160) stated that obesity and overweight are often used synonymously when there is an excessive storage of energy in the form of body fat, and is identified when a person is more than 20% over the ideal body weight. The term “obesity” is applied to men whose body fat is >20% of body weight, and to women whose body fat is >30% of body weight. Overweight is defined as excess body weight, usually greater than 10% above ideal weight. Keller & Thomas (1995: 160) further stated that this excess in weight may not necessarily be body fat, but it usually is. The preferred method of determining obesity is by estimating the percent of body weight that is fat.

There is strong evidence showing the relationship between high BMI or obesity and health problems, especially coronary disease, because obesity is linked to hypercholesterolemia, hypertension and poor blood glucose control in diabetes. Weight begins to influence coronary disease risk somewhere between a BMI of 25 and 30 and increases dramatically above a BMI of 30 (Wasling, 1999: 1243). Although weight-to-height ratios correlate highly with body fat and lean body tissue: excess fat tissue weight, excess weight can also include lean body mass or a large body frame.

Using of BMI has both advantages and disadvantages for assessing body fat. The advantages are the ready availability in population studies and ease of measurement. The disadvantage is that it does not distinguish between fat and non-fat tissues. Therefore, individuals with high BMI or overall obesity should be further examined for relative fatness and/or fat distribution. Because of the very low sensitivity of this measure, BMI should be viewed as a screening device and the results interpreted with caution and common sense (Keller & Thomas, 1995: 163).

For obesity *per se*, the body shape of a person can influence the risk of developing coronary disease. Central obesity or the apple shape, poses greater health risk than femoral obesity or the pear, by contributing to metabolic syndromes, which include hyperinsulinemia, hypercholesterolemia and hypertriglyceridemia. It is possible for central obesity to occur with a healthy BMI between 20 and 25: this still requires a weight loss effort. Weight begins to influence coronary disease risk somewhere between a BMI of 25 and 30, and increases dramatically above a BMI of 30, because there is an association between obesity and hypercholesterolemia. It was found that the health benefits of a 10% weight loss could reduce total cholesterol by 10%; LDL-cholesterol by 15%; triglycerides by 30% and increase HDL-cholesterol by 8% (Wasling, 1999: 1243-1244).

Duration of hyperlipidemia. Duration of illness is a factor influencing adaptation, and so possibly influences health behaviors. People usually need time for adaptation (Marino & Kooser, 1981: 56), because each individual's reaction to stress is different, depending on the duration of illness. In the beginning, people may not be confident that they can behave for good health and may not be completely aware of what they are facing. As time passes, they learn to face the situation better, because

the long time makes them learn to cope appropriately with the stressors. At last, they have developed self-care abilities and have more accepted change, which causes them to have more confidence in health practices (Saiseesub, 2000: 47). This is because having health problems or chronic illnesses for a length of time causes persons learn to adjust and live with the abnormality, and thus have good health-promoting behavior. This is consistent with Orem (1985: 108-109), who stated that self-care capacity is developed from past experiences, and time is needed to develop an individual's capacity. Therefore, the longer the duration of illness, the better the frequency of health practices. Many studies have shown that duration of illness is significantly positively associated with health-promoting behavior in various groups (Chaisri, 1988: 81-82; Sampunyu, 1996: 110). However, some studies have found that duration of illness is not significantly associated with health-promoting behavior (Homnan, 1996: 73; Inkoom, 1998: 78; Pongsomboon, 1996: 78; Pongkeaw, 1997: 89).

Perceived health risk is similar to perceived susceptibility or perceived vulnerability, which is mentioned in the Health Belief Model (Becker, et al., 1977: 27-46), one of the theoretical explanations for health protection. The Health Belief Model was proposed in the 1960s as a framework for exploring why some people who are illness-free take action to avoid illness, while others fail to take protective action. This model is derived from social-psychological theory, primarily the work of Lewin, who conceptualized that the life space in which an individual exists is composed of regions, some having negative valence, some having positive valence, and others being relatively neutral. Illnesses are conceived to be regions of negative valence that can be expected to exert a force moving the person away from the region.

Health-protecting behaviors are strategies for avoiding the negatively valenced regions of illness and disease (Pender, 1996: 35). In this model, variables proposed as directly affecting the predisposition to take action are perceiving a threat to personal health and the conviction that the benefits of taking action to protect health outweigh the barriers that will be encountered. Beliefs about personal susceptibility and the seriousness of a specific disease combine to produce the degree of threat or negative valence of a particular disease. Thus, perceived health risk is one of the important variables in health protection.

Perceived health risk or perceived susceptibility refers to an individual's own estimated subjective probability that he or she will encounter a specific health problem (Rosenstock, in Glanz, et al., Eds., 1990: 43). It is also one component of perceived health status. If the individual considers himself weak or fatigued, he may conclude that he is highly susceptible to a specific health problem or to illness in general. In this perspective, healthy persons perceive that they themselves have a probability of being sick, whereas the diagnosed persons perceive that they themselves have a high probability that the complications or severe illness may occur. In addition, a person may identify himself as part of a high-risk group, based on the incidence of a specific health problem within the general population. This factor is often related to age. It will undoubtedly affect his attitude toward preventive health services. Unfortunately, effective prevention must often begin well in advance of the peak period (Pender, 1975: 386).

These perceptions influence persons to be more likely to engage in health-promoting and health-protecting behaviors. Tirrel & Hart (1980: 490) found that perceived susceptibility to complications was positively associated with exercise compliance in coronary disease patients. In several studies, perceived susceptibility has been found to be significantly related to breast self-examination (Champion & Miller, 1992: 81-96; Williams, 1988: 611-616).

Education. Educational level influences individuals' health behavior, because it reflects the individuals' background of knowledge and skills. Highly educated persons were more likely to seek health-related information and have better understanding of health education than those with lower education levels. Pender (1975: 387) stated that some persons in higher educational or socioeconomic levels may be more aware of the whole range of preventive health alternatives available. They may also be more likely than persons at lower educational or socioeconomic levels to choose the most effective preventive health alternatives.

In addition, Pender (1982: 161) posited that people with different education levels have the ability to receive different knowledge and skills in self-care practices. Many studies have shown that educational level is an important determinant of health-promoting behavior (Inkoom, 1998: 71; Kittichotpanich, 2001: 166-167; Muhlenkamp & Sayles, 1986: 336; Puttapitukpol, 2001: 105-106). For example, Muhlenkamp &

Sayles (1986: 336) found that education had a positive relationship with health promotion and health protection. The subjects with higher education were more likely to have higher levels of healthy behaviors, such as nutrition and exercise, than those with lower education levels.

Puttapitukpol (2001: 106) found that education had a significantly direct positive effect on health responsibility of pregnant adolescents. It also had a significantly indirect positive effect on health responsibility by affecting social support and perceived barriers. With higher levels of education, pregnant adolescents increased their levels of health responsibility and social support but decreased their levels of perceived barriers. However, several studies have shown that education has no impact on the health-promoting behavior of various groups (Iemsawasdikul, 1998: 117-119; Oumpram, 1998: 97; Patanavanichnun, 2000: 97-98; Somsap, 2000: 66).

Summary

The theoretical and research literature pertinent to hyperlipidemic women has been presented. The literature reviewed covered hyperlipidemic women, health-promoting behaviors, nutritional health-promoting behavior, food consumption behaviors of the southern Thais, dietary assessment, perceived self-efficacy, social support, perceived health risks, and demographic characteristics.

CHAPTER 3

METHODOLOGY

This chapter provides a description of the research methodology used in this study, including research design, population and sample size, setting, instrumentation, data collection, protection of human subjects and data analysis.

Research Design

This cross-sectional study was designed to examine the explanation and prediction of personal factors: age, body mass index, duration of hyperlipidemia, perceived health risks and education; and behavior-specific cognition and affect (perceived self-efficacy and social support), as predictors of nutritional health-promoting behavior among women with hyperlipidemia.

Population and Sample Size

Population

The target population was women with hyperlipidemia who sought help from the Medical Clinic, General Medical Practice Clinic and Menopause Clinic at the Out-patient Department of Songklanagarind Hospital, Hat Yai Hospital and Songkla Hospital from September to December 2002, and who met the following criteria:

Inclusion criteria:

- 1) Aged 30 years and over
- 2) Diagnosed by a physician as having hyperlipidemia within 12 months, i.e. having serum cholesterol higher than 200 mg/dl, and/or serum triglyceride higher than 200 mg/dl.
- 3) Thai-language literate
- 4) Consciousness intact
- 5) Treated at one of the above Clinics in the Out-patient Department

6) Had not or currently has not heart disease; diabetes mellitus; hypertension; renal disease; hypothyroidism; receiving hormones, oral contraceptives, and cholesterol-lowering drugs

Sample size

The sample size was determined by the formula of Kerlinger & Pedhazur (1973, cited by Vorapongsathorn, 1987: 90), so that the sample size should be equal to, or more than, thirty times the number of the independent variables: $n/k \geq 30$

Where n = number in sample

k = number of independent variables

Seven independent variables were included in this study.

Therefore $n \geq 30 (7)$

$n \geq 210$ samples

Approximate sample size = 210 cases

However, to guard against missing data or incomplete data, which is a common problem in multivariate analysis, 20% of the minimum sample size, or approximately 42 cases, were added to the sample, bringing the total to 252 cases. In actual data collection, a sample size of 263 was selected.

Instrumentation

The instruments in this study include: 1) the Personal Data Form, 2) the Nutritional health-promoting behavior Scale, 3) the Perceived Health Risks Scale, 4) the Perceived Self-efficacy Scale, and 5) the Social Support Scale. All instruments were developed by the investigator. These instruments are described in the following sections.

1. The Personal Data Form

The investigator developed the Personal Data Form to collect data on the attributes of the participants, namely age, education, religion, occupation, marital status, family income, adequacy of family income, family members, menstruation, duration of hyperlipidemia, family member(s) with hyperlipidemia, body mass index and lipid profiles, food buying, cooking, type of food consumption, cooking method, frequency of food consumption per day, and eating out. (Appendix C).

2. The Nutritional health-promoting behavior Scale

As identified in the literature review, there was no specific tool for investigating health-promoting behavior about the nutrition of hyperlipidemia women. The researcher developed an instrument to measure this concept, and it was used in the study.

Steps involved in item development were:

2.1 Review of the literature about the concepts of health behavior, health-promoting behavior, nutritional health-promoting behavior, food-consumption behavior, nutrition-promoting behavior, foodways, food behavior, food habits and food pattern.

2.2 Review the literature about food consumption guidelines for hyperlipidemia patients as well as the food-based dietary guideline for Thai people (FBDG).

2.3 Analyze the concepts of nutritional health-promoting behavior using the concept analysis method of Walker & Avant (1995).

2.4 The defined elements gathered from the literature review were clustered and then conceptually matched with the nutritional health-promoting behavior in Pender's Health Promotion Model (Pender, 1996) by modification from the Health-Promoting Life Style Profile II (HPLPII) in the category "nutrition" (Walker, et al., 1995). Twenty-two hyperlipidemic women were interviewed using two parts of the questionnaires: 1) the nutritional behavior questionnaire consisted of 28 items, and 2) the semi-quantitative food frequency questionnaire consisted of 6 categories: carbohydrate, protein, cholesterol, fat and oil, desserts and beverages, as well as milk and milk products. The researcher analyzed these pilot findings and extracted the important elements of nutritional health-promoting behavior.

2.5 All of the elements gathered from the interview, together with those identified from the literature review, were used as the basis for developing each item of the instrument. Finally, the nutritional health-promoting behavior scale contained 29 items that measured the frequencies of food consumption practices. The responses were rated on a five-point Likert scale of frequency of practice, ranging from routinely, frequently, sometimes, seldom and never.

2.6 The content validity of the instrument was evaluated by five experts (Appendix A) and several items were modified based upon their recommendations.

2.7 The corrected instrument was tested as two parts in pilot studies. First, the instrument was tested with three women with hyperlipidemia to clarify the instructions and wording of the items. Second, testing was done with thirty women with hyperlipidemia to evaluate item clarity and to estimate reliability.

The nutritional health-promoting behavior scale is composed of 17 subscales:

- 1) Low-cholesterol diet control consisted 8 items (items 1, 2, 6, 7, 8, 9, 10, and 13)
- 2) Low-fat diet control consisted of 5 items (items 4, 5, 6, 7, and 17)
- 3) Low-triglyceride diet control consisted of 9 items (items 1, 2, 3, 6, 7, 11, 12, 13, and 14)
- 4) Low-sugar diet control consisted of 3 items (items 12, 13, and 14)
- 5) High-fiber diet practice consisted of 2 items (items 15 and 16)

The responses were on a five-point Likert scale. Their meaning was:

- | | |
|------------|--|
| Never | means the respondents had never had any nutritional health-promoting behavior at all. |
| Seldom | means the respondents practiced the nutritional health-promoting behavior rarely, or 1-2 times per month. |
| Sometimes | means the respondents practiced the nutritional health-promoting behavior occasionally, or 1-2 times a week. |
| Frequently | means the respondents often practiced the nutritional health-promoting behavior, or 3-4 times a week. |
| Routinely | means the respondents practiced the nutritional health-promoting behavior regularly or daily, or 5-7 times a week. |

The questionnaire consisted of 4 positive items (items 1, 15, 16 and 17) and 13 negative items (items 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14). The meaning of the scoring of the answers was as follows:

	Positive items	Negative items
Never	1 point	5 points
Seldom	2 points	4 points
Sometimes	3 points	3 points
Frequently	4 points	2 points
Routinely	5 points	1 point

The total score for the nutritional health-promoting behavior is calculated by summation of the scores of the 17 items ranging from 17 to 85, with higher scores reflecting higher levels of nutritional health-promoting behavior in general, or within a specific subscale. However, Walker, et al., (1995) stated that the use of means rather than sums of scale items is recommended to retain the 1 to 5 metric of item responses and to allow meaningful comparisons of scores across subscales.

Thus, for the total and/or the subscales, the mean score can be interpreted as three levels by mean score ($\bar{X}$) $\pm$ standard deviation (SD), as follows:

Mean score of $> (\bar{X} + 1SD)$ means hyperlipidemia women have “good” nutritional health-promoting behavior.

Mean score of $= (\bar{X} \pm SD)$ means hyperlipidemia women have “moderate” nutritional health-promoting behavior.

Mean score of $< (\bar{X} - 1SD)$ means hyperlipidemia women have “poor” nutritional health-promoting behavior.

3. The Perceived Health Risks Scale

The Perceived Health Risks Scale was developed by the researcher. Item generation for the instrument was based upon Rosenstock’s concept (1966, cited by Pender, 1982: 48) of perceived susceptibility, and Pender’s concept (1975: 385-390) of perceived vulnerability. The questionnaire was composed of 3 subscales: 1) causes of hyperlipidemia consisted of 6 items (items 1-6), 2) perceived general health consisted of 1 item (item 7), and 3) complications of hyperlipidemia consisted of 4 items (items 8-11).

The responses were rated on a five-point Likert scale, ranging from disagree, slightly agree, moderately agree, highly agree, and very highly agree. Their meaning was:

Disagree	means the respondent did not agree with that item.
Slightly agree	means the respondent slightly agreed with that item.
Moderately agree	means the respondents moderately agreed with that item.
Highly agree	means the respondent highly agreed with that item.
Very highly agree	means the respondent strongly agreed with that item.

The questionnaire consisted of 10 positive items (items 1-6, 8-11) and 1 negative item (item 7). The meaning of the scoring of the answers was as follows:

	Positive items	Negative items
Disagree	1 point	5 points
Slightly agree	2 points	4 points
Moderately agree	3 points	3 points
Highly agree	4 points	2 points
Very highly agree	5 points	1 point

The total score is calculated by summation of the scores of the 11 items, ranging from 11-55, with higher scores reflecting higher levels of perceived health risk.

4. The Perceived Self-efficacy for Nutritional health-promoting behavior Scale

The Perceived Self-Efficacy for Nutritional health-promoting behavior Scale was developed by the researcher. Item generation for the instrument was based on Bandura's concept of self-efficacy (1997), aiming to measure the perceived self-efficacy of women with hyperlipidemia in practicing health promotion behavior in nutrition in 2 dimensions: level and magnitude or performing of omitting, decreasing or giving up of favorite eating behavior, as well as constraining non-favorite eating behavior. The questionnaire was composed of 21 items.

The responses were rated on a five-point Likert scale, ranging from no confidence, little confidence, moderate confidence, high confidence, and very high confidence. Their meaning was:

No confidence means the respondents did not believe in their ability to perform nutritional health-promoting behavior at all.

Little confidence means the respondents had a slight belief in their ability to perform nutritional health-promoting behavior.

Moderate confidence means the respondents had a moderate belief in their ability to perform nutritional health-promoting behavior.

High confidence means the respondents had a high belief in their ability to perform nutritional health-promoting behavior.

Very high confidence means the respondents had a strong belief in their ability to perform nutritional health-promoting behavior.

The questionnaire consisted of 21 positive items. The scoring of the answers was as follows:

No confidence	=	1 point
A little confidence	=	2 points
Moderate confidence	=	3 points
High confidence	=	4 points
Very high confidence	=	5 points

The total score is calculated by summation of the scores for the 20 items (omitting item 21), ranging from 20-100, with higher scores reflecting higher levels of perceived self-efficacy for nutritional health-promoting behavior.

5. The Social Support Scale

The Social Support Scale was developed by the researcher. Item generation of the instrument was based on House's (1981) and Pender's (1996) concepts of social support, which assessed the individual's perceived level of social support. The instrument is composed of 4 dimensional subscales:

- 1) emotional support consisted of 5 items (items 1-5)
- 2) appraisal support consisted of 4 items (items 6-9)
- 3) informational support consisted of 5 items (items 10-14)
- 4) instrumental support consisted of 5 items (items 15-19)

The responses were rated on a five-point Likert scale, ranging from strongly disagree, disagree, uncertain, agree, and strongly agree. Their meaning was:

Strongly disagree means the respondents absolutely disagree with that item

Disagree means the respondents do not agree with that item

Uncertain means the respondents are not sure to agree or disagree with that item.

Agree means the respondents agree with that item.

Strongly agree means the respondents absolutely agree with that item.

The questionnaire consisted of 19 positive items. The scoring of the answers was as follows:

Strongly disagree	=	1 point
Disagree	=	2 points
Uncertain	=	3 points
Agree	=	4 points
Strongly agree	=	5 points

The total score is calculated by summation of the scores of the 19 items, ranging from 19-95, with higher scores reflecting higher levels of perceived social support.

Validity

Content validity of the instruments was evaluated by ten experts divided into two groups: 1) experts in the field of nutrition consisted of five experts, validating the Nutritional health-promoting behavior Scale, and 2) experts validating the content validity of the Perceived Health Risks Scale, the Perceived Self-Efficacy for Nutritional health-promoting behavior Scale, and the Social Support Scale were composed of 2 persons in the field of behavioral science, 1 in the field of public health nursing, and 2 in the field of professional medical-surgical nursing. From their recommendations, several items were modified so that they could be subjected to empirical testing.

Reliability

The corrected instruments were tested as part of two pilot studies. First, the instruments were tested with three women with hyperlipidemia to clarify the instructions and wording of the items. Second, testing was conducted with thirty women with hyperlipidemia to evaluate item clarity and to estimate reliability. These women were patients who sought help from the Medical Clinic, General Medical Practice Clinic and Menopause Clinic at the Out-patient Departments of

Songklanagarind, Hat Yai and Songkla hospitals, in Songkla Province. The time required to interview each subject was approximately 30 minutes. The results were tested by Cronbach's Alpha Coefficient. The equation was as follows (Luecha, et al., 1989):

$$\alpha = \frac{n}{n-1} \left[1 - \frac{\sum Si^2}{St^2} \right]$$

When α = reliability coefficient

n = number of item

Si^2 = summation of variance of scores in each item

St^2 = variance of total scores

The reliability results for the instruments were as follows:

- 1) Nutritional health-promoting behavior Scale = .75(30 cases) and = .77 (263 cases)
- 2) Perceived Health Risks Scale = .76 (30 cases) and = .73 (263 cases)
- 3) Perceived Self-Efficacy for Nutritional health-promoting behavior Scale = .82 (30 cases) and = .89 (263 cases)
- 4) Social Support Scale = .94 (30 cases) and = .91 (263 cases).

Setting

Data collection was conducted at three major hospitals in Songkla Province: Songklanagarind, Hat Yai and Songkla hospitals. These hospitals had the largest number of referrals in the southern part of Thailand. In each hospital, data were collected from subjects who sought help from three clinics of the out-patient departments, the Medical, General Medical Practice and Menopause clinics. However, most of the subjects (80%) were recruited from the General Medical Practice Clinics of the three hospitals.

Data Collection

The investigator and six research assistants were in charge of data collection. The research assistants were six registered nurses practicing at the three sampling hospitals. The investigator trained all of them prior to data collection. The training

covered the objectives of the study, data collection procedures and the roles of the research assistants. Initially, the investigator and all of the research assistants held a meeting together. Then, the investigator described the objectives of the study and thoroughly discussed with the research assistants the content of each instrument, item by item, in order to ensure uniform understanding and that the subjects would be interviewed using the same question for every item. Then, the procedures of data collection and the protection of human subjects were discussed. Finally, the investigator, together with all of the research assistants, interviewed one woman with hyperlipidemia to serve as an example of data collection, and then discussed again anything encountered. After all questions had been addressed, actual data collection commenced. Data collection took place from June to September 2002. The process of data collection was as follows:

1. Permission from the Faculty of Graduate Studies, the Human Research Board of Mahidol University and three sampling hospitals was sought prior to data collection.
2. The investigator met the directors of the nursing departments of the three sampling hospitals, introduced herself and explained the data collection.
3. The investigator informed the head nurses of each selected unit in the sampling hospitals about the objectives and the process of the study.
4. On the data collection date, the investigator or the research assistants obtained permission from the head nurses or in-charge nurses of each unit before identifying patients' medical records and selecting those meeting the set criteria.
5. The participants who had been identified were approached. Those who agreed to participate in the study were asked to sign the form for protection of human subjects.
6. The investigator or the research assistants retrieved personal data and the last blood cholesterol level from the patients' medical records and filled in the relevant parts of the personal data form.
7. Each participant was interviewed, to complete the remaining parts of the personal data form. Each sample was later asked to answer four sets of questionnaires: 1) the Perceived Health Risks Scale, 2) the Perceived Self-Efficacy for Nutritional health-promoting behavior Scale, 3) the Social Support Scale, and 4) the Nutritional

health-promoting behavior Scale. Completion of the entire step for each participant required 30-40 minutes.

8. The investigator or the research assistants checked the completeness of the data in each questionnaire after the interview was concluded.

Protection of Human Subjects

The study was conducted after having obtained final permission to perform the study from the Faculty of Graduate Studies, Mahidol University, the Human Research Board of Mahidol University and the sampled hospitals. Potential participants were informed about the purpose of the study and their right to decline or to withdraw from the study at any time. Their names were not attached to the data. A code number was assigned to ensure confidentiality. Each participant received a gift upon completion of the interview. The only known inconvenience was the time (30 to 40 minutes) required to complete the questionnaires.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences/Personal Computer Plus (SPSS/PC). Statistical significance was set at the level 0.05. The analytical procedures were as follows:

1. The personal data form was analyzed by frequency distribution, percentage, mean, and standard deviation.
2. Information about perceived health risks, perceived self-efficacy for nutritional health-promoting behavior, social support, and nutritional health-promoting behavior, was analyzed using descriptive statistics.
3. The research hypotheses were analyzed by stepwise multiple regression analysis.

Summary

In this chapter, the research design, population and sample size, instrumentation, setting, data collection, procedures for protection of human subjects and procedures for data analysis were presented.

CHAPTER 4

RESULTS

This chapter presents the details of the study's results. They are illustrated in three sections: characteristics of the subjects, distribution of nutritional health-promoting behavior (NHPB) and influencing factors, and description of influencing factors that affect the total scale and the five subscales of the NHPB, as follows:

- 1) Characteristics of the subjects, i.e., demographic characteristics, health characteristics, and dietary habits (Table 4.1, 4.2, and 4.3)
- 2) Distribution of the NHPB by total scale and its five subscales (Tables 4.4 and 4.5)
- 3) Distribution of influencing factors, including perceived health risks, perceived self-efficacy, and social support (Table 4.4)
- 4) Description of influencing factors that affect the total scale and the five subscales of the NHPB (Tables 4.6-4.12).

Characteristics of the Subjects

The characteristics of the subjects consist of 3 parts: 1) demographic characteristics (Table 4.1), 2) health characteristics (Table 4.2), and 3) dietary habits (Table 4.3).

Demographic Characteristics

The total number of the subjects was 263. Ages ranged from 31-80 years and the mean age was 48 years. Approximately half of the subjects were 40-49 years old (45.3%), had an educational level higher than high school (59.2%), and worked as an official (54.4%). Almost all were Buddhists (95.8%). Most were married (73.8%), had adequate monthly family income (75.7%), and had two to four family members (67.7%) (Table 4.1).

Table 4.1. Demographic characteristics of the samples (n=263)

Variable	Number	Percentage
Age (Years)		
30-39	39	14.8
40-49	119	45.3
50-59	75	28.5
≥60	30	11.4
Range = 31, $\bar{X}$ = 48.46, SD = 8.80		
Education		
No formal education	6	2.3
Elementary school (grades 1-6)	62	23.6
High school (grades 7-12)	39	14.8
Higher than high school	156	59.2
Range = 0-21, $\bar{X}$ = 11.65, SD = 5.43		
Religion		
Buddhist	252	95.8
Islam	11	4.2
Occupation		
House-wife	42	16.0
Agriculture	22	8.4
Merchant	26	9.9
Official	143	54.4
Employee	27	10.3
Other, such as retired official	3	1.1
Marital status		
Single	39	14.8
Married	194	73.8
Widowed	17	6.5
Divorced / separated	13	4.9

Table 4.1. Demographic characteristics of the samples (n=263) (continued)

Variable	Number	Percentage
Family income (Baht per month)		
≤ 10,000	75	28.5
10,001-20,000	90	34.2
20,001-30,000	44	16.8
30,001- 40,000	23	8.7
40,001- 50,000	15	5.7
> 50,000	16	6.2
Range = 1,500-100,000, $\bar{X}$ = 23,413.61, SD = 18,299.69		
Adequacy of family income		
Inadequate	23	8.7
Adequate	199	75.7
Savings	41	15.6
Family members		
One	21	8.0
Two to four	178	67.7
Five to seven	60	22.8
More than seven	4	1.5

Health characteristics

Based on Asian BMI, half of the subjects (51%) had a BMI between 23.00 – 29.99 (kg/ m²), whereas based on European BMI, more than half of them (60%) had a BMI between 18.50 – 24.99 kg/m.² Only 6.1% of them had BMI equal to, or more than, 30 kg/ m². Approximately half of the subjects (49.8%) had cholesterol levels between 200- 239 mg/dl. Four samples had cholesterol levels less than 200mg/dl, but they had triglyceride levels more than 200mg/dl. More than half of them still had menstruation (57%). Sixty percent of the subjects had LDL-cholesterol levels between 160-219 mg/dl and 44 % had HDL-cholesterol levels more than 60 mg/dl. Most of them had serum triglyceride levels of less than 200 mg/dl (88.2%) and had no family

member with hyperlipidemia (78.3%). Approximately 34.6% of the subjects had known that they had hyperlipidemia for 1-3 months (Table 4.2).

Table 4.2 Health characteristics of the samples (n=263)

Variable	Number	Percentage
Menstruation		
Yes	150	57.0
No	113	43.0
Duration of hyperlipidemia (months)		
<1	34	12.9
1-3	91	34.6
>3-6	42	16.0
>6-9	22	8.4
>9-12	74	28.1
Range , 0.10-12, $\bar{X}$ = 5.42 , SD = 4.50		
Family member with hyperlipidemia		
Yes	57	21.7
No	206	78.3
Body mass index (kg/m²) (Asian BMI)		
<18.50	10	3.8
18.50-22.99	103	39.2
23.00-29.99	134	51.0
≥30.00	16	6.1
Range = 16.48-37.07, $\bar{X}$ = 24.02, SD = 3.50		
Body mass index (kg/ m²) (European BMI)		
< 18.50	10	3.8
18.50 – 24.99	158	60.1
25.00- 29.99	79	30.0
≥ 30.00	16	6.1
Range = 16.48- 37.04, $\bar{X}$ = 24.02, SD= 3.50		

Table 4.2 Health characteristics of the samples (n=263) (continued)

Variable	Number	Percentage
Cholesterol (mg/dl)		
<200	4	1.5
200-239	131	49.8
240-299	112	42.6
≥300	16	6.1
Range = 154-442, $\bar{X}$ = 244.68, SD = 35.72		
Triglyceride (mg/dl)		
<200	232	88.2
200-500	31	11.8
Range = 20-461, $\bar{X}$ = 124.94, SD = 78.78		
HDL cholesterol (mg/dl) (n=75)		
<35	2	2.7
35-45	19	25.3
>45-60	21	28.0
>60	33	44.0
Range = 20-100, $\bar{X}$ = 59.34, SD = 17.84		
LDL cholesterol (mg/dl) (n=75)		
<130	6	8.0
130-159	18	24.0
160-219	45	60.0
≥220	6	8.0
Range = 103.40- 329.60, $\bar{X}$ 178.56, SD = 36.51		

Dietary Habits

For dietary data, the majority of the subjects bought (89%) and cooked food by themselves (76%). The favored cooking method was curry (48%). They ate three times a day (62.4%) and ate out at least once a day (30.8%) (Table 4.3).

Table 4.3. Dietary habits of the samples (n=263)

Variable	Number	Percentage
Food buying		
Self	233	88.6
Other person	30	11.4
Cooking		
Self	200	76.0
Other person	63	24.0
Type of food consumption		
Cooked at home	192	73.0
Street vended foods	60	22.8
Other, such as uncertainty, Sometimes cooked at home, sometimes Bought ready-to-eat foods	11	4.2
Cooking method		
Boiling, steaming, roasting	46	17.5
Stir-frying	59	22.4
Frying	20	7.6
Curry	126	47.9
Other, such as all of them; stir-frying and curry; oiling, stir-frying and frying	12	4.6
Frequency of food consumption per day		
Once	3	1.1
Twice	89	33.8
Three times	164	62.4
More than three times	7	2.7
Eat out		
At least once a day	81	30.8
Once in a few days	12	4.6
Once in several days	10	3.8
Once a week	42	16.0
A few times a month	58	22.1
Other, such as uncertain, depending on convenience, occasion	2	0.8
None	58	22.1

Descriptive Statistics of Influencing Factors, including Perceived Health Risks, Perceived Self-Efficacy, and Social Support; and Total Scale and Five Subscales of the NHPB

This table shows mean scores (SD) of perceived health risks, perceived self-efficacy, and social support. They were 33.98 (7.20), 67.89 (13.06), and 73.97 (9.51), respectively. Their average mean scores (SD) were 3.09 (.65), 3.39 (.65), and 3.89 (.50), respectively. Their distribution was normal and narrow. The mean score (SD) of the total scale of NHPB was 64.11 (7.29). Its average mean scores (SD) was 3.79 (.43). The distribution was also normal and narrow. For each subscale of the NHPB, the mean scores (SD) of the subscales of low-triglyceride diet, low-cholesterol diet, high-fiber diet, low-fat diet, and low-sugar diet were 35.27 (4.37), 31.34 (4.07), 7.44 (1.80), 18.32 (2.46), and 10.62 (2.28), respectively. Their average mean scores (SD) were 3.92 (.49), 3.92 (.51), 3.72 (.90), 3.66 (.49), and 3.54 (.76), respectively. The skewness of these subscales ranged from .120 to -.515. The distribution was narrow (Table 4.4).

Table 4.4 Descriptive statistics of influencing factors and total scale and five subscales of the NHPB (n=263)

Variables		No. of item	Potential scores	Actual range	Mean (SD)	Mean ÷ items (SD)	Skewness	CV
1. Influencing factors								
1.1 Perceived health risks		11	11-55	17-51	33.98 (7.20)	3.09 (.65)	.052	0.21
1.2 Perceived self-efficacy		20	20-100	26-100	67.89 (13.06)	3.39 (.65)	-.204	0.19
1.3 Social support		19	19-95	42-95	73.97 (9.51)	3.89 (.50)	-.117	0.13
2. Nutritional health-promoting behavior (NHPB)								
2.1 Total scale of NHPB		17*	17-85	42-82	64.11 (7.29)	3.77 (.43)	-.103	0.11
2.2 Subscale of low-triglyceride diet		9	9-45	19-45	35.27 (4.37)	3.92 (.49)	-.515	0.12
2.3 Subscale of low-cholesterol diet		8	8-40	17-40	31.34 (4.07)	3.92 (.51)	-.420	0.13
2.4 Subscale of high-fiber diet		2	2-10	3-10	7.44 (1.80)	3.72 (.90)	-.336	0.24
2.5 Subscale of low-fat diet		5	5-25	12-25	18.32 (2.46)	3.66 (.49)	.120	0.13
2.6 Subscale of low-sugar diet		3	3-15	3-15	10.62 (2.28)	3.54 (.76)	-.399	0.21

Note: CV = coefficient variation

* Total scale of NHPB = sum up of all subscales which some item may be established more than one subscale.

This study found that the majority of the subjects (62-71%) had a moderate level of NHPB by total scale and five subscales. Only 16% of the total diet were at a good level, whereas 14% were at a poor level. The subscales were also similar to the total scale diet. Approximately 15-21% of the subjects had a good level of the NHPB, whereas 14-17% of them had a poor level of the NHPB. They were the subscales low-triglyceride, low-fat, low-cholesterol, high-fiber, and low-sugar diet (Table 4.5).

Table 4.5 Frequency and percentage of the subjects who perform the NHPB at good, moderate, and poor levels, classified by total scale and five subscales of the NHPB (n =263)

Variables	Good > ($\bar{x} + 1 \text{ SD}$) N (%)	Moderate ($\bar{x} \pm 1 \text{ SD}$) N (%)	Poor < ($\bar{x} - 1 \text{ SD}$) N (%)
NHPB* by total scale and subscales			
1. Total scale diet	42 (16.00)	184 (70.0)	37 (14.0)
2. Subscale low-triglyceride diet	39 (14.8)	187 (71.1)	37 (14.1)
3. Subscale low-cholesterol diet	39 (14.8)	182 (69.2)	42 (16.00)
4. Subscale high-fiber diet	44 (16.7)	178 (67.7)	41 (15.6)
5. Subscale low-fat diet	46 (17.5)	178 (67.7)	39 (14.8)
6. Subscale low-sugar diet	55 (20.9)	163 (62.0)	45 (17.1)

Note: NHPB* = Nutritional health-promoting behavior

Description of Influencing Factors that Affect Total Scale and Five Subscales of the NHPB

This table shows the summary of the correlation matrix between influencing factors (age, body mass index, education, duration of hyperlipidemia, perceived health risks, perceived self-efficacy, and social support) and study variables (total scale and five subscales of the NHPB (Table 4.6)).

Correlation between Influencing Factors and Total Scale and Five Subscales of the NHPB

Pearson correlation analysis was performed to determine the correlation among influencing factors and the study variables as well as to detect multicollinearity among all independent variables. The results of correlation coefficients are presented in table 4.6. The results showed that age and perceived self-efficacy were positively correlated with total scale and five subscales NHPB ($p < .01$ - $p < .001$). The older the better the NHPB. Body mass index, duration of hyperlipidemia, and perceived health risks were not correlated with the total scale of the NHPB and its five subscales. Education was negatively associated with the total scale of the NHPB and its five subscales, except for the subscale high-fiber diet ($p < .05$ - $p < .01$). Social support was positively correlated with total scale and five subscales of NHPB, except for the subscale of low cholesterol diet ($p < .01$ - $p < .001$). Perceived self-efficacy had the strongest correlation with NHPB, as compared to the other variables. Also, there were correlations among some of the predictive variables. Their correlation coefficients ranged from .114 to -.478, indicating low multicollinearity (Table 4.6).

Table 4.6 Correlation matrix between influencing factors and studied variables (n=263)

Variables	1	2	3	4	5	6	7
1. Age	1.00						
2. Body mass index	.141*	1.00					
3. Education	-.478**	-.218**	1.00				
4. Duration of hyperlipidemia	-.156**	.035	.265***	1.00			
5. Perceived health risks	-.041	.058	.184**	.086	1.00		
6. Perceived self-efficacy	.263***	-.183**	-.064	.078	.114*	1.00	
7. Social support	.275***	-.052	-.174**	-.071	-.151**	.348***	1.00
8. NHPB in total scale	.377***	-.025	-.169*	-.027	-.092	.556***	.227***
8.1 Subscale of low-triglyceride diet	.310***	-.091	-.170**	-.050	-.088	.532***	.187**
8.2 Subscale of low-cholesterol diet	.315***	.000	-.124*	.031	-.093	.449***	.104
8.3 Subscale of high-fiber diet	.181**	.040	-.064	-.050	-.044	.335***	.183**
8.4 Subscale of low-fat diet	.349***	-.101	-.182**	-.053	-.039	.479***	.256***
8.5 Subscale of low-sugar diet	.349***	-.092	-.194**	-.048	-.073	.432***	.168***

Note: *p < .05, ** p < .01, ***p < .001, NHPB= Nutritional health-promoting behavior.

Answering the Research Hypothesis

Results of multiple regression analysis for the prediction of influencing factors on the total scale of the NHPB and its five subscales

Based on Table 4.7, the results of regression analysis on the total mean score of NHPB were illustrated. The first step, stepwise multiple regression analysis, was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by stepwise method. Three independent variables influenced the total scale of the NHPB. The highest predictor was perceived self-efficacy, which could explain 30.90% of the variances in the total scale of the NHPB ($Beta = .556$, $R^2 = .309$, $F = 116.961$, $p < .001$). The second highest predictor was age, which could increase the prediction up to 36.70% of its variances ($Beta = .248$, $R^2 = .367$, $F = 23.485$, $p < .001$). The last predictor was perceived health risks, which could increase the prediction up to 38.60% of the variances of the total scale of NHPB ($Beta = -.141$, $R^2 = .386$, $F = 8.213$, $p < .01$).

Table 4.7 Stepwise multiple regression of influencing factors on the total scale of NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.556	.309	.309	.307	116.961***	.310	.556	10.815***
2.	Age	.606	.367	.057	.362	23.485***	3.062	.248	4.846***
3.	Perceived health risk	.621	.386	.019	.379	8.213**	-.143	-.141	-2.866**

Constant (a) = 11.935, Overall F = 8.213**

Note: ** p < .01 , *** p < .001

Results of multiple regression analysis for the prediction of influencing factors on the subscale low-triglyceride diet of the NHPB

Based on Table 4.8, the results of regression analysis on the subscale of low triglyceride diet were illustrated. The first step, stepwise multiple regression analysis was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by the stepwise method. Three independent variables influenced the subscale low-triglyceride diet. The highest predictor was perceived self-efficacy, which could explain 28.30% of the variances of this subscale ($Beta = .532$, $R^2 = .283$, $F = 103.227$, $p < .001$). The second highest predictor was age, which could increase the prediction to 31.50 % of its variances ($Beta = .183$, $R^2 = .315$, $F = 11.809$, $p < .01$). The last predictor was perceived health risks, which could increase the prediction up to 33.30% of its variances ($Beta = -.139$, $R^2 = .333$, $F = 7.318$, $p < .01$).

Results of Multiple Regression Analysis for the Prediction of Influencing Factors on the Subscale Low-Cholesterol Diet of the NHPB

Based on Table 4.9, the results of regression analysis on the subscale of low cholesterol diet were illustrated. The first step, stepwise multiple regression analysis was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by stepwise method. Four independent variables influenced the subscale low-cholesterol diet. The highest predictor was perceived self-efficacy, which could explain 19.40% of the variances in this subscale ($Beta = .440$, $R^2 = .194$, $F = 62.736$, $p < .001$). The second highest predictor was age, which could increase the prediction to 24.20% of its variances ($Beta = .228$, $R^2 = .242$, $F = 16.572$, $p < .001$). The third highest predictor was perceived health risks, which could increase the prediction to 25.80% of its variances ($Beta = -.129$, $R^2 = .258$, $F = 5.722$, $p < .05$). The last predictor was social support, which could increase the prediction up to 27.20% of its variances ($Beta = -.129$, $R^2 = .272$, $F = 4.808$, $p < .05$).

Table 4.8 Stepwise multiple regression of influencing factors on the subscale low-triglyceride diet of the NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.532	.283	.283	.281	103.227***	.178	.532	10.160***
2.	Age	.561	.315	.031	.309	11.809**	2.495	.183	3.436**
3.	Perceived health risks	.577	.333	.019	.326	7.318**	-.084	-.139	-2.705**

Constant (a) = 10.265, Overall F = 7.318**

Note: ** p < .01 , *** p < .001

Table 4.9 Stepwise multiple regression of influencing factors on the subscale low-cholesterol diet of the NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.440	.194	.194	.191	62.736***	.137	.440	7.921***
2.	Age	.492	.242	.048	.236	16.572***	1.127	.228	4.071***
3.	Perceived health risks	.508	.258	.016	.250	5.722*	-.073	-.129	-2.392*
4.	Social support	.522	.272	.014	.261	4.808*	-.055	-.129	-2.193*

Constant (a) = 7.620 Overall F = 4.808*

Note: * p < .05 , *** p < .001

Results of multiple regression analysis for the prediction of influencing factors on the subscale high-fiber diet of the NHPB

Based on Table 4.10, the results of regression analysis on the subscale high-fiber diet were illustrated. The first step, the stepwise multiple regression analysis was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by stepwise method. One independent variable, perceived self-efficacy, influenced the subscale high-fiber diet, and could explain 11.20% of the variances in this subscale ($Beta = .335$, $R^2 = .112$, $F = 33.054$, $p < .001$).

Results of multiple regression analysis for the prediction of influencing factors on the subscale low-fat diet of the NHPB

Based on Table 4.11, the results of regression analysis on the subscale low-fat diet were illustrated. The first step, stepwise multiple regression analysis, was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by stepwise method. Two independent variables influenced the subscale low-fat diet. The highest predictor was perceived self-efficacy, which could explain 22.90 % of the variances in this subscale ($Beta = .479$, $R^2 = .229$, $F = 77.725$, $p < .001$). The last predictor was age, which could increase the prediction to 28.30% of its variances ($Beta = .239$, $R^2 = .283$, $F = 19.332$, $p < .001$).

Table 4.10 Stepwise multiple regression of influencing factors on the subscale high-fiber diet of the NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.335	.112	.112	.109	33.054***	.046	.335	5.749***

Constant (a)=4.297 Overall F = 33.054***

Note: *** p < .001

Table 4.11 Stepwise multiple regression of influencing factors on the subscale low-fat diet of the NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.479	.229	.229	.227	77.725***	.090	.479	8.816***
2.	Age	.532	.283	.053	.277	19.332***	0.883	.239	4.397***

Constant (a) = .173, Overall F = 19.332***

Note: *** p < .001

Results of Multiple Regression Analysis for the Prediction of Influencing Factors on the Subscale Low-Sugar Diet of the NHPB

Based on Table 4.12, the results of regression analysis on the subscale low-sugar diet were illustrated. The first step, stepwise multiple regression analysis, was computed with age, body mass index, duration of hyperlipidemia, education, perceived health risks, perceived self-efficacy, and social support as the predictors. These seven independent variables were entered simultaneously into the regression equation by stepwise method. Two independent variables influenced the subscale low-sugar diet. The highest predictor was perceived self-efficacy, which could explain 18.70% of the variances in this subscale ($Beta = .432$, $R^2 = .187$, $F = 59.955$, $p < .001$). The last predictor was age, which could increase the prediction to 22% of its variances ($Beta = .190$, $R^2 = .220$, $F = 11.191$, $p < .01$).

Table 4.12 Stepwise multiple regression of influencing factors on the subscale low-sugar diet of the NHPB (n=263)

Step	Variables	Multiple R	R ²	R ² Change	Adj R ²	F	b	Beta	T
1.	Perceived self-efficacy	.432	.187	.187	.184	59.955***	.075	.432	7.743***
2.	Age	.469	.220	.034	.214	11.191**	.750	.190	3.345**

Constant (a)= -3.342, Overall F = 11.191**

Note: **p<.01, *** p < .001

CHAPTER 5

DISCUSSION

This research aimed to examine the nutritional health-promoting behavior of hyperlipidemic women and related factors, i.e., age, body mass index, duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, and social support. The following discussion is presented in relation to the objectives and hypotheses of the study, in two major parts, as follows: Part 1, discussion of the nutritional health-promoting behavior ; Part 2, discussion of the research hypothesis.

The results of this study are discussed with the relevant data in the following order: 1) personal data, 2) total scale and subscales of nutritional health-promoting behavior (NHPB), 3) factors influencing NHPB, comprising perceived health risks, perceived self-efficacy and social support.

Personal Data

There are, however, limitations in comparing these results with previous studies, since few studies focused directly on hyperlipidemic women were found. In foreign countries, the majority were conducted in hyperlipidemic populations composed of both men and women and/or only men.

This study had three interesting points. Firstly, the average age of the sample was 48 years, which was lower than the findings of most studies in the foreign countries. It indicated that the sample in this study had early hyperlipidemia for their age, which is similar to a number of previous studies that have shown that women usually have hyperlipidemia at the age of 55 years or older (Goanantakoon, 2001: 9; Heim & Brunsell, 2000: 742-743; Sorrentino, 2000: 42; Walsh & Grady, 1995: 1152; Yu, et al., 2000: 544). For instance, Heim and Brunsell (2000: 742) found that more than half of the women over 55 years of age had hyperlipidemia, with total cholesterol levels of 240 mg/dl or higher. It was also congruent with a study of Lottenberg, et al. (1996:265-275) that the average age of hypercholesterolemic women was 51 years.

The early hyperlipidemia in women in this study indicated that they were at high risk to noncommunicable disease, especially coronary heart disease. Several longitudinal studies had provided evidence that dyslipidemia obtained in middle age predicted cardiovascular risk better than in old age, which perhaps more accurately reflected lifelong exposure (Hall&Luepker,2000:354).

Another reason of early hyperlipidemia of the sample in this study might come from the purposive method. The inclusion criteria included women diagnosed by a physician as having hyperlipidemia within 12 months and had no diseases related to hyperlipidemia. As a result, women concerning their health by annual medical check-ups since younger age were more likely to be found. The other women having hyperlipidemia at old age may not eligible due to most of them always had disease related to hyperlipidemia.

Secondly, approximately half of the sample in this study had total cholesterol equal or more than 240 mg/dl as well as more than half of them had LDL-cholesterol equal or more than 160 mg/dl. These findings indicated that they were at high risk of many chronic diseases deriving from hyperlipidemia, including coronary heart disease, hypertension, cerebrovascular accident, etc. It could be explained that the sample in this study had higher proportion of total cholesterol to HDL-cholesterol. It was equal to 4.12, while normal value was equal or less than 3.5. The higher the proportion, the higher incidence of coronary heart disease. For this reason, it was due to the best incidence of heart disease might be the higher ratio of total cholesterol to HDL-cholesterol (Huether & McCance, 1996:641). This result was consistent with a study of Lottenberg ,et al.(1996:265-275) that hyperlipidemic women had the average total cholesterol of 243 mg/dl.

Thirdly, according to Asian BMI, half of the subjects in this study was overweight, whereas 30% of them was overweight depending on European BMI. The numeral difference of overweight persons of these criterias could be explained that Asian females had a smaller size compared with European females (Komin, 2002: 38- 39). Thus, Asian females (but not the Chinese) have a lower BMI for the same age and percentage of body fat than do white women. When the BMI cut- off points for overweight was calculated ,based on the assumption of a percentage of body fat at BMI value of 25 kg/ m², this value was slightly different and generally higher than

those of Europeans (WHO expert consultation, 2004: 157- 163). This result indicated that the subjects in this study were at high risk of chronic diseases related to hyperlipidemia. There was an evidence that overweight women were more likely to have hypercholesterolemia than normal weight women (Grabauskas, et al., 2003). Also, it was found that obesity was related to higher level of serum LDL-cholesterol (Hall & Luepker, 2000:354).

Nutritional Health-Promoting Behavior

The results of this study demonstrated a moderate level of overall NHPB. Nevertheless, detailed investigation of the results has revealed that despite a moderate level of overall NHPB, only 16% of the sample had NHPB at a good level and 14% reported poor performance of NHPB (Table 4.5).

The reported moderate level in the NHPB total scale could be explained with the Health Promotion Model (HPM), which was proposed by Pender (1996). Pender states that the set of variables within the behavior-specific cognitions and affect are considered to be a major motivational significance of performing health-promoting behavior as well as a critical core for intervention. They consist of cognitive and affective components, including individuals' perceptions and interpretations of what they experience directly affect their behaviors; interpersonal influences; and situational influences. This was due to most of the subjects in this study (87%) had been informed that they had hyperlipidemia and might receive advice about health care concerning dietary behavior for the reduction of hyperlipidemia from health care providers. The received information and advice would influence their NHPB. This is supported by a study conducted by Aubin, et al. (1998: 1207-1218), which found that the adults aged 18-65 years who were informed that they had hyperlipidemia expressed an intention to modify their behaviors, resulting in more changes in dietary habits and consumption of a low-fat diet than among those with normal blood cholesterol levels. Medeiros, et al. (1996:751-758) also found that the subjects with hypercholesterolemia had better knowledge about a fatty diet and better dietary behaviors in respect of a low-fat, high-fiber diet, compared with those with normal levels of blood cholesterol.

However, the interviews with the sample in this study reflected an undefined system and pattern of medical care regarding nutritional advice for hyperlipidemic individuals. The patients mostly received brief verbal suggestions and the records of the annual medical check-ups for hyperlipidemic individuals only stated ‘provided suggestions about foods’, without detailed information. This finding is consistent with the result of a study conducted by Elson ,et al. (1994: 1073-1080), which found that the time spent giving advice specifically for reducing lipid levels was only 15% of the total referral time. Moreover, Lazovich ,et al. (2000: 123) also found that only 15-30% of physicians gave patients advice about nutrition. Therefore, the information and advice given to the sample in this study might be inadequate for enhancing the sample’s perceptions, beliefs, and attitudes to the extent that they could conduct NHPB appropriately; thus the NHPB total scale was reported at a moderate level. This is because individuals’ dietary behaviors are rationale and are influenced by predisposing factors, comprising knowledge, attitudes, beliefs, values, and perceptions. They are correlated with the individuals’ motivation for health behavior since they provide the rationale for the behavior (Green & Kreuter, 1991).

However, having knowledge does not always lead to desirable health behaviors. Perceptions, beliefs, and appropriate values are key factors leading to the need for knowledge, which will finally result in desirable dietary behaviors (Damapongsa, 2002: 44). Likewise, studies conducted by Lewis ,et al. (1989: 201) and Kayman (1989: 191-193) showed that knowledge of nutrition, thoughts, beliefs and habits, influence food intake and its potential for change through a commitment to action, which is a significant first step in the process of behavior development.

This study also found that, although most subjects bought and cooked foods themselves, their buying and cooking were inappropriate as most of them used stir-frying and frying methods, and used coconut milk when making curries. Only 9% of the sample reported regular performance of abstinence from fried foods and only 14% regularly consumed foods prepared by boiling, steaming, baking or grilling methods, instead of frying or stir-frying. This finding was consistent with a number of studies on NHPB, which found that the samples tended to have more fried or stir-fried foods than foods cooked with boiling, steaming, baking, grilling, or oil-free methods (Oumpram, 1998: 91-92; Sang-Gassanee, 2000: 55; Tammatisthan, 2000: 38-44). This

is probably because oil-free cooking methods are more complicated and time-consuming, and thus it is inconvenient for working women, such as the sample in this study. Moreover, stir-frying and frying cooking methods are more convenient and less time-consuming; thus, it is more difficult to buy foods cooked with boiling, steaming, baking, or grilling methods. As a consequence of these restrictions, the sample in this study was more likely to have fried or stir-fried foods, which were widely available, easy to buy, and convenient to cook.

This sample's behavior can be explained with Pender's HPM (Pender, 1996), which states that eating behaviors consist of food selection, food preparation, and food consumption. They are situational influences referring to personal perceptions and cognitions of any situation or context, which can facilitate or impede behavior, as they are the antecedents of behavior that enable individuals to realize a motivation (Green & Kreuter, 1991:151). According to Pender (1996:69-70), one's plan to engage in a particular behavior is proposed as hinging on the anticipated benefits or outcomes that will occur and will not invest the efforts that are perceived as impossible to achieve. Anticipated barriers also have been shown to affect intentions to engage in a particular behavior and the actual execution of the behavior. When readiness to act is high and barriers are low, the probability of action is much greater.

Likewise, the health belief model, which states that individuals will conduct health protecting behavior once the appraisal demonstrates that the perceived benefits outweigh the perceived barriers (Glanz, et al., 1990: 43). This is consistent with the concept proposed by Hongwiwat (1985: 92) and Saihu (1985: 15), explaining that the dietary decision-making process is simple, with the main considerations being the advantages and disadvantages of an action. If the desirable dietary elements are abundant, available, inexpensive, and convenient for cooking and storage, individuals are more likely to consume them. On the contrary, the barriers or disadvantages of having such diets will reduce an individual's tendency to have a particular diet, or may inhibit particular dietary behavior. This is in accord with Pender, et al. (2002: 201), who stated that simple cooking methods do affect individuals' dietary choices. Speedy and effortless preparation techniques are more attractive for the consumer because they respond to the hurried contemporary lifestyle. This was demonstrated in a study conducted by Samitasiri, et al. (1994: 62), which found convenience to be an

outstanding factor affecting the dietary behavior of working women in Bangkok. The finding agrees with that of Harnack, et al. (1997: 957-965), which showed that the perception of convenience and availability was a predictive factor for the low-fat dietary behaviors of adult subjects.

The dietary culture of each ethnic group and region is another factor affecting low-fat dietary behavior, since the taste of food is usually defined by social culture (Sanjur, 1982: 47). Chinese people, for example, prefer cooking with oil, e.g. frying or stir-frying, to oil-free cooking, and thus tend to have a high-fat diet. A similar preference was also found among African-Americans; a study revealed that African-American women like to cook with oil and like fried foods (Behera, et al., 2000: 303). For this study, the finding may be explained by the fact that large numbers of people in the southern region of Thailand are Chinese Thais. Moreover, food vendors in various workplaces are mostly Chinese Thais; thus, the instant foods available in the markets are usually cooked using frying or stir-frying methods.

Hence, the sample of this study was constrained by the situational influences. Interviews with the sample and observation of foods sold in the study-site hospital also revealed that most foods were fried or stir-fried and most curries had coconut milk as an ingredient. Moreover, most of the subjects in this study worked outside the home, resulting to consume a high fat diet from eat out.

This study also found that the sample reported moderate levels for the total scale of social support. However, further investigation of each subscale revealed that the sample received less social support regarding the receipt of information than the other subscales, with the lowest score being receipt of information concerning health care practice, followed by asking physicians and nurses about health care for patients (Appendix, Table 4.21). This sample's behavior can be explained with Pender's HPM (Pender, 1996), which states that interpersonal influences, such as social support, have been shown to affect individuals' predisposition to engage in health-promoting behavior in a number of studies. Individuals are likely to undertake behaviors for which they will be admired and socially reinforced. Likewise, Green & Kreuter (1991: 165) states that conveying support or feedback from other people, which may encourage or discourage individuals in maintaining a behavior. The factors include

social support from significant others, such as family members, friends, or acquaintances, as well as advice and feedback from health care providers.

This is probably because the sample in this study was interested in health care; thus, family members might assume that they already conducted appropriate health care practices and did not need any advice. Moreover, the sample did not have any ailments, despite hyperlipidemia; therefore, the family members perceived that they were healthy, able to take care of themselves, and did not need to be accompanied on medical visits. This is supported from the data showing that almost all subjects attended a medical visit on their own. Some limitations in the social support provided to the sample reflected constraints of reinforcing factors, which may have contributed to the moderate level in the NHPB total scale.

The result of this study is consistent with that of the study of middle-aged women without disease and hyperlipidemia, conducted by Sintanayothin (2000: 74-75), which found moderate levels of NHPB among the sample group. This is probably because the sample in this study did not have any disease and was middle-aged; most were <50 years of age. Despite having hyperlipidemia, there were no physical disorders present and the sample could work normally. Therefore, the women in this study perceived themselves healthy, since there were no apparent health problems, such as cancer or other diseases because hyperlipidemia is a health deviance without apparent signs and symptoms unless it has further impact leading to consequent chronic illness.

Another reason that may underlie this result is probably that the sample underrated their level of perceived health risk, as perceived risk of illness changes over the period of behavior modification. In the precontemplation, the sample might not perceive any risk of illness and might believe that they already practiced healthy dietary behaviors (Brown, et al., 1995). The perceived risk of illness is categorized into three levels: 1) ignorance or not having any perceived risk of illness, 2) partially-perceived risk without wanting to believe that one is at risk, and 3) perceived risk at a high level (SriLaong, 1999: 54). The sample in this study may fall into the second category, with the perception that they only had hyperlipidemia but did not have any illness, so that the perceived health risk was reported at moderate levels.

This result is consistent with the research conducted by Duncan ,et al. (2003: 624-628), which found that African women who were at risk of cardiovascular disease underestimated their perceived health. Although they were more obese and consumed higher fat diet than white women, the African women did not perceive that their body figures and dietary behavior were worse than those of white women. Similarly, Behera ,et al. conducted a study of low awareness of cardiovascular disease risk among low-income African-American women and found that the sample had poor perceived risk of cardiovascular disease, as they did not consider it to be a major cause of women's death, despite the high incidence rate (Behera, et al., 2000: 302). This concurs with the results of the studies by Brannstorm ,et al. (1994: 155-161) and Luepker (1994: 37-42), which found that more than half of the sample with high cholesterol levels were not aware of the effect of high cholesterol on their health. Van Maarle ,et al., who led a study on risk perception of participants in a family-based genetic screening program for familial hypercholesterolemia, found similar results, as, on average, the sample underestimated the risk of hyperlipidemia and myocardial infarction (Van Maarle, et al., 2003: 136). The results of these studies indicated that most people underestimated hyperlipidemia as a risk factor for illness.

In addition, the majority of the sample in this study (78%) did not have any medical history of hyperlipidemia among close relatives, such as their parents. Therefore, the sample expressed their perceived risk of illness at a lower level than those whose close relatives had hyperlipidemia. This is consistent with the result of the study led by Van Maarle, which found that the sample with a family history of hyperlipidemia reported perceived risk of myocardial infarction at a higher levels than those without any family history of hyperlipidemia (Van Maarle, et al., 2003: 136-143).

The result of this study is inconsistent with previous studies of hyperlipidemic women with diseases (Pongkeaw, 1997: 72-74; Kairoj, 1999: 46-52). This is probably because the women with diseases had greater awareness of self-care, thus reporting the NHPB total scores at high levels. The data from this study showed that, in the group of women whose total cholesterol level was 240 mg/dl or higher, those with higher levels of total cholesterol reported better NHPB than those with lower levels of total cholesterol, at a statistically significant level ($p<.01$)

(Appendix, Table 4.10). This result indicates that the subjects with total cholesterol higher than 240 mg/dl attempted to conduct better NHPB, possibly because they were aware of the higher risk of illness, thus trying to modify their dietary behavior. This could be supported by the results of a study led by Medeiros, et al., which found that the sample with hypercholesterolemia and disease had less fatty diets than those with hypercholesterolemia without disease (Medeiros, et al., 1996: 755). This could be explained by the health belief model, which states that perceived susceptibility is a significant variable defining human behavior. According to Rosenstock (In Glanz, et al., Eds., 1990 : 39-62) perceived susceptibility affects psychological readiness to perform a behavior. The key component is that actions are taken to avoid the disease. Once individuals perceive that they are at risk of disease and that the disease may be severe, they then conduct activities to reduce the risk and severity of that disease. Pender (1975: 386) also explained that individuals modify their behavior when they perceive the risk of contracting disease.

The study of each NHPB subscale showed that the sample reported levels of NHPB, as well as a moderate total scale result. Dietary behaviors as regards a low-triglyceride diet and low-cholesterol diet were reported with higher scores than the other subscales (average mean = 3.92) (Table 4.4). Detailed investigation revealed that the NHPB in each subscale was similar to the total scale, since approximately 14-17% of the sample still reported fairly low levels of NHPB (Table 4.5), as discussed in detail below.

1. Subscale low-triglyceride diet

The sample conducted NHPB in the low-triglyceride diet subscale at a moderate level, with an average score higher than that of other subscales, except for the subscale low cholesterol diet, which had the same average value (average mean = 3.92, SD = .49) (Table 4.4). Although 15% of the sample reported good levels of NHPB in this subscale, 14% reported poor performance (Table 4.5).

The sample's reported NHPB score in this subscale was higher than for other subscales, which may be due to their knowledge of poor health resulting from dietary behaviors that elevate triglyceride levels, as several of the listed behaviors are clearly risk behaviors (Appendix, Table 4.13). The sample may have received information from various sources such as healthcare providers, or the mass media. The

information then acted as cues to action for preventing threats of illness and led to health preventing behavior, according to the concept of the health belief model (Becker, et al., 1977: 27-46). In this study, such behavior is maintenance of a low-triglyceride diet. This concurs with the results of the study conducted by Guibert ,et al. (1999: 105-110), which found a correlation between cues to action and increased compliance with treatment among patients with hypercholesterolemia.

Moreover, it is well known among the general public that some diets pose health risks. Such knowledge may be transferred by word-of-mouth. A research study conducted by Pongkeaw (1997: 72), for instance, found that most women with coronary heart disease in Bangkok, and their offspring, knew that they should avoid foods containing fat, such as fatty meat, or foods cooked with coconut milk.

Another reason underlying this result may be social expectations, as not consuming alcoholic beverages has been a traditional practice of women in Thai culture over a long time. It is known that dietary behavior is closely related to culture; hence the term “eating culture”, which refers to the daily lifestyle of people in a society and their dietary behaviors integrated with social and cultural components. Eating culture is a dietary lifestyle that exists integrally in a society and is socially accepted and believed as an appropriate pattern of dietary behavior (Samitasiri, et al., 1994: 5). The aforementioned reasons may contribute to the higher NHPB score for low-triglyceride diets, in comparison with other subscales, because dietary behavior is health behavior, which is a personal characteristic consisting of beliefs, expectations, perceptions, motives, and values integrated into action for the maintenance, restoration, and promotion of health (Gochman, 1982: 169). Therefore, correct knowledge, understanding and perception will generate appropriate dietary behavior.

Further study of each item found that the highest scored item was ‘not having food cooked with animal fat’, of which 75% of subjects reported regular performance, followed by not having alcoholic drinks, having foods cooked with vegetable oil and not having very sweet desserts, with reported regular performance at percentages of 72, 51, and 33, respectively. This result is consistent with the results of a study conducted by Pongkeaw (1997: 73), which investigated the NHPB of women with coronary heart disease, and found that, in the subscale concerning a high-fat diet, the sample reported avoiding foods cooked with animal fat as they knew that such food increases plasma

lipid. However, this result does not accord with the findings of a number of previous studies of southern people, which found that these subjects still cooked with animal fats, e.g. beef, chicken, and lard (Chaichana, 1997: 7; Kraiwong, 1993: 75; Sang- Gassanee; 2000: 53-57; Tammatisthan 2000: 46-48).

Educational differences among the samples may account for these differing results. Most subjects in this study had fairly high education levels, higher than secondary level, whereas the samples in the above previous studies were mostly educated to primary level. People with higher education tend to seek more information about health care and are more likely to understand recommendations about self-care than those with lower education levels. Therefore, the sample in this study might have learned that animal fat had a negative effect on their health. This finding supports Pender (1975: 387), who stated that people with high education levels are likely to perform health promotion behavior more effectively than those with lower education levels.

The result of this study is consistent with those of a number of previous studies of NHPB among women. It has been found that most samples did not consume alcoholic beverages, did not have very sweet desserts, and had foods cooked with vegetable oil (Oumpram, 1998: 91-92; Sintanayothin, 2000: 74; Iemsawasdikul, 1998: 95-97; Pongkeaw, 1997: 73; Kairoj, 1999: 74). This is because non-consumption of alcoholic beverages is a common practice among Thai women, as aforementioned. Abstinence from very sweet desserts is probably due to the well-known fact of its negative effect on health. For the consumption of foods cooked with vegetable oil, the behavior may be a consequence of wide and continuous promotion campaigns via various media, especially television, which is found to have the most influence on the dietary behavior of working women (Samittasiri, et al., 1994: 38). These promoting campaigns generate consumers' perceptions of the health benefits of cooking with vegetable oil.

The sample in this study reported regular avoidance of inappropriate dietary behaviors, comprising the consumption of very sweet fruits and sweetened drinks, at only levels of 9% and 13%, respectively. This result is consistent with the results of previous studies with working women living in Bangkok, which found that

approximately half of the samples rarely, or sometimes, avoided a high-sugar diet (Sintanayothin, 2000: 75; Samittasiri et al., 1994: 39-40).

The sample's reported preference for very sweet fruits may be due to the climate of the southern region, which is suitable for tropical fruits. The southern region of Thailand is abundant with sweet and delicious tropical fruits, which are mostly inexpensive and widely available. It is also found that, in the eating culture of the southern region, most people prefer sweet fruits to non-sweet ones (Chaichana, 1997: 7; Kraiwong, 1993: 82).

The tropical climate of Thailand may also account for the sample's preference for sweetened drinks. The climate in the southern region, in particular, remains hot throughout every season. Therefore, iced sweet drinks, which help to provide relief from the heat and which are refreshing, are popular. They are also convenient, as it is apparent that, in general, the drinks available in the market are sweet and inexpensive.

Moreover, the popularity of sweetened drinks may result from the influence of American dietary culture, including the consumption of soft drinks, which has been popular worldwide since the mid to late 20th century (Dahlan, 2003: 103-104). In addition, it has been found that Thai people easily adapt dietary fashions and fads, and frequently follow the current of popular culture; they are thus easily influenced by western dietary culture (Dahlan, 2003: 101). This was made apparent by the study of Samittasiri, et al. (1994: 61), which found that working women in Bangkok drank tea/coffee and carbonated beverages at percentages of 22.6 and 20.8, respectively.

A number of studies also found that, in comparison with men, women tend to have more snacks, especially when they are under stress, such as crisps, which contain high levels of sugar and carbohydrate. Women tend to resort to snacks to distract themselves from the stress (Gore, et al., 2003: 399-405; Grogan, et al., 1997: 19-31; Rasheed, 1998: 409-414). This may be explained according to the theory that stress reduces the level of serotonin in the brain, which relates to the emotions, and the consumption of foods containing carbohydrate can increase the level of serotonin in the brain (Thai Rath, 2001: 7). This is supported by the study of Laitinen, et al., which found that women under stress like to have candy, sweet pastry, and chocolate (Laitinen, et al., 2002: 29-39).

The result of this study regarding dietary behavior of not having very sweet fruit is not consistent with previous studies in women with disease and/or disorders, comprising menopausal women and women with coronary heart disease (Oumpram 1998: 91-92; Pongkeaw, 1997: 125-126), as the women in these previous studies reported better behavior in this aspect. This is probably because the sample of this study did not have a disease and did not have any abnormal sign or symptom although they had hyperlipidemia. The sample, therefore, did not strictly conduct dietary behaviors relating to low-triglyceride diets in a similar fashion to women with diseases/disorders did. This is in accord with the concept of the health belief model, which states that individuals will conduct health behavior when they perceive risks and have indicators of illness, such as abnormal symptoms (Rosenstock, in Glanz, et al., Eds., 1990: 39-62).

2. Subscale low-cholesterol diet

The sample practiced this NHPB subscale at a moderate level, with an average score higher than the other subscales, including the subscale low-triglyceride diet (average mean = 3.92, SD = .51) (Table 4.4). Although 15% of the subjects rated the NHPB in this subscale at a good level, 16% rated their behavior as poor (Table 4.5).

The higher NHPB score for this subscale, compared with other subscales, as found in the subscale low-triglyceride diet, may be due to the knowledge of the sample, and the general public, about the negative effects of a high-cholesterol diet on health. Moreover, several items in the questionnaire clearly reflected risk behavior (Appendix, Table 4.13), as in the subscale low-triglyceride diet.

The results for each question item showed that the item “not having foods cooked with animal fat” attained the highest score, followed by “having foods cooked with vegetable oil”, as mentioned above. The sample expressed inappropriate dietary behavior for consuming seafood with high cholesterol, as only 9% reported regularly avoiding this behavior. This finding is consistent with the results of previous studies in population in the southern region, which found that the samples liked seafood and frequently consumed seafood despite being aware of the fact that it increases plasma lipids (Nakha, 1999: 165-168; Chaichana, 1997: 7; Kraiwong, 1993: 99; Sang-Gassanee 2000: 56; Tammatisthan, 2000: 62-63).

This is similar to the result of Trondsen ,et al. (2003: 1-14), which found that women aged 45-69 years in Norway, on average, consumed seafood 15 times per month and almost half of them were overweight (46%).

This could be explained by the availability of seafood, since both fringes of the southern region border on a coastline; therefore, seafood is abundant in the South. The seafood there is fresh, tasty, inexpensive, and convenient to buy, and has thus been a major component in the dietary habits of southern people for a long time. It is also noteworthy that, although the sample demonstrated knowledge about major high cholesterol diets during the interviews, they did not know the information in detail and did not realize that some seafood, such as fish roe and oysters, should be avoided. This finding is consistent with a study conducted by Pongkeaw (1997: 72-73), which found that, although most women with coronary heart disease knew the type of diet that should be avoided, they could not give the names of such diets in detail.

3. Subscale high-fiber diet.

The sample rated NHPB in this subscale at a moderate level (average mean = 3.72, SD = .92) (Table 4.4). Although 17% of the sample conducted the behavior in this subscale at a good level, and 16% rated their performance at a poor level (Table 4.5).

This is probably because most people are not familiar with the health benefits of a fiber diet. They may not be aware that maintenance of a low-fiber diet is a risk behavior in the same way as they are aware of risks from a high-cholesterol and high-triglyceride diet. Moreover, the sample might be constrained by the availability of a high-fiber diet, as interviews with the sample and observation of foods sold at the hospital and various other places revealed that there were less high-fiber dietary foods on sale than fried or stir-fried foods, and curries with coconut milk.

Further investigation of each item found that 31% of the sample had non-sweet fruits regularly which was higher than those who did not eat heavy sweet fruits regularly (8%) (Appendix, Table 4.13). Moreover, 30% of the sample reported having at least four ladles of vegetable daily. These results were inconsistent with the findings of a study of middle-aged working women in Bangkok conducted by Sintanayothin (2000: 75), since the sample of this study reported better behavior in this respect. This may be because of differences in eating culture and environment

among the different regions of Thailand. The southern region has an abundant supply of vegetables and the ingredients of southern foods usually include a lot of vegetables. Moreover, vegetables are always used as garnishes in southern foods, which are usually spicy – a unique characteristic of the foods in this region.

The results of this study are also inconsistent with those of another study (Campbell, et al., 2000: 306), which found that the majority of blue-collar middle-aged women (82%) had less than five servings of fruits and vegetables daily, which is lower than the standard quantity for Americans. This may be due to the differences in dietary culture of each ethnic group. Traditional Thai food has been voted one of the five types of foods for health, comprising Mediterranean, Latin American, Japanese, Korean, and traditional Thai foods, because it consists of rice as the main dish, eaten with fish and vegetable side dishes. Thai food, therefore, provides fiber from rice, which is a complex carbohydrate, and from vegetables, whereas western food contains low levels of dietary fiber.

4. Subscale low-fat diet.

The sample rated their NHPB in this subscale at a moderate level, with an average mean score lower than the results of other subscales, except the subscale low-sugar diet (average mean = 3.66, SD = .49) (Table 4.4). It was found that although 18% of the sample expressed the behavior in this subscale at a good level, 15% expressed a poor level for this subscale (Table 4.5) , indicating that the dietary behavior in this subscale was fairly poor.

This result is probably due to the sample's preference for the taste of food. Although the women in this study knew that high-fat diet is bad for their health and several actions are clearly risk behavior, they might select food according to its taste rather than considering health condition because fried or stir-fried food is more tasty than food cooked with boiling, steaming, grilling, or roasting methods. This is consistent with the psychological concept, which explains that two psychological factors involving in the process of selecting foods are 1) motives for making decision, which are more likely to be affective motives, such as food taste, rather than cognitive motives; and 2) attitude toward the food, i.e., one's like or dislike of that food (Hongwiwat, 1985: 90). This is apparent in the research conducted by Kairoj (1999: 51), which found that middle-aged women with hypertension who could not maintain

diet control reported the familiarity with certain food and preference for fatty food. Similarly, Harnack ,et al. (1997: 957-965) found that food taste is a barrier of having low-fat diets among adult subjects who commented that low-fat diets were not tasty.

The availability of food may be another factor influential to dietary behavior regarding low-fat diet because fried and stir-fried foods are more convenient to buy than foods cooked with oil-free methods. Eating culture of each ethnic may also affect food choices, as previously mentioned.

The sample reported the highest score of NHPB in response to having fish, with 46 percent of them regularly had fish in their diet. This result is consistent with the study of NHPB in patients with hypertension regarding having low-fat protein diet (Hengyotmark, 2001: 72-73), which revealed appropriate behavior among the sample by having fish instead of meat. Similarly, Trondson ,et al. also found that most middle-aged or older women in Norway (83%) had fish for dinner on average every other day (Trondson, et al., 2003: 1-14). The result of this study may be due to the sample's reception of knowledge about health benefits of having fishes from health care providers and various media.

In addition, the southern region of Thailand has abundant supply of fishes as it locates on the coasts, as mentioned above. Fishes are convenient and inexpensive. Therefore, the level of perceived benefits of having fish tends to be higher than perceived barriers. This is supported by the health belief Model, which states that individuals will conduct health preventing behavior once their weighing results in more perceived benefits, in comparing with perceived barriers (Glanz, et al., 1990: 43). The inappropriate dietary behavior of the sample in this subscale was having fried foods, as discussed above.

5. Subscale low-sugar diet.

The sample rated their NHPB in this subscale at a moderate level, with the lowest average mean score in comparison with the other subscales (average mean = 3.54, SD = .76) (Table 4.5). Although 21% of the subjects performed the behavior at a good level, a poor level of behavior was found in 17% of subjects, which is the highest percentage compared with the other subscales (Table 4.6). These results indicated that the sample inappropriately conducted the behavior in the low-sugar diet subscale the most.

The taste of food may account for the sample's behavior in this subscale. The women in this study knew that having high-sugar diet was bad for their health and all actions in this subscale are risk behaviors; however their likes of the taste were superior to health awareness because sweet drinks are more tasty than plain water. Likewise, very sweet fruits are much more tasty than non-sweet fruits. Moreover, high-sugar diets are widely available, convenient to buy, and inexpensive. Thus the perceived benefits of having high sugar diets overpowered perceived barriers, leading to the sample's decision of having such diets.

For each item, the item stating "not having very sweet dessert" was responded to with the highest score, with 33% of subjects reporting regular performance of this behavior, indicating an appropriate eating behavior. The behaviors that were inappropriately conducted included having very sweet fruit and having sweetened drinks, as aforementioned.

Factors Influencing Nutritional Health-Promoting Behavior

Research Hypothesis: age, education, body mass index (BMI), duration of hyperlipidemia, perceived self-efficacy, perceived health risks and social support can explain the variations in NHPB in hyperlipidemic Women.

Perceived self-efficacy

Perceived self-efficacy was the variable of first choice. It had a positive correlation with total NHPB and could explain 30.9% of the variation in NHPB (Table 4.7). This result indicated that a person with a high level of perceived self-efficacy is very likely to perform NHPB. People with a high level of perceived self-efficacy usually perceive a problem as a challenge instead of avoiding it. They tend to perceive barriers at a low level, and thus possess the motivation to perform NHPB. People with low levels of perceived self-efficacy discontinue conducting NHPB once they encounter a barrier. In contrast, people with high levels of perceived self-efficacy would continue conducting NHPB, despite the barriers.

Perceived self-efficacy was chosen as the first factor in predicting variations in NHPB because it is a personal factor that has significant role in self-control for omitting, reducing and quitting inappropriate dietary behaviors and/or in forcing oneself to eat a healthy diet, despite a dislike or lesser preference for that diet.

Therefore, perceived self-efficacy helps a person achieve the desired goal of hyperlipidemia management. Although it has been found that human dietary behaviors are associated with both internal and external factors, most studies have revealed that internal factors, especially perceived self-efficacy, are more associated with dietary behavior than external factors (Van Duyn, et al., 2001: 69). This is because dietary behaviors are more complex, varied, and continuous than other health behaviors (Ma, et al., 2001: 95). Perceived self-efficacy influences motivation control, thinking processes, emotional states, adaptation to the environment, and the achievement of desired behaviors (Maibach & Murphy, 1995: 43); thus it relates to a person's actions and efforts, as well as the duration of one's maintaining appropriate behaviors (Clark, 1996: 154). Hence, perceived self-efficacy is a significant factor in the development of new behaviors and the maintenance of appropriate health behavior (Van Duyn, et al., 2001: 69-78).

The result of this study is consistent with that of several previous research studies into on health promoting behavior in women, which found that perceived self-efficacy is a significant variable influencing the performance of health promoting behavior in both the total scale and subscale levels (Iemsawasdikul, 1998: 113-114; Kairoj, 1999: 43). Likewise, a number of foreign studies on dietary behavior have found that perceived self-efficacy has a significant positive relationship with high-fiber diet, such as a diet rich in vegetables and fruit (Ma, et al., 2002: 157-166; Van Duyn, et al., 2001: 69-78; Victor, et al., 2002: 131). Another study of factors associated with fruit and vegetable consumption among women conducted by Havas, et al. (1998: 1141-1148) showed that perceived self-efficacy was a significant predicting factor for vegetable and fruit consumption among women participating in the program.

However, this research was a cross-sectional study, and thus there are limitations in identifying causative and consequent variables. Such findings require a prospective study or experimental research, which is beyond the scope of the current study.

Age

Age was the variable of second choice and it demonstrated a positive relationship with the NHPB total scale. It could explain the variation in the NHPB

total scale by 5.8%, thus the explanatory power increased to 36.7% (Table 4.7), indicating that people with advancing age tend to have higher level of improving the NHPB total scale.

This is because age is associated with individual development. It defines maturity, ability, needs, experience, knowledge, beliefs, attitudes, thoughts, perceptions, and decision-making (Varner & Younger, 1995: 253). Therefore, with advancing age, a person tends to make the right decisions in performing health-promoting behavior. Moreover, increasing age leads to deterioration in health status; therefore, older people tend to increasingly care for their health so that they can maintain a healthy condition until later stages of their lives.

The results of this study correspond with several studies on health-promoting behavior in women, which found that people of older age tended to perform health-promoting behavior in both the total scale and the subscale more than younger people (Oumpram, 1998: 41-42; Sintanayothin, 2000: 82; Iemsawasdikul, 1998: 119; Pongkeaw, 1997: 72; Kairoj, 1999: 120; Duffy, 1998: 361).

Perceived health risks

Perceived health risk was the variable of third choice. It had a negative correlation with, and could explain variations in NHPB by an additional 1.9%, thus increasing the predicting power to 38.6% (Table 4.7), indicating that people with low levels of perceived health risk would performance the total NHPB to a good level. This is probably because most subjects knew that they had hyperlipidemia and received knowledge about health care from medical professionals. The subjects then acknowledged their health risks and modified their dietary behaviors, leading to improved behaviors, resulting the low level of perceived health risks.

Statistically, bivariate analysis did not show that perceived health risk was correlated with total NHPB, but it was significantly positively correlated with perceived self-efficacy ($r = .114$, $p < .05$) and education level ($r = .184$, $p < .01$); it was also negatively correlated with social support at a significant level ($r = -.151$, $p < .01$) (Table 4.6). Further pairing investigation of perceived health risk and the correlated variables revealed that the addition of perceived self-efficacy into a multiple regression analysis equation resulted in the inclusion of perceived health risk into the predictive equation, whereas the combination of perceived health risk with other

variables did not induce such a result. This, therefore, indicated a strong correlation between perceived health risk and perceived self-efficacy.

The negative correlation between perceived health risk and total NHPB may be because the perceived health risk measure developed by the researcher for this study was not sensitive enough to explain the total NHPB. The measure was developed and used for the first time in this study, so that there may have been some problems of construct validity, as the content might tend to measure subjects' knowledge more than their perceptions.

Another underlying reason may be due to possible two-way correlation between perceived health risk and the total NHPB thus the correlation is beyond the analysis with the stepwise multiple regression method. The women in this study reported moderate levels of the total NHPB; hence they might perceive health risk at low levels. They were informed of having hyperlipidemia thus perceiving the risk of illness; however, the women might believe that they could maintain appropriate dietary behavior and evaluated the health risk according to their behavior.

Moreover, the sample of this study might underrate perceived health risk as previously discussed. They might also react with psychological defense mechanism, i.e., they knew about having hyperlipidemia but did not accept that they were at high risk of illness. This is apparent in a number of previous studies, which demonstrated that women tend to solve problem by adjusting their affective states more than dealing with the problem directly (Gore, et al., 2003: 399-405; Grogan, et al., 1997: 19-31; Rasheed, 1998: 409-414).

The limitation in explaining the correlation between perceived health risk and NHPB may also lie in the data collection process, where data concerning these two variables were collected at the same time.

The result of this study is consistent with that of the study on correlates of healthy eating habits in low-income Black women and Latinas, conducted by Sandersphillips (1994: 781-787), which found correlation between low level of perceived risk of cancer and the sample's healthy eating habits.

The result of this study is inconsistent with those of the studies of NHPB and the consumption of high-fat diets in subjects with coronary heart disease (Voranan, 1998: 23-54; Srilaong, 1999: 121-122). These studies found that perceived health risk

could not explain such inappropriate behavior. The inconsistent results may be due to differences in the sample characteristics and the measures used in the studies.

The result of this study differs from that of a foreign study, which found that adult subjects were highly aware of risks from high plasma cholesterol and they strictly avoided a high-fat diet (Glanz, 1999: 112). This is probably because of cultural differences that lead to different perceived health risks; thus, adult Thai people in this study may be less aware of, and pay less attention to, risks from hyperlipidemia than adults in foreign countries. It was also found that low perceived risks were associated with inappropriate dietary behavior, such as having sweetened drinks or snacks (Kubik, et al., 2002: 339-345).

Social Support

In this study, social support could not explain variations in the NHPB total scale in a stepwise multiple regression analysis equation, although it had a significant correlation with the NHPB total scale in bivariate analysis ($r = .227, p < .001$) (Table 4.7). This is probably because the correlation between social support and NHPB total scale is not independent from age and perceived self-efficacy, which social support is a variable relating to age ($r = .275, p < .001$) and perceived self-efficacy ($r = .348, p < .001$) (Table 4.7). Thus, when these two variables were included into the regression equation, the regression coefficient for social support was reduced to an insignificant level.

Moreover, the correlation between social support and the NHPB total scale was fairly low, in comparison with age and perceived self-efficacy, even though it was statistically significant ($r = .227, p < .001$) (Table 4.7). This is probably because hyperlipidemia is associated with individuals' eating habits, thus it is not the disorder that highly requires social support for activities. The sample had to choose what they would like to do concerning dietary behavior by themselves. Therefore, self-care practice is mostly dependent on individual level.

In addition, most subjects in this study were educated at high levels thus they were able to think and to make decision about the action by themselves and their family members might not dare to give them suggestion.

Nevertheless, detailed investigation of the NHPB subscales revealed that social support was selected as the fourth choice only in the subscale low-cholesterol

diet and it had a negative correlation with this subscale. Social support could explain an additional 1.4% in variation in the NHPB subscale low-cholesterol diet, thus increasing the explanatory power to 27.2% (Table 4.10). This result indicates that people with high social support will perform NHPB poorly in the subscale low-cholesterol diet.

Regarding statistical analysis, bivariate analysis showed significantly positive correlations between social support and age ($r=.275$, $p<.001$), and perceived self-efficacy ($r=.348$, $p<.001$). On the other hand, social support was significantly negatively correlated with education level ($r=-.174$, $p<.01$) and perceived health risk ($r=-.151$, $p<.01$) (Table 4.6). Further study of the relationships between social support and each of the correlated variable showed that when adding perceived self-efficacy into the multivariate analysis equation, social support would be included into the equation in a negative direction. However, the inclusion of other variables did not induce the same consequence. This result, therefore, indicated a strong relationship between social support and perceived self-efficacy.

The negative correlation between social support and NHPB regarding low-cholesterol diet reported in this study may be associated with the characteristics of the sample. Most subjects in this study were married and had dietary behavior in the same way as their husbands and/or children, who were healthy; therefore, the subjects did not strictly avoid high-cholesterol diet. It is apparent that family had significant roles on the sample's NHPB, as it has been reported that family members have more influence on individuals' modification of health promoting behavior than friends and colleagues. (Pender, 1996: 260-261, 269). This is because people in the same family tend to have preference for the same kind of foods due to the transferal of eating habits within the family, including the attitude toward type of foods, flavors, and cooking methods, leading to similar taste for foods (Tangchoorat, 1983: 92). Therefore, if family members have inappropriate dietary behavior, the social support tends to be negative. The study led by Buaghman, et al.(2003:129-137), for instance, found that obese women with hyperlipidemia who had high-fat, low-carbohydrate diet received social support from family and friends more than overweight women.

In addition, one of the traditional practices in Thai eating culture is the whole family having meals from the same food set. Having a separated set for an individual

may induce sense of isolation to that person. Therefore, even though the women in this study wanted to modify their inappropriate dietary behavior, negative support or no support from their families might contribute to the negative correlation with NHPB regarding low-cholesterol diet.

However, most research on health-promoting behavior in women in both the total scale and the subscales have found that social support had a positive correlation with health-promoting behavior (Oumpram, 1998: 95-96; Kittichotpanich, 2001: 170-171; Puttapitukpol, 2001: 104-105). Similarly, foreign studies have also found that social support was correlated with health-promoting behavior and was a significant predicting factor for the behavior. Seeman (2000: 366), for example, found that the bonding with friends and family in older adults was associated with, and was a significant predictor for, illness prevention behavior including appropriate dietary behavior and reduction of risk, such as avoidance of a high-fat diet.

Education

This study found no relationship between education level and the total NHPB, although the bivariate analysis resulted in significantly negative correlation ($r = -.169$, $P < .01$) (Table 4.6). This is probably because education was correlated with age ($r = -.478$, $P < .001$) and perceived health risks ($r = -.184$, $P < .01$) (Table 4.6). Therefore, once the age and perceived health risks were selected into the regression equation, the regression coefficient of education decreased to the level of statistical insignificance.

In addition, the correlation between education and the NHPB total scale was fairly low in comparison with other factors, although it was statistically significant (Table 4.6). Education, therefore, could not significantly explain variations in the NHPB total scale.

The negative correlation between education and NHPB total scale in this study may be because 78% of the sample had high education levels, worked out of home and ate out (30.8%). These findings were consistent with a study conducted by Jeffery and French (1996: 1007), which found that a high education level was correlated with working out of home. In addition, eating out leads to high-fat, high-cholesterol and low-fiber diets (Pender, et al., 2002: 201), as discussed above.

This study corresponds with several studies of health-promoting behavior among various women's populations, which consistently found that education could not explain variations in health-promoting behavior (Oumpram, 1998:97; Iemsawasdikul, 1998: 117-119; Pongkeaw, 1997: 85-86; Duffy, 1988: 358-362).

Body Mass Index

This study found no correlation between BMI and total NHPB, either in the bivariate analysis or the multivariate analysis. This is probably because there was not much variation of BMI among the sample members of this study, as most subjects were overweight. The BMI in this study, therefore, could not be a predictor for total NHPB.

This study is consistent with the study of NHPB in menopausal professional nurses, which found that BMI could not explain variations in NHPB (Iemsawasdikul, 1998: 117-119).

Duration of Hyperlipidemia

This study found no correlation between the duration of having hyperlipidemia and total NHPB. This result is probably due to little differences in the duration among the sample, as most subjects had been diagnosed for less than six months. Therefore, the duration of having hyperlipidemia could not act as a predictor of total NHPB. This finding is consistent with a study of women with coronary heart disease (Pongkeaw, 1997: 89), which found that duration of illness could not explain variations in health-promoting behavior.

In conclusion, the variables which could explain the variation in the NHPB total scale were perceived self-efficacy, age, and perceived health risks. These variables could jointly explain 38.60% of the variation in the NHPB of hyperlipidemic women. The other 61.40% may come from undiscovered variables affecting the NHPB total scale of hyperlipidemic women. Considering Pender's Health Promoting Model (Pender, 1996), on which this study was based, the study hypothesis was partially supported.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

Conclusion

This research was a descriptive cross-sectional study aiming to examine the nutritional health promoting behavior (NHPB) of hyperlipidemic women and the effects of related factors, comprising age, body mass index (BMI), duration of hyperlipidemia, perceived health risks, education, perceived self-efficacy, and social support, on the NHPB of hyperlipidemic women. The conceptual framework of this study was based on the Health Promotion Model proposed by Pender (1996), in selection of the studied variables. The sample was composed of 263 hyperlipidemic women over 30 years of age who received medical service at the general, medicine, and golden age clinics of the Outpatient Department of Songkhla Nagarind Hospital, Hatyai Hospital, and Songkhla Hospital, during the period September to December 2002. Data were collected by interview method using the instrument that the researcher developed for this study, which was utilized for the first time. This instrument consisted of measures for perceived health risks, perceived self-efficacy, social support, and NHPB. The validity of all these measures was examined by 10 experts, and then re-examined after alteration according to the experts' suggestions. After receiving the experts' approval, the four measures - perceived health risks, perceived self-efficacy, social support, and NHPB - were examined for Cronbach's alpha coefficient of reliability and the resultant reliability values were 0.73, 0.89, 0.91, and 0.75, respectively. The obtained data were analyzed using the SPSS computer software program and the frequency count method, before being calculated into percentage value, mean value, and standard deviation. The research hypotheses were examined using stepwise multiple regression analysis. The results of this study are summarized below.

1. Personal data

The sample in this study was composed of women having hyperlipidemia for less than six months, with an average age of 48 years. The subjects were in a non-

menopausal period, had higher than secondary level education. Most subjects were employed, married, and had adequate income for their families of 2-4 members. The majority were slightly overweight ($BMI = 23-24.99 \text{ kg/m}^2$), total cholesterol was at a moderate level (245 mg/dl) (48.7% had total cholesterol $\geq 240 \text{ mg/dl}$) and the level of LDL-cholesterol was fairly high (68% $\geq 160 \text{ mg/dl}$, 92% $\geq 130 \text{ mg/dl}$)(Tables 4.1, 4.2). Most subjects bought fresh food and cooked themselves at home. The cooking methods were mostly curry(48%),stir-fried or fried (29%). Only seventeen percent was boiling, or steaming(Table 4.13)

2. Nutritional health- promoting behavior

The sample rated NHPB in both the total scale and the subscales at a moderate level. The average mean for the NHPB total scale was 3.77 (SD=.43).

For the NHPB subscales, the sample attained average means of 3.54-3.92 (SD=.49-.90). The subscales with the highest average mean were low-triglyceride diet and low-cholesterol diet (average mean=3.92, SD=.49 and .51, respectively). The lowest average mean was found in the subscale low-sugar diet (average mean=3.54, SD=.76).

3. Factors influencing NHPB

The results of stepwise multiple regression analysis showed that perceived self-efficacy, age, and perceived health risks could explain 38.60% ($P<.01$) of the variation in the NHPB of hyperlipidemic women. Perceived self-efficacy and age had positive effects on NHPB, whereas perceived health risks had negative effects.

Implications of Research Findings and Recommendations

The findings of this study could be applied for further development or modification of nursing policy and nursing practice, as recommended below.

1. The results of this study showed that perceived self-efficacy was the most powerful variable for explaining variations in the NHPB of hyperlipidemic women. With reference to this finding, the following actions are recommended.

Health care professionals should play significant roles in promoting perceived NHPB self-efficacy among women in general, as well as hyperlipidemic women, since a large number of women may have hyperlipidemia but not be aware of

it, since they do not have a medical check-up. NHPB perceived self-efficacy can be promoted, as detailed below.

1.1 Organizing a program for promoting perceived self-efficacy for hyperlipidemic women, and women in general.

1.2 Organizing a training program of promoting and enhancing clients' self-efficacy for nurses and personnel who are responsible for the perceived self-efficacy promotion program for hyperlipidemic women, to enhance their knowledge and consultation techniques for promoting perceived self-efficacy in hyperlipidemic women, and women in general.

1.3 Developing manual guidelines in form of document to promote individuals' self-efficacy in NHPB of hyperlipidemic women, such as brochures or manuals, so that hyperlipidemic women can use them as guidelines, along with the advice and training previously received.

2. Referring to the finding that the sample rated NHPB in both total scale and subscales at moderate levels, with the lowest score in the low-sugar diet subscale (not having sweetened drinks), followed by the low-fat diet subscale (not having fried foods), the following actions are recommended:

2.1 Promoting modification in dietary behavior of hyperlipidemic women and women in general to prevent and/or to treat hyperlipidemia in the context of the lifestyle and dietary culture of the southern region, including a low-sugar diet, which consisted of consuming sugar-free drinks, such as water, instead of having sweetened drinks and consuming fruits that are not very sweet; a low-fat diet, which consisted of avoiding fried foods or fried sweets and consuming foods cooked by boiling, steaming, grilling, or roasting, instead of fried foods; a low-cholesterol diet, which consisted of consuming fish, instead of other high-cholesterol dietary foods; and a cooking method using boiling, steaming, or grilling methods, and/or making spicy salads or non-coconut milk curries instead of cooking with frying or stir-frying methods.

To achieving these goals, for example, nurses should provide a dietary modification course, which consists of the sessions of nutritional health education and establishing the commitment to take action in performing NHPB. This offers a training program of assisting clients' NHPB.

2.2 Providing the public with healthy menu diet as well as information about hyperlipidemia through mass media, which consist of its increasing incidence in women, and the health risks of hyperlipidemia, including the relationship between a high-fat diet and hyperlipidemia, so that the general public become aware of the significance of hyperlipidemia for health and the appropriate dietary behaviors for its prevention and/or treatment. Moreover, public awareness of nutrition for health can be raised with the provision of simple and practical information via various media, such as radio, television, newspapers, brochures or a brief dietary manual for hyperlipidemic people.

2.3 Setting up systematic consultation services for NHPB among hyperlipidemic women, as follows:

2.3.1 Setting up dietary clinics in the workplace to provide advice to hyperlipidemic women and campaigns to examine women for hyperlipidemia in medical check-ups at least once a year, with continuous follow-up.

2.3.2 Providing a hot-line service to answer inquiries about hyperlipidemia and appropriate dietary behaviors for hyperlipidemic women and women in the general public.

These actions should lead to early detection of hyperlipidemia among high-risk women, resulting in early treatment with dietary therapy, thus reducing the risk of food-related disease.

Policy

From the findings of this study, it is recommended that organizations involved with women's health in the southern region should develop an active and concrete policy concerning NHPB for hyperlipidemic women, as detailed below.

1. Provide information about dietary behavior that is appropriate to age, and information about the relation between a high-fat diet and hyperlipidemia, especially among pre-menopausal and menopausal women who are at high risk of hyperlipidemia due to estrogen deficiency.

2. Coordinate with multidisciplinary members of the health care team, including physicians nutritionists and health educators, to promote and maintain the performance of appropriate NHPB by hyperlipidemic women. These women are at

risk of major chronic diseases, thus, prevention of these diseases tends to be more cost-effective than treatment of the illness.

3. Promoting healthy dietary issues as a crucial component in the Health Promotion Policy of an organization, including health care settings; school; communities; work sites, especially those having a lot of women; and the consumer marketplace.

4. Encourage the performance of NHPB among the following four groups of southern women

4.1 Women and the general public. This study found that the sample liked fried foods, very sweet fruit, and sweetened drinks. These dietary behaviors are inappropriate for everybody, not only hyperlipidemic women.

4.2 Women at risk, comprising young women, women with low level perceived self-efficacy, women with low level perceived health risk, and women not having a medical check-up.

4.3 Women with detected hyperlipidemia, comprising women receiving a medical check-up. These women should receive advice about NHPB and being empowered to increase their perceived self-efficacy in performing NHPB.

4.4 Healthy women. The women in this group could be models for the performance of NHPB.

Nursing Research

1. A study should be conducted to improve the measures developed and used in this research for the first time. These were NHPB, perceived self-efficacy in the NHPB of hyperlipidemic women, perceived health risks, and social support measures. Improving these measures, so that they may become a high quality instrument, will be beneficial, as the instrument could be used further with various populations in the context of Thai society.

2. Further research on NHPB should focus on the following issues:

2.1 Study with the same population as this study, investigating perceived health risks and social support with other variables, as this study found that these two variables affect the NHPB of hyperlipidemic women. However, the review

of the related literature and the findings of previous studies of NHPB revealed that their relationship with NHPB was different from this study.

2.2 Study of hyperlipidemic women in different contexts, such as those living in rural areas, women in the workplace, or in other regions of the country. The results could be compared with the results of this study, leading to research findings that can represent the NHPB of hyperlipidemic Thai women. Moreover, such study could also examine Pender's conceptual framework (Pender, 1996) in explaining the phenomenon of NHPB in other groups of hyperlipidemic women.

2.3 Study of hyperlipidemic men. The results could be compared with the results of this study, and elucidate differences in the NHPB of hyperlipidemic men and women.

3. The results of this study have shown that perceived self-efficacy, age, and perceived health risks can explain 38.6% of the variation in the NHPB of hyperlipidemic women. There are, therefore, other factors that can further explain the variations in the NHPB of hyperlipidemic women. Thus, further study of other factors influencing NHPB, such as occupation, personality, perceived health status, perceived barriers, perceived benefits, and commitment to a plan of action, should be carried out.

4. There should be a prospective study to investigate the relationships between various factors and the NHPB of hyperlipidemic women after a period of time.

5. Developing a model for generating self-confidence or perceived self-efficacy in NHPB for hyperlipidemic women.

6. An intervention program should be tested with each population, to investigate the development of perceived self-efficacy in performing NHPB, such as a trial with hyperlipidemic women, since perceived self-efficacy was found to be the most powerful factor explaining variations in the NHPB of hyperlipidemic women. A trial might also be conducted with adolescents or adults to compare the NHPB covering populations of all ages.

7. Qualitative research should be conducted in some issues, to deeply investigate those factors that may affect the NHPB of hyperlipidemic women; for example, a study of family social support affecting to the NHPB among

hyperlipidemic women or a study of the changing process in NHPB of hyperlipidemic women.

Limitations of the Study

Referring to the results, a number of limitations were found in this study, as follows:

1. The subjects of this study were hyperlipidemic women from southern Thailand. Thus, their NHPB might differ from hyperlipidemic women in other regions. Moreover, the subjects were quite a specific group, as they were middle-aged hyperlipidemic women with high education levels. The subjects were also interested in health care, as demonstrated by their report of learning about hyperlipidemia from their annual medical check-up. Therefore, the sample in this study might represent women from similar sociocultural contexts but not those in different contexts.
2. The investigator developed the research instrument for this study, and thus there were probably limitations in the validity and reliability of the instrument. The measure that had a low reliability value was the perceived health risks measure, of which the Cronbach's alpha coefficient was 0.73. Improvement of this research instrument is required for further use.
3. The research design of this study did not lead to findings about cause-effect relationships, because it was a cross-sectional study.

Contribution to Nursing Theory

This research was a study of NHPB in hyperlipidemic women and factors related to variances in NHPB, based on the concept of the Health Promotion Model proposed by Pender (1996). The results of this study generated a body of knowledge that may be utilized for improving nursing science, either by expanding existing theories or developing new knowledge, by elucidating the theory at presumption level, as discussed below.

This research applied the nursing concept of the health-promoting behavior developed by Pender and colleagues (1995) as a conceptual framework for explaining the NHPB in hyperlipidemic women, in combination with nutritional concepts

concerning diet for the reduction of hyperlipidemia. The new body of knowledge generated is discussed below.

1. Expanding the concept concerning NHPB in hyperlipidemic women

The concept of NHPB proposed by Pender and colleagues(1995) outlined health promoting dietary behavior for people in general. The behavior is composed of two domains: 1) appropriate diet, including low fat, low sugar, cereal, vegetables, fruits, milk, meat, egg, fish and dried beans, avoiding instant foods high in sodium and fat; and 2) meal patterns. It is evident that the suggested appropriate diet lacked clear and specific details for hyperlipidemic women that can be applied for practical use. Therefore, the integration of dietary guidelines for reducing hyperlipidemia with the concept of appropriate dietary behavior developed by Pender and colleagues (1995) will elucidate the NHPB for hyperlipidemic women, leading to further development of a practical theory for NHPB in hyperlipidemia. The guidelines for dietary behavior should include information about types, quantities, and meal frequency that enhance the reduction of plasma lipid levels. The guidelines should be composed of five components: low-triglyceride diet, low-cholesterol diet, high-fiber diet, low-fat diet, and low-sugar diet,. Moreover, this concept could lead to the development of an instrument for measuring NHPB in hyperlipidemic women, which could also be used with other populations, such as overweight people.

2. Generating new knowledge of NHPB in southern hyperlipidemic women in nursing perspective.

3. Proving the concept in Pender's HPM

The results of this study confirmed the importance of perceived self-efficacy, the concept in the behavior-specific cognitions and affect in explaining and predicting NHPB. This finding is similar to those of other studies of health promoting behaviors in other domains, which found that it was the strongest predictor of the variation of NHPB in hyperlipidemic women in this study. This led to improving the knowledge and understanding of NHPB in hyperlipidemic women, and related factors. This knowledge could be used as guidelines for the development of nursing activities that are appropriate for the modification of dietary behavior for hyperlipidemic women by promoting their perceived self-efficacy of NHPB.

In conclusion, the findings of this study can be applied for further development of nursing science, by elucidating the concept of NHPB in Pender's Health Promotion Model and by developing knowledge at the predictive level, which could provide guidelines for further development of practical theories.



BIBLIOGRAPHY

- Abbasi, F., et al. (2000). High carbohydrate diets, triglyceride-rich lipoproteins, and coronary heart disease risk. The American Journal of Cardiology, 85(1), 45-48.
- Ahmed, S.M., Clasen, M.E., & Donnelly, J.F. (1998). Management of dyslipidemia in adults. American Journal of Family Physician, 57(9), 2192-2204.
- Aish, A.E., & Isenberg, M. (1996). Effects of Orem – based nursing intervention on nutritional self – care of myocardial infarction patients. International Journal of Nursing Student, 33(3), 259-270.
- Allen, J.K., & Xu, X. (1997). Coronary revascularization in women. Critical Care Nursing Clinics of North America, 9(4), 497-509.
- Angotti, C.M., Chan, W.T., Sample, C.J., & Levine, M.S. (2000). Combined dietary and exercise intervention for control of serum cholesterol in the workplace. American Journal of Health Promotion, 15(1), 9-16.
- Aubin, M., Godin, G., Vezina, L. Maziade, J., & Desharnais, R. (1998). Hypercholesterolemia screening. Does knowledge of blood cholesterol level affect dietary fat intake? Canadian Journal of Family Physician, 44, 1289-1297.
- Austin, M.A., et al. (2000). Cardiovascular disease mortality in familial forms of hypertriglyceridemia : A 20- year prospective study. Circulation. 101 (24), 2777-2782.
- Baas, L.S. (Ed.). (1991). Essentials of cardiovascular nursing. Maryland : AN Aspen Publication.
- Bailey, S., & Goldberg, J.P. (1989). Eating patterns and weight concerns of college women. Journal of the American Dietetic Association, 89(1), 95-96.
- Bales, A.C. (2000). In search of lipid balance in older women : New studies raise questions about what works best. Symposium : Second of four articles on hyperlipidemia. Postgraduate Medicine, 108(7), 57-60.

- Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman and Company.
- _____. (1977). Social learning theory. New Jersey: Prentice-Hall.
- _____. (1986). Social foundation of thought and action: A social cognitive theory. New Jersey: Prentice-Hall.
- Barry, P. (1993). Coronary artery disease in older women. Geriatrics, 48(1), 4-8.
- Baughman, K., Logue, E., Sutton, K., Capers, C., Jarjoura, D., & Smucker, W. (2003). Biopsychosocial characteristics of overweight and obese primary care patients: Do psychosocial and behavior factors mediate sociodemographic effects? Preventive Medicine, 37(2), 129- 137.
- Baxendale, L.M. (1992). Pathophysiology of coronary artery disease. Nursing Clinics of North America, 27(1), 143-285.
- Becker, M.H. (1974). The health belief model and personal health behavior. New Jersey: Charles B. Slack.
- Becker, M.H., et al. (1977). Selected psychosocial models and correlated of individual health related behaviors. Medical Care, 15, 27-46.
- Behera, S.K., Winkleby, M.A., & Collins, R. (2000). Low awareness of cardiovascular disease risk among low-income African-American women. American Journal of Health Promotion, 14(5), 301-305.
- Beresford, S.A.A., Curry, S.J., Kristal, A.R., Lazovich, D., Feng, Z., & Wagner, E.H. (2002). A dietary intervention in primary care practice : The eating patterns study. American Journal of Public Health, 87(4), 610-616.
- Bird, C.E., & Rieker, P.P. (1999). Gender matters : An integrated model for understanding men's and women's health. Social Science & Medicine, 48(6), 745-755.
- Brannstrom, I., Persson, L.A., & Wall, S. (1994). Gender and social patterning of health: The Norsjo cardiovascular preventive programme in northern Sweden 1985-1990. Scandinavian Journal of Primary Health Care, 12(3), 155-161.
- Brant, P., & Weinert, C. (1981). The PRQ: A social support measure. Nursing Research, 30, 277-280.

- Brier, K.L., Tornow, J.J., Ries, A.J., Weber, M.P., & Downs, J.R. (1999). Forecasting patient outcomes in the management of hyperlipidemia. Archives of Internal Medicine, 159(6), 569-575.
- Brownell, K.D. (1999). The central role of lifestyle change in long-term weight management. Clinical Cornerstone, 2(3), 43-51.
- Brunner, E., White, I., Thorogood, M., Bristow, A., Curle, D., & Marmot, M. (1997). Can dietary interventions change diet and cardiovascular risk factors? A meta-analysis of randomized controlled trials. American Journal of Public Health, 87(9), 1415-1422.
- Butcher, A.H., et al. (1988). Heart smart : A school health program meeting the 1990 objectives for the nation. Health Education Quarterly, 5(1), 17-34.
- Caggiula, A.W., & Mustad, V.A. (1997). Effects of dietary fat and fatty acids on coronary artery disease risk and total and lipoprotein cholesterol concentrations : Epidemiologic studies. American Society for Clinical Nutrition, 65(5), 1597S-1610S.
- Callaghan, D.M. (2003). Health- promoting self- care behaviors, self-care self-efficacy and self- care agency. Nursing Science Quarterly, 16(3), 247-254.
- Campbell, M.K., DeVellis, B.M., Strecher, V.J., Ammerman, A.S., DeVellis, R.F., & Sandle, R.S. (1994). Improving dietary behavior : The effectiveness of tailored messages in primary care settings. American Journal of Public Health, 84(50), 783-787.
- Campbell, M.K., et al (1999). A tailored multimedia nutrition education pilot program for low-income women receiving food assistance. Health Education Research, 14 (2), 257-267.
- Campbell, M.K., et al. (2000). Tailoring and targeting a worksite health promotion program to address multiple health behaviors among blue – collar women. American Journal of Health Promotion, 14(5), 306-313.
- Campos, H., Mata, L., Siles, X., Vives, M., Ordovas, J.M., & Schefer, E.J. (1992). Prevalence of cardiovascular risk factors in rural and urban Costa Rica. Circulation, 85(2), 648-658.
- Caplan, G. (1974). Support systems and community mental health. New York: Behavioral Publications.

- Cassel, J. (1976). The contribution of the social environment to host resistance. American Journal of Epidemiology, 104, 107-123.
- Champion, V. L., & Miller, T. (1992). Variables related to breast self- examination. Psychology of Women Quarterly, 16, 81- 96.
- Chinuntuya, P. (2001). A causal model of exercise behavior of the elderly in Bangkok metropolis. Thesis of doctor of nursing science, Faculty of graduate studies, Mahidol University.
- Clark, D.O. (1996). Age, socioeconomic status and exercise self – efficacy. The Gerontologist, 36(2), 157-164.
- Clark, M., et al. (1997). Development and evaluation of a computer – based system for dietary management of hyperlipidemia. Journal of the American Dietetic Association, 97(2), 146-150.
- Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.
- Cohen, S., & Syme, S.L. (1985). Social support and health. Orlando: Academic Press.
- Collanghan, P., & Morissey, J. (1993). Social support and health : A review. Journal of Advance Nursing, 18, 203-210.
- Coughlan, B.J., & Sorrentino, M.J. (2000). Does hypertriglyceridemia increase risk for coronary artery disease? Growing evidence suggests it plays a role. Symposium : Third of four articles on hyperlipidemia. Postgraduate Medicine, 108(7), 77-84.
- Cunningham, S. (1992). The epidemiologic basis of coronary disease prevention. Nursing Clinics of North America, 27(1), 153-169.
- Daly- Nee, C., Brunt, H., & Jairath, N. (1999). Risk and coronary heart disease. In N. Jairath (Ed.), Coronary heart disease & risk factor management :A nursing perspective (pp.3-19). Philadelphia : W. B. Saunders Company.
- Delichatsios, H.K., et al. (2001). Randomized trial of a “ Talking Computer” to improve adults’ eating habits. American Journal of Health Promotion, 15 (4), 215-224.
- _____. (2001). Eat Smart : Efficacy of a multifaceted preventive nutrition intervention in clinical practice. Preventive Medicine, 33(2 part 1), 91-98.

- Devine, C.M., & Sandstrom, B. (1996). Relationship of social roles and nutrition beliefs to fat avoidance practices : Investigation of a US model among Danish women. Journal of the American Dietetic Association, 96(6), 580-584.
- Dimond, M., & Jones, S.L. (1983). Chronic illness across the life span. Connecticut: Appleton & Century Crofts.
- Dobs, A.S., et al (1994). A comparison of education methods and their impact on behavioral change in patients with hyperlipidemia. Patient Education & Counseling, 24(2), 157-164.
- Dossey, B.M., Keegan, L., & Guzzetta, C.E. (2000). Holistic nursing : A handbook for practice. (3rd ed.). Gaithersburg, Maryland : An Aspen Publication.
- Doyle, P., & Hamilton, G. (1999). Women and coronary heart disease. In N. Jairath (Ed.), Coronary heart disease & risk factor management: A nursing perspective (pp. 278- 289). Philadelphia: W.B. Saunders Company.
- Duffy, M.E. (1988). Determinants of health promotion in midlife women. Nursing Research, 37(6), 358-362.
- Duncan, G.E., Anton, S.D., Newton, R.L., & Perri, M.G. (2003). Comparison of perceived health to physiological measures of health in Black and White women. Preventive Medicine, 36, 624-628.
- Elson, R.B., Splett, P.L., Bostick, R.M., Aeppli, D., & Haberman, M. (1994). Dietitian practices for adult outpatients with hypercholesterolemia referred by physicians. The Minnesota Dietitian Survey. Archive of Family Medicine, 3(12), 1073-1080.
- Fair, J.M., & Burke, L.E. (1995). Cholesterol education. In S. L. Woods, R.S.S. Froelicher, C.J. Halpenny, & S.U. Motzer (Eds.), Cardiac nursing (3rd ed., pp.735- 747). Philadelphia: J.B. Lippincott Company.
- Fawcett, J. & Downs, F. (1992). The relationship of theory and research. (2nd ed.). Philadelphia: F.A. Davis Company.
- Fawcett, J. (1995). Analysis and evaluation model of nursing. (3rd ed.). Philadelphia: F.A. Davis Company.
- Feather, N.T. (Ed.). (1982). Expectations and actions: Expectancy- value models in psychology. New Jersey: Lawrence Erlbaum Associates.

- Felton, G. M., Parsons, M.A., Misener, T.R., & Oldaker, S. (1997). Health-promoting behaviors of black and white college women. Western Journal of Nursing Research, 19(5), 654- 667.
- Felton, G.M., Parsons, M.A., & Bartoces, M.G. (1997). Demographic factors : Interaction effects on health – promoting behavior and health related factors. Public Health Nursing, 14(6), 361-367.
- Fitzpatrick, A. (2002). Conventional and natural therapies for hyperlipidemia. International Journal of Integrative Medicine, 4(2), 8-10.
- Fleury, J. (1992). The application of motivational theory to cardiovascular risk reduction. Journal of Nursing Scholarship, 24(3), 229-237.
- Fleury, J., & Cameron – Go, K. (1997). Women 's rehabilitation and recovery. Critical Care Nursing Clinics of North America, 9(4), 577-587.
- Foster, G.M., & Anderson, B.G. (1978). Medical anthropology. New York: John Wiley & Son.
- Fraser, G.E., et al. (1992). A possible protective effect of nut consumption on risk of coronary heart disease: The Adventist Health Study. Archives of Internal Medicine, 152, 1416-1424.
- Frame, C.J., Green, C.G., Herr, D.G., Myers, J.E., & Taylor, M.A. (2001). The stages of change for dietary fat and fruit and vegetable intake of patients at the outset of a cardiac rehabilitation program. American Journal of Health Promotion, 15 (6), 405-413.
- Gillespie, A.H., & Achterberg, C.L. (1989). Comparison of family interaction patterns related to food and nutrition. Journal of the American Dietetic Association, 89 (4), 509-512.
- Gillis, A.J. (1993). Determinants of a health – promoting lifestyle : An integrative review. Journal of Advanced Nursing, 18, 345-353.
- Glanz, K. & Mullis, R.M. (1988). Environmental interventions to promote health eating : A review of models, programs, and evidence. Health Education Quarterly, 15(4), 395-415.
- Glanz, K. (1999). Progress in dietary behavior change. American Journal of Health Promotion, 14(2), 112-117.

- Glanz, K., Lewis, F.M., & Rimer, B. (Eds.). (1990). Health behavior and health education. San Francisco: Jossey- Bass.
- Gochman, D.S. (1988).Health behavior emerging research perspective. New York: Plenum Press.
- Goldsmith , C. (2001). Guide to care for patients. Hyperlipidemia. Physician Assistant, 25 (8), 49-50.
- Gordon, M. (1997). Manual of nursing diagnosis . St.Louis: Mosby.
- Gordon, D.J., et al. (1989). High- density lipoprotein cholesterol and cardiovascular disease : Four prospective American studies. Circulation, 79 (1), 8-15.
- Gore, S.A., Foster, J.A., DiLillo, V.G., Kirk, K., & West, D.S. (2003). Television viewing and snacking. Eating Behaviors, 4, 399-405.
- Gotto, A.M., et al. (1994). Heart disease in the assessment and treatment of hypercholesterolemia: Coronary artery disease and other atherosclerotic disease, family history, and left ventricular hypertrophy. The American Journal of Medicine, 96(6A), 6A-9S-6A-18S.
- Grabauskas, V., et al. (2003). Prevalence of dyslipidemias among Lithuanian rural population(CINDI program). MEDICINA, 39(12), 1215-1222.
- Green, L.W., & Kreuter, M.W. (1991). Health promoting planning : An educational and environmental approach. (2nd ed.). Mountain View: Mayfield Publication.
- Grodner, M., Anderson, S.L., & Deyoung, S. (2000). Foundation and clinical applications of nutrition : A nursing approach. (2nd ed.). St.Louis: Mosby.
- Grogan, S.C., Bell, R., & Conner, M. (1997). Eating sweet snacks: Gender differences in attitudes and behaviour. Appetite, 28, 19-31.
- Grundy, S.M. (1999). Nutrition and diet in the management of hyperlipidemia and atherosclerosis. In M. E. Shils, J.A.Olson, M. Shike, & A.C.Ross (Eds.), Modern nutrition in health and disease (9th ed., pp.1199- 1216). Philadelphia :Williams& Wilkins.
- Guggetta, C.E., & Dossey, B.M. (Eds.). (1992). Cardiovascular nursing: Holistic practice. St. Louis: Mosby Year Book.
- Guibert, R., Leduc, N., Fournier, P, & Tetreault, H. (1999). What factors determine whether individuals found to have hypercholesterolaemia at mass screening accept to advice to visit their physician. Public Health, 113(3), 105-110.

- Hall, K.M., & Luepker, R.V. (2000). Is hypercholesterolemia a risk factor and should it be treated in the elderly?. American Journal of Health Promotion, 14(6), 347-356.
- Harnack, L., Block, G., Subar, A., Lane, S., & Brand, R. (1997). Association of cancer prevention-related nutrition knowledge, beliefs, and attitudes to cancer prevention dietary behavior. Journal of the American Dietetic Association, 97(9), 957-965.
- Hatton, D.C., et al. (1996). Improved quality of life in patients with generalized cardiovascular metabolic disease on a prepared diet. American Society for Clinical Nutrition, 64, 935-943.
- Hayman, L.L., & Ryan, E.A. (1997). The cardiovascular hearth profile: Implications for hearth promotion and disease prevention. Pediatric Nursing, 20(5), 509-515.
- Hays, N.P., et al. (2002). Eating behavior correlates of adult weight gain and obesity in healthy women aged 55-65 y. American Journal of Clinical Nutrition, 75(3), 476-483.
- Heim, L.J., & Brunsell, S.C. (2000). Heart disease in women. Primary Care, 27(3), 741-767.
- Hengyotmark, A. (2001). A study of health-promoting behaviors of essential hypertensive patients. Thesis of master of nursing science (Adult nursing), Faculty of graduate studies, Mahidol University.
- Herrmann, J. K., Carter, V.D., & Lowther, N. (1991). Cholesterol. In L. S. Baas (Ed.), Essentials of cardiovascular nursing (pp. 23- 47). New York: Academic Press.
- Hess, M.L. (Ed.). (1999). Heart disease in primary care. Philadelphia : Williams & Wilkins.
- House, J.S. (1981). Work stress and social support. Anglewood Cliffs, New Jersey: Prentice Hall.
- Huether, S.E., & McCance, K.L. (Eds.). (1996). Understanding pathophysiology. St. Louis: Mosby.
- Hupcey, J.E. (1998). Clarifying the social support theory-research linkage. Journal of Advance Nursing, 27, 1231-1241.

- Ingall, T.J. (2000). Preventing ischemic stroke: Current approaches to primary and secondary prevention. Postgraduate Medicine, 107(6), 34-50.
- Jairath, N. (Ed.). (1999). Coronary heart disease & risk factor management : A nursing perspective. Philadelphia : W.B. Saunders Company.
- Jeffery, R.W., & French, S.A. (1996). Socioeconomic status and weight control practices among 20- to 45-year-old women. American Journal of Public Health, 86(7), 1005-1010.
- Juarbe, T.C. (1998). Cardiovascular disease – related diet and exercise experiences of immigrant Mexican women. Western Journal of Nursing Research, 20(6), 765-782.
- Kayman, S. (1989). Applying theory from social psychology and cognitive behavioral psychology to dietary behavior change and assessment. Journal of the American Dietetic Association, 89(2), 191-202.
- Keller, C., & Thomas, K.T. (1995). Measurement of body fat and fat distribution. Journal of Nursing Measurement, 3(2), 159-174.
- Khan, M.G. (1996). Heart disease diagnosis and therapy: A practical approach. Philadelphia: Williams & Wilkins.
- Khan, R.L., & Antonucci, T.C. (1980). Convey over life course: Attachment, roles, and social support. In P.B. Baltes & O.G.Brim (Eds.), Life-span development and behavior (Vol.3, pp. 253-286). New York: Academic Press.
- King, K.B., Rowe, M.A., & Zerwic, J. J. (2000). Concerns and risk factor modification in women during the year after coronary artery surgery. Nursing Research, 49 (3), 167- 172.
- King, K.M. (2000). Gender and short – term recovery from cardiac surgery. Nursing Research, 49(1), 29-36.
- Kittichotpanich, B. (2001). Causal relationship between nutritional promoting behaviors and pregnancy outcome in low income pregnant women. Thesis of doctor of public health, Faculty of graduate studies, Mahidol University.
- Koikkalainen, M., et al. (1999). Difficulties in changing the diet in relation to dietary fat intake among patients with coronary heart disease. European Journal of Clinical Nutrition, 53, 120-125.

- Kubik, M.Y., et al (2002). Food – related beliefs, eating behavior, and classroom food practices of middle school teachers. Journal of School Health, 72(8), 339-345.
- Laitinen, J., Ek, E., & Sovio, U. (2002). Stress-related eating and drinking behavior and body mass index and predictors of this behavior. Preventive Medicine, 34, 29-39.
- Larkin, F.A., et al (1989). Comparison of estimated nutrient intakes by food frequency and dietary records in adults. Journal of the American Dietetic Association, 89 (2), 215-223.
- Larosa, J.C. (1998). Hyperlipidemia. Clinical Cornerstone, 1(1), 1-64).
- Lazovich, D., Curry, S.J., Beresford, S.A.A., Kristal, A.R., & Wagner, E.H. (2000). Implementing a dietary intervention in primary care practice : A process evaluation. American Journal of Health Promotion, 15(2), 118-125.
- Lottenberg, A.M.P., et al. (1996). Plasma cholesteryl ester synthesis, cholesteryl ester transfer protein concentration and activity in hypercholesterolemic women: Effects of the degree of saturation of dietary fatty acids in the fasting and postprandial states. Atherosclerosis, 126(2), 265-275.
- Ludwig, D.S., et al. (2002). Dietary fiber, weight gain, and cardiovascular disease risk factors in young adults. The Journal of the American Medical Association, 282 (16), 1539-1546.
- Luepker, R.V. (1997). Current status of cholesterol treatment in the community: The Minnesota heart survey. American Journal of Medicine, 102(2A), 37-42.
- Lusk, S.L., Kerr, M.J., & Ronis, D.L. (1995). Health – promoting lifestyles of blue – collar, skilled trade, and white – collar workers. Nursing Research, 44(1), 20-24.
- Lusk, S.L., Ronis, D.L., Kerr, M.J., & Atwood, J.R. (1994). Test of the health promotion model as a causal model of workers' use of hearing protection. Nursing Research, 43(3), 151-157.
- Ma, J., Betts, N.M., Horacek, T., Georgiou, C., White, A., & Nitzke, S. (2002). The importance of decisional balance and self – efficacy in relation to stages of change for fruit and vegetable intakes by young adults. American Journal of Health Promotion, 16(3), 157-166.

- Ma, J., Betts, N.M., & Hampl, J.S. (2000). Clustering of lifestyle behaviors : The relationship between cigarette smoking, alcohol consumption, and dietary intake. American Journal of Health Promotion, 15(2), 107-117.
- Maben, J., & Clark, J.M. (1995). Health promotion : A concept analysis. Journal of Advanced Nursing, 22, 1158-1165.
- Mahanonda, N., et al. (2000). Obesity and risk factors of coronary heart disease in healthy Thais : A cross – sectional study. Journal of the Medical Association of Thailand, 83(2), S35- S45.
- Maibach, E., & Murphy, D.A. (1995). Self – efficacy in health promotion research and practice : Conceptualization and measurement. Health Education Research, 10 (1), 37-50.
- Malotte, C. K., & Gilbert, J. (1995). Cardiovascular health promotion in the young. In S. L. Woods, R.S.S. Froelicher, C.J. Halpenny, & S.U. Motzer (Eds.), Cardiac nursing (3rd ed., pp.662- 667). Philadelphia: J.B. Lippincott Company.
- Marino, J.C., & Kooser, J.A. (1981). The psychological care of cancer client and their families: Period of high risk in cancer nursing. St. Louis: Mosby Book.
- McIntosh, W.A., Fletcher, R.D., Kubena, K.S., & Landmann, W.A. (1995). Factors associated with sources of influence /information in reducing red meat by elderly subjects. Appetite, 24(3), 219-230.
- Medeiros, D.M. (1996). Diet fat and fiber knowledge, beliefs and practices are minimally influenced by health status. Nutrition Research, 16(5), 751-758.
- Melchionda, N., et al. (2003). The QUOVADIS study: Features of obese Italian patients seeking treatment at specialist centers. Diabetes Nutrition & Metabolism, 16(2), 115-124.
- Muhlenkamp, A.F., Brown, N.J., & Sands, D. (1985). Determinants of health promotion activities in nursing clinic clients. Nursing Research, 34(6), 327-332.
- Murdaugh, C.L. (1992). The person with coronary artery disease risk factors. In C.E Guzzetta & B.M .Dossey(Eds.), Cardiovascular nursing: Holistic practice (pp. 197-219). St. Louis: Mosby Year Book.

- Murphy, J.G. (Ed.). (1997). Mayo clinic : Cardiology review. (2nd ed.). Philadelphia : Lippincott Williams & Wilkins.
- Newton, K.M., & Froelicher, E. S. (1995).Coronary heart disease risk factors. In S.L. Woods, R.S.S. Froelicher, C.J. Halpenny, & S.U. Motzer (Eds.), Cardiac nursing (3rd ed., pp. 205-206). Philadelphia: J. B. Lippincott Company.
- Norbeck, J.S. (1981). Social support: A model for clinical research and application. Advance in Nursing Science, July, 43-59.
- Ockene, J.K ., et al. (1995). Physician training for patient-centered nutrition counseling in a lipid intervention trial. Preventive Medicine, 24, 563-570.
- Ockene, I.S., et al. (1999). Effect of physician-delivered nutrition counseling training and an office-support program on saturated fat intake, weight, and serum lipid measurements in a hyperlipidemic population. Archives Internal of Medicine, 159, 725-731.
- Orem, D.E. (1985). Nursing : Concepts of practice. (3rd ed.). New York: McGraw-Hill.
- _____. (1991). Nursing : Concepts of practice. (4th ed.). Philadelphia: Mosby Year Book.
- Oster, G., & Thompson, D. (1996). Estimated effects of reducing dietary saturated fat intake on the incidence and costs of coronary heart disease in the United States. Journal of the American Dietetic Association, 96(2), 127-131.
- Palank, C.L. (1991). Determinants of health – promotive behavior: A review of current research. Nursing Clinics of North America, 26(4), 815-833.
- Patanavanichnun, N. (2000). Perceived self-efficacy and health promoting behaviors among pregnant industrial workers. Thesis of master of nursing science (Maternal and child nursing), Faculty of graduate studies, Mahidol University.
- Pender, N.J. (1975). A conceptual model for preventive health behavior. Nursing Outlook, 23, (6), 385-390.
- _____. (1989). Expressing health through lifestyle patterns. Nursing Science Quarterly, 3(3), 115-122.
- _____. (1982). Health promotion in nursing practice. New York : Appleton & Century-Crofts.

- _____. (1987). Health promotion in nursing practice. (2nd.ed.). Norwalk :
Appleton & Lange.
- _____. (1996). Health promotion in nursing practice. (3rd.ed.). Norwalk :
Appleton & Lange.
- Pender, N.J., & Pender, A.R. (1986). Attitudes, subjective norms, and intentions to
engage in health behaviors. Nursing Research, 35(1), 15-18.
- Pender, N.J., Murdaugh, C.L., & Parsons, M.A. (2002). Health promotion in nursing
practice. (4th.ed.). New Jersey : Prentice Hall.
- Pender, N.J., Walker, S.N., Sechrist, K.R., & Frank-Stromborg, M. (1990). Predicting
health – promotion lifestyles in the workplace. Nursing Research, 39(6), 326-
332.
- Pizzi, E.R., & Wolf, Z.R. (1998). Health risks and health promotion for older women :
Utility of a health promotion diary. Holistic Nursing Practice, 12(2), 62-72.
- Porth, C.M. (Eds.). (1994). Pathophysiology : Concepts of altered health states. (4th
ed.). Philadelphia : J.B. Lippincott Company.
- Price, R.A., Sorensen, T.I.A., & Stunkard, A.J. (1989). Component distributions of
body mass index defining moderate and extreme overweight in Danish women
and men. American Journal of Epidemiology, 130(1), 193-201.
- Puttapitukpol, S. (2001). A causal model of the health responsibility of pregnant
adolescents. Thesis of doctor of nursing science, Faculty of graduate studies,
Mahidol University.
- Raats, M.M., Sparks, P., Geekie, M.A., & Shepherd, R. (1999).The effects of
providing personalized. Dietary feedback: A semi- computerized approach.
Patient Education and Counseling, 37, 177- 189.
- Racelis, M.C., & Lombardo, K., & Verdin, J. (1998). Impact of telephone
reinforcement of risk reduction education on patient compliance. Journal of
Vascular Nursing, 16(1), 16-20.
- Rasheed, P. (1998). Perception of body weight and self-reported eating and exercise
behaviour among obese and non-obese women in Saudi Arabia. Public Health,
112, 409-414.

- Ratner, P.A., Bottorff, J.L., Johnson, J.L., & Hayduk, L.A. (1994). The interaction effects of gender within the health promotion model. Research in Nursing & Health , 17 (5).341- 358.
- Rich – Edwards, J.W., Manson, J.E., Hennekens, C.H., & Buring, J.E. (1995). The primary prevention of coronary heart disease in women. The New England Journal of Medicine, 332(26), 1758-1766.
- Riffle, K.L., Yoho, J., & Sams, J. (1989). Health-promoting behaviors, perceived social support, and self- reported health of Apalachian elderly. Public Health Nursing , 6 (4), 204- 211.
- Ritter, C. (1988). Social support, social networks and health behaviors. In D. S. Gochman (Ed.), Health behavior emerging research perspectives (pp. 152). New York: Plenum Press.
- Rosenstock, I.M. (1990). The health belief model : Explaining health behavior through expectancies, In K. Glanz, F.M. Lewis., & B.K. Rimer(Eds.), Health behavior and health education (pp. 39-62). San Francisco: Jossey-Bass.
- Rossi, S. R., Jonnalagadda, S. S., & Kris- Etherton. (1999). Dietary factors. In N. Jairath (Ed.), Coronary heart disease & risk factor management: A nursing perspective(pp. 109- 137). Philadelphia: W. B. Saunders Company.
- Sadler, D. (1984). Nursing for cardiovascular health. Norwalk: Appleton-Century-Crofts.
- Saiseesub, Y. (2000). A study of perceived self- efficacy and situational influences on exercise behavior in coronary artery disease patients at Uttaradit hospital. Thesis of master of nursing science (Adult nursing), Faculty of graduate studies, Mahidol University.
- Sandersphillips, K. (2002). Correlates of healthy eating habits in low-income black women and Latinas. Preventive Medicine, 23(6), 781-787.
- Sang-gassanee, S. (2000). Health behaviors and plasma lipid levels in Muslim patients with coronary heart disease during fasting period in the month of Ramadan in Narathiwat province. Thesis of master of nursing science (Adult nursing), Faculty of graduate studies, Mahidol University.
- Sanjur, D. (1982). Social and cultural perspectives in nutrition. New Jersey: Prentice-Hall.

- Schaefer, C., Coyne, J.C., & Lazarus, R.S. (1981). The health-related function of social support. Journal of Behavioral Medicine, 4, 381-406.
- Schafer, R. B., Schafer, E., Dunbar, M., & Keth, P.M. (1999). Marital food interaction and dietary behavior. Social Science & Medicine, 48(6), 787- 796.
- Schuster, P.M., Wright, C., & Tomich, P. (1995). Gender differences in the outcomes of participants in home programs compared to those in structured cardiac rehabilitation programs. Rehabilitation Nursing, 20(2), 93-101.
- Seeman, T.E. (2000). Health promoting effects of friends and family on health outcomes in older adults. American Journal of Health Promotion, 14(6), 362-370.
- Serembus, J.F. (1998). The healthy heart: Health promotion and maintenance. Holistic Nursing Practice, 12(2), 44-51.
- Shils, M.E., Olson, J.A., Shike, M., & Ross, A.C. (Eds.). (1999). Modern nutrition in health and disease. (9th ed.). Philadelphia : Williams & Wilkins.
- Singh, R.B., et al.(1998). Prevalence and risk factors of hypertension and age- specific blood pressures in five cities : A study of Indian women. International Journal of Cardiology, 63(2),165-173.
- Sinthanayothin, P. (2000). The study of health perceptions and health promoting behaviors in midlife working women in Bangkok. Thesis of master of nursing science (Maternal and child nursing), Faculty of graduate studies, Mahidol University.
- Sorensen, G., Stoddard, A., & Macario, E. (1998). Social support and readiness to make dietary changes. Health Education& Behavior, 25 (5). 586- 598.
- Sorensen, G., et al. (1998). The effects of a health promotion-health protection intervention on behavior change: The Wellworks study. American Journal of Public Health, 88(11), 1685-1690.
- Sorrentino, M.J. (2000). Cholesterol reduction to prevent coronary artery disease: What do the data show? Symposium : First of four articles on hyperlipidemia. Postgraduate Medicine, 108(7), 40-42.
- Sorrentino, M.J. (2000). Hyperlipidemia : A four-article symposium. Postgraduate medicine, 108(7), 39-100.

- Stevens, V.J., Glasgow, R.E., Toobert, D.J., Karanja, N., & Smith, K.S. (2002). Randomized trial of a brief dietary intervention to decrease consumption of fat and increase consumption of fruits and vegetables. American Journal of Health Promotion, 16(3), 129-134.
- Stoto, M.A., & Durch, J.S. (1991). National health objectives for the year 2000 : The demographic impact of health promotion and disease prevention. American Journal of Public Health, 81(11), 1456-1465.
- Stuifbergen, A.K., & Becker, H.A. (1994). Predictors of health – promoting lifestyles in persons with disabilities. Research in Nursing & Health, 17(3), 3-13.
- Sutor, C. J.W., & Crowley, M. F. (1984). Nutrition: Principles and application in health promotion. (2nd ed.). Philadelphia: J.B. Lippincott Company.
- Suwonnaroop, N. (1999). Health promoting behaviors in older adults : The effect of social support, perceived health status, and personal factors. Doctoral Dissertation, Case Western Reserve University.
- Tammatisthan, S. (2000). The study of health behaviors in patients with coronary health disease: A case study at Vachira Phuket hospital. Thesis of master of nursing science (Adult nursing), Faculty of graduate studies, Mahidol University.
- Thoits, P.A. (1982). Conceptual methodological and theoretical problem in studying social support as a buffer against life stress. Journal of Health and Social behavior, 23, 145-159.
- Thompson, F.E., & Byers, T. (1994). Dietary assessment resource manual. The Journal of Nutrition, 124, 2245S- 2317S.
- Tilden, V.P. (1985). Issues of conceptualization and measurement of social support in the construction of nursing theory. Research in Nursing & Health, 8, 201-202.
- Tirrel, B.E., & Hart, L.K. (1980). The relationship of health beliefs and knowledge to exercise compliance in patients after coronary artery bypass. Heart & Lung, 9, 487-493.
- Trondsen, T., Braaten, T., Lund, E., & Eggen, A.E. (2003). Consumption of seafood- the influence of overweight and health beliefs. Food Quality and Preference, 1-14.

- Van Duyn, M.A., et al. (2001). Association of awareness, intrapersonal and interpersonal factors, and stage of dietary change with fruit and vegetable consumption: A national survey. American Journal of Health Promotion, 16 (2), 69-78.
- Van Maarle, M.C., Stouthard, M.E., & Bonsel, G.J. (2003). Risk perception of participants in a family-based genetic screening program on familial hypercholesterolemia. American Journal of Medical Genetic, 15;116A(2), 136-143.
- Verges, B.L., et al. (1998). Comprehensive cardiac rehabilitation improves the control of dyslipidemia in secondary prevention. Journal of Cardiopulmonary Rehabilitation, 18(6), 408-415.
- Walker, L.O., & Avant, K.C. (1995). Strategies for theory construction in nursing. (3rd ed.). Norwalk, Connecticut: Appleton & Lange.
- Walker, S.N., Volkan, K., Sechrist, K.R., & Pender, N.J. (1988). Health- promoting life styles of older adults : Comparisons with young and middle- aged adults, correlates and patterns. Advances in Nursing Science, 11, 76- 90.
- Walker, S.N., Sechrist, K.R., & Pender, N.J. (1987). The health – promoting lifestyle profile : Development and psychometric characteristics. Nursing Research, 36 (2), 76-81.
- Walsh, J.M.E., & Grady, D. (1995). Treatment of hyperlipidemia in women. The Journal of the American Medical Association, 274(14), 1152-1158.
- Wasling, C. (1999). Role of the cardioprotective diet in preventing coronary heart disease. British Journal of Nursing, 8(18), 1239-1248.
- Weiss, R. (1974). The provision of social relationships. In Z. Rubin (Ed.), Doing unto others (pp.17-26). Englewood Cliffs, New Jersey: Prentice-Hall.
- Whitehead, D. (1999). The nature of health promotion in acute and community settings. British Journal of Nursing, 8(7), 463-467.
- WHO expert consultation. (2004). Approximate body- mass index for Asian populations and its implications for policy and intervention strategies. The LANCET, 363(9403),157-163.
- Wiley, J.A., & Camacho, T. C. (1980). Lifestyle and future health : Evidence from the Alameda County study. Preventive Medicine, 9, 1-21.

- Williams, C. (1995). Healthy eating : Clarifying advice about fruit and vegetables. British of Medical Journal, 310, 1453-1455.
- Williams, R.D. (1988). Factors affecting the practice of breast self-examination in older women. Oncology Nursing Forum, 15, 611-616.
- Woods, A. (2001). Guide to care for patients. Hyperlipidemia. Nurse Practitioner, 26 (7), 59-60.
- Woods, B.A. (2002). High cholesterol (hyperlipidemia). Nursing, 32(6), 56-57.
- Woods, S.L., Froelicher, E.S.S., Halpenny, C.J., & Motzer, S.U. (Eds.). (1995). Cardiac nursing. (3rd ed.). Philadelphia : J.B. Lippincott Company.
- Working Group on Food Based Dietary Guideline for Thai. (1998). Food Based Dietary Guideline for Thai. Nakornpatom: Institute of Nutrition, Mahidol University.
- Wright, R.S., Kottke, T.E., & Gau, G.T. (1997). Hyperlipidemia and other risk factors for atherosclerosis. In J.G. Murphy (Ed.), Mayo clinic : Cardiology review (2nd ed., pp.133-144). Philadelphia : Lippincott Williams & Wilkins.
- Yu, J.N., Cunningham, J.A., Thouin, S.R., Pharm, T.G., & Liu, D. (2000). Hyperlipidemia. Primary Care, 27(3), 541-587.
- กนกกรณ์ อ่วมพราหมณ์. (2541). การรับรู้ภาวะสุขภาพ การสนับสนุนทางสังคมและพฤติกรรมส่งเสริมสุขภาพของสตรีวัยหมดประจำเดือน. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- กมลพรรณ หอมนาน. (2539). ความสัมพันธ์ระหว่างความรู้สึกลึกซึ้งในตนเอง การรับรู้สมรรถนะในตนเองกับพฤติกรรมการดูแลตนเองของผู้สูงอายุ. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- กองบรรณาธิการ. (2542). การส่งเสริมสุขภาพ:กระบวนทัศน์ใหม่ทางด้านสุขภาพ. หมออนามัย, 8 (5), 17-40.
- กองบรรณาธิการ. (เมษายน 2544). น้ำหนักเท่าไรจึงจะพอดี. ใกล้หมอ, 25(4), 44-46.
- กัลยา วานิชย์บัญชา. (2545). การใช้ SPSS for Windows ในการวิเคราะห์ข้อมูล. (พิมพ์ครั้งที่ 5). กรุงเทพมหานคร : ห้างหุ้นส่วนจำกัด ซี เค แอนด์ เอส โฟโต้สตูดิโอ.
- กิตินันท์ สิทธิชัย. (2540). การศึกษารับรู้ภาวะสุขภาพ การสนับสนุนจากคู่สมรส และพฤติกรรมส่งเสริมสุขภาพของมารดาที่ติดเชื้อเอชไอวี. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

- เกียรติชัย ภูมิปัญญา และคณะ. (2543). การศึกษาแบบไปข้างหน้าระยะเวลา 5 ปีเกี่ยวกับปัจจัยเสี่ยงของโรคหลอดเลือดหัวใจในกลุ่มพนักงานบริษัทชินวัตร 3615 ราย : ความชุกของปัจจัยเสี่ยงต่างๆ จากการสำรวจ. จดหมายเหตุทางการแพทย์, 83, S8-S105.
- แก้ว กังสดาลอำไพ. (2543). อาหารในสหัสวรรษใหม่ของคนไทย. วารสารโภชนาการ, 35 (2), 83-93.
- ขนิษฐา นาคะ. (2542). วิถีชีวิตและการดูแลตนเองของผู้สูงอายุในหมู่บ้านชนบทแห่งหนึ่งในภาคใต้. วิทยานิพนธ์ปริญญาพยาบาลศาสตรดุษฎีบัณฑิต สาขาพยาบาลศาสตร์, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ขวัญตา ศรีสกุลวัฒนา. (2541). การศึกษาพฤติกรรมส่งเสริมสุขภาพของผู้สูงอายุโรคข้อเข่าเสื่อม. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- คณะกรรมการการจัดทำแผนโภชนาการในคณะกรรมการโภชนาการแห่งชาติ. (2541). แผนอาหารและโภชนาการแห่งชาติ : ตามแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติฉบับที่ 8 (พ.ศ 2540-2544). (ฉบับแก้ไขปรับปรุง, กันยายน 2541). กรุงเทพมหานคร:คณะกรรมการโภชนาการแห่งชาติ.
- คณะกรรมการจัดงานสมโภชน์กรุงรัตนโกสินทร์ 200 ปี. (2525). ศิลปะวัฒนธรรมไทยเล่มที่ 3. กรุงเทพมหานคร: โรงพิมพ์พิมพ์ณศ.
- คณะทำงานจัดทำข้อปฏิบัติการกินอาหารเพื่อสุขภาพที่ดีของคนไทย. (2543). คู่มือ ชงโภชนาการ: กินพอดี สุขีทั่วไทย. นนทบุรี: กองโภชนาการ กรมอนามัย กระทรวงสาธารณสุข.
- คณะทำงานจัดทำข้อปฏิบัติการกินอาหารเพื่อสุขภาพที่ดีของคนไทย. (2544). คู่มือ ชงโภชนาการ: กินพอดี สุขีทั่วไทย (พิมพ์ครั้งที่3). นนทบุรี: กองโภชนาการ กรมอนามัย กระทรวงสาธารณสุข.
- จันทนา พงษ์สมบูรณ์. (2539). ปัจจัยที่มีผลกระทบต่อพฤติกรรมส่งเสริมสุขภาพของผู้ติดเชื้อเอชไอวี. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต สาขาวิชาพยาบาลศาสตร์, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- จันทร์ทิพย์ ลิ้มตระกูล. (2538). กลไกการเกิดพฤติกรรมการกิน. ใน Food Focus. กรุงเทพมหานคร: ชมรมวิทยาศาสตร์การอาหารและโภชนาการ ภาควิชาคหกรรมศาสตร์ คณะวิทยาศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ ประสานมิตร.
- จิตรา ไชยชนะ. (2540). การประยุกต์ทฤษฎีแรงจูงใจในการป้องกันโรคหลอดเลือดหัวใจของกลุ่มเสี่ยงอายุระหว่าง 40-59 ปี เขตเทศบาลเมืองจังหวัดสงขลา. วิทยานิพนธ์ปริญญา

- วิทยาศาสตร์มหาบัณฑิต(สาธารณสุขศาสตร์) สาขาวิชาเอกสุขศึกษา, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- จิรวรรณ อินคุ่ม. (2541). การศึกษาพฤติกรรมส่งเสริมสุขภาพของผู้สูงอายุโรคหลอดเลือดหัวใจตีบ. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- จิรารัตน์ จินวัฒน์. (2541). ผลของกระบวนการกลุ่มต่อการรับรู้ภาวะสุขภาพ และพฤติกรรมส่งเสริมสุขภาพของสตรีวัยหมดประจำเดือน. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- จุลี จตุรพัฒน์. (2545). ภาวะไขมันในเลือดสูงผิดปกติ. Fascino Health Journal, 12, 5.
- จุฬารณ รุ่งพิสุทธิพงษ์. (2542). อาหารกับโรคหลอดเลือดหัวใจ. Thai Journal of Parenteral & Enteral Nutrition, 10(3), 74-84.
- ชื่นชีวิต. (23 กรกฎาคม 2545). วิจัยอาหารไขมันสูงแต่ละภาค. ไทยรัฐ, หน้า 7.
- ชื่นชีวิต. (5 พฤศจิกายน 2544). ยิ่งเครียดยิ่งกินเพื่อผ่อนคลาย. ไทยรัฐ, หน้า 7.
- ชุดิวรรณ ปุรินทรากิบาล. (2541). การประยุกต์ทฤษฎีความสามารถตนเองในการส่งเสริมพฤติกรรมสุขภาพด้านการรับประทานอาหารของผู้สูงอายุ ในชมรมผู้สูงอายุ จังหวัดปทุมธานี. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์) สาขาวิชาเอกสุขศึกษา, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ชุมศักดิ์ พุกษาพงษ์. (พฤศจิกายน 2540). ไขมันร้ายจริงหรือ. ใกล้หมอ, 21 (11), 32-41.
- ชุมศักดิ์ พุกษาพงษ์. (มกราคม 2541). ผู้หญิงก็เป็นโรคหัวใจได้. ใกล้หมอ, 22 (1), 32- 36.
- ณัฐ ภมรประวดี ไกรสิทธิ์ ดันติศิริรินทร์ และ เขารัตน์ ปรปักษ์ขาม(บรรณาธิการ). (2541). แผนกลยุทธ์การวิจัยสุขภาพ. กรุงเทพมหานคร : บริษัท พี เอ ลีฟวิ่ง จำกัด.
- ทวีทอง หงษ์วิวัฒน์. (2528). บริโภคนิสัย แนวคิด และแนวทางการวิจัยทางสังคมศาสตร์ เพื่อควบคุมโรคพยาธิใบไม้ในตับ ใน โรคพยาธิใบไม้ในตับ บริโภคนิสัย กับแนวคิดและการแก้ไขทางสังคมศาสตร์และสุขศึกษา: รายงานการประชุมเชิงปฏิบัติการ. กรุงเทพมหานคร: งานส่งเสริมการวิจัยและตำรา กองบริการการศึกษา มหาวิทยาลัยมหิดล.
- ทวีลักษณ์ วรรณฤทธิ์. (2543). โรคหัวใจกับวัยสูงอายุ. พยาบาลสาร, 27 (2), 7-41.
- ธิดาทิพย์ ชัยศรี. (2541). การศึกษาพฤติกรรมส่งเสริมสุขภาพของผู้ป่วยโรคความดันโลหิตสูงชนิดไม่ทราบสาเหตุ. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

- นภัส ศิริสัมพันธ์. (2527). พฤติกรรมการบริโภคของประชากรในเขตเทศบาลเมืองชลบุรี ใน พฤติกรรมการกินของคนไทย: รายงานการประชุมเชิงปฏิบัติการ. กรุงเทพมหานคร: บริษัท ประชูปริวรรค์.
- น้ำค้าง ว่องเกษญา. (2541). ความสัมพันธ์ระหว่างปัจจัยลักษณะส่วนบุคคล การรับรู้ความสามารถของตนเอง การรับรู้ภาวะสุขภาพ กับวิถีชีวิตที่ส่งเสริมสุขภาพของผู้สูญเสียแขนขา. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร์) สาขาวิชาเอกพยาบาล สาธารณสุข, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- น้ำเพชร หล่อตระกูล, สมบัติ ไชยวัฒน์ และ ดวงฤดี ลาสุชะ. (2544). การสนับสนุนทางสังคมและพฤติกรรมส่งเสริมสุขภาพของผู้สูงอายุโรคหลอดเลือดหัวใจตีบ. พยาบาลสาร, 28(1), 49-61.
- นริศ เจนวิริยะ. (พฤศจิกายน 2535). อาหารอารมณ์. ใกล้หมอ, 16(11), 36-37.
- นิตยา ไกรวงศ์. (2536). บริโภคนิสัยและโภชนาการของผู้สูงอายุในจังหวัดสงขลา. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยสงขลานครินทร์.
- นิตยา ตั้งชูรัตน์. (2526). อาหารควบคุมน้ำหนัก. ใน อาหารบำบัดโรค. (หน้า 87-105). ปทุมธานี: มหาวิทยาลัยสุโขทัยธรรมาธิราช.
- นิตยา ตั้งชูรัตน์. (2527). นิสัยและความเชื่อในการกินอาหาร. ใน เอกสารการสอนชุดวิชาโภชนาการกับชีวิตมนุษย์ หน่วยที่ 6-10. (หน้า 248-249). ปทุมธานี: มหาวิทยาลัยสุโขทัยธรรมาธิราช.
- นิธิ มหานนท์ และคณะ. (2543). ความสัมพันธ์ของความอ้วนกับปัจจัยเสี่ยงอื่น ๆ ของโรคหลอดเลือดหัวใจในประชากรไทยสุขภาพดี. จดหมายเหตุทางการแพทย์, 83, s35-s45.
- นิยมศรี วุฒิชัย และคณะ. (2543). รูปแบบการบริโภคอาหาร วิถีชีวิต และสถานะโภชนาการของนักศึกษาพยาบาลสาขาวิทยาศาสตร์สุขภาพในเขตกรุงเทพมหานคร. วารสารโภชนาการ, 35(1), 7-21.
- บรรหาร กอนันต์กุล และจันทรีสมน ด่านศิริกุล. (2542). คู่มือประกอบการรักษาภาวะโคเลสเตอรอลในเลือดสูงของผู้ป่วยหลอดเลือดหัวใจตีบตัน. (พิมพ์ครั้งที่ 3). กรุงเทพมหานคร: บริษัท บริสคอล-ไมเยอร์ สควิบ.
- บรรหาร กอนันต์กุล. (2544). มารู้จักโคเลสเตอรอลกันเถอะ. (พิมพ์ครั้งที่ 4, ปรับปรุงใหม่ครั้งที่ 1). กรุงเทพมหานคร: ไฟเซอร์ อินเทอร์เน็ตชั่นแนล จำกัด.
- บัญญัติ สุขศรีงาม. (มกราคม 2541). พฤติกรรมการฟุ่มเฟือยของคนไทย. ใกล้หมอ, 22(1), 79- 80.

- เบญจา ยอดคำเนิน. (2529). บริโภคนิสัยและชนบทรรมนิยมประเพณีในการบริโภคอาหาร ใน เบญจา ยอดคำเนิน และคณะ(บรรณาธิการ), ทฤษฎีและการศึกษาทางสังคมวิทยาและมานุษยวิทยาการแพทย์ (หน้า 73-75). กรุงเทพมหานคร: โอเดียนสโตร์.
- ประสงค์ ชีรพงศ์นภลัย. (2541). ปัจจัยที่มีอิทธิพลต่อพฤติกรรมส่งเสริมสุขภาพของक्रमมัธยมศึกษาในเขตกรุงเทพมหานคร. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร์) สาขาวิชาเอกสุขภาพศึกษา, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ปราณีต ผ่องแผ้ว(บรรณาธิการ). (2539). โภชนศาสตร์ชุมชน: ในสังคมที่มีการเปลี่ยนแปลงภาวะเศรษฐกิจอย่างรวดเร็ว. กรุงเทพมหานคร: บริษัท ลิฟวิ้ง ทรานส์ มีเดีย.
- ปริศนา วรรณันท์. (2541). พฤติกรรมสุขภาพของผู้ป่วยโรคหลอดเลือดหัวใจตีบภายหลังการขยายหลอดเลือดหัวใจ. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ปิยะมิตร ศรีธรา. (2544). โรคหลอดเลือดหัวใจและปัจจัยเสี่ยง. วารสารโภชนาการ, 36(2), 33- 35.
- พิทยา สายหนู. (2527).พฤติกรรมการณ์ของคนไทยและวิธีการศึกษาวิจัย ใน พฤติกรรมการณ์ของคนไทย: รายงานการประชุมเชิงปฏิบัติการ. กรุงเทพมหานคร: บริษัทประยูรวงศ์.
- พิมลรัตน์ เตโชพิทยากุล และวิทยา ศรีดามา. (2544).อาหารกับภาวะไขมันในเลือดสูง . ในวิทยา ศรีดามา(บรรณาธิการ), โรคต่อมไร้ท่อและเมตะบอลิซึม(หน้า443- 450). กรุงเทพมหานคร : โรงพิมพ์แห่งจุฬาลงกรณ์ มหาวิทยาลัย.
- เพลินใจ ดังคณะกุล, วิภา สุโรจนะเมธากุล, กรณา วงศ์กระจ่าง และ จันตรี บุญปิ่น. (2537). การประเมินคุณค่าทางโภชนาการของฟาสต์ฟู้ดประเภทต่างๆ. อาหาร, 24, 190-200.
- เพลินพิศ เลหาวิริยะกมล. (2531). ความสัมพันธ์ระหว่างปัจจัยบางประการกับการปรับตัวในผู้ป่วยภายหลังการผ่าตัดเปลี่ยนลิ้นหัวใจ. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต สาขาพยาบาลศาสตร์, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- มันทนา ประทีปะเสน. (2538). อาหารและโรคหลอดเลือดหัวใจ. ใน เอกสารประกอบการประชุมวิชาการสาธารณสุขแห่งชาติ ครั้งที่ 5 วันที่ 6-8 ธันวาคม 2538. กรุงเทพมหานคร:โรงแรมเอเชีย.
- มันทนา ประทีปะเสน. (2539). การปรับเปลี่ยนพฤติกรรมด้านโภชนาการเพื่อส่งเสริมสุขภาพครอบครัวที่มีฐานะทางเศรษฐกิจต่ำในเขตชุมชนเมือง. ใน วิสัยทัศน์ทางอาหารและโภชนาการโดยภาควิชาโภชนวิทยา คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล ร่วมกับชมรมโภชนวิทยามหิดล วันที่ 24-26 เมษายน 2539. ณ โรงแรมเค.พี.แกรนด์ จังหวัดจันทบุรี. กรุงเทพมหานคร: ภาควิชาโภชนวิทยา คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล.

- ยุคนธร ทองรัตน์. (2541). การศึกษาการรับรู้ภาวะสุขภาพกับพฤติกรรมส่งเสริมสุขภาพของผู้ป่วยเด็กโรคธาลัสซีเมียวัยเรียนตอนปลาย. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- เยาวเรศ สมทรัพย์. (2543). ปัจจัยที่มีอิทธิพลต่อการปฏิบัติด้านสุขภาพของผู้ป่วยเบาหวานในจังหวัดสงขลา. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลอนามัยชุมชน, บัณฑิตวิทยาลัย มหาวิทยาลัยสงขลานครินทร์.
- เยาวลักษณ์ เสรีเสถียร. (2543). ปัจจัยที่มีอิทธิพลต่อการปรับตัวด้านบทบาทหน้าที่ของการเป็นมารดาในระยะตั้งครรภ์ของหญิงวัยรุ่น. วิทยานิพนธ์ปริญญาพยาบาลศาสตรดุษฎีบัณฑิต, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- รพีพร ประกอบทรัพย์. (2541). การสนับสนุนทางสังคมจากสามี การสนับสนุนทางสังคมจากมารดาและพฤติกรรมส่งเสริมสุขภาพของหญิงตั้งครรภ์วัยรุ่น. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ระพีพล ญูชรรณ อยุธา(บรรณาธิการ). (2544). รักหัวใจ ใส่ใจโคเลสเตอรอล: เพื่อสุขภาพหัวใจดี ถ้วนหน้า. กรุงเทพมหานคร: บริษัทไฟเซอร์ อินเตอร์เนชั่นแนล.
- รายงานจากแผนกเวชระเบียนและสถิติผู้ป่วย. (2542). จำนวนผู้ป่วยโรคหลอดเลือดหัวใจ. สงขลา: โรงพยาบาลสงขลานครินทร์. เอกสารไม่ตีพิมพ์
- รายงานจากแผนกเวชระเบียนและสถิติผู้ป่วย. (2544). จำนวนผู้หญิงที่มีภาวะไขมันในเลือดสูง. สงขลา : โรงพยาบาลหาดใหญ่. เอกสารไม่ตีพิมพ์
- รายงานจากแผนกเวชระเบียนและสถิติผู้ป่วย. (2544). จำนวนผู้หญิงที่มีภาวะไขมันในเลือดสูง. สงขลา : โรงพยาบาลสงขลา. เอกสารไม่ตีพิมพ์
- รายงานจากแผนกเวชระเบียนและ สถิติผู้ป่วย. (2544). จำนวนผู้หญิงที่มีภาวะไขมันในเลือดสูง. สงขลา : โรงพยาบาลสงขลานครินทร์. เอกสารไม่ตีพิมพ์
- รายงานจากห้องปฏิบัติการเคมีคลินิก. (2543). จำนวนผู้หญิงที่มีภาวะไขมันในเลือดสูง. สงขลา: โรงพยาบาลสงขลานครินทร์. เอกสารไม่ตีพิมพ์
- รุ่งโรจน์ กฤตยพงษ์ และ สุภชัย ไชยธีระพันธ์. (2541). ผลที่เกิดขึ้นจากภาวะหลอดเลือดแดงแข็ง. ใน ญัฐ ภมรประวัติ, ไกรสิทธิ์ ตันติสิรินทร์และเยาวลักษณ์ ปรปักษ์ขาม(บรรณาธิการ), แผนกสุขภาพการวิจัยสุขภาพ (หน้า 619-633). กรุงเทพมหานคร: บริษัท พี เอ ลีฟวิ่ง จำกัด.

- เรณา พงษ์เรืองพันธุ์. (2538). วิจัยความสัมพันธ์ระหว่างปัจจัยคัดสรรกับความพึงพอใจในการ
ดำเนินชีวิตของผู้ป่วยโรคกล้ามเนื้อหัวใจขาดเลือดในเขตพื้นที่ชายฝั่งทะเลภาคตะวันออก
ของประเทศไทย. วารสารพยาบาล, 44 (3), 198-208.
- ลินจง โปธิบาล และคณะ. (2543). ความทุกข์ของปัจจัยเสี่ยง ภาวะเสี่ยงและการรับรู้ภาวะเสี่ยงต่อการ
เป็นโรคหลอดเลือดหัวใจในผู้สูงอายุไทย. พยาบาลสาร, 27 (2) , 16- 28.
- โลกโสภิน. (27 กรกฎาคม 2545). จ้วงอาหารระบายความเครียด ชอบกินมันๆ รสเค็มหวาน. ไทยรัฐ,
หน้า 7.
- วงสาวาท โกศลวัฒน์. (2543). ปัญหาโภชนาการในยุคโลกาภิวัตน์. โครงการอบรมวิชาการ เรื่อง
โภชนาการทันยุค 9-11 และ 16-18 สิงหาคม 2543 ณ สถาบันวิจัยโภชนาการ มหาวิทยาลัย
มหิดล ศาลายา, นครปฐม : สถาบันวิจัยโภชนาการ มหาวิทยาลัยมหิดล.
- วริยา วชิราวัฒน์ และ ศิริอร สีนุ. (2540). น้ำหนักกับความงามของผู้หญิง. สารสภากาพยาบาล, 12
(1), 13-24.
- วลิดา ศักดิ์บัณฑิตสกุล. (2541). การสนับสนุนทางสังคม และพฤติกรรมส่งเสริมสุขภาพของสตรี
ที่ใช้แรงงานในโรงงานอุตสาหกรรมสิ่งทอ จังหวัดสระบุรี. วิทยานิพนธ์ปริญญาพยาบาล
ศาสตรมหาบัณฑิต สาขาการพยาบาลแม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- วัฒนา ประทุมสินธุ์ และคณะ. (2529). พฤติกรรมการกินของประชาชนในภาคใต้ของประเทศไทย.
ปัตตานี: มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตปัตตานี.
- วาริณี เอี่ยมสวัสดิกุล. (2541). อาการของภาวะหมดประจำเดือน และปัจจัยที่มีอิทธิพลต่อพฤติ
กรรมการส่งเสริมสุขภาพของพยาบาลวิชาชีพวัยหมดประจำเดือน. วิทยานิพนธ์ปริญญา
พยาบาลศาสตรดุษฎีบัณฑิต, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- วิชัย ดันไพจิตร, ปรียา ลีพหกุล และ รัตนา พากเพียรกิจวัฒนา. (2544). การให้คำปรึกษาเพื่อป้องกัน
และบำบัดโรคอ้วน. คลินิก, 17(4), 305-317.
- วิชัย ดันไพจิตร, รัตนา พากเพียรกิจวัฒนา และ สุระภี เสริมพาณิชย์กิจ. (2534). การอภิปราย
โภชนาการเพื่อสุขภาพครั้งที่ 2 น้ำหนักคุณกับชีวิต. โภชนศาสตร์คลินิก, 4, 67-77.
- วิชัย ดันไพจิตร, รัตนา พากเพียรกิจวัฒนา และสุนาญ เดชางาม.(2529). โภชนศาสตร์ประยุกต์.
กรุงเทพมหานคร: บริษัทประยูรวงศ์.
- วิชัย ดันไพจิตรและคณะ. (2529). อาหารและการบำบัดภาวะไขมันในเลือดสูง. โภชนศาสตร์
ประยุกต์. กรุงเทพมหานคร: บริษัทประยูรวงศ์.
- วิชัย ดันไพจิตร, ปรียา ลีพหกุล, และ รัตนา พากเพียรกิจวัฒนา. (2544). การตรวจคัดกรองโรคอ้วน
และภาวะทุพโภชนาการในผู้ใหญ่. คลินิก, 17 (4), 292-304.

- วิชัย ตันไพจิตร. (2530). ภาวะไขมันสูงในเลือด. โภชนศาสตร์คลินิก, 4, 1-23.
- วิศาล คันธารัตนกุล(บรรณาธิการ). (2538). การอบรมระยะสั้น ครั้งที่ 1 “เวชศาสตร์ฟื้นฟูในผู้ป่วยโรคหัวใจ แนวทางรักษาที่ควรรู้.” กรุงเทพมหานคร: บริษัท โฮลิสติก แพบลิชชิง.
- วินัส ลิฬหกุล และณอมขวัญ ทวีบุรณ์ (บรรณาธิการ). (2541). โภชนศาสตร์สำหรับพยาบาลเล่ม 1. กรุงเทพมหานคร: บริษัทบุญศิริการพิมพ์.
- วินัส ตันติบูล. (2530). การลดระดับโคเลสเตอรอลในเลือด. วารสารพยาบาลศาสตร์, 5(4), 269-284.
- วิณะ วีระไวทยะ และสง่า ดามาพงษ์. (2541). พฤติกรรมกรบริโภคอาหาร: ทบทวนองค์ความรู้สถานการณ์และปัจจัยที่เกี่ยวข้องภายใต้โครงการสืบสานวัฒนธรรมไทยสู่สุขภาพที่ยั่งยืน. ใน ไพบูลย์ ดวงจันทร์ (บรรณาธิการ), หนังสือสืบสานวัฒนธรรมไทยสู่สุขภาพที่ยั่งยืน2 (หน้า 1- 153). กรุงเทพมหานคร: โรงพิมพ์องค์การสงเคราะห์ทหารผ่านศึก.
- ศรีสุดา เจริญวงศ์วิวัฒน์. (2539). การรับรู้สมรรถนะของตนเองและพฤติกรรมการดูแลตนเองของผู้ป่วยโรคกล้ามเนื้อหัวใจตาย. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ศิริทิพย์ โกสกันเฑาะ. (2541). ปัจจัยที่มีอิทธิพลต่อพฤติกรรมส่งเสริมสุขภาพของสตรีวัยหมดประจำเดือน จังหวัดนครราชสีมา. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร) สาขาวิชาเอกพยาบาลสาธารณสุข, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- ศิริพร เหลียงกอบกิจ และ นิธิ มหานนท์. (2540). ระบาดวิทยาของโรคหัวใจโคโรนารีในประเทศไทย. สารศิริราช, 49(10), 999-1001.
- ศิริวรรณ ยืนยง, เกศอุไร เผด็จศึก และ พรเพ็ญ เมธาจิตติพันธ์. (2543). การศึกษาพฤติกรรมการส่งเสริมสุขภาพในระยะหลังคลอดของมารดาที่ติดเชื้อเอชไอวี. วารสารพยาบาลศาสตร์, 8(2), 25-36.
- ศุภชัย ไชยธีระพันธ์ . (2530). โรคหลอดเลือดหัวใจในประเทศไทย. คลินิก, 3 , 786- 794.
- ศุภชัย ไชยธีระพันธ์ และคณะ. (2541). การวิจัยโรคหัวใจและหลอดเลือด. ใน ณัฐ ภูมิประวดี, ไกรสิทธิ์ ตันติสิรินทร์และเขาวลัษณ์ ปรีภัยขาม(บรรณาธิการ), แผนกลยุทธ์การวิจัยสุขภาพ(หน้า 44-58). กรุงเทพมหานคร: บริษัท พี เอ ลีฟวิ่ง จำกัด.
- ศุภวรินทร์ หันกิตติกุล. (2539). ปัจจัยที่มีอิทธิพลต่อพฤติกรรมส่งเสริมสุขภาพผู้สูงอายุจังหวัดลำปาง. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร) สาขาวิชาเอกสุขภาพ, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- สง่า ดามาพงษ์. (2543). ก้าวสู่สังคมแห่งการมีภาวะโภชนาการดี. วารสารโภชนาการ, 35(2), 94-107.

- สมบัติ ไชยวัฒน์ , ยุพิน กลิ่นขจร , ดวงฤดี ลาสุขะ และทิพาพรวงศ์หังษ์กุล. (2543). การสนับสนุนทางสังคมโดยเครือข่าย ความสามารถในการดูแลตนเอง และคุณภาพชีวิตของผู้สูงอายุที่ป่วยด้วยโรคเรื้อรัง. พยาบาลสาร, 27(2), 29- 41.
- สิรินทร์ พิบูลย์นิยม และ ประภาศรี ภูวเสถียร. (2543). ก้าวทันสถานการณ์: กิเลสสู่ความเป็นเลิศ กิเลสตามกระแสและแฟชั่น. วารสารโภชนาการ, 35(2), 71-82.
- สุคนธ์ นุปผา . (2541). การเปรียบเทียบความถูกต้องของแบบสอบถามความถี่อาหารการบริโภคทั้งปริมาณ กับการสัมภาษณ์อาหารบริโภคย้อนหลัง 24 ชั่วโมง เป็นเวลา 3 วันในการประเมินสารอาหารที่ได้รับของผู้สูงอายุในจังหวัดตรัง. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร์) สาขาวิชาเอกโภชนาการ, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- สุดาวรรณ ชันชมิตร. (2538). พฤติกรรมกรบริโภคอาหารของนักเรียนชั้นประถมศึกษาปีที่6 สังกัดสำนักงานคณะกรรมการการประถมศึกษาแห่งชาติในภาคกลาง(ภาควิชาละศึกษา), บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย.
- สุทธิลักษณ์ สมิตะสิริ, วชิราภรณ์ วรรณดี, อรุวรรณ เข้มบริสุทธิ์, วันเพ็ญ รัศมีโสภภาพ, ไพรวลัย ดันดีวัฒนเสถียร และวรากร คชไกร. (2537). รายงานการวิจัย: การศึกษาปัจจัยที่มีผลต่อวัฒนธรรมการกินของผู้หญิงทำงานในมหานครกรุงเทพ: กรณีศึกษาย่านถนนสีลมและรัฐวิสาหกิจ. นครปฐม:สถาบันวิจัยโภชนาการ มหาวิทยาลัยมหิดล.
- สุนทรา เลี้ยงเชวงวงศ์ . (2541). ผลของการให้ความรู้ด้านสุขภาพและการส่งเสริมการรับรู้ความสามารถของตนเองต่อแบบแผนการดำเนินชีวิตของผู้ป่วยโรคหลอดเลือดหัวใจ. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลอายุรศาสตร์และศัลยศาสตร์, บัณฑิตวิทยาลัย มหาวิทยาลัยเชียงใหม่.
- สุพร พริงเพริศ. (2538). ความสัมพันธ์ระหว่างการรับรู้ภาวะสุขภาพ การสนับสนุนทางสังคมกับพฤติกรรมการดูแลตนเองของผู้ป่วยภายหลังการผ่าตัดหลอดเลือดแดงโคโรนารี. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต สาขาพยาบาลศาสตร์, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- สุกัลลักษณ์ บุญความดี. (2541) . การศึกษาพฤติกรรมสุขภาพของผู้ที่มีน้ำหนักเกินมาตรฐานในกรุงเทพมหานคร. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

- สุรัตน์ โคมินทร์. (2538). Management of hyperlipidemia. ใน วิชาส คณธรรตณกุล(บรรณาธิการ), การอบรมระยะสั้น ครั้งที่ 1 “เวชศาสตร์ฟื้นฟูในผู้ป่วยโรคหัวใจ แนวทางการรักษาที่ควร ู้” (หน้า 133-142). กรุงเทพมหานคร: บริษัท โฮลิสติก พับลิชชิ่ง.
- สุรัตน์ โคมินทร์. (2545). ภาวะน้ำหนักเกินและโรคอ้วน: ภัยเงียบของสังคมไทย. วารสาร โภชนาการ, 37(3), 38-39.
- เสก ปัญญสังข์ และ สุทธิชัย จิตะพันธ์กุล. (2543). โรคหลอดเลือดหัวใจโคโรนารีในผู้สูงอายุ. วาร สารพฒนาวิทยาและเวชศาสตร์ผู้สูงอายุ, 1 (2), 53-65.
- แสงเดือน พรหมแก้วงาม, ศิริพร สิงหนนตร และ นิตยา ญญไญคำ. (2544). การงูใจตนเองและพฤติ กรรมส่งเสริมสุขภาพของผู้สูงอายุภายหลังการขยายหลอดเลือดโคโรนารีด้วยบอลลูน. พยาบาลสาร, 28(1), 62-73.
- อดิศักดิ์ ศรีละออง. (2542). สังคมจิตวิทยาในการบริโภคอาหารไขมันของผู้ป่วยโรคหัวใจขาดเลือด. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต สาขาวิชาสังคมศาสตร์การแพทย์และสา ธารณสุข, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- อมร นนทสุต. (2543). ทิศทางกรมอนามัยในสหัสวรรษที่ 3. Thailand Journal of Health Promotion and Environmental Health, 23 (2), 11-19.
- อรทัย ธรรมกันมา. (2541). การสนับสนุนจากคู่สมรส และพฤติกรรมการส่งเสริมสุขภาพในหญิง ตั้งครรภ์ที่มีภาวะเสี่ยง. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาล แม่และเด็ก, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- อรพินท์ กายโรจน์. (2542). ผลกระทบของการรับรู้สมรรถนะของตนเอง และความคาดหวังผลลัพธ์ ที่จะเกิดขึ้นต่อการปฏิบัติด้านสุขภาพ ของผู้หญิงวัยกลางคนที่เป็นโรคความดันโลหิตสูง. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยสงขลานครินทร์.
- อรอนงค์ สัมพันธุ์. (2539). การศึกษาปัจจัยพื้นฐาน การรับรู้ภาวะสุขภาพและพฤติกรรมส่งเสริมสุขภาพของผู้ป่วยโรคความดันโลหิตสูง. วิทยานิพนธ์ปริญญาพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- อัญริยา พ่วงแก้ว. (2540). การศึกษาพฤติกรรมสุขภาพของผู้หญิงโรคหลอดเลือดหัวใจใน กรุงเทพมหานคร. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.



List of Experts

There are ten experts who have validated the content of research instruments including the – Promoting Behavior in Nutrition Scale, the Perceived Self- Efficacy for Health- Promoting in Nutrition Scale, and the Norbeck Social Support Questionnaire. They are:

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Department of Nutrition, Faculty of Public Health, Mahidol University
- 8 Associate Professor Dr. Venus Leelakakul
Department of Fundamental Nursing Faculty of Nursing Mahidol
University
- 9 Dr. Nantawan Suwonnaroop
Department of Public Health Nursing, Faculty of Nursing, Mahidol
University
- 10 Associate Professor Dr. Uraiporn Chittchang
Community Nutrition Section, Institute of Nutrition, Mahidol University



CONSENT FORM FOR THE PARTICIPANTS

My name is Wandee Kahawong. I am a doctoral candidate at the Faculty of Nursing, Mahidol University, and are studying in a study about nutritional health – promoting behavior among hyperlipidemic women. You are invited to participate in this study. As you know, hyperlipidemia has been a major public health issue in both developed and developing countries, resulting from it is a prominent risk factor leading to cardiovascular diseases, especially coronary heart disease. It is also found that coronary heart disease is a dramatically leading cause of death in adult population in Thailand as well as other countries. It makes the harmful effects to individual, family and society. Currently, the incidence of hyperlipidemia in women highly increases.

However, hyperlipidemia is a health deviation which can be prevented and / or treated by an appropriate eating behavior, related to a number of personal and environmental factors.

I hope that the information gained for this study will help nurses and other health professionals provide care for hyperlipidemic women in term of nutritional health-promoting behavior.

If you are agree to participate, the interview will be done approximately 30-50 minutes for collection the personal data, social support, perceived health risks, perceived self-efficacy and nutritional health-promoting behavior.

Participation in this study should not be obtained additional inspection. You can decline or withdraw from the study at any time. You are guaranteed anonymity in this study. Therefore, all your responses will be confidential and you will not be identifiable in any way in the report of this study. All information will be reported as group data.

If you have any question now or at any time during the study, please feel free to ask me.

Thank you for your time and participation.

Sincerely,

.....

Wandee Kahawong

Fundamental Department,

Faculty of Nursing, Prince of Songkla University

Tel : 074-28-6584 Mobile phone : 09-9715657

The study information has been explained and I voluntarily agree to give my consent to participate in this study.

.....

(Signature of the participant).

Date.....

คำชี้แจงและการพิทักษ์สิทธิ์ของผู้เข้าร่วมการวิจัย

ดิฉันชื่อ นางสาววันดี กะหวงศ์ ขณะนี้กำลังศึกษาระดับปริญญาเอก คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล กำลังทำวิจัยเรื่องพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการของสตรีที่มีภาวะไขมันในเลือดสูง ในฐานะผู้วิจัยดิฉันขอเล่าถึงโครงการวิจัยที่กำลังทำอยู่ และขอชวนเชิญท่านเข้าร่วมในโครงการนี้

เป็นที่ทราบกันดีว่า ปัจจุบันภาวะไขมันในเลือดสูงเป็นประเด็นปัญหาทางสาธารณสุขที่สำคัญในระดับชาติ เนื่องจากเป็นปัจจัยเสี่ยงสำคัญที่ทำให้เกิดโรคหัวใจและหลอดเลือดซึ่งเป็นปัญหาสาธารณสุขที่สำคัญของทุกประเทศทั่วโลก เนื่องจากเป็นโรคที่คร่าชีวิตมนุษย์เป็นอันดับหนึ่งทั้งของประเทศไทยและประเทศอื่นๆ โดยเฉพาะอย่างยิ่งโรคหลอดเลือดหัวใจซึ่งเป็นการเจ็บป่วยเรื้อรังที่ส่งผลกระทบต่อบุคคล ครอบครัว และสังคมโดยรวม โรคหลอดเลือดหัวใจมีอุบัติการณ์สูงขึ้นอย่างต่อเนื่องโดยเฉพาะในสตรี อย่างไรก็ตามภาวะไขมันในเลือดสูงเป็นความเบี่ยงเบนทางสุขภาพที่สามารถแก้ไขได้ เพื่อป้องกันไม่ให้เกิดโรคหลอดเลือดหัวใจดังกล่าว โดยการปรับเปลี่ยนพฤติกรรมด้านโภชนาการให้ถูกต้องเหมาะสม ซึ่งเกี่ยวข้องกับปัจจัยหลายประการ ทั้งในระดับบุคคลและสิ่งแวดล้อม ดังนั้นข้อมูลที่ได้รับจากการวิจัยครั้งนี้จะช่วยให้พยาบาลและเจ้าหน้าที่ที่มสุขภavnนำไปปรับปรุงการบริการด้านการส่งเสริมสุขภาพ โดยเฉพาะอย่างยิ่งด้านโภชนาการของสตรีที่มีภาวะไขมันในเลือดสูงได้

ถ้าท่านตัดสินใจเข้าร่วมในโครงการนี้ ดิฉันจะขอสัมภาษณ์เกี่ยวกับข้อมูลส่วนบุคคล การรับรู้โอกาสเสี่ยง การรับรู้สมรรถนะของตนเอง แรงสนับสนุนทางสังคม และพฤติกรรมส่งเสริมด้านโภชนาการของท่าน ตามรายละเอียดในแบบสอบถามจำนวน 1 ชุด (จำนวน 5 ฉบับ) โดยจะใช้เวลาประมาณ 30-50 นาที จะไม่มีการตรวจพิเศษใดๆ เพิ่มในการศึกษานี้ ข้อมูลที่ได้จากการศึกษานี้จะถูกรับเก็บเป็นความลับ และไม่มีการเปิดเผยชื่อของท่านให้ผู้อื่นทราบ แต่จะนำข้อมูลที่ได้ไปวิเคราะห์และสรุปในภาพรวมเท่านั้น ไม่ว่าท่านจะเข้าร่วมในโครงการวิจัยนี้หรือไม่ท่านจะยังคงได้รับการรักษาที่ดีเช่นเดียวกับผู้ป่วยคนอื่นๆ และถ้าท่านต้องการที่จะถอนตัวออกจากการศึกษานี้เมื่อใด ท่านก็สามารถกระทำได้อย่างอิสระ

ถ้าท่านมีคำถามใดๆ ก่อนที่จะตัดสินใจเข้าร่วมโครงการนี้ และในระหว่างการเข้าร่วมวิจัยโปรดซักถามดิฉันได้อย่างเต็มที่ จึงขอขอบคุณมา ณ โอกาสนี้เป็นอย่างสูง

ขอขอบคุณอย่างสูง

(.....) ผู้วิจัย

นางสาววันดี กะหวงศ์

ภาควิชาการพยาบาลเบื้องต้น คณะพยาบาลศาสตร์

มหาวิทยาลัยสงขลานครินทร์

โทรศัพท์ 074 286584, 099715657

สำหรับผู้เข้าร่วมการวิจัย

ข้าพเจ้าได้อ่านหรือได้รับคำอธิบายตามรายละเอียดข้างบนอย่างครบถ้วน และมีความเข้าใจเป็นอย่างดี ดังนั้นข้าพเจ้ายินดีเข้าร่วมในการวิจัยครั้งนี้

ลายเซ็น.....

(.....)

วันที่..... เดือน..... พ.ศ.....



Personal Data Form

H.N.

Hospital code

Date of collecting data

Questionnaire No.

I. General data

Instruction : Please answer the questionnaire about yourself by selecting only one answer for each question with the mark ✓ in the () or fill in the space.

1. Age.....years

2. Education

- () 1. No formal education
- () 2. Elementary school (grades 1 – 6)
- () 3. High school (grades 7 – 12)
- () 4. Diploma
- () 5. Bachelor
- () 6. Graduate

3. Religion

- () 1. Buddhist
- () 2. Christian
- () 3. Islam
- () 4. Others, such as Sikh

4. Present Occupation

- () 1. House wife
- () 2. Agriculture
- () 3. Merchant
- () 4. Official
- () 5. Employee
- () 6. Other

5. Marital status

- () 1. Single
- () 2. Married
- () 3. Widowed
- () 4. Divorced/separated

6. Family income (Bath per month)
7. Adequacy of family income
 - () 1. Inadequate
 - () 2. Adequate
 - () 3. Savings
8. Family members
 - () 1. One
 - () 2. Two to four
 - () 3. Five to seven
 - () 4. More than seven
9. Menstruation
 - () 1. Yes
 - () 2. No
10. Duration of hyperlipidemia (month)
11. Genetic hyperlipidemia
 - () 1. Yes
 - () 2. No
12. Food buying
 - () 1. Self
 - () 2. Other person
13. Cooking
 - () 1. Self
 - () 2. Other person
14. Type of food consumption
 - () 1. Home cooked foods
 - () 2. Street vended foods
 - () 3. Other, specify.....
15. Cooking method
 - () 1. Boiling, steaming, roasting
 - () 2. Stir – frying
 - () 3. Frying
 - () 4. Curry
 - () 5. Other

16. Frequency of food consumption per day

- ☐ 1. One
- ☐ 2. Two
- ☐ 3. Three
- ☐ 4. More than three

17. Eat out

- ☐ 1. None
- ☐ 2. At least one a day
- ☐ 3. Once in a few days
- ☐ 4. Once in several days
- ☐ 5. Once a week
- ☐ 6. A few times a month
- ☐ 7. Other



II Data from Medical Records

Nutritional record of hyperlipidemic women

1. Present body weight kg.
2. Height cm.
3. Body mass index kg/m²
4. Serum total cholesterol mg/dl
5. Serum triglyceride mg/dl
6. Serum HDL – cholesterol mg/dl
7. Serum LDL - cholesterol mg/dl
8. FBS mg/dl
9. Albumin g/dl
10. Globulin g/dl
11. Hemoglobin g/dl

แบบบันทึกข้อมูลส่วนบุคคล

เฉพาะผู้วิจัย

H.N

รหัสโรงพยาบาล

วันที่เก็บข้อมูล

เลขที่แบบสอบถาม ☐ ☐ ☐

1 2 3

I. ข้อมูลทั่วไป

คำชี้แจง : กรุณาตอบแบบสอบถามเกี่ยวกับตัวท่านตามความเป็นจริง โดยเลือกตอบเพียงคำตอบเดียวในแต่ละข้อ โดยการทำเครื่องหมาย ✓ ลงในช่องว่าง () หรือเติมคำลงในช่องว่าง

1. อายุ ปี ☐ ☐

4 5

2. ระดับการศึกษา ☐

() 1. ไม่ได้เรียนหนังสือ

6

() 2. ประถมศึกษา (ป.1-ป.6)

() 3. มัธยมศึกษา (ม.1- ม.6)

() 4. อนุปริญญา

() 5. ปริญญาตรี

() 6. สูงกว่าปริญญาตรี

3. ศาสนาที่นับถือ

() 1. พุทธ ☐

() 2. คริสต์

7

() 3. อิสลาม

() 4. อื่นๆ เช่น ซิกข์

4. อาชีพปัจจุบัน

() 1. อยู่กับบ้าน ☐

() 2. เกษตรกรรม

8

() 3. ค้าขาย

() 4. รับราชการ

() 5. ลูกจ้างระบบ ... เช่น ทำงานเป็นแม่บ้าน

() 6. อื่นๆ ระบบ ...

5. สถานภาพสมรส ☐
- () 1. โสด 9
- () 2. คู่
- () 3. หม้าย
- () 4. หย่าหรือแยกกันอยู่
6. รายได้รวมทั้งหมดของครอบครัวเฉลี่ยต่อเดือน..... ☐ ☐ ☐ ☐ ☐ ☐
- 10 11 12 13 14 15
7. ความเพียงพอของรายได้ของครอบครัว ☐
- () 1. ไม่พอใช้ 16
- () 2. พอใช้
- () 3. เหลือเก็บ
8. จำนวนสมาชิกในครอบครัว ☐
- () 1. อยู่คนเดียว 17
- () 2. 2-4 คน
- () 3. 5-7 คน
- () 4. มากกว่า 7 คน
9. ภาวะการมีประจำเดือน ☐
- () 1. ยังมีประจำเดือน 18
- () 2. หหมดประจำเดือน หหมดมา.....ปี
10. ระยะเวลาที่ได้รับการวินิจฉัยจากแพทย์ว่าได้รับไขมันในเลือดสูง เดือน ☐ ☐ ☐
- 21 22 23
11. ภาวะไขมันในเลือดสูงของบุคคลในตระกูล ☐
- () 1. มีระบุ.....ใคร ? 24
- () 2. ไม่มี
12. ผู้รับผิดชอบในการซื้ออาหารของครอบครัว ☐
- () 1. ซื้อเอง 26
- () 2. ไม่ได้ซื้อเอง ผู้ซื้อระบุ.....
13. ผู้รับผิดชอบในการปรุงอาหารในครอบครัว ☐
- () 1. ปรุงเอง 27
- () 2. ไม่ได้ปรุงเอง ผู้ปรุงระบุ.....

14. ส่วนใหญ่อาหารที่ท่านรับประทาน เป็นประเภทใด ☐ 28
- () 1. ทำรับประทานเองที่บ้าน
 - () 2. ซื้ออาหารถุงที่ปรุงสำเร็จแล้ว
 - () 3. อื่นๆ ระบุ ...
15. ส่วนใหญ่อาหารที่ท่านรับประทานปรุงโดยวิธีใด ☐ 29
- () 1. ต้ม ตุ่น นึ่ง อบ ย่าง ยำ
 - () 2. ผัด
 - () 3. ทอด
 - () 4. แกงต่างๆ
 - () 5. อื่นๆ ระบุ...
16. ส่วนใหญ่ท่านรับประทานอาหารวันละกี่มื้อ ☐ 30
- () 1. 1 มื้อ
 - () 2. 2 มื้อ
 - () 3. 3 มื้อ
 - () 4. มากกว่า 3 มื้อ
17. การรับประทานอาหารนอกบ้าน ☐ 32
- () 1. ไม่รับประทาน
 - () 2. รับประทานทุกวัน อย่างน้อยวันละ 1 มื้อ
 - () 3. รับประทาน 2-3 วัน ต่อครั้ง
 - () 4. รับประทาน 4-5 วันต่อครั้ง
 - () 5. รับประทานสัปดาห์ละครั้ง
 - () 6. รับประทานเดือนละ 1-2 ครั้ง
 - () อื่นๆ ระบุ

II ข้อมูลจากประวัติรายงานทางการแพทย์

แบบบันทึกข้อมูลทางโภชนาการสำหรับสตรีที่มีไขมันในเลือดสูง

- | | |
|----------------------------|---------------------------|
| 1. น้ำหนักปัจจุบัน | กิโลกรัม |
| 2. ส่วนสูง | เซนติเมตร |
| 3. ดัชนีความหนาของร่างกาย | กิโลกรัม / ตารางเมตร |
| 4. serum total cholesterol | mg/dl |
| 5. serum triglyceride | mg/ dl |
| 6. serum HDL – cholesterol | mg/ dl |
| 7. serum LDL – cholesterol | mg/ dl |
| 8. FBS | mg/ dl |
| 9. Albumin | g/dl |
| 10. Globulin | g/dl |
| 11. Hemoglobin | g/dl |



APPENDIX D

NUTRITIONAL HEALTH-PROMOTING BEHAVIOR SCALE

Nutritional Health – Promoting Behavior Scale

Instructions :

The nutritional health-promoting behavior scale seeks information about nutritional behaviors of hyperlipidemic women. In the previous month, please try to recall how many times you consumed these foods. Please answer each statement and select the section most relevant to what you did by marking ✓. Please provide only one response to each statement.

- Routinely means you practice the nutritional health – promoting behavior regularly or daily, or 5 to 7 times a week.
- Frequently means you often practice the nutritional health-promoting behavior or 3 to 4 times a week.
- Sometimes means you practice the nutritional health – promoting behavior occasionally, or 1 to 2 times a week.
- Seldom means you practice the nutritional health-promoting behavior rarely, or 1 to 2 times per month.
- Never means you do not practice the nutritional health-promoting behavior at all.

For example

Nutritional health-promoting behavior	Frequency of practice				
	Routinely (5-7 times a week)	Frequently (3-4 times a week)	Sometimes (1-2 times a week)	Seldom (1-2 times per month)	Never
I eat heavy sweet fruit such as durian, jackfruit.		✓			

The statement means that, in the past month, how many times you ate heavy sweet fruit, such as durian, jackfruit, or any one and/or a variety of types in this group. If you ate durian 3 to 4 times a week, it means you ate it frequently.

Nutritional health-promoting behavior	Frequency of practice				
	Routinely (5-7 times a week)	Frequently (3-4 times a week)	Sometimes (1-2 times a week)	Seldom (1-2 times per month)	Never
1. I eat food cooked using vegetable oil, such as soybean oil, corn oil, and bran oil.					
2. I eat food cooked using animal fat, such as chicken fat, lard.					
3. I eat food or desserts cooked using coconut milk : coconut curries, such as Masaman curry; Kanom Kaeng-Buad, such as banana in coconut mill.					
4. I eat fried food or desserts, such as fried chick, Hoy Tord, Patong-ko.					
5. I eat food cooked by boiling, steaming, roasting, such as boiled chicken, steamed chicken.					
6. I eat animal skin and/or fatty meat, such as belly pork, medium fat beef.					
7. I eat mixed food dishes or Thai fast food with high fat, such as Khao man kai, Khao mok kai, Khao kha moo, Khao moo-krob, Khao na pet.					

Nutritional health-promoting behavior	Frequency of practice				
	Routinely (5-7 times a week)	Frequently (3-4 times a week)	Sometimes (1-2 times a week)	Seldom (1-2 times per month)	Never
8. I eat seafood (except fish) such as roe, squid and shellfish.					
9. I eat offal, such as liver, heart, intestine, stomach.					
10. I eat food or desserts					
11. I drink alcoholic beverages, such as spirits, beer, wine.					
12. I drink sweet beverages, such as carbonated beverages, sweet drinks, iced coffee.					
13. I eat heavy sweet desserts, such as Thong-Yip, Thong-Yodd, chocolate.					
14. I eat heavy sweet fruit, such as durian, jackfruit.					
15. I eat non-sweet fruit, such as guavas, oranges, Malay apples.					
16. I eat at least 4 ladles of whole vegetable each day.					
17. I eat both freshwater fish and seafish.					

แบบประเมินพฤติกรรมด้านโภชนาการสำหรับสตรีที่มีภาวะไขมันในเลือดสูง

คำชี้แจง

แบบสอบถามนี้ต้องการทราบข้อมูลเกี่ยวกับพฤติกรรมด้านโภชนาการของสตรีที่มีภาวะไขมันในเลือดสูง โปรดพิจารณาว่าในระยะ 1 เดือนที่ผ่านมา ท่านปฏิบัติพฤติกรรมนี้บ่อยแค่ไหน ขอให้ท่านทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับการปฏิบัติของท่านมากที่สุด โดยเลือกตอบเพียงคำตอบเดียวในแต่ละข้อ และขอความกรุณาตอบทุกข้อ โดยมีเกณฑ์การตอบดังนี้

ปฏิบัติเป็นประจำ	หมายถึง	ท่านปฏิบัติกิจกรรมนั้นๆ ทุกครั้งที่มีโอกาสหรือ 5-7 ครั้งต่อ สัปดาห์
ปฏิบัติเกือบทุกครั้ง	หมายถึง	ท่านปฏิบัติกิจกรรมนั้นๆ เกือบทุกครั้งที่มีโอกาสหรือ 3-4 ครั้ง ต่อสัปดาห์
ปฏิบัติบางครั้ง	หมายถึง	ท่านปฏิบัติกิจกรรมนั้นๆ เป็นบางครั้งที่มีโอกาสหรือ 1-2 ครั้ง ต่อสัปดาห์
ปฏิบัตินานๆ ครั้ง	หมายถึง	ท่านปฏิบัติกิจกรรมนั้นๆ นานๆ ครั้งที่มีโอกาสหรือ 1-2 ครั้ง ต่อเดือน
ไม่เคยปฏิบัติ	หมายถึง	ท่านไม่เคยปฏิบัติกิจกรรมนั้นๆ เลย

ตัวอย่าง

ข้อความ	ความถี่ในการปฏิบัติ				
	ปฏิบัติเป็นประจำ (5-7 ครั้งต่อ สัปดาห์)	ปฏิบัติเกือบทุก ครั้ง (3-4 ครั้ง ต่อสัปดาห์)	ปฏิบัติบาง ครั้ง (1-2 ครั้ง ต่อสัปดาห์)	ปฏิบัติ นานๆ ครั้ง (1-2 ครั้ง ต่อเดือน)	ไม่เคย ปฏิบัติ
ฉันรับประทานผลไม้รสหวานจัด เช่น ทุเรียน ขนุน					

จากตัวอย่าง หมายความว่า ใน 1 เดือนที่ผ่านมา ท่านรับประทานผลไม้รสหวานจัด เช่น ทุเรียน ขนุน ชนิดใดชนิดหนึ่ง หรือหลายชนิดรวมกันในกลุ่มนี้ บ่อยแค่ไหน เช่น รับประทานทุเรียน สัปดาห์ละ 3-4 ครั้ง นั่นคือปฏิบัติเกือบทุกครั้ง

ข้อความ	ความถี่ในการปฏิบัติ				
	ปฏิบัติเป็นประจำ (5-7 ครั้งต่อสัปดาห์)	ปฏิบัติเกือบทุก ครั้ง (3-4 ครั้งต่อสัปดาห์)	ปฏิบัติบางครั้ง (1-2 ครั้งต่อสัปดาห์)	ปฏิบัติ นานๆครั้ง (1-2 ครั้งต่อเดือน)	ไม่เคยปฏิบัติ
1. ฉันรับประทานอาหารที่ปรุงโดยใช้น้ำมันพืช เช่น น้ำมันถั่วเหลือง น้ำมันข้าวโพด น้ำมันรำข้าว					
2. ฉันรับประทานอาหารที่ปรุงโดยใช้น้ำมันสัตว์ เช่น น้ำมันไก่ น้ำมันหมู					
3. ฉันรับประทานอาหารคาวหวานที่ปรุงโดยใช้กะทิ ประเภทแกงกะทิต่างๆ เช่นแกงมัสมั่น ประเภทขนมแกงบวชต่างๆ เช่น กล้วยบวชชี					
4. ฉันรับประทานอาหารคาวหรือขนมที่ปรุงโดยการทอดเช่น ไก่ทอด หอยทอด ปาท่องโก๋					
5. ฉันรับประทานอาหารที่ปรุงโดยการ ต้ม ตุ่น นึ่ง ปิ้งย่าง เช่น ไก่ต้ม ไก่ตุ๋น					

ข้อความ	ความถี่ในการปฏิบัติ				
	ปฏิบัติเป็นประจำ (5-7ครั้งต่อสัปดาห์)	ปฏิบัติเกือบทุก ครั้ง (3-4 ครั้งต่อสัปดาห์)	ปฏิบัติบางครั้ง ครั้ง (1-2 ครั้งต่อสัปดาห์)	ปฏิบัติ นานๆครั้ง (1-2ครั้งต่อเดือน)	ไม่เคยปฏิบัติ
6. จัณรับประทานหนังสัตว์ เช่น หนังไก่ หนังเป็ด หนังหมู (หัน) และ / หรือเนื้อสัตว์ติดมัน เช่น หมูสามชั้น เนื้อวัวติดมัน					
7. จัณรับประทานอาหารจานเดียวที่มีไขมันสูง ประเภท ข้าวมันไก่ ข้าวหมกไก่ ข้าวขาหมู ข้าวหมูกรอบ ข้าวหน้าเป็ด					
8. จัณรับประทานอาหารทะเลต่างๆ นอกเหนือจากปลา เช่น ไข่ปลา ปลาหมึก หอย กุ้ง ปู					
9. จัณรับประทานเครื่องในสัตว์ เช่น ตับ หัวใจ ลำไส้ กระเพาะ					
10. จัณรับประทานอาหารคาวหรือขนมหวานที่มีไข่แดง					

ข้อความ	ความถี่ในการปฏิบัติ				
	ปฏิบัติเป็นประจำ (5-7ครั้งต่อสัปดาห์)	ปฏิบัติเกือบทุก ครั้ง (3-4 ครั้งต่อสัปดาห์)	ปฏิบัติบางครั้ง (1-2 ครั้งต่อสัปดาห์)	ปฏิบัติ นานๆครั้ง (1-2ครั้งต่อเดือน)	ไม่เคยปฏิบัติ
11. ถังดื่มน้ำเครื่องดื่มน้ำที่มีแอลกอฮอล์ เช่น เหล้า เบียร์ ไวน์ ต่างๆ					
12. ถังดื่มน้ำเครื่องดื่มน้ำที่มีรสหวาน เช่น น้ำอัดลม น้ำหวาน ไอศกรีม					
13. ถังดื่มน้ำประเภทขนมที่มีรสหวานจัด เช่น ทองหยิบ ทองหยอด ช็อคโกแลต					
14. ถังดื่มน้ำประเภทผลไม้รสหวานจัด เช่น ทุเรียน ขนุน					
15. ถังดื่มน้ำประเภทผลไม้รสไม่หวานจัด เช่น ฝรั่ง ส้มเขียวหวาน ชมพู่					
16. ถังดื่มน้ำประเภทผัก รวบรวมกัน อย่างน้อยวันละ 4 ทักพี					
17. ถังดื่มน้ำประเภทปลาทั้ง ปลาน้ำจืด และปลาน้ำเค็ม					



Perceived self-Efficacy for Nutritional Health-Promoting Behavior Scale

Instructions :

The perceived self-efficacy for nutritional health-promoting behavior scale seeks information about your perception of your ability to practice nutritional health-promoting behavior. Please answer each statement and select the response that is in best agreement with your personal perception, by marking ✓. Please provide only one answer for each statement. There are no right or wrong answers.

- Very high confidence means you have a strong belief in your ability to perform nutritional health-promoting behavior regularly, or every time.
- High confidence means you have a high belief in your ability to perform nutritional health-promoting behavior frequently, or almost every time.
- Moderate confidence means you have a moderate belief in your ability to perform nutritional health-promoting behavior sometimes, or occasionally.
- A Little confidence means you have a slight belief in your ability to perform nutritional health-promoting behavior.
- No confidence means you have no belief in your ability to perform nutritional health-promoting behavior at all.

For example

Perceived self – efficacy	Very high confidence	High confidence	Moderate confidence	A little confidence	confidence
I stop eating promptly when I feel full.	✓				

The statement focuses on how much confidence you perceive you have in your ability to do something, such as to stop eating promptly when you feel full. Do you feel confident that you can do it, or not ?

Perceived self - efficacy	Very confidence	High confidence	Moderate confidence	A little confidence	No confidence
1. I use soybean oil, corn oil, bran oil for cooking.					
2. I choose diluted coconut milk instead of concentrated coconut cream.					
3. I do not eat fried or stir-fried food.					
4. I do not eat high-fat diet.					
5. I remove fat every time when fatty meat will be eaten.					
6. I remove skin every time when meat will be eaten.					
7. I drink fruit juice instead of ice cream					
8. I avoid eating all visceral organ.					
9. I do not eat roe, squid, shellfish.					
10. I eat only egg white.					
11. I drink fruit juice instead of alcoholic beverages.					
12. I do not eat desserts and/or sweet fruits.					
13. I drink water instead of sweet beverages.					
14. I eat whole-grain rice or					

Perceived self - efficacy	Very confidence	High confidence	Moderate confidence	A little confidence	No confidence
home-pounded rice instead of polished rice.					
15. I eat at least 4 ladles of vegetables each day.					
16. I eat fish instead of meat.					
17. I eat a diet made of soybean or soybean curd instead of meat.					
18. I drink no more than 1 glass a day of low-fat or defatted milk or eat at least 2 tablespoons of small fish each day.					
19. I eat all of the five food groups each day.					
20. I stop eating promptly when I feel full.					
21. I do not eat unsafe colored food and/or food containing dangerous chemical.					

**แบบสอบถามการรับรู้สมรรถะของตนเองต่อการปฏิบัติพฤติกรรมส่งเสริมสุขภาพ
ด้านโภชนาการของสตรีมีภาวะไขมันในเลือดสูง**

คำชี้แจง

แบบสอบถามนี้ต้องการทราบข้อมูลเกี่ยวกับการรับรู้ความสามารถของท่าน ต่อการปฏิบัติพฤติกรรมส่งเสริมสุขภาพด้านโภชนาการ โดยจะมีข้อความสั้นๆ ให้ท่านตอบ คำตอบที่ได้ไม่มีถูกหรือผิด และทุกคำตอบจะเก็บไว้เป็นความลับ

ขอให้ท่านอ่านข้อความแต่ละข้อให้เข้าใจ แล้วทำเครื่องหมาย ✓ ลงในช่องที่เกี่ยวกับความคิดเห็นของท่านมากที่สุด โดยตอบเพียงคำถามเดียวในแต่ละข้อ กรุณาตอบทุกข้อ โดยมีหลักเกณฑ์การตอบดังนี้

- | | | |
|--------------------|---------|---|
| เชื่อมั่นมากที่สุด | หมายถึง | ท่านเชื่อมั่นว่าตนเองสามารถปฏิบัติพฤติกรรมนั้นๆ
สม่ำเสมอหรือทุกครั้ง |
| เชื่อมั่นมาก | หมายถึง | ท่านเชื่อมั่นว่าตนเองสามารถปฏิบัติพฤติกรรมนั้นๆ ได้
บ่อยครั้ง หรือเกือบครั้ง |
| เชื่อมั่นปานกลาง | หมายถึง | ท่านเชื่อมั่นว่าตนเองสามารถปฏิบัติพฤติกรรมนั้นๆ ได้บาง
ครั้ง |
| เชื่อมั่นน้อย | หมายถึง | ท่านเชื่อมั่นว่าตนเองสามารถปฏิบัติพฤติกรรมนั้นๆ ได้
น้อยครั้ง หรือนานๆ ครั้ง |
| ไม่เชื่อมั่นเลย | หมายถึง | ท่านเชื่อมั่นว่าตนเองไม่สามารถปฏิบัติพฤติกรรมนั้นๆ ได้
สำเร็จเลย |

ตัวอย่าง

ข้อความ	เชื่อมั่น มากที่สุด	เชื่อมั่น มาก	เชื่อมั่น ปานกลาง	เชื่อมั่น น้อย	ไม่เชื่อมั่น เลย
ฉันจะหยุดรับประทาน อาหารทันทีเมื่อรู้สึกอึด แม้ จะเป็นอาหารที่ชอบ	✓				

จากตัวอย่าง ต้องการทราบความเชื่อมั่นของท่านในการปฏิบัติ ว่าท่านมีความเชื่อมั่นระดับใดในการที่จะทำสิ่งนั้นๆ เช่น ท่านจะหยุดรับประทานทันทีเมื่อรู้สึกอึด ท่านเชื่อมั่นว่าทำได้ หรือทำไม่ได้ ถ้าทำได้ท่านเชื่อมั่นระดับใด

ข้อความ	เชื่อมั่นมาก ที่สุด	เชื่อมั่นมาก	เชื่อมั่น ปานกลาง	เชื่อมั่น น้อย	ไม่เชื่อมั่น เลย
1. ฉันใช้น้ำมันพืช เช่นน้ำมันถั่วเหลือง น้ำมันข้าวโพด น้ำมันรำข้าวปรุงอาหารรับประทาน แม้จะมีราคาแพงกว่า					
2. ถ้าปรุงอาหารรับประทานเองฉันจะใช้หางกะทิแทนหัวกะทิ					
3. ฉันไม่รับประทานอาหารที่ปรุงโดยการทอดหรือผัด แม้จะเป็นอาหารที่ฉันชอบ					
4. ฉันจะไม่รับประทานอาหารเลยถ้าอาหารที่สั่งมาเป็นอาหารมันๆ					
5. ฉันจะเลาะไขมันออกทุกครั้งเมื่อรับประทานเนื้อสัตว์ติดมัน					
6. ฉันจะเลาะหนัง เช่น หนังไก่ หนังเป็ดออกทุกครั้ง เมื่อรับประทานเนื้อสัตว์					
7. ฉันดื่มน้ำผลไม้แทนไอศกรีม					
8. ฉันหลีกเลี่ยงที่จะรับประทานเครื่องในสัตว์ทุกชนิด					

ข้อความ	เชื่อมั่น มากที่สุด	เชื่อมั่นมาก	เชื่อมั่น ปานกลาง	เชื่อมั่น น้อย	ไม่เชื่อมั่น เลย
9. ฉันไม่รับประทานไข่ปลา ปลาหมึก หอย กุ้ง ปู แม้จะ ชอบมากก็ตาม					
10. ถึงแม้จะชอบรับประทาน ไข่ แต่ฉันจะรับประทาน เฉพาะไข่ขาว					
11. ฉันดื่มน้ำผลไม้ น้ำผัก แทนเครื่องดื่มที่มีแอลกอฮอล์					
12. ฉันจะไม่รับประทานขนม หวานและ/ หรือผลไม้ที่มีรส หวานทุกชนิด					
13. ฉันจะดื่มน้ำเปล่าแทน เครื่องดื่มที่มีรสหวาน เช่น โอ เลี่ยน น้ำหวาน น้ำอัดลม					
14. ฉันจะรับประทานข้าว กล้อง หรือข้าวซ้อมมือ แทน ข้าวขัดสี แม้จะมีราคาแพงกว่า					
15. ฉันรับประทานผักรวมๆ กันอย่างน้อยวันละ 4 ท็อปปี แม้ ว่าจะลำบากในการหาซื้อ					
16. ฉันรับประทานปลาแทน เนื้อสัตว์ชนิดอื่น					

ข้อความ	เชื่อมั่นมากที่สุด	เชื่อมั่นมาก	เชื่อมั่นปานกลาง	เชื่อมั่นน้อย	ไม่เชื่อมั่นเลย
17. ฉันรับประทานอาหารที่ปรุงโดยใช้โปรตีนจากถั่วเหลืองหรือเต้าหู้แทนเนื้อสัตว์					
18. ฉันดื่มนมพร่องไขมันหรือขาดไขมันวันละไม่เกิน 1 แก้ว หรือรับประทานปลาเล็กปลาน้อยอย่างน้อยวันละ 2 ซ่อนกินข้าว					
19. ฉันจะรับประทานอาหารให้ครบทั้ง 5 หมู่ในแต่ละวัน					
20. ฉันจะหยุดรับประทานอาหารทันทีเมื่อรู้สึกอิ่ม แม้จะเป็นอาหารที่ชอบ					
21. ถ้าอาหารที่สั่งมา มีการเติมสีในอาหารและ/หรือมีการปนเปื้อนสารเคมี ฉันจะไม่รับประทานเลย					



Perceived Health Risks Scale

Instructions :

The perceived health risks scale seeks information about your views or perceptions about your own susceptibility to disease, or complications from hyperlipidemia. Please read each statement and then mark ✓ in the section that agrees best with how you feel or perceive. Please select only one answer for each statement. There are no right or wrong answers.

- Very highly agree means the statement has the highest relevance to your view or perception.
- Highly agree means the statement has high relevance to your view or perception.
- Moderately agree means the statement has moderate relevance to your view or perception.
- Slightly agree means the statement has slight relevance to your view or perception.
- Disagree means the statement has no relevance to your view or perception.

For example

Perceived health risks	Very highly agree	Highly agree	Moderately agree	Slightly agree	Disagree
1. I think I have hyperlipidemia because of eating a high fat diet.	✓				

The statement focuses on your perception, not your knowledge or what you actually do. Please answer according to your personal perception.

Perceived health risks	Very highly agree	Highly agree	Moderately agree	Slightly agree	Disagree
1. I have hyperlipidemia because at my age the risk is increased.					
2. I have a probability of getting hyperlipidemia because of having familial hyperlipidemia.					
3. I think I have hyperlipidemia because of lack of exercise.					
4. I think I have hyperlipidemia because of stress in my work.					
5. I think either obese or thin people have probability of hyperlipidemia.					
6. I think I have hyperlipidemia because of eating a high fat diet.					
7. Now, I think I am healthy although I have hyperlipidemia.					
8. I think I am at greater risk of coronary heart disease than other people are.					
9. I think I am at greater risk of hyperlipidemia than other people are.					
10. I think I am at greater risk of cerebrovascular accident than other people are.					
11. I think I am at greater risk of renal disease than other people					

แบบสอบถามการรับรู้โอกาสเสี่ยงต่อการเกิดโรค

คำชี้แจง : แบบสอบถามนี้ต้องการทราบข้อมูลเกี่ยวกับความเข้าใจ หรือความรู้สึกนึกคิดเกี่ยวกับโอกาสเสี่ยงโรค หรือภาวะแทรกซ้อนจากภาวะไขมันในเลือดสูงของท่าน ในแบบสอบถามจะมีข้อความให้ท่านพิจารณาถึงความเข้าใจ หรือความรู้สึกนึกคิดตามความเป็นจริงของท่านมากที่สุด ดังนั้นคำตอบของท่านไม่มีถูกหรือผิด ขอให้ท่านตอบให้ตรงกับ ความเข้าใจ หรือความรู้สึกนึกคิดของท่านให้มากที่สุด โดยทำเครื่องหมาย ✓ ในช่องที่ตรงกับความเข้าใจหรือ ความรู้สึกนึกคิดของท่านมากที่สุดเพียงคำตอบเดียว และขอความกรุณาตอบทุกข้อ โดยมีเกณฑ์ในการเลือกตอบดังนี้

เห็นด้วยมากที่สุด	หมายถึง	ข้อความนั้นตรงกับความเข้าใจ หรือความรู้สึกนึกคิดของท่านมากที่สุดหรือทั้งหมด
เห็นด้วยเป็นส่วนมาก	หมายถึง	ข้อความนั้นตรงกับความเข้าใจ หรือความรู้สึกนึกคิดของท่านค่อนข้างมาก แต่ไม่ทั้งหมด
เห็นด้วยปานกลาง	หมายถึง	ข้อความนั้นตรงกับความเข้าใจ หรือความรู้สึกนึกคิดของท่านเพียงครั้งเดียว
เห็นด้วยน้อย	หมายถึง	ข้อความนั้นตรงกับความเข้าใจ หรือความรู้สึกนึกคิดของท่านเพียงเล็กน้อย
ไม่เห็นด้วย	หมายถึง	ข้อความนั้นไม่ตรงกับความเข้าใจ หรือความรู้สึกนึกคิดของท่านเลย

ตัวอย่าง

ข้อความ	เห็นด้วยมากที่สุด	เห็นด้วยเป็นส่วนมาก	เห็นด้วยปานกลาง	เห็นด้วยน้อย	ไม่เห็นด้วย
1 ฉันคิดว่าฉันมีไขมันในเลือดสูงเนื่องจากการรับประทานอาหารที่มีไขมันสูง	✓				

จากตัวอย่าง เน้นที่ความคิดของท่าน ไม่ใช่ความรู้ ไม่ใช่การปฏิบัติ ท่านคิดอย่างไร ให้ตอบตามที่ท่านคิด

ข้อความ	เห็นด้วย มากที่สุด	เห็นด้วย เป็นส่วน มาก	เห็นด้วย ปานกลาง	เห็นด้วย น้อย	ไม่เห็น ด้วย
1 ฉันมีไขมันในเลือดสูงเนื่องจากฉันอยู่ในวัยที่มีโอกาสเกิดไขมันในเลือดสูง					
2 ฉันมีโอกาสดเกิดไขมันในเลือดสูงเนื่องจากมีบุคคลในตระกูลของฉันมีไขมันในเลือดสูง					
3 ฉันคิดว่าฉันมีไขมันในเลือดสูงเนื่องจากไม่ได้ออกกำลังกาย					
4 ฉันคิดว่าฉันมีไขมันในเลือดสูงเนื่องจากเครียดจากการทำงาน					
5 ฉันคิดว่าไม่ว่าคนอ้วนหรือคนผอมต่างก็มีโอกาสไขมันในเลือดสูง					
6 ฉันคิดว่าฉันมีไขมันในเลือดสูงเนื่องจากการรับประทานอาหารที่มีไขมันสูง					
7 ฉันคิดว่าขณะนี้ร่างกายของฉันแข็งแรงดีแม้มีไขมันในเลือดสูง					
8 ฉันคิดว่าฉันมีโอกาสเจ็บป่วยด้วยโรคหลอดเลือดหัวใจตีบมากกว่าคนปกติ					
9 ฉันคิดว่าฉันมีโอกาสเจ็บป่วยด้วยโรคความดันโลหิตสูงมากกว่าคนปกติ					
10 ฉันคิดว่าฉันมีโอกาสเจ็บป่วยด้วยโรคอัมพาตหรือโรคอัมพฤกษ์มากกว่าคนปกติ					
11 ฉันคิดว่าฉันมีโอกาสเจ็บป่วยด้วยโรคไตมากกว่าคนปกติ					



Social Support Scale

Instructions :

The social support scale seeks information about your perception the amount of help or support that you receive from close persons, such as family members, relatives or close friends. Please read each statement and mark ✓ in the section in best agreement with how you feel. Please select only one answer to each statement.

- Strongly agree means the statement is most relevant to your feeling or perception.
- Agree means the statement is relevant to your feeling or perception.
- Uncertain means that you are not sure whether the statement is relevant to your feeling or perception
- Disagree means the statement is not relevant to your feeling or perception.
- Strongly disagree means the statement is absolutely not relevant to your feeling or perception.

For example

Social support	strongly disagree	Disagree	Uncertain	Agree	Strongly agree
I get concern from close relatives, such as asking about my health.				✓	

Social support	strongly disagree	Disagree	Uncertain	Agree	Strongly agree
1. I get concern from close relatives.					
2. I talk to someone about how I am feeling.					
3. I receive attention to my problem or unhappy feeling without annoyance.					
4. I feel important due to encouragement from close relatives.					
5. I receive consolation from close relative when I worry about my health status or illness.					
6. I get acceptance about caring for myself.					
7. I receive praise that I practice well in accordance with advice.					
8. I get reminders about inappropriate practices.					
9. I get delight for practice as well as other persons.					
10. I receive suggestion about appropriate food consumption.					
11. I receive suggestion about appropriate food consumption.					
12. I receive advice to go to the physician for follow- up and/or when something is wrong					

Social support	strongly disagree	Disagree	Uncertain	Agree	Strongly agree
13. I get directions on how to take good care of myself from close relatives' asking the physician or nurse.					
14. I receive knowledge about healthy practices from close relatives who have access the media					
15. I receive beneficial food from the preparation or purchase by close relatives.					
16. I get necessary financial support when I need it.					
17. I receive caring when I am sick.					
18. I get someone to accompany me when I have to go to the physician.					
19. I get a happy atmosphere to encourage healthy behaviors.					

แบบวัดแรงสนับสนุนทางสังคม

คำชี้แจง :

แบบวัดแรงสนับสนุนทางสังคมนี้ ต้องการทราบข้อมูลเกี่ยวกับปริมาณความช่วยเหลือหรือการสนับสนุนที่ท่านได้รับจากบุคคลใกล้ชิด เช่น สมาชิกในครอบครัว ญาติ หรือเพื่อนสนิท

ขอให้ท่านอ่านข้อความแต่ละข้อให้เข้าใจ แล้วทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับความคิดเห็นของท่านมากที่สุด ขอให้ท่านตอบเพียงคำตอบเดียวในแต่ละข้อ และขอความกรุณาตอบทุกข้อโดยเกณฑ์การตอบมีดังนี้

เห็นด้วยอย่างยิ่ง หมายถึง ข้อความนั้นๆ ตรงกับความรู้สึก ความคิดเห็นของท่านมากที่สุด

เห็นด้วย หมายถึง ข้อความนั้นๆ ตรงกับความรู้สึก ความคิดเห็นของท่าน

ไม่แน่ใจหรือเฉยๆ หมายถึง ท่านไม่แน่ใจ หรือไม่มีความคิดเห็นต่อข้อความนั้นๆ

ไม่เห็นด้วย หมายถึง ข้อความนั้นๆ ไม่ตรงกับความรู้สึก ความคิดเห็นของท่าน

ไม่เห็นด้วยอย่างยิ่ง หมายถึง ข้อความนั้นๆ ไม่ตรงกับความรู้สึก ความคิดเห็นของ ท่านมากที่สุด

ตัวอย่าง

ข้อความ	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจหรือเฉยๆ	เห็นด้วย	เห็นด้วยอย่างยิ่ง
1. ฉันได้รับความห่วงใย และเอาใจใส่จากบุคคลใกล้ชิดเสมอ เช่น คอยสอบถามเกี่ยวกับสุขภาพของฉัน				✓	

ข้อความ	ไม่เห็นด้วย อย่างยิ่ง	ไม่เห็น ด้วย	ไม่แน่ใจ หรือเฉยๆ	เห็นด้วย	เห็นด้วย อย่างยิ่ง
1.ฉันได้รับความห่วงใยและ เอาใจใส่จากบุคคลใกล้ชิด เสมอ เช่น คอยสอบถามเกี่ยวกับ สุขภาพของฉัน					
2.เมื่อไม่สบายใจฉันมีบุคคล ใกล้ชิดที่สามารถพูดคุยได้					
3. บุคคลใกล้ชิดสนใจรับฟัง ปัญหาหรือความรู้สึกไม่สบาย ใจของฉันโดยไม่แสดงความ หงุดหงิดหรือรำคาญใจ					
4.บุคคลใกล้ชิดคอยให้กำลังใจ ฉันในการปฏิบัติตัวเพื่อให้ มีสุขภาพดี ทำให้ฉันรู้สึกว่า ตนเองมีความสำคัญต่อเขา					
5. บุคคลใกล้ชิดคอยปลอบใจ ฉัน เมื่อฉันรู้สึกวิตกกังวล เกี่ยวกับการเจ็บป่วย หรือสุข ภาพของฉัน					
6. บุคคลใกล้ชิดเห็นด้วยกับ การดูแลสุขภาพของฉัน					
7. บุคคลใกล้ชิดกล่าวชมว่า ฉันทำตามคำแนะนำของ แพทย์และพยาบาล ได้ดี					
8. บุคคลใกล้ชิดคอยเตือนเมื่อ ฉันปฏิบัติตัวไม่เหมาะสม เช่นรับประทานอาหารที่มีไขมัน สูง					

ข้อความ	ไม่เห็นด้วย อย่างยิ่ง	ไม่เห็น ด้วย	ไม่แน่ใจ หรือเฉยๆ	เห็นด้วย	เห็นด้วย อย่างยิ่ง
9. บุคคลใกล้ชิดแสดงความ ชื่นชมที่ฉันปฏิบัติตัวในการดูแล สุขภาพได้ดี เช่นเดียวกับ คนอื่นๆ					
10. บุคคลใกล้ชิดช่วยหาข้อมูล หรือหนังสือเกี่ยวกับการ ปฏิบัติตัวเพื่อให้มีสุขภาพดี มาให้ฉัน เช่นการรับประทานอาหาร					
11. ฉันได้รับคำแนะนำจาก บุคคลใกล้ชิดเกี่ยวกับการรับ ประทานอาหารที่เหมาะสม					
12. บุคคลใกล้ชิดคอยแนะนำ หรือเตือนให้ฉันไปพบแพทย์ ตามนัดและ/ หรือเมื่อมีอาการ ผิดปกติ					
13. บุคคลใกล้ชิดคอยสอบถาม แพทย์หรือพยาบาลเกี่ยวกับการดูแล สุขภาพให้แก่นักเรียน					
14. บุคคลใกล้ชิดพยายามหา ความรู้เกี่ยวกับการปฏิบัติตัว เพื่อให้มีสุขภาพดีจากการอ่าน หนังสือ ฟังรายการวิทยุ หรือ ดูโทรทัศน์มาบอกฉัน					

ข้อความ	ไม่เห็นด้วย อย่างยิ่ง	ไม่เห็น ด้วย	ไม่แน่ใจ หรือเฉยๆ	เห็นด้วย	เห็นด้วย อย่างยิ่ง
15.บุคคลใกล้ชิดจัดหาหรือ ซื้ออาหารที่มีประโยชน์มาให้ ฉันรับประทาน					
16.เมื่อฉันต้องการเงินบุคคล ใกล้ชิดจะให้การช่วยเหลือ					
17.บุคคลใกล้ชิดคอยดูแลฉัน เมื่อฉันเจ็บป่วย					
18. เวลามาพบแพทย์ตามนัด บุคคลใกล้ชิดจะสละเวลามา กับฉันด้วย					
19.บรรยาการในบ้านส่งเสริม สนับสนุนให้ฉันปฏิบัติตัว เพื่อให้มีสุขภาพดี					



Table 4.13 Mean, standard deviation, and percentage for the scores of each rating scale of each item of the nutritional health-promoting behavior (NHPB) (n = 263)

Nutritional health-promoting behavior (NHPB)			Percentage of each rating scale %				
	$\bar{x}$	SD	5	4	3	2	1
1. Eat food cooked with vegetable oil, such as soybean oil, corn oil, and bran oil.	4.21	0.97	50.6	27.0	16.7	4.2	1.5
2. Do not eat food cooked with animal fat, such as chicken fat, lard. *	4.65	0.69	74.9	17.1	6.5	1.1	0.4
3. Do not eat food or desserts cooked with coconut milk: coconut curries, such as masaman curry; Kanom Kaeng-Buad, such as banana in coconut milk. *	3.49	0.92	10.3	44.5	32.3	9.5	3.4
4. Do not eat fried food or desserts, such as fried chicken, Hoy Tord, Pa-tong-ko. *	3.16	1.02	8.7	28.5	39.2	17.1	6.5
5. Eat food cooked by boiling, steaming, roasting, such as boiled chicken, steamed chicken.	3.24	1.06	13.7	25.5	36.9	19.4	4.6
6. Do not eat animal skin and/or fatty meat, such as pork belly, medium fat beef. *	4.02	0.99	38.0	36.1	17.9	6.1	1.9

Note 1-5 = rating scale; 5 = Routinely; 4 = Frequently; 3 = Sometimes; 2 = Seldom; 1 = Never; * Negative items, (%) = percentage of each rating scale

Table 4.13 Mean, standard deviation, and percentage for the scores of each rating scale of each item of the nutritional health-promoting behavior (NHPB) (n = 263) (continued)

Nutritional health-promoting behavior (NHPB)			Percentage of each rating scale %				
	$\bar{x}$	SD	5	4	3	2	1
7. Do not eat mixed food dishes or Thai fast foods with high fat, such as Khao man kai, Khao mok kai, Khao kha moo, Khao moo-krob, Khao na pet. *	3.63	0.78	9.1	53.2	30.0	6.8	0.8
8. Do not eat seafood (except for fish), such as roe, squid and shellfish. *	3.14	1.04	8.7	29.3	35.4	20.2	6.5
9. Do not eat visceral organs, such as liver, heart, intestine, stomach.*	4.05	0.89	33.8	44.9	15.2	4.9	1.1
10. Do not eat food or desserts containing egg yolk. *	3.54	1.01	17.1	38.0	30.0	11.8	3.0
11. Do not drink alcoholic beverages, such as spirits, beer, wine. *	4.65	0.67	71.9	24.0	2.7	0.4	1.1

Note 1-5 = rating scale; 5 = Routinely; 4 = Frequently; 3 = Sometimes; 2 = Seldom; 1 = Never; * Negative items,(%) = percentage of each rating scale

Table 4.13 Mean, standard deviation, and percentage for the scores of each rating scale of each item of the NHPB (n = 263) (continued)

Nutritional health-promoting behavior (NHPB)	$\bar{x}$	SD	Percentage of each rating scale %				
			5	4	3	2	1
12. Do not drink sweet beverages, such as carbonated beverages, sweet drinks, iced coffee. *	3.24	1.18	13.3	33.8	25.9	17.1	9.9
13. Do not eat heavy sweet desserts, such as Thong-Yip, Thong-Yodd, chocolate. *	4.09	0.83	32.7	49.4	13.3	3.4	1.1
14. Do not eat heavy sweet fruit, such as durian, jackfruit. *	3.30	1.06	8.7	41.8	27.0	15.2	7.2
15. Eat non-sweet fruit, such as guavas, oranges, Malay-apples.	3.81	1.06	30.8	35.4	20.2	11.8	1.9
16. Eat at least 4 ladles of whole vegetables each day.	3.63	1.16	29.7	24.7	28.9	12.2	4.6
17. Eat both freshwater fish and sea fish.	4.26	0.83	46.4	37.3	12.5	3.4	0.4

Note 1-5 = rating scale; 5 = Routinely; 4 = Frequently; 3 = Sometimes; 2 = Seldom;

1= Never; * Negative items,(%) = percentage of each rating scale

Table 4.14 Comparison of frequency and percentage of the subjects with low and high serum cholesterol levels classified by age, education, occupation, food buying, cooking, and BMI (Chi-square test) (n=263)

Variables	Total N(%)	Serum cholesterol levels		Sig.(2-sided)
		Low (<240mg/dl) N(%)	High($\geq$ 240mg/dl) N(%)	
Age				.000***
< 50 years	98 (72.59)	60 (46.88)	202 (76.81)	
$\geq$ 50 years	37 (27.41)	68 (53.12)	61 (23.19)	
Total	135 (100)	128 (100)	263 (100)	
Education				.309
Below high school	61 (45.19)	46 (35.94)	107 (40.68)	
Higher than high school	74 (54.81)	82 (64.06)	156 (59.32)	
Total	135 (100)	128 (100)	263 (100)	
Occupation				.167
Work at home	62 (45.93)	51 (39.84)	113 (42.97)	
Work outside	73 (54.07)	77 (60.16)	150 (57.03)	
Total	135 (100)	128 (100)	263 (100)	

Note: ***P<.001, BMI = body mass index

Table 4.14 Comparison of frequency and percentage of the subjects with low and high serum cholesterol levels classified by age, education, occupation, food buying, cooking, and BMI (Chi-square test) (n=263) (continued)

Variables	Total N(%)	Serum cholesterol levels		Sig.(2- sided)
		Low (<240mg/dl) N (%)	High(≥ 240mg/dl) N(%)	
Food buying				.877
Self	120 (88.89)	113 (88.28)	233 (88.59)	
Other	15 (11.11)	15 (11.72)	30 (11.41)	
Total	135 (100)	128 (100)	263 (100)	
Cooking				.102
Self	97 (71.85)	103 (80.47)	200 (76.05)	
Other	38 (28.15)	25 (19.53)	63 (23.95)	
Total	135 (100)	128 (100)	263 (100)	
BMI				.820
Normal (18.50 - < 23.00 kg/m ²	53 (41.41)	50 (40.00)	103 (40.71)	
Overweight (≥ 23.00 kg/ m ²	75 (58.59)	75 (60.00)	150 (59.29)	
Total	128 (100)	125 (100)	253 (100)	

Note: ***P<.001, BMI = body mass index

Table 4.15 Comparison of mean scores of perceived health risks between subjects who had low (n=135) and high serum cholesterol levels (n=128) (t-test)

Groups	N	Mean	SD	t- value	Sig.(2-tailed)
Low serum cholesterol level (< 240 mg/ dl)	135	33.11	7.07	-2.016	.045*
High serum cholesterol level (≥240 mg/dl)	128	34.89	7.25		

Note: *p<.05

Table 4.16 Comparison of frequency and percentage of the subjects with low and high serum cholesterol levels classified by total scale and five subscales of the NHPB (Chi-square test) (n=263)

Variables	Total N (%)	Serum cholesterol levels		Sig.
		Low (<240mg/dl) N (%)	High (≥240mg/dl) N (%)	
1.NHPB*** by total diet				.004**
Good behavior	42(15.97)	15(11.11)	27(21.09)	
Moderate behavior	184(69.96)	93(68.89)	91(71.09)	
Poor behavior	37(14.07)	27(20.00)	10(7.81)	
Total	263 (100)	135 (100)	128 (100)	
2.Low-triglyceride diet				.071
Good behavior	39(14.83)	15(11.11)	24(18.75)	
Moderate behavior	187(71.10)	96(71.11)	91 (71.09)	
Poor behavior	37(14.07)	24(17.78)	13(10.16)	
3.Low-cholesterol diet				.010*
Good behavior	39(14.83)	13(9.63)	26(20.31)	
Moderate behavior	182(69.20)	94(69.63)	88(68.75)	
Poor behavior	42(15.97)	28(20.74)	14(10.94)	
4. High-fiber diet				.046
Good behavior	44 (16.73)	19 (14.07)	25 (19.53)	
Moderate behavior	178 (67.68)	88 (65.19)	90 (70.31)	
Poor behavior	41 (15.59)	28 (20.74)	13 (10.16)	
5. Low-fat diet				.004**
Good behavior	46(17.49)	14(10.37)	32(25.00)	
Moderate behavior	178(67.68)	96(71.11)	82(64.06)	
Poor behavior	39(14.83)	25(18.52)	14(10.94)	

*p<.05, **p<.01, ***NHPB = Nutritional health-promoting behavior

Table 4.16 Comparison of frequency and percentage of the subjects with low and high serum cholesterol levels classified by total scale and five subscales of the NHPB (Chi-square test) (n=263)(continued)

Variables	Total N (%)	Serum cholesterol levels		Sig.
		Low (<240mg/dl) N (%)	High(≥ 240mg/dl)N (%)	
6.Low-sugar diet				.017*
Good behavior	55(20.91)	20(14.81)	35(27.34)	
Moderate behavior	163 (61.98)	86 (63.70)	77 (60.61)	
Poor behavior	45 (17.11)	29 (21.48)	16 (12.50)	

*p<.05, **p<.01, ***NHPB = Nutritional health-promoting behavior

Table 4.17 Comparison of mean scores of serum cholesterol levels, total scale of the NHPB, five subscales of the NHPB, and perceived health risks between low BMI (BMI < 23 kg/m²) (n=103) and high BMI (BMI ≥23 kg/m²) (n=150) groups (t-test)

Variables	Mean	SD	t- value	Sig.(2-tailed)
Serum cholesterol levels of				
Low BMI	244.91	39.25	-.147	.883
High BMI	245.59	33.71		
NHPB* by total diet				
Low BMI	64.20	7.16	.097	.923
High BMI	64.11	7.40		
Low-triglyceride diet				
Low BMI	35.63	4.05	1.030	.304
High BMI	35.06	4.52		
Low-cholesterol diet				
Low BMI	31.42	3.98	.125	.901
High BMI	31.35	4.05		
High-fiber diet				
Low BMI	7.33	1.91	-.915	.361
High BMI	7.54	1.71		
Low-fat diet				
Low BMI	18.56	2.46	1.347	.179
High BMI	18.14	2.45		
Low-sugar diet				
Low BMI	10.77	2.26	.851	.395
High BMI	10.52	2.27		
Perceived health risks				
Low BMI	33.48	6.52	-.890	.374
High BMI	34.29	7.51		

Note :NHPB* = nutritional health-promoting behavior, BMI = body mass index

Table 4.18 Correlation matrix among age, body mass index, education, duration of hyperlipidemia, perceived health risks, perceived self-efficacy, social support, serum cholesterol levels, serum triglyceride levels, and the total scale of NHPB (n=263)

Variables	1	2	3	4	5	6	7	8	9	10
1. Age	1.00									
2. Body mass index	.141*	1.00								
3. Education	-.478**	-.218**	1.00							
4. Duration of hyperlipidemia	-.156*	.035	.265**	1.00						
5. Perceived health risks	-.041	.058	.184**	.086	1.00					
6. Perceived self-efficacy	.263**	-.183**	-.064	-.078	.114	1.00				
7. Social support	.275**	-.052	-.174**	-.071	-.151*	.348**	1.00			
8. Serum cholesterol levels	.174**	.041	.057	.079	.111	.224**	.171**	1.00		
9. Serum triglyceride levels	.247**	.330**	-.197**	-.169**	.147*	.051	-.082	.091	1.00	
10. Total scale of the NHPB****	.377**	-.025	-.169*	-.027	-.092	.556**	.227**	.214**	.078	1.00

*p < .05, ** p < .01, NHPB*** = nutritional health-promoting behavior

Table 4.19 Mean, standard deviation, and percentage for the scores of each rating scale of each item of perceived health risks (n=263)

Perceived health risks	$\bar{x}$	SD	Percentage of each rating scale (%)				
			5	4	3	2	1
1. I have hyperlipidemia because at my age the risk is increased.	3.64	1.21	28.9	30.0	24.3	9.1	7.6
2. I have a probability of getting hyperlipidemia because of having familial hyperlipidemia.	2.19	1.29	6.1	12.9	19.4	17.5	44.1
3. I think I have hyperlipidemia because of lack of exercise.	3.62	1.40	35.7	27.4	13.7	9.9	13.3
4. I think I have hyperlipidemia because of stress in my work.	2.77	1.38	14.1	19.0	21.3	20.9	24.7
5. I think either obese or thin people have probability of hyperlipidemia.	3.92	1.26	42.2	32.3	10.3	6.1	9.1
6. I think I have hyperlipidemia because of eating a high fat diet.	4.14	1.11	51.0	26.2	13.3	4.9	4.6
7. Now, I do not think I am healthy because I have hyperlipidemia. *	2.53	1.25	9.5	12.5	24.3	28.9	24.7
8. I think I am at greater risk of coronary heart disease than other people are.	2.99	1.37	13.7	29.3	22.1	12.5	22.4

Note: 1-5 = rating scale; 5 = Very highly agree; 4 = Highly agree; 3 = Moderately agree; 2 = Slightly agree; 1 = Disagree; * Negative item; % = percentage of each rating scale

Table 4.19 Mean, standard deviation, and percentage for the scores of each rating scale of each item of perceived health risks (n=263) (continued)

Perceived health risks	$\bar{X}$	SD	Percentage of each rating scale (%)				
			5	4	3	2	1
9. I think I am at greater risk of hypertension than other people are.	3.07	1.34	15.6	27.4	24.7	13.3	19.0
10. I think I am at greater risk of cerebrovascular accident than other people are.	2.70	1.39	11.0	24.0	18.6	17.1	29.3
11. I think I am at greater risk of renal disease than other people are.	2.39	1.29	4.9	20.5	19.4	19.0	36.1

Note: 1-5 = rating scale; 5 = Very highly agree; 4 = Highly agree; 3 = Moderately agree; 2 = Slightly agree; 1= Disagree; * Negative item; % = percentage of each rating scale

Table 4.20 Mean, standard deviation, and percentage for the scores each rating scale of each item of perceived self-efficacy (n=263)

Perceived self-efficacy	$\bar{x}$	SD	Percentage of each rating scale (%)				
			5	4	3	2	1
1. Use soybean oil, corn oil, bran oil for cooking.	4.49	0.81	63.9	24.7	8.4	2.3	0.8
2. Choose diluted coconut milk instead of concentrated coconut cream.	2.80	1.20	9.5	18.3	31.6	23.6	17.1
3. Do not eat fried or stir-fried food.	2.66	1.13	6.8	14.1	35.0	26.2	17.9
4. Do not eat high-fat diet.	2.97	1.16	12.5	17.9	33.1	26.6	9.9
5. Remove fat every time when fatty meat will be eaten.	3.47	1.26	26.6	26.6	21.3	18.3	7.2
6. Remove skin every time when meat will be eaten.	3.60	1.32	33.5	24.7	19.4	13.3	9.1
7. Drink fruit juice instead of ice cream.	3.80	1.19	36.5	27.4	19.8	11.8	4.6
8. Avoid eating all offal.	3.57	1.22	30.0	22.1	28.9	12.5	6.5
9. Do not eat roe, squid, shellfish.	3.07	1.21	16.7	15.6	36.9	19.8	11.0
10. Eat only egg white.	2.86	1.29	11.8	21.3	28.1	19.0	19.8
11. Drink fruit juice instead of alcoholic beverages.	4.30	1.00	58.2	22.8	12.9	3.4	2.7
12. Do not eat desserts and/or sweet fruits.	2.86	1.18	11.8	13.3	39.2	20.9	14.8

Note: 1-5 = rating scale; 5 = Very high confidence; 4 = High confidence; 3 = Moderate confidence; 2 = A little confidence; 1 = No confidence; % = percentage of each rating scale

Table 4.20 Mean, standard deviation, and percentage for the scores each rating scale of each item of perceived self-efficacy (n=263) (continued)

Perceived self-efficacy			Percentage of each rating scale (%)				
	$\bar{x}$	SD	5	4	3	2	1
13. Drink water instead of sweet beverages.	3.62	1.23	30.0	28.5	22.4	11.8	7.2
14. Eat whole-grain rice or home-pounded rice instead of polished rice.	2.82	1.32	14.4	15.2	28.1	22.1	20.2
15. Eat at least 4 ladles of vegetables each day.	3.46	1.17	24.0	24.7	29.3	17.1	4.9
16. Eat fish instead of meat.	3.75	1.01	26.2	35.0	28.5	8.0	2.3
17. Eat a diet made of soybean or soybean curd instead of meat.	3.13	1.18	14.8	21.7	35.4	17.9	10.3
18. Drink no more than 1 glass a day of low-fat or defatted milk or eat at least 2 tablespoons of small fish each day.	3.25	1.16	17.5	23.6	31.9	20.2	6.8
19. Eat all of the five food groups each day.	3.57	1.08	22.1	31.9	30.4	11.8	3.8
20. Stop eating promptly when I feel full.	3.86	1.07	35.4	27.8	27.4	6.5	3.0
21. Do not eat unsafe colored food and/or food containing dangerous chemical.	4.02	1.08	44.1	26.6	17.9	9.5	1.9

Note: 1-5 = rating scale; 5 = Very high confidence; 4 = High confidence; 3 = Moderate confidence; 2 = A little confidence; 1 = No confidence; % = percentage of each rating scale

Table 4.21 Mean, standard deviation, and percentage for the scores of each rating scale of each item of social support (n=263)

Social support			Percentage of each rating scale (%)				
			5	4	3	2	1
Emotional support							
1. Get concern from close relatives.	4.05	0.76	25.9	57.4	12.5	3.8	0.4
2. Talk to someone about how I am feeling.	4.22	0.64	31.6	60.8	6.1	1.1	0.4
3. Receive attention to my problem or unhappy feeling without annoyance.	4.09	0.65	24.0	63.1	11.0	1.9	0
4. Feel important due to encouragement from close relatives.	4.23	0.64	33.8	55.9	9.5	0.8	0
5. Receive consolation from close relatives when I worry about my health status or illness.	4.10	0.66	25.5	60.8	11.8	1.9	0
Appraisal support							
6. Get acceptance about caring for myself.	3.95	0.69	18.6	60.8	17.5	3.0	0
7. Receive praise that I practice well in accordance with advice.	3.62	0.85	13.7	44.9	31.6	9.5	0.4
8. Get reminders about inappropriate practices.	3.86	0.87	22.1	50.2	19.8	7.2	0.8
9. Get delight for practice as well as other persons.	3.75	0.76	12.5	55.5	26.6	4.6	0.8

Note: 1-5 = rating scale; 5 = Strongly agree; 4 = Agree; 3 = Uncertain; 2 = Disagree;

1 = Strongly disagree; % = percentage of each rating scale

Table 4.21 Mean, standard deviation, and percentage for the scores of each rating scale of each item of support (n=263) (continued)

Social support			Percentage of each rating scale (%)				
	$\bar{x}$	SD	5	4	3	2	1
Informational support							
10. Receive health-related information or booklet.	3.49	0.95	11.0	45.6	27.0	13.7	2.7
11. Receive suggestions about appropriate food consumption.	3.81	0.85	17.1	56.3	17.9	7.6	1.1
12. Receive advice to go to the physician for follow-up and/or when something is wrong.	3.94	0.82	23.2	54.4	15.6	6.5	0.4
13. Get directions on how to take good care of myself from close relatives' asking the physician or nurse .	3.47	0.98	12.2	43.0	27.0	15.2	2.7
14. Receive knowledge about healthy practices from close relatives who have access to the media.	3.63	0.92	13.7	50.6	22.8	11.0	1.9
Instrumental support							
15. Receive beneficial food from the preparation or purchase by close relatives.	3.73	0.94	18.6	49.4	20.5	9.5	1.9
16. Get necessary financial support when I need it.	4.06	0.77	27.4	56.7	10.6	5.3	0

Note: 1-5 = rating scale; 5 = Strongly agree; 4 = Agree; 3 = Uncertain; 2 = Disagree; 1 = Strongly disagree; % = percentage of each rating scale

Table 4.21 Mean, standard deviation, and percentage for the scores of each rating scale of each item of social support (n=263) (continued)

Social support			Percentage of each rating scale (%)				
	$\bar{X}$	SD	5	4	3	2	1
17. Receive caring when I am sick.	4.22	0.63	31.2	60.8	6.8	0.8	0.4
18. Get someone to accompany me when I have to go to the physician.	3.84	0.96	25.1	45.6	20.2	6.5	2.7
19. Get a happy atmosphere to encourage healthy behaviors.	3.94	0.80	21.7	57.4	14.8	5.3	0.8

Note: 1-5 = rating scale; 5 = Strongly agree; 4 = Agree; 3 = Uncertain; 2 = Disagree; 1 = Strongly disagree; % = percentage of each rating scale

Table 4.22 Other health characteristics of the samples

Variable	Number	Percentage
Fasting blood sugar (mg/dl)(n=239)		
<70	2	0.8
70-110	228	95.4
>110	9	3.8
Range = 65-211, $\bar{x} = 93.70$, SD = 12.49		
Albumin (g/dl)(n=31)		
<3.5	4	12.9
3.5-5.5	27	87.1
Range = 3.2-5.3, $\bar{x} = 4.18$, SD = 0.50		
Globulin (g/dl) (n=20)		
<2.8	1	5.0
2.8-3.2	3	15.0
>3.2	16	80.0
Range = 2.7-4.0, $\bar{x} = 3.49$, SD = 0.33		
Hemoglobin (g/dl) (n=203)		
<10	5	2.5
10-12	6	21.7
>12	156	76.8
Range = 8.1-16.0, $\bar{x} = 12.67$, SD = 1.12		

BIOGRAPHY

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