PERCEIVED SELF - EFFICACY, INTERPERSONAL INFLUENCE, AND ADOLESCENT CORONARY HEART DISEASE RISK BEHAVIORS

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This descriptive research aimed to study relationships between adolescent CHD risk behaviors, perceived self-efficacy and interpersonal influence. The Health Promotion Model (Pender, 1996) was used as a conceptual framework of the study. The sample consisted of 428 adolescents from grade 10,11,12 of 5 high schools under the Elementary Education Department and from year 1,2,3 of 5 colleges belonging to the Department of Vocational Education in Bangkok. Subjects were selected by multistage random sampling. Data were collected between June and August 2000. Self-administered questionnaires were used to collect data. These questionnaires included a demographic data form, adolescent CHD risk behaviors questionnaire, perceived self-efficacy questionnaire, and the interpersonal influence questionnaire. Data were analyzed using descriptive statistics and correlation analysis.

The results of this study indicated that the majority of adolescents had low CHD risk behaviors. The behaviors of smoking contributed the least CHD risk behavior and, the lack of exercise behavior showed the highest CHD risk behavior scores. Moreover, adolescents had a high perceived self-efficacy with interpersonal influence. Correlation analysis showed that perceived self-efficacy and the interpersonal influence had a significant negative correlation with adolescent CHD risk behaviors ($r = -.55$ and $-.39$, $p<.01$, respectively).

This study is suggestive for nurses to concern with perceived self-efficacy and the interpersonal influence that are significant factors in the prevention of adolescent CHD risk behaviors, which in turn will enhance healthy behaviors in adolescent.

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ขนิษฐา ตีวารี : การรับรู้สมรรถนะของตนเอง อิทธิพลระหว่างบุคคลและพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่น (PERCEIVED SELF-EFFICACY, INTERPERSONAL INFLUENCE, AND ADOLESCENT CORONARY HEART DISEASE RISK BEHAVIORS). คณะกรรมการควบคุมวิทยานิพนธ์ รุจา ภู่ไพบูลย์, D.N.S., จริยา วิทยศุภร, D.N.S. 124 หน้า ISBN 974-665-074-2

การวิจัยเชิงบรรยายครั้งนี้มีวัตถุประสงค์เพื่อศึกษาการรับรู้สมรรถนะของตนเอง อิทธิพลระหว่างบุคคลและพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่น พร้อมทั้งศึกษาความสัมพันธ์ระหว่างการรับรู้สมรรถนะของตนเอง อิทธิพลระหว่างบุคคลและพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่น โดยใช้ Health Promotion Model ของ Pender เลือกกลุ่มตัวอย่างโดยการสุ่มแบบขั้นตอน (multistage random sampling) เป็นนักเรียน 428 คน จากชั้นม.4, 5 และ 6 โรงเรียนมัธยม 5 แห่ง สังกัดกรมสามัญศึกษา และจากชั้นปี1, 2 และ 3 ของวิทยาลัยอาชีวศึกษา 5 แห่งสังกัดกรมอาชีวศึกษา โดยเก็บข้อมูลระหว่างเดือนมิถุนายนถึงเดือนสิงหาคม 2543 โดยให้วัยรุ่นตอบแบบสอบถามด้วยตนเองซึ่งประกอบด้วยแบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่น แบบสอบถามการรับรู้สมรรถนะของตนเอง และแบบสอบถามอิทธิพลระหว่างบุคคล วิเคราะห์ข้อมูลโดยใช้สถิติบรรยายและการวิเคราะห์ความสัมพันธ์

ผลการศึกษาพบว่า วัยรุ่นส่วนใหญ่มีพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจอยู่ในระดับต่ำ สำหรับพฤติกรรมเสี่ยงด้านการสูบบุหรี่อยู่ในระดับน้อยที่สุดและ พฤติกรรมขาดการออกกำลังกายเป็นพฤติกรรมเสี่ยงสูงที่สุด ในขณะที่วัยรุ่นมีการรับรู้สมรรถนะของตนเองและอิทธิพลระหว่างบุคคลสูงและพบว่าการรับรู้สมรรถนะของตนเองและอิทธิพลระหว่างบุคคลมีความสัมพันธ์ทางลบกับพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่น ($r = -.55$ และ $-.39$, $p < .01$)

การศึกษานี้มีข้อมูลสำหรับพยาบาลในการปฏิบัติการพยาบาลโดยคำนึงถึงการรับรู้สมรรถนะของตนเองและอิทธิพลระหว่างบุคคล ซึ่งเป็นปัจจัยสำคัญในการป้องกันพฤติกรรมเสี่ยงโรคหลอดเลือดหัวใจของวัยรุ่นอันจะส่งผลให้เกิดพฤติกรรมส่งเสริมสุขภาพที่ดีในวัยรุ่น

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CHAPTER I

INTRODUCTION

Background and Rationale

The important situation of the public health trend in Thailand, according to the Public Health Development Plan in the National Development Plan of Economics and Society Number 8 (1997-2001), heart disease is the increasing incidence. The death rate is increasing each year, from 49.5 out of a hundred thousand people per year in 1989 to 78.9 out of hundred thousand people per year in 1995 and number one cause of death in Thai population (Policy and Public Health Plan, 1997:30). The Committee for Controlling Non-communicable Diseases evaluated that if this disease was left uncontrolled by the year 2000, there would be a high death rate due to the coronary heart disease (CHD), of 82.6 out of a hundred thousand people per year (Prateepasen, M., 1996:91).

More attention should be given to adolescents, who are at a turning point in their lives. It was found that many American people die from heart disease. These illnesses are all related to health behavior during an individual's early adolescent years (Karn, et al., 1996: 365). During this stage, adolescents are given more responsibility, but at the same time lack experience in many different aspects of life. As an adolescent changes from a child to an adult, his/ her interests, attitude, and judgement of value also change. As a result a generation gap is created between childhood and adulthood. In facing problems and adjusting to change, an adolescent

may begin to act out or perform various inappropriate behaviors (Srilenavut, S., 1987: 72). A significant factor contributing to this occurrence is a change in health behavior and life styles (Bureau of committee promoting and coordinating the affair of national youth, 1994: 46). In particular, health behaviors related to the cause of coronary heart disease namely smoking, alcohol and caffeine drinking, having food with high fat and calorie content, and lack of exercise (Geen & Kruter, 1991:37), are common behaviors of daily life and can be changed.

From the study of Thailand's adolescent behavior, it was found that CHD risk behaviors as a whole. (Anukoolwuthipong, M., 1997: 76; Visutthikul, K., 1997: 73) and each risk behavior begin within the middle adolescent. From the National Statistic Bureau in 1993, as summarized in the Public Health Development Plan Number 8, smoking and consuming alcohol begins between the ages of 15-24 years. Studies conducted by Chiralkulpattana, P. (1993: 19) also show that the highest chances of beginning to smoke are between the ages of 15-19 years. From the study of adolescent behavior in Thailand, it was found that an estimate of 53.2% adolescents chose to drink alcohol for the first time at the ages of 15-16 years(Pothi-asd, P.,1992: 150).

Furthermore, According to a predictive study on health behavior, the scenario of tobacco and alcohol consumption in 2020 will expand apparently to adolescent and these will affect morbidity and mortality of Thai people (Gajeena, A., et al., 1999: 30 - 31). Besides this, unhealthy dietary intake, including foods with high fat and high calories, along with lack of exercise, also contribute to the risk of CHD. These behaviors are a main cause of health problems in urban areas, especially in Bangkok. Rapid change in society, competition and the influence of advertisements on

consumers, which persuades consumers, especially students, to change their eating habits to suit the ever-rapidly growing fast food trend, all contribute to the build up of high cholesterol and obesity (Prateepasen, M., 1994: 22). In a collective information study conducted by the Nutrition Institute, Mahidol University, the number of 3,435 people the aged above 6 years in Bangkok was measured on nutritional status. The study overweight among 20% adolescents (Hongchoweg, y., 1997: 4). In addition, the survey of Mamee, S., et al. (1992: 143) which was specifically carried out in high school students in Bangkok found obesity in between 7.8-11.8% of both sexes. This problem may be due to over nutrition in school age children resulting from their heavy drinking of soft drinks as well as their intake of high energy producing food from fat (Yamsuwan, U., 1993: 759-764)

Other than the influence from high fat and calorie dietary intake, it was also found that the lack of exercise was highest among the adolescent population. Thus, it serves as the result of general health risk research (Chirakulpattana, P., 1993: 57; Sornsri, C., 1998: 89) and the result of health behaviors contributing to the risk of CHD research (Visutthikul, K.,1997: 79; Aukulvutthipong, M., 1997: 92). This proved to be true for adolescents aged between 15-19 years are less likely to play sports than those aged between 6-11 years old and 12-14 years old (National Statistic Bureau, 1992: 128). Therefore, it can be concluded that Thai teenagers aged 15-19 years old most likely have this CHD risk.

In the process of preventing non-communicable diseases, the Ministry of Public Health showed that death due CHD in Thailand is primarily caused by smoking, eating high calorie, high fat, and salty foods, drinking alcohol, obesity, lack

of exercise and stress (Narueponthjirakul, C., 1998: 82). All these factors can be changed if individuals understand how to take care themselves to prevent CHD.

From these health issues involving Thai adolescents, this research was developed. Interest in studying CHD risk behaviors among middle adolescents of approximate aged between 15 -19 years , most of which are studying in high school or college. This is the age when youths have the health risk behavior in the beginning stage. From the studying researcher believe that this period of year represents a major turning point in the development of most individuals, particular by regarding health behavior among Thai adolescents. In addition, schools and colleges were chosen for the setting of the study because they are becoming more and more recognized as optimum sites for health promotion and prevention programs to be conducted. These setting provides the opportunity for role modeling, peer pressure, and consistent support and education, which enhance or change health behavior among adolescents.

Thus, efforts directed toward primary prevention of cardiovascular disease in the youth population have been mainly focused on the modification of health behaviors such as physical activity, dietary intake, and cigarette smoking. The four main reasons for promoting youth, firstly a certain proportion of children and adolescents are at excess physiological and behavioral risk (Baumrind, 1987, Olbrich, 1990 cited by Tenn & Dewis, 1996: 326; Behrman & Kliegman, 1998: 16); secondly physiological risk factors and health behavior track from adolescent into adulthood (Kelder, et al.,1994: 1122-1124; Pietial, et al.,1995: 325); thirdly the development of physiological risk factors depends largely on the initiation of health-compromising behaviors (World Health organization, 1994: 2; 1995: 12); and fourly primary prevention can be achieved through the modification of behaviors known to be related

to physiological risk factors (Jame, 1996: 1443; Levy, et al., 1984: 346 - 349) before behavioral patterns are more fully established and resistant to change; it is difficult to reverse the situation and reduce the resulting risk of CHD in adulthood.

The definition of risk denotes that the outcome is negative (Gorin & Arnold, 1998: 19). Yet in reality, for many health aspects, both "approaching a positive state" and "avoiding a negative state" serve as sources of motivation for certain health habits. Thus, a mixed motivation model (both approaching and avoiding) may be considered as the role behind the Health Promotion Model (Pender, 1996) in this study.

From the previously mentioned reasons, it can be seen that the risk of CHD can be controlled by avoiding health risk behaviors and by promoting the implementation of healthy actions. Choosing not to consume alcohol, as well as not to smoke, exercising and choosing the appropriate dietary intake (foods with low fat, low calories and low cholesterol) will help promote good health and lessen the risk of CHD.

Therefore, adolescents with health risk behaviors are related to the lack of health promoting behaviors. However, the occurrence health promoting behavior also depends on other variables which have an effect on the motivation to action. Therefore, it is of interest to study which elements are related to the adolescent CHD risk behaviors and take those related elements to explain such behavior. This method would lead to the health promotion and disease prevention in adolescents.

Conceptual framework

The Health Promotion Model (HPM), as presented by Pender (1996; 66-75) in Figure 1, provided the basis for the framework of this study. It includes 3 main dimensions, which are (1) the individual characteristics and experiences, (2) behavior specific cognition and effect and (3) behavioral outcome.

Researchers have been interested in numerous variables falling under the "behavior-specific cognition and effect" category of the health promotion model as serving as motivation and main point for the initiation and maintenance of a health promoting behavior (Fleury, 1992: 232). Furthermore, these variables constitute a critical core for intervention, as they are subject to modification through nursing actions (Pender, 1996: 68).

This study chose to examine perceived self-efficacy element, for which Pender has developed the concept from the social cognitive theory by Bandura (1977: 1982). He said that the perceived self-efficacy is the judgment of personal capability to organize and execute a particular course of action (Bandura, 1986: 391). It is not concerned with the skill one has. In the HPM (Figure 1), perceived self-efficacy is proposed as being influenced by activity-related effect.

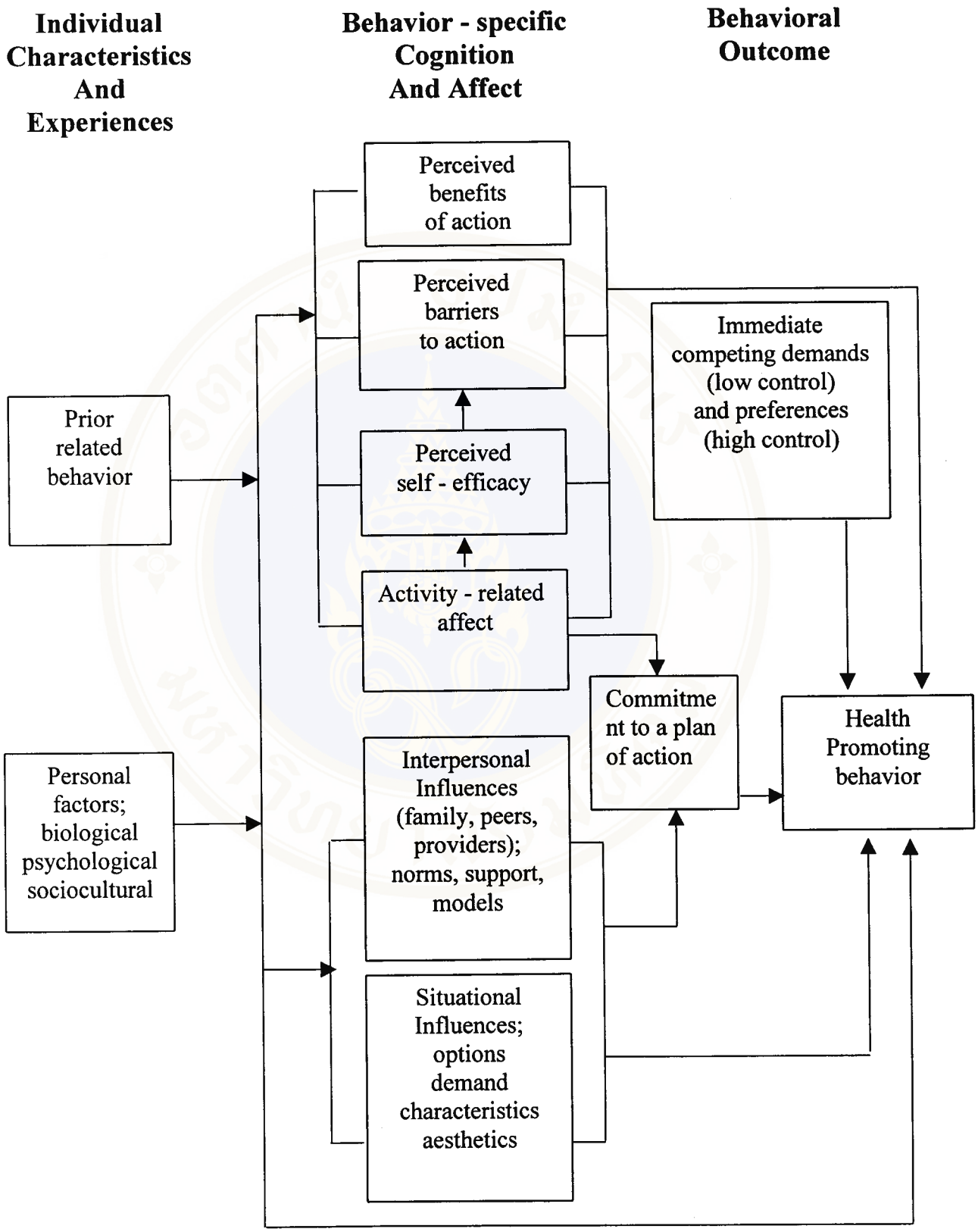

Figure 1. The Health Promotion Model (Pender, 1996: 67)

The more positive the activity-related effect, the greater the perceptions of efficacy. Whereas, self-efficacy is proposed as influencing perceived barriers to action, with higher efficacy resulting in lowered perception of barriers to the performance of the target behavior. Self-efficacy motivates health promoting behavior directly by efficacy expectation, that is a judgment of the likely consequences (e.g. benefits), and in directly by commitment or persistence in pursuing a plan of action. At the same time, as based in Bandura's line of thought, self-capacity results from the expectation for a certain behavior that is related to a past behavior or past experience to succeed. In other words, perceived self-efficacy is related to the prior behavior.

Thus, the perceived self-efficacy corresponds to the total outcome of past experiences, cognition and the effects that all motivate a certain behavioral outcome. From numerous studies, perceived self-efficacy was shown to be positively related to health promoting lifestyle behavior (Yamchanchai, W., 2538: 44-46; Waller, et al., 1998: 17-32; Weitzel & Waller, 1990: 26-34, Pender, et al., 1990: 326-332). At the same time, perceived self-efficacy was viewed as being an important variable related to health promotion lifestyle behavior among adolescents (Gillis, 1994: 13; Kwanngen, S., 1994: 72l). Furthermore, perceived self-efficacy has been found to be positively related to health behavior especially concerning exercise behavior (Simon et al., 1997: 48-50), dietary intake behavior (Gracey, et al., 1996: 187-204), quitting smoking (Kowalski, 1997: 128-42; Machee & Talsma, 1995: 242-8) and quitting alcohol drinking (Loveland-Cherry, et al., 1996: 497-511). However, perceived self-efficacy has been analyzed, study relationships between perceived self-efficacy, and CHD risk behaviors in adolescent group was not found in Thailand. Thus it is

important to study relationship between these variables in order to provide better understanding on perceived self-efficacy and CHD risk behaviors.

Adolescent health is especially linked to behavior. If the environment is dangerous, health risk behaviors are more likely to occur, such as alcohol or drugs use, eating unhealthy food (Friedman, et al., 1989: 309). Moreover, experiment with, alcohol and cigarette is commonly in middle adolescence as high CHD risk behavior (Willis, 1997: 112).

The studying intrinsic factors affecting the behavior of adolescents, interest has also been taken in extrinsic factors, or how the society or environment influences health behavior in an adolescent. Primary sources of interpersonal influence on health-promoting behaviors are parents and peers (Pender, 1996: 71). These persons play an important role on an adolescent's health behavior (Erikson, 1963 cited by Friedman, 1989: 310). Parents and peers may be related to health behaviors that contribute to the risk of CHD, which include smoking (Limtrakul, O., 1991: 21; McDermott, et al., 1992: 146-50; Greenlumd, et al., 1997; 1345-8), drinking alcohol (Pothiard, P., 1992: 155; Loveland-Cherry Leech, et al., 1996: 497-511) eating (Hongchovej, Y., 1997: iv ; Nutbean, et al., 1989: 322) and exercising (Moore, et al.,1991: 215-219).

From the above ideas conceptual framework and theory, this study focused on perceived self-efficacy, which is considered to be the primary motive that relates health behavior, and interpersonal influence. Together they should be major motivates of health behavior. This relationship focus the framework for the research and is shown in Figure 2.

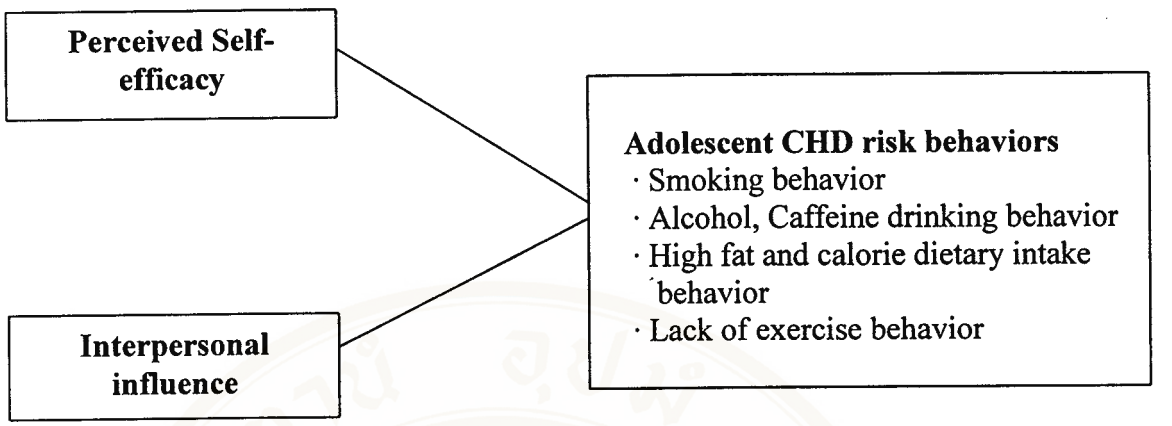

Figure 2. Research Framework

The research questions of this study are:

1. What are perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors?

2. What is the relationship between perceived self-efficacy and adolescent CHD risk behaviors?

3. What is the relationship between interpersonal influence and adolescent CHD risk behaviors?

Objectives of the Research

The purposes of this study are:

1. To describe perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors.

2. To describe the relationship between perceived self-efficacy and adolescent CHD risk behaviors.

3. To describe the relationship between interpersonal influence and adolescent CHD risk behaviors.

Hypotheses of research

1. There is a negative relationship between perceived self- efficacy and adolescent CHD risk behaviors.

2. There is a negative relationship between interpersonal influence and adolescent CHD risk behaviors.

Scope of the study

The goal of this descriptive study is primarily to describe perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors . Secondly, this study aims to examine the relationship between perceived self-efficacy and adolescents' CHD risk behaviors. Finally, this study aims to investigate the relationship between interpersonal influence and adolescent CHD risk behaviors. The study is to be conducted with at least 432 adolescents who are currently studying upper secondary education, including the Elementary Education Department and the Vocational Education Department, both under the Ministry of Education.

Expected Outcome and Benefits

1. The results of this study are likely to provide specific, helpful information about factors related to health behavior contributing to risk of CHD.

2. Health care providers can use this information in developing an effective intervention to prevent CHD risk behaviors and promote healthy behavior.

3. The results of this study can be used as the basis for further nursing research and as a guide for developing nursing discipline.

Definition of Variables

The operational definitions of the terms used in this study are as follows:

Perceived self - efficacy is defined as the degree of an adolescent's confidence in perceiving their ability to successfully perform specific health behaviors required to prevent risks related to coronary heart disease. These preventive behaviors include avoiding or stopping cigarette smoking, avoiding consumption of alcohol and caffeine, balancing a healthy dietary intake, and exercising. These can be measured by using the perceived self-efficacy questionnaire developed by the researcher based on the Health Promotion Model (Pender, 1996). Higher scores indicate higher levels of perceived self-efficacy to perform health preventive behavior against CHD.

Interpersonal Influence refers to the effects of norm, social support and modeling of parents and peers on preventive CHD risk behavior of adolescent, in accordance with the adolescent cognition concerning that it may or may not be irrelevant to reality. It was included in the "Interpersonal Influence Questionnaire," which has been developed by the researcher based on the Health Promotion Model (Pender, 1996). Higher scores indicate higher levels of interpersonal influence toward preventive CHD risk behaviors.

Adolescent coronary heart disease risk behavior refer to the action or adolescents' behavior contributing to risk of coronary heart disease, which consists of smoking, dietary intake of high calorie and high fat foods, lack of exercise, and consuming alcohol and caffeine. This can be measured by using the "Adolescent Coronary Heart Disease Risk Behaviors Questionnaire" developed by the researcher based on previous research and the literature. Higher scores indicate higher levels of adolescents' coronary heart disease risk behavior as defined by the following:

Smoking behavior refers to cigarette smoking (active smoking) of more than 1 cigarette per day or living in the fumed area (passive smoking) over 60 minutes per day (Muscat, et al., 1991: 141; Emmon, et al., 1992 cited by Kaplan, 1993: 370).

Alcoholic beverages drinking behavior means drinking alcoholic beverages which so that the level of ethanol intake over 30g. per day (three drinks a day) (WHO, 1994:23)

Caffeine beverage drinking behavior means drinking tea, coffee, chocolate, energetic drinks and cola which contain amounts of caffeine over 100 milligram per day (Petcharat, B., 1987: 21-22) and coffee drinking of more than 1 cup/day (Rakchayaban, U., 1997: 79).

High fat and high caloric dietary intake behavior refers to eating foods containing great amounts of saturated fat, high calorie and high cholesterol (WHO, 1990:13) such as meat with fatty skin, duck skin and chicken skin, animal fat, egg yolk, as well as fast foods.

Lack of Exercise behavior means the lack of aerobic physical activity or vigorous sports including moderate intense running, swimming, walking, aerobic dancing, which result in a heart rate between 60-90% of the maximum heart rate, rapid breathing, and energy expenditure of 150-200 calories/ day (Department of Public Prosecution, Ministry of Public health, 1999).

CHAPTER II

LITERATURE REVIEW

A number of literature sources, articles, and related topics of the study have been reviewed. Relevant information is grouped under the following four topics:

1. Overview of risk factors of coronary heart disease with the Health Promotion Model
2. Adolescent coronary heart disease risk behaviors
3. The relationship between perceive self-efficacy and adolescent coronary heart disease risk behaviors
4. The relationship between interpersonal influence and adolescent coronary heart disease risk behaviors

Overview of risk factors of coronary heart disease with the Health Promotion Model

Coronary heart disease (CHD) was discovered a long time ago. The World Health Organization (WHO) recommended terms and definitions of the disease in 1979. The WHO suggests using the term "ischemic heart disease" and "coronary heart disease" interchangeably. The recommended definition is "impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by

obstruction changes in the coronary circulation to the heart" (International Society and Federation of Cardiology, 1979, cited by World Health Organization, 1982: 5).

The major cause of chronic decrease in coronary blood flow found in most of the coronary heart disease patients is atherosclerosis (World Health Organization, 1982: 8; Sukumalchan, 1981: 293; Goldman, 1994: 33) and its protean manifestations, include sudden death, myocardial infarction, and other major disturbances of cardiac function (WHO, 1990: 11).

The etiology of atherosclerosis is not completely understood (Wolfgang & Dennison, 1982: 218) so the term "risk factor" presents an attractive item of study in relation to cardiovascular modifiability or non-modifiability (Cunninghum, 1992: 153; Brownson, et al, 1996: 206). Two groups of factors have been identified as correlates of increased atherosclerotic disease risk. Constants are those factors, such as heredity, sex, race (Levy, et al., 1984: 345; WHO, 1994: 1), which are not under the control of the individuals. The behavioral precursors of smoking, rich diet, serum lipid level (Stamler, 1992: 47-48), inadequate physical activity or lack of exercise, (Schmid, et al., 1995: 1207; Gidding, 1999: 261), and alcohol and caffeine drinking (Green & Kreuter, 1991: 37), are of considerable importance because of the possibility of behavioral modification. In accordance with this, the WHO (1994: 1-2) mentioned the term "risk factor" as this usually refers to modifiable biological characteristics (serum lipids and their fractions, blood pressure, blood glucose and insulin, and thrombogenic factors, among others), but can also be applied to a behavior, such as smoking or physical inactivity. Other behaviors or lifestyles in particular dietary habit, are also risk factors.

The summary of the outcome of environmental factor behavior in relation to metabolite or biological characteristics leads to causes of disease as shown in figure3.

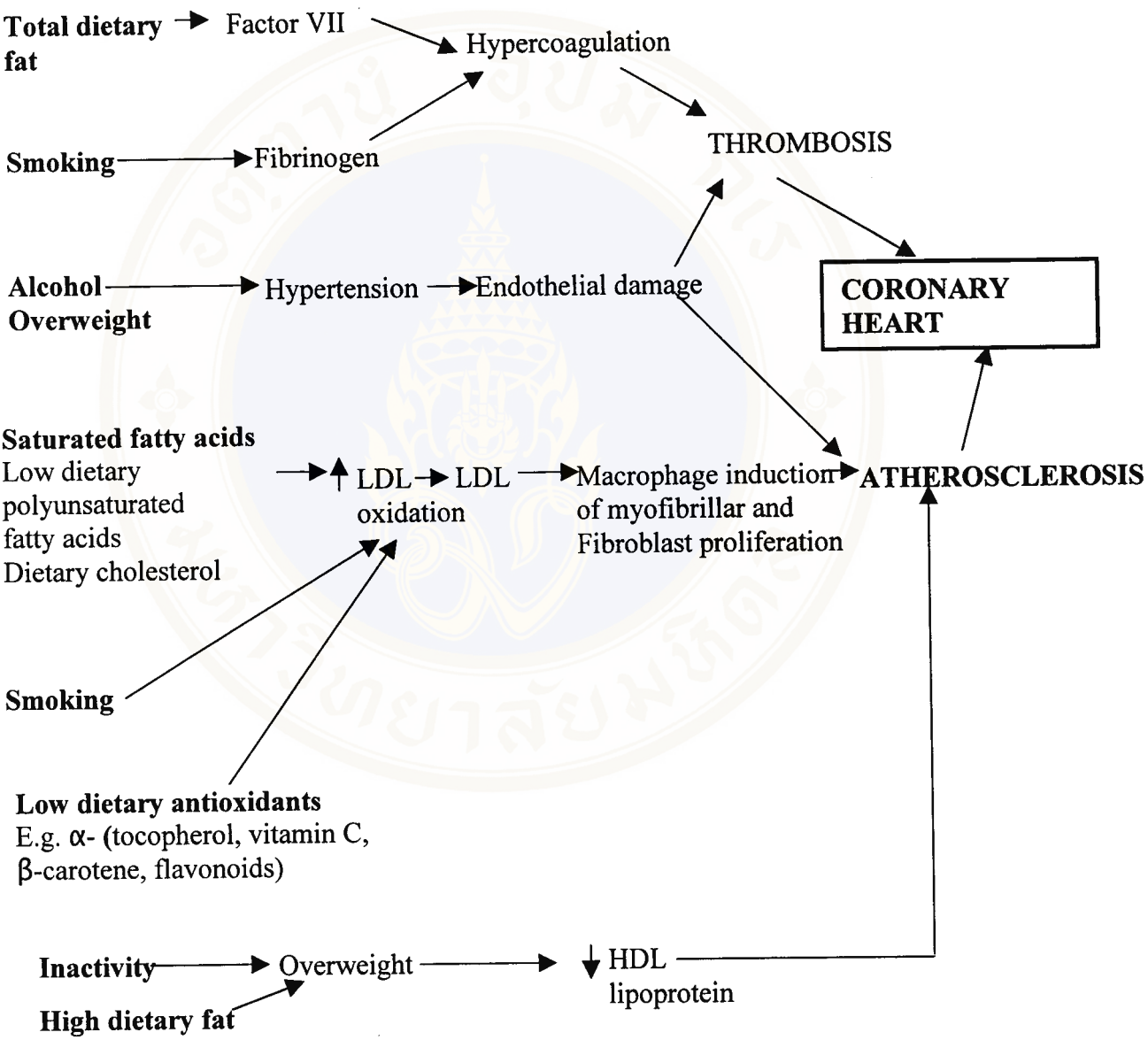

Figure 3: A modern view of the development of the development of coronary heart disease. (James, 1996: 1443) All arrows indicate a stimulatory (i.e. aggravating) effect except ↑ LDL = raised LDL; ↓ HDL lipoprotein = lowered HDL.

It shows that, for practical purposes, the term "risk factor" should be used pragmatically; when the factor concerned actually predicts risk from the point of view of prevention, it is important to establish a cause and effect relationship between health behavioral factors and CHD. As such, disease prevention focuses on the avoidance of illness and agents of illness, as well as the identification and minimization of risk behaviors (Gorin & Arnold, 1998: 18). The behavior patterns are established in adolescence, when choice of behavior can be one of the risk factors acting in combination to cause a disease (WHO, 1995: 12 -13).

Furthermore, the atherosclerotic process is often already in its initial stage in children and young people (Report of the Cardiovascular Review Group, 1994: 145) and tends to progress to occurrences in the coronary arteries from the beginning of the second decade of life onwards (Gidding, 1999: 253). In accordance with previous studies, it has also been shown that risk-factor patterns in adolescence were related to the development of cardiovascular disease in middle age (WHO, 1990: 21). Thus, prevention is best described as adolescents' health-protecting behavior that can be strategically controlled in the first and foremost stages of CHD.

Similarly, the concept of promoting cardiovascular health through encouraging healthful behavior rather than the medical treatment of risk factors has been a greater priority. Nursing is concerned with health and encouraging adolescents to understand, adopt and maintain lifestyle practices that will reduce their risk of disease and illness. Many attempts to intervene have been undertaken without an adequate identification of the psychosocial determinants of motivation in individuals' CHD risk behaviors. As a result, interventions designed to enhance individual motivation in behavioral change have showed limited effectiveness (Godin, 1989

cited by Fleury, 1992:229). From the studies, the Health Promotion Model gives the complexity of human behavior and motivation a theoretical foundation, which must be developed to better understand the relationship among factors that influence individual motivation, and to provide a basis for the continuing development of more effective intervention strategies. This is the rationale for the use of the Health Promotion Model (Pender, 1996) in this study. In particular, the study has concentrated on a negative approach in CHD risk behavior (smoking, drinking, lack of exercise, and high fat dietary intake) among adolescents. This approach has helped to counter-balance the frequent positive approach promoting "healthy lifestyle" (don't smoke, don't drink, take regular exercise, and follow a balanced diet). Problem behaviors and health promoting behavior have not always been consistent and each may vary over time. However the concept of "lifestyle" provides a useful method of linking health behavior (Nutbeam, 1989: 318). Pender (1982, cited by walker, et al, 1987:76) suggested that health protecting (preventive) and health promoting behavior might be viewed as complementary components of a healthy life-style and proposed the Health Promotion Model (HPM).

The HPM as depicted has been used as a framework for research aimed at predicting overall health-promoting lifestyles as well as specific behaviors such as the study of health-promoting lifestyles of blue-collar workers (Weitzel, 1989:99-104), health-promoting lifestyle of workplace fitness program participants (Pender, et al, 1990:326-332), health-promoting lifestyles among ambulatory cancer patients (Frank-Stromborg, et al., 1990:1159-1168), health-promoting lifestyles of participants in the national survey of personal health practices and consequences (Johnson, et al, 1993:132-138), adolescents' exercise beliefs and prediction of their exercise behavior

(Garcia, et al., 1995:213-219), and predicting use of hearing protection among factory workers (Lusk et al., 1994:151-157). In the studies in which most of the HPM variables were tested the variance explained ranged from 19% to 59%.

An analysis of the studies reported indicates that perceived self-efficacy, perceived benefits and perceived barriers were empirically supported as predictors of health behaviors in the majority of studies in which they were included. Especially, self-efficacy and barriers received the strongest support. These variables within the Behavior-Specific Cognitions and Affect category of HPM (Figure1) are considered to be amenable to change, with models proposed being used as a basis for structuring interventions to promote healthy lifestyles. However, the large number of variables currently under investigation makes the total HPM difficult to test and therefore limits its potential as a guide for theory-based nursing intervention. As such, the researcher studied selected variables including perceived self-efficacy and interpersonal influences, and the study focuses on both individual determinants of behavior and external determinants among adolescents.

These concepts are based on the assumption of HPM, that "Persons have the capacity for reflective self-awareness, including assessment of their own competencies" and that "Self-initiated reconfiguration of person-environment interaction is essential to behavior change" (Pender, 1996:55). Therefore, the primary purpose of this descriptive, correlation field study is to test the usefulness of perceived self-efficacy and interpersonal influence within the Health Promotion Model in explaining the occurrence of adolescent CHD risk behaviors. It leads to strategies emphasizing the active role of the adolescent in shaping and maintaining health behaviors and modifying the environmental context for healthy behaviors.

Adolescent coronary heart disease risk behaviors

The results of the epidemiological study show that coronary artery heart disease (CHD) is related to obesity. Western styles of living include food with high fat and calories, stress, lack of exercise, alcohol drinking, heavy smoking, drinking coffee, etc. These are factors that cause CHD to occur rapidly, especially, among adolescents. In Bangkok, behavior is changing with social and economic development and increasing amounts of Western culture are being adapted into urban lifestyles from the influence of the mass media. Also there is less use of energy because of modern technology, which results in high stress, a rapid pace of society and more competition. A health lifestyles study of 291 Thai people in the city area found that 50.5% do not exercise, 90% have no dietary intake control, 66.3% drink alcohol, 70.1% smoke, 82.8% do not play sports, 62.5% do not use public parks for recreation (Moo Payak, K., & Pundi, v., 1996: 56 - 57). These findings are related to coronary heart disease (CHD) risk behaviors

Smoking Behavior

The behavior of smoking cigarettes is a powerful independent contributor to the occurrence of CHD, particularly to myocardial infarction and sudden death (Kannel, 1987 : 215 - 216 ; Kannel, 1992 : 71). Smoking plays an agitator role in CHD, causing atherosclerosis, etiologic factors of the disease and myocardial ischemic process agents. Major etiologic agents of these mechanisms are nicotine and carbon monoxide (Chongsomchit, S., 1999 : 21). Nicotine increases the heart rate and blood pressure and enhances platelet aggregation and peripheral lipid mobilization

stimulating catecholamine release (Reuther & Hansen, 1985 : 242). Consequences of the process are blood concentration and artery wall injuries (Fitzgerald, et al., 1988 : 267). The artery wall injury is the hypothesis of atherosclerosis mentioned by Ross (1992 cited by Supasansanee, 1998 : 38).

Moreover, the effects of cigarette smoking are related to reduction of high-density lipoprotein (Reuther & Hensen, 1985 : 242 ; Mjos, 1988 : 272 - 274; Godsland, et al., 1998 : 40). Muscat, et al. (1991 : 141) found that smoking 1 cigarette raised the total cholesterol level by 0.33 mg/dl in males ($p < .001$) and 0.48 mg/dl in females ($p < .001$). There was a report that suggested women who smoke 1-14 cigarette per day, would have a 1.4 times increase in blood pressure. In addition, if persons are in a place where cigarette smoking is common, his/her blood pressure would be 3 times higher than a person who does not smoke (Willett et al., 1987: 1303 – 9) because of hypertension, which is a risk factor in cardiovascular disease (Levy, et al., 1984: 345). In Thailand, it has been shown that CHD events were associated with smoking habits among the Thai population as well (Chanrit, S., 1983 : Ix ; Shatkhaw, C, 1990 : iv).

At the same time, non-smokers who are exposed to smoking environments (passive smoking) or are in environments with elevated levels of carbon monoxide, such as travelling on freeways for more than 60 minutes per day, are likely to undergo the effects that direct smoking has on smokers (Kaplan, et al., 1993: 370). Glatz & Parmley (1991: 1 – 10) reviewed studies in passive smoking and heart disease. These results suggested that the combination of epidemiological studies with demonstration of physiological changes from exposure to environmental tobacco smoke (ETS), together with biochemical evidence that elements of ETS have a significant adverse

effects on the cardiovascular system, leads to the conclusion that ETS is a risk factor for cardiovascular disease.

Cigarette smoking is probably the most modifiable cardiovascular risk factor in youth (Gidding, 1999 : 254). Individuals who smoke are much more likely to have atherosclerotic plaque at earlier ages than those who do not (Pathobiological Determinants of Atherosclerosis in Youth Research Group, 1990: 3023). At present, approximately 90 percent of cigarette smokers began smoking when they were adolescents (Department of Health, et al., 1998: 271). An investigation using the National Youth Risk Behavior Survey found that data indicated that current smoking had increased among high school students (Everett, et al., 1998 : 137). Results from the 1995 Youth Risk Surveillance System also suggested that, in the United States, most of the risk behaviors, including smoking behavior, that are associated with these causes of death, are initiated during adolescence. (Kann, et al., 1996 : 365)

In Thailand, the number of regular smokers is high and it also shows that the age of highest smoking initiation is above 15 (Suwan, P., et al., 1995: 103). There is still a problem that people in mid-adolescence experiment with ideas and develop insights and reflections on their own feelings and those of others (Behrman & Klietman, 1998: 16). Several research studies show that adolescent cigarette smoking was associated with close friends' smoking (Distefan, et al., 1998: 466; Limtrakul, A., 1991: 21).

Unfortunately, smoking may be the most prevalent risk factor in adolescents and the most difficult to treat because of the addictive power of nicotine (Gidding, et al., 1994 : 2585 ; Breslau & Peterson, 1996 : 217). The WHO states that the narcotic effects of smoking are habit-forming (Poomsawat, W., 1999 : 15). Hence, starting to

smoke only 1 cigarette in a teenage group is a risk factor which can cause long–term health consequences increasing the risk of CHD and all the effects of smoking and addiction.

Alcohol and Caffeine Drinking Behavior

There is strong evidence that a moderate alcohol intake (10 - 30 g. of ethanol, i.e. 1 - 3 drinks) is protective against coronary heart disease as compared with abstention and heavy drinking (World Health Organization, 1994: 21; Kannel & Mass, 1987: 214 ; Miller, et al., 1990: 923 ; Lazarus, et al., 1997: 909), a positive linear relationship was demonstrated between alcohol and high density lipoprotein (HDL) cholesterol, and an inverse linear relation was shown for alcohol and low density lipoprotein (LDL) cholesterol. These effects were demonstrated despite only relatively light to moderate alcohol intake (Godsland, et al, 1998: 40; Reuther & Homsen, 1985: 249; Dai, et al., 1985: 620., & Donahue, et al., 1985: 458). However, overall alcohol intake provides the sum of multiple components: some of which may be protective against CHD, and some of which may increase CHD risk by its effect in raising blood pressure. This is seen at an intake level above 2 - 3 drinks a day (Marmot & Brunner, 1991: 565; Langer, et al, 1992: 910 - 913) and also, alcohol has other potentially harmful effects on the cardiovascular system (Cowie, 1997 : 457).

This debate has centered on the so called U shaped curve describing the relation of alcohol consumption to risk of death from coronary heart disease. Heavy drinkers have an increased risk of death compared with moderate drinkers, but moderate drinkers have a lower mortality rate than abstainers (Marmot & Brunner, 1991: 565 World Health Organization, 1994: 22 - 23).

The study of Weinmann, et al (1997: 505-508) found that caffeine drinking has an effect on the cardiovascular system after adjusting for cigarette smoking and other risk factors. They observed little association between usual caffeine intake from coffee, tea, and cola at a daily consumption of fewer than 5 cups of drip coffee (< 687 mg per day) and primary cardiac arrest. They identified cardiac arrest cases without a history of clinical heart disease or major morbidity through paramedic incident reports during the period 1988 - 1994 and they interviewed the spouses of cases to obtain information on caffeine intake. Moreover, they also show that there is an elevated risk associated with high caffeine consumption. In addition, Sesso et al. (1999 : 162) investigated coffee and tea intake and the risk of myocardial infarction. The results showed the odds ratio for drinking > 1 cup/day of decaffeinated coffee (1 cup = 237 ml) versus nondrinkers was 1.25 (95 % confidence interval (CI) 0.35 - 0.90), and tea drinking was associated with a lower risk of myocardial infarction.

A review of prospective studies in 1996 showed conversely that during 10 years of follow-up there were 712 documented cases of CHD. After adjustment for age, smoking, and other CHD risk factors, they found no evidence for any positive association between coffee consumption and risk of subsequent CHD in US women (Willett, et al., 1996 : 458).

In view of the conflicting data on coffee and caffeine as possible cardiovascular risk factors, it is premature to take a firm position on whether to advise individuals to reduce or avoid coffee and/or caffeine ingestion, but long range effects of coffee cannot be identified at present. However, a study among the Thai population found that drinking 1 cup of coffee per day was associated with CHD with

an odds ratio of 1.42 (95 % CI = 1.12 - 1.81) as compared with nondrinkers (Rakchayaban, U., 1997: 79).

Although the effects of alcohol and caffeine are still ambiguous, alcohol and caffeine consumption were found in coronary heart disease of Thai patients, therefore alcohol and caffeine intake aspects of health behavior will be included in this study.

Moreover, the projected study on major health behavior in 2020 found that Thai people's consumption of alcohol will increase in terms of both volume and rate. The consumption will rise among teenagers (Gajeena, A., et al., 1999: 28), and will affect the morbidity and mortality of Thai people. The study was aimed at forecasting health behavior and identifying suitable prevention and control, as well as health promotion strategies. It shows that alcohol drinking among Thai adolescents at an undergraduate level is 93.4 % in male and 63.6 % in females. The average age of starting to drink is 16.4 (Caffry, et al., 1995: 38). In entertainment service places such as discotheques, pubs, karaoke bars, snooker clubs, etc. alcohol is sold in varying forms (Suwan, P. & et al., 1995: 104 - 105), and the study of Potiast (1992: 155) shows that frequenting the place of sale is a factor that has the largest influence on an adolescent's alcohol drinking behavior.

Previous studies with health behaviors contributing to the risk of CHD among Thai adolescents in Bangkok metropolis indicated 92.61 - 94.34 % of adolescents, consumped caffeine through Coca Cola, and 71.8 - 80.7% of adolescents drank tea, coffee, chocolate, and cocoa (Visutthikul, K., 1997: 59; Anukoolwuthipong, M., 1997: 67).

From the literature review, when considering the alcohol and caffeine drinking behavior of adolescents the matter of increasing energy shows that the category of

soft drinks, drinks mixed with sugar and alcohol give high energy. The surplus energy might have to be stored in the form of body fat (Boonkwamdee, S., 1996; 26 - 27). Alcoholic beverages supply energy at 7 calories/g., but with little or no nutrients and can influence the occurrence of cardiovascular disease (Sukprasert, B., 1999 : 27 - 28). The American Heart Association has recommended that alcohol should not account for more than 15 percent of the total daily calories consumed by an individual, which is up to a maximum of 1.75 oz daily (the equivalent of 3.5 glasses of wine or 3 beers or 2 mixed drinks) (Alexander & LaRosa, 1994: 77 - 78). Similarly, WHO recommendation that emphasizes the positive effects of alcohol might do more harm than good. Intake of above three drinks a day (30 g of ethanol alcohol daily) indicates evidence of both cardiovascular and social harm (World Health Organization, 1994 : 22 - 23).

Ethyl alcohol (ethanol) is the type of alcohol found in alcoholic beverages. Different drinks contain varying amounts of alcohol (Table 1). Each scoring size in table 1 contains the same amount of alcohol (12 g).

Table 1 : Alcohol content in beverages

Serving Size	Beverage	Alcohol by Volume, %
12 oz	Light beer	2.4
12 oz	Beer	3.2
4 oz	Wine	12
3 oz	Martini(gin and vermouth)	40
1 oz	Distilled spirits	50

Source : Alexander & LaRosa, 1994 : 76.

Dietary Guidelines for Americans do not recommend alcoholic beverage consumption. If adults elect to drink, they should consume alcohol in moderate amounts: for Women, no more than 1 drink a day; and for men, no more than 2 drinks a day. One drink accounts for 12 ounces of regular beer or 5 ounces of wine or 1-1.5 ounces of distilled spirits (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 1990). Therefore, if adolescents have excessive alcohol intake behavior, they will probably increase the risk factors on both direct and indirect occurrences of CHD. This is equal to caffeine consumption behavior of more than 100 mg/day (Petcharut, B., 1987: 21 - 22). This shows that if the weight of the caffeine in the ready-made food is 150 grams in 5 ounces, then there will be a difference in the amount of caffeine mixed as in table 2.

Table 2 : The caffeine content of ready-made food

Ready-made food products	Amount of caffeine	
	Milligrams/150 grams	Milligrams/350 cc
instant coffee	40 - 110	-
percolated coffee	65 - 125	-
decaffeined coffee	2 - 8	-
bagged tea	25 - 30	-
leaf tea	30 - 50	-
instant tea	25 - 30	-
Coca – Cola	-	65
Mountaindew	-	49
Pepsi	-	43

Source: Petcharut, B., 1987: 21

The study also shows that the drinking category of 150 ml strength has caffeine of 50 milligrams. If adolescents have drinks with more caffeine than 100 mg/day there is a direct effect on the heart, which includes arrhythmia, high cardiac output, increased blood pressure and blood sugar. This increased risks for CHD should be prevented and avoided as already mentioned.

High–fat and high–calorie dietary intake behavior

The association of nutrition with cardiovascular disease (CVD) occurs principally through the role of diet in several primary and secondary CVD risk factors, including high blood cholesterol, high blood pressure, obesity, and diabetes mellitus (American Heart Association, 1988 cited by Glanz, et al., 1995: 512; Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure, 1993: 162–164). Especially, high serum cholesterol is one of the major etiologically significant risk factors for CHD and other atherosclerotic diseases (Kannel & Mass, 1987: 213–214: World Health Organization, 1990: 13).

In healthy people, about three quarters of the total cholesterol is contained within the low–density lipoprotein (LDL). Cholesterol in LDL is also referred to as the “bad cholesterol”, because the high levels of LDL cholesterol are strongly correlated with the incidence of CHD (Piano & Schwertz, 1994: 14) and atherosclerosis identified in youth was directly related to LDL cholesterol level (PDAY Research Group; 1990: 3018), whereas HDL cholesterol or "good cholesterol" is associated with a lower risk of CHD (Sharrett & at al.,1999: 843).

Many studies have established that a correlation exists between CHD and the amount of fat and saturated fat in food. High intakes of fat or saturated fat (e.g.

tallow, meat with fat, entrails, bacon, and fried foods), and cholesterol (See Table 4) also have an unfavourable influence on clotting components of the circulation system (e.g. factor VII) involved in thrombogenesis and CHD risk (Meade, et al., 1980: 1050–1053).

Furthermore, children in overweight groups have significantly higher adjusted means for total blood cholesterol, lower mean HDL-cholesterol concentration (Dwyer, et al., 1998 : 602), and other studies have indicated that systolic and diastolic blood pressure were significantly higher in obese adolescents (Body Mass Index 30 ± 1.3 kg / m2) (Caprio, et al., 1996: 12). These issues are of great clinical relevance in view of the recent findings showing that the risk for CHD and atherosclerosis is greatly increased in adolescents who have been overweight. The most significant reason for obesity is related to lifestyle, especially dietary patterns, as manifested in youth.

Eating habits have contributed to the epidemic of CHD in high intake of fat and calories, as well as low fiber intake (WHO, 1990: 13). The new incidence in prospective studies reports that the dietary fiber intake and consumption of fruits, vegetables, and complex carbohydrates, which contain nutrients, such as antioxidants, vitamins, might prevent CHD (Yochum, et al., 1999: 943; WHO, 1994: 4-7; Kushi, et al., 1985: 813-814; Steinberg & Participants, 1992: 2339-2340). It also shows that linoleic acid and omega-3 fatty acid, which are present in fish in large amounts, are able to reduce levels of LDL cholesterol and platelet aggregation. Besides this the alternative food source of omega-3 fatty acid exists and should be recommended for persons seeking advice about these essential fatty acids. Walnut oil and walnuts, wheat germ oil, soybean lecithin, soybeans and common beans, butternuts, and

seaweed are all sources of generous quantities of omega-3 fatty acids without cholesterol (Weiner, 1986: 833; Manosoontorn, S., & Supornsinchai, C., 1999: 8).

High-risk dietary habits must be addressed before they are established during childhood and adolescence, especially, high calorie nutritional patterns such as sweets or food with high fat and high calories, such as fast food (Drewnowski, 1994: 114).

Fast food is a food that the producers are prepared to sell to the buyers for their comfort and time saving convenience. Fast-food can be eaten immediately and is suitable for the rapid pace of society. These kinds of food are hamburgers, fried chicken, donuts, pizza, etc. Some of these foods are referred to by the WHO as "junk food" because they contain few valuable nutrients. They consist of flour, fat and high sugar (Wallasevee, A., and 1993: 24). Moreover, from the study of Tungkul, P., et al., (1994: 190 - 200) on Western fast food and Thai food on the matter of energy amount received in proportion to cholesterol level as shows in Table 3(Tanpichit Wichai, 1987: 113), it was shown that a one -plate food such as boiled or steamed rice with chicken, fried rice and various fried noodles give high energy and fat. Especially, the Western foods from fast food outlets such as pizza, hamburger, fried chicken, and sandwiches produce 900-1800 calories of energy per meal. But the generally adolescents aged between 16-19 years old only need 1,850-2,400 kilo-calories per day (Department of Health, 1989: 161)

However, at present, surveys of fast food eating behavior show that it is well liked among adolescents and students especially those in Bangkok. Studies of health behavior contributing to the risk of coronary heart disease among high schools for 601 persons shows that the value of Body Mass Index (BMI) is more than 30

kilograms/meter^2. The 44.40% of subjects are overweight or obese (Anukoolwuthipong, M., 1997: 57). There are a mutual factor to take into account with diabetes mellitus, hypertension and hypercholesterolaemia diseases. This is because every 10% of body weight increase, increases systolic blood pressure by 6.6 millimeters; Cholesterol increases by 12 mg/dl and glucose increases by 2 mg/dl (Pi-Sunyer, 1994: 989), which is a CHD risk factor. This can be controlled significantly by dietary intake behavior in food choice selection in health promotion behavior. The study of Neumark-Sztainer (1997: 457) found that adolescents engaging in health-promoting behavior were at decreased risk of unhealthy eating.

Table 3 The content cholesterol in certain foods.

Kind of food ***(100 gram)***	**Cholesterol** ***Milligram***	**Kind of food** ***(100 gram)***	**Cholesterol** ***milligram***
Beef	91	Pig liver or ox liver	438
Pork	89	Chicken liver	746
Chicken	80	Kidney	375
Chicken skin	93	Pancreas	466
Oyster	>200	Brain	>2,000
Crab meat	101	Butter	250
Shrimp meat	150	Cheese	90 - 113
A whole egg	548	Lard	95
Albumen	0	Milk	14
Yolk of egg	1480	Margarine	0
Spawn	>300	Catfish	44

Source : Tanpichit, W. ,1987 :113

Table 4 Energy and Nutrient Composition per 100g. Edible portion of Thai foods and Western Countries' foods

Kinds of food	Energy	Protein	Fat
Fresh ham on rice	152	6.7	5.7
Chicken with rice cooked in Chicken broth	199	6.5	8.2
Chicken green curry on rice	152	4.7	5.1
Rice with chicken paste	189	5.6	7.3
Fried rice with pork and egg	177	4.8	8.4
Rice cooked with chicken and curry powder	169	6.7	4.2
Rice with red pork	169	6.2	5.6
Fried rice noodles, Thai style	237	7.7	13.3
Wide rice noodles with pork, egg and soy sauce	294	6.3	9.7
Pork skin fried	169	51	46
Processed pork	419	16.7	37.4
Stuffed sweet pork	355	21.3	29.3
Thong Yip (Golden flowers)	393	7.9	19.7
Thong Yod (Golden drops)	337	4.3	13.4
Foi Thong (Golden silk threads)	423	13.5	25.8
Egg custard, baked	193	6.3	7.9
Mungbean custard, baked	139	5.9	7.2
Glutinous Rice Steeped in coconut milk	278	3.1	6.3
Lod - Chong in coconut milk	127	0.8	3.7
Egg custard, steamed	161	6.9	4.5
Ice - cream	461	13.8	18

Kinds of food	Energy	Protein	Fat	Cholesterol
Chicken sandwich	235	9.8	12.3	77.3
Chicken hamburger	300	14	17.3	77.3
Fish hamburger	285	11.6	15.6	74.2
Big Mac hamburger	274	13.2	17	33.6
Hawaiian Pizza	214	12.2	9.6	26
Supreme Pizza	245	12.6	12.2	35.7
Mixed Pizza	234	14.4	12.8	54
Seafood Pizza	225	15.3	10.7	68.9
Hotdog	267	10.7	14.8	45
Fried Chips	334	4.3	19.1	-
Fried chicken breast	282	24.3	15.9	86
Fried chicken leg	276	22.4	17.7	117
Grille chicken breast	164	26.4	6.9	69.6
Grille chicken leg	196	24	11	115
Butter chocolate doughnut	385	3.6	15	126
Sunny doughnut	382	5.5	17.6	56
Strawberry doughnut	311	3.6	12.5	37.5

Source: Nutrition division, Department of Health, 1992: 61 -7;Tangkhanakul,P cited by Visuthikul,K.,1997: 18

Lack of exercise behavior

Exercise is "a subset of physical activity that is planned, structured, and repetitive" (Center for Disease Control and Prevention, 1997: 203) and is done to improve or maintain physical fitness including cardiorespiratory endurance, and overall beneficial effects on the cardiovascular system in general. According to the literature review, many studies showed that physically active and physically fit adults are less likely than sedentary adults to develop the chronic disease that causes most of the morbidity and mortality for CHD (Kannel, et al., 1986: 821- 822; Paffenbarger, et al., 1993: 541; Slattery, et al., 1989: 306-307; Blair, et al., 1995: 1095-1096; Leon, et al., 1987: 2388).

Powell et al. (1987 cited by WHO, 1995: 24) inferred from their review of 43 studies that the relationship was causal and that the relative risk associated with physical inactivity was similar in magnitude to those associated with hyper cholesterlaemia and smoking. So substantive is this relationship that in 1992 the American Heart Association Committee on Exercise and Cardiac Rehabilitation of the Council on Cardiology presented a position statement on physical inactivity or lack of exercise as a risk factor for the development of CHD (Fletcher, et al., 1992: 340).

In addition, regular aerobic physical activity increases exercise capacity and plays a role in both primary and secondary prevention of coronary heart disease (Chandrasheckhar & Anand, 1991: 1723-1739). Physical activity habits established early in life may persist into adult years which is the same as diseases such as obesity and CHD, for which sedentary behavior is a likely risk factor, and are lifelong processes with origins during childhood (Sallis, et al., 1992: 5248). Particularly,

aerobic exercise has been associated with reduced atherosclerotic risk factors in adolescents (Fripp, et al., 1985: 813).

As such, increased physical activity and exercise in childhood and adolescence is recommended as a part of the strategy for CHD reduction. In particular, the amount of physical activity required either to lower CHD risk (Gidding, 1999: 259 - 260) or to reduce clinical manifestations is far from established, but includes effects of raising HDL cholesterol, reducing or controlling body weight and lowering blood pressure, and its impact on glucose tolerance (Kannel, 1986: 823; Simons-Morton, et al., 1997: 49; Centers for Disease Control and Prevention, 1997: 203).

Paffenbarger, et al., (1993: 538-545), found that taking up moderately vigorous sports, such as swimming, tennis, handball and jogging or running, were associated with a lower risk of death from all causes, and from CHD in which those activities are the aerobic exercises that the adolescents had been asked to do for 30 to 60 minutes as daily exercise (Ingelfinger, 1992: 19). Similarly, a new report from the physician's health study suggested that frequency of exercise was inversely related to risk of non-fatal myocardial infarctions (MI) as well as to the combined risk of non-fatal MI or death due to heart disease (see Table 5), when frequency seemed to be a better predictor of a lower risk (Chaae, C.U., 1998). While frequency and duration both contribute to health benefits, these data suggest that how often a person exercises is more important in terms of reducing the risk of heart disease. Experts have offered new ways of exercise, which is characterised by moderate intensity. This has more advantages in providing advised energy expenditure of 150-200 calories per day (see example in Table 6).

Table 5: The link between the frequency of exercise and the risks of cardiac events.

Frequency	Relative risks	
	Non - fatal MI	Non - fatal MI or CHD death
< 1 x / wk	1.00	1.00
1 - 2 x / wk	0.64	0.72
3 - 4 x / wk	0.62	0.66
≥ 5 x / wk	0.54	0.56

Source: Claudia, C. U., 1998

Energy expenditure may be reduced because less energy is required for sedentary behavior, such as watching television and playing video games. In 12 to 17 year old adolescents, the prevalence of obesity increases by 1.2 to 2.9 % for each additional hour of television viewed (Dietz & Gortmaker, 1985: 809). While watching television requires no energy in excess of resting metabolic rates, it may reduce the time spent in more energy-expending activity. Therefore, the International Consensus Conference on Physical Activity Guidelines for Adolescents recommends that all adolescents engage in physical activity daily, or nearly everyday, as part of play, games, sport, or planned exercise. They should do this in three or more sessions per week, with activities that last 20 minutes or more per time, and require a moderate to vigorous level of exertion, resulting in a heart rate of 60–90% of maximum heart rate (Centers for disease Control and Prevention, 1997: 203; The American College of Sports Medicine and the American Heart Association, cited by Department of Health, 1999: 2).

Table 6: Duration of physical activity-related energy expenditure of 150 calorie

physical activity	Duration (minutes)
Walking - 2.8 kilometers	35
Cycling - 8 kilometers	30
Dancing in a rapid rhythm	30
Walking - 3.2 Kilometers	30
Aerobics	30
Swimming	20
Basketball	15 - 20
Jogging - 2.4 Kilometers	15

Source: U.S. Department of Health and Human Services, 1996 cited by Department of Health (Thailand), 1999 :4

In Thailand, exercise behavior among both girls and boys tends to decline steadily during adolescence. Leisure time activity of sport played in adolescence, between the ages of 15 - 19 is less than in children with aged 6 - 11 and 14 years old, through gradual reduction (National Statistics Office, 1992: 128). Although adolescents are more physically active than adults, many young peoples' lack of exercise is in the highest level, according to the study of health risk conducted among Thai adolescents (Chirakulpatana, P., 1993: 57; Sornsri, C., 1998: 89; Anukoolwuthipong, M., 1997: 92; Visuthikul, K., 1997: 79).

It obviously shows that most Thai adolescents still have a lack of exercise behavior, although physical exercise promotes health in a variety of physiological and psychological ways in adolescents (Aarts, et al., 1997: 563). Furthermore, exercise among adolescents is consistently related to lower levels of anxiety and stress, and higher levels of physical activity are inversely associated with use of substances (e.g. cigarettes) (Winnail, et al., 1995: 438). Consequently, smoking, obesity, stress, and lack of exercise are risk factors in CHD that adolescents can change.

The relationship between perceived self-efficacy and adolescent health behaviors contributing to the risk of CHD.

Perceived self–efficacy and health behaviors

Perceived self–efficacy is a variable within behavior-specific cognition and this is a component of Pender's Health Promotion Model.

The Health Promotion Model is based on social cognitive theory, which identifies the reciprocal determinants of behavior as cognition and other personal factors, prior behavior, and environment (Garcia, et al., 1995: 213). Although individuals are influenced by their environment, they are not passive recipients but have the capacity to manage their lives successfully. They do this through reciprocal interaction with their environment (Halm & Alpen, 1993: 433). Self-efficacy is a central concept of Bendura's social cognitive theories combining features of social learning theories and cognitive behavior theories (Bandura, 1977, 1986), which implicate self-efficacy, the belief in one's ability to perform a certain task, as a pivotal construct in understanding and modifying human behavior. Perceived self–efficacy is

defined as a judgement of one's abilities to accomplish a certain level of performance, whereas an outcome expectation is a judgement of the likely consequences such behavior will produce (Bandura, 186: 391; 1977: 193; Pender, 1987: 62; 1996: 69).

An extensive literature has accumulated that generally indicates that perceived self-efficacy mediates a wide variety of meaningful human behaviors, including several health-related behaviors. It has been found that perceived self-efficacy was related to health-promoting lifestyle activities whereas perceived self-efficacy is an important factor in order to predict health-promoting lifestyles (Yamchanchai, 2538: 44-46; Kwan-Ngen, 2537: 72; Waller, et al, 1998: 17-32; Weitzel & Waller, 1990: 23-34, Pender, et al., 1990: 329). Besides this, research on the determinants of perceived self - efficacy with health behavior is also seen in the variety of the patients in which the perceived self-efficacy is positively associated with health promoting behavior in patients with chronic lung disease (Phurut, 2539: 64; Chanchanakit, C., 2541: 93). A significant positive correlation was noted between perceived self-efficacy and self-care behavior (e.g. avoiding consumption of alcohol, giving up smoking, doing exercise, avoiding high carbohydrate and cholesterol intake) in myocardial infarction patients (Charoenwongwiwat, S., 1995: 22-43), in diabetes mellitus patients (Kingery & Glasgow, 1989: 14-18) and in the elderly (Homnan, K., 1996).

The majority of studies were in patients with chronic illness and the elderly. A part of all research associated with health status showed their healthy behavior can lead to improvement and rehabilitation by healthy behavior. Similarly, Grembowski (1993: 89) found that older adults with high self-efficacy had lower health risk in all behavior and better health.

Previous studies are not only of benefit to patients or the elderly. At the same time, we should pay attention to the matter of health promotion of people in general, particularly adolescents. This is because adolescent is recognized as a most opportune time to establish health promoting cognitive and social behavior. Therefore, the purpose of this study was to test the relationship of the selected perceptual characteristics for the description of engagement in health promoting behavior and preventive risk behavior, contributing to disease. In this view, perceived self-efficacy, as a personal factor, influences behavior. Moreover, perceived self-efficacy had been shown to be predictive of adolescents' health promoting lifestyles (Gillis, 1994: 13; smith, 1992). Perceived self-efficacy is the only consistent significant predictive variable of health promoting behavior in early, middle and late adolescents (Barnett, 1989). High self-efficacy perception will result in a greater number of health promoting behaviors. Engagement in these behaviors represents support for the hypothesized relationships in Pender's Health Promotion Model.

In Thailand, there are few studies about perceived self-efficacy in healthy adolescents. However, Kwan-Ngen, S. (2537: 72) studied the relationship between self-efficacy with health promoting lifestyles in adolescent students for 441 persons in Chiang Mai province and found that self-efficacy was significantly correlated with health-promoting lifestyles ($r = .5008$, $p < .001$). Together, these variables explained 25.08% of the variance in adolescent health-promoting lifestyle scores. But because the self-efficacy was measured by the General Self-Efficacy subscale of the Self-Efficacy Scale (Sherer, et al., 1982), the tool reflects the belief in personal ability to affect outcomes in various situations and self-evaluation on individual ability in general work.

In addition, a healthy lifestyle has been described in many different ways, including very specifically as avoiding bad health habits, and very broadly, as behavior under personal control (Frank-Stromborg, et al., 1990: 1159). It is difficult to set goals, and therefore limits its potential as a guide for theory-based nursing intervention in health promotion and prevention among adolescents. The researcher is interested to resume the research study on the perceived self-efficacy in specific-health behavior and preventative health behavior, contributing to the risk of CHD. Even though perceived self-efficacy was empirically supported as a predictor of health behaviors in the majority of previous studies, there is a need to study this in Thai adolescents. Perceived self-efficacy is believed to be domain- specific, that is pertaining to specific behaviors in a particular context, which cannot be necessarily generalized to other behaviors or other contexts (Bandura, 1986: 397; Redland, 1993: 434; Palank, 1991: 820; Kurlowicz, 1998: 220).

The correlation of perceived self-efficacy and adolescent CHD risk behaviors

The research about the relationship between perceived self-efficacy and health risk behavior and CHD, from the literature review, does not meet with the research that has studied the overall of CHD risk behaviors. This includes eating behavior, smoking behavior, alcohol drinking behavior and exercise behavior related to perceived self-efficacy. Simons-Morton, et al. (1997: 48-49) assessed blood pressure, cholesterol, body mass index, timed run for distance, physical-activity self-efficacy and perceived support for physical activity among 2410 third grade pupils from 96 schools in four states. The results showed that children with lower cholesterol and higher perceived self-efficacy in physical activity were associated with more physical

activity. In the same way, physical activity and intentions about exercise are related to very specific beliefs about one's personal physical activity, that have been strongly associated with, or predictive of, the physical activity of adolescents.

Many studies showed that the effects of exercise self-efficacy of adolescents was related indirectly to exercise behavior (Trost, 1996: 145; Garcia, 1995: 217-218) and direct effects on exercise together, predicted adolescents' exercise behavior (Reynolds, 1990: 541-551; Hofstetter, et al., 1990: 1169) with self-efficacy increasing across the stages in the exercise (Nigg & Courney, 1998: 222).

In adolescents' dietary intake behavior, Gracey, et al. (1996: 187-204) found that healthy eating related negatively to television watching and alcohol drinking, and positively to self-efficacy, considering weight control and well-being as important, and having influence over foods at home for teenage school students.

When considering the characteristics that reduce the risk behavior of eating a high energy and high calorie diet, several people have been interested to study the factors that have an influence on fruit and vegetable consumption. Heatey & Thombs (1997: 172-7) defined fruit and vegetable consumption self-efficacy as a construct representing perceptions of one's ability to eat fruits and vegetable in various situations. They found that youths with a varied diet who do not restrict food selections to particular food groups, showed higher level of fruit-vegetable consumption self-efficacy. Similarly, other studies found that self-efficacy for diet - related behaviors was strongly associated with schoolchildrens' usual food choices (Parcel, et al., 1995: 23-7). Thus, self-efficacy may be used as a construct to enhance behavior change. In regard to alcohol drinking behavior, Loveland- Cherry (1996: 497-511) found that self-efficacy was negatively correlated with alcohol use/abuse.

Finally, self-efficacy has been implicated as having a direct influence on smoking behavior. Clark, et al., (1990: 357 - 63) found that one's confidence in the ability to stop smoking was significantly related to successful cessation. Further studies have found that the perceived self-efficacy and constructs of power, such as commitment to change behavior, were positively correlated to successful maintenance of smoking cessation (Kowalski, 1997: 128-42; Macnee & Talsmu, 1995: 242-8).

Thus, the concept of self-efficacy receives support as a possible determinant of health-promotive behavior, especially health behavior that is related to CHD. Gremboski, et al. (1993: 96-98) studied health behavior areas: exercise, dietary fat intake, weight control, alcohol intake, and smoking with perceived self-efficacy. The finding showed that efficacy expectations or perceived self-efficacy to perform and control these behaviors was greater for those who were not at risk in each health behavior ($P < .0001$). This agrees with Strecher et al. (1986: 73-9), whose results showed that people with high self-efficacy are more likely to acquire or maintain protective health behavior (e.g., aerobic exercise), control a behavior (e.g. weight control), or stop a behavior (e.g., cigarette smoking) (Bandura, 1992 cited by Grembowski, et al., 1993: 92).

Therefore, if perceived self-efficacy and CHD risk behaviors are strongly correlated in adolescents, nursing has a role to increase adolescents' preventive self-efficacy to promote behavior changes and reduce health risk in primary prevention, through perceived self-efficacy thought, which mediates the relationship between knowledge and action (Bandura, 1986: 39). This is because the knowledge in health programs is insufficient for accomplished performance.

The Relationship between Interpersonal Influences and Adolescent CHD Risk Behavior

Interpersonal influences versus health promoting behavior.

According to Pender (1996:70), interpersonal influences are cognitions involving the behaviors, beliefs or attitudes of others. These cognitions may or may not be realistic. Initial sources of interpersonal influence on health-supporting behaviors are families, peers, and health care providers. The interpersonal influence variable by the revised HPM (Pender 1996) has been tested in different samples, but few have studied in the Thai setting. The research in Thailand has been conducted to study only behavior of the elderly in some populations. For example, Kapraedee studied aims to evaluate various parameters that may have a positive impact on the health-promoting behaviors of male elderly with benign prostatic hyperplasia. Data was analyzed in terms of Pearson's Product Moment Correlation which showed that there was a significant correlation with interpersonal influences ($r = .617$, $p < .001$). Moreover, it can predict behaviors at the level of 38.10% ($p < .001$) (Kapraedee, J., 1998: 53).

Similarly, the results of the study revealed that overall health-promoting behavior of the elderly with osteoarthritis had a statistically significant positive correlation with interpersonal influences ($r = .3487$, $P < .001$) (Teesakunwatana, K., 1998; 48). The study of Inkoom, J. (1998: 69) indicated that health promoting behaviors in the elderly with coronary artery disease have a positive correlation with interpersonal influences, at the significant level of .01 ($r = .3703$). Furthermore, interpersonal influences have been shown to affect adolescents' behaviors directly by

developing them to meet their satisfactions concerning their age. Adolescents need love, care and self-esteem. They are also very keen to try any form of new experiences, for which they have mutual support from their peers (Piyasilp, W., 1996: 123). These needs have to be responded to, as an individual's choices influence thoughts and behaviors from families. However, adolescents favor freedom and isolation from their families (Willis, 1997: 112). As such, peers are obviously influential, and adolescents spend most of their time outside their homes. Peers, therefore, have an effective role on activities and increasing influences (Cordts, 1996: 245-247). Pender (1996: 71) stated that "Interpersonal influences include: norm (expectations of significant others), social support (instrumental and emotional encouragement), and modeling (vicarious learning through observing others engaged in a particular behavior)".

The Correlation of Interpersonal Influence and Adolescent CHD Risk Behavior

The study of overall adolescent behaviors with interpersonal influence hasn't appeared in prior research. However, several studies have examined the correlation between interpersonal influences, which consists of parental influence and peer influence on each cardiovascular health behavior.

For smoking behavior, a study was conducted among 2,212 adolescents in high school. When the 21 variables were analyzed by stepwise multiple regression, they revealed that the highest variance of smoking behavior is significantly affected by the smoking behavior of close friends (Mc Dermott, et al., 1992: 146-50). In agreement, Headen, et al. (1991: 7) found that friends' behavior was strongly related

to smoking initiation among adolescents. The odds of smoking if a friend smoked were 2.44 times greater.

Besides this, data from 933 children in the Bogalusa Heart Study (1993 through 1994) analyzed cigarette smoking attitudes and first use. These results showed 40% first smoked with a family member and 46% obtained their first cigarette from a family member or from home. The correlation of ever having smoked was influenced by best friends smoking (Geelund, et al., 1997: 1346-1347). Especially, family smoking provides frequent exposure to the modeling of smoking behavior. Adolescents in homes where people smoke constantly have the behavior modeled for them (Kegler, et al., 1999: 36). In accordance with the longitudinal Teenage Attitudes and Practices Survey research examined parental influences on two transitions in the adolescent smoking uptake process. The results show that among non-smokers, the baseline of having male best friends who smoked predicted experimentation in the next 4 years. Among experimenters, having male or female best friends who smoked, and lack of parental concern about future smoking distinguished those who progressed to established smoking as a follow-up. Furthermore, communicating with parents first about serious problems provided protection against progression from experimentation to established smoking (Distefan, et al., 1998: 466). However, no differential effects of family and peer influence on adolescent smoking throughout the 14 to 18 year old levels was evident (Wang, et al, 1995: 200).

For alcohol drinking behavior, the major focus of the qualitative investigation was to explore alcohol-drinking behavior among high school adolescents. The results suggest that adolescents who have alcohol drinking behavior will perceive good results of drinking and cling to subculture drinking peer groups. Whereas non-

drinkers will ponder the long-term goals of life that are motivated from non-drinking families (Ziervogel, et al., 1997: 271). In addition, the reasons for alcohol drinking behavior of adolescents include fun and the desire to join in parties. At the same time these drinking styles are related to those of their parents and peers (Feldman, et al., 1999: 48). While the study of Pohthiart, P. (1992:iv) revealed that the most common predictor of alcohol drinking behavior was the drinking behavior of close friends. Besides this, Loveland-Cherry, et al. (1996: 497) examined correlates of levels of alcohol use and misuse. They found that peer approval, peer use and exposure by peers, and parental permissiveness were positively correlated with alcohol use. Child-parent interactions, family adjustment, and peer adjustment were negatively correlated with alcohol use.

Therefore, family and friends create social environments and their support may be crucial in initiating and sustaining health behavior. Social contacts may tell, remind, or threaten others in order to promote positive health behavior (e.g. to exercise) or to deter negative health behavior (e.g. to avoid alcohol) (Unberson, 1992: 908). Examples such as the ease of talking with a mother about things which are bothering young people was negatively correlated with drinking alcohol, coffee, smoking, unhealthy eating. They are positively related with physical activity and healthy dieting in Norwegian adolescents (Nutbean, et al., 1989: 322). Possible mechanisms for the relationship between parental and adolescent behavior levels include parents serving as role models, sharing activities, and providing enhancement by emotional support that influences adolescents to increase their levels of healthy behavior.

A longitudinal data set was employed to explore the sources of stability and change in young adult behaviors concerning drinking, diet, and exercise. There is substantial change in the performance of health behaviors during the first three years of college, and peers have a strong impact on the magnitude of that change. In overall changes, however, parents are much more important than peers as sources of influence over these behaviors. Of the various social influence processes considered, the direct modeling of behaviors appears to be the most important avenue of influence for both parents and peers (Lau., et al., 1990: 240).

Furthermore, according to Hongchoowej Y., 1997: D, a program was set up in order to decrease fast food consumption which is categorized as risk food contributing to CHD among secondary level students together with social motivation from parents and peer support. The outcome of the study showed that the participants had better consumption behaviors by decreasing their fast food intake. While Pender (1996: 266), from his study of social support which was one of the variables on interpersonal influence, stated that social support had a direct relationship with health promoting behavior and was a beneficial resource.

Finally, lack of exercise behavior was considered as risk behavior contributing to CHD. Several studies indicated that interpersonal physical activity or exercise among young people included peer or friend support for, and participation in, physical activity (Reynolds, et al., 1990: 541; Anderren, & Wold, 1992: 341). Likewise, research generally revealed a positive relationship between the exercise or physical activity level of parents and that of their children, particularly adolescents. Parental support for physical activity was correlated with active lifestyle among adolescents (Zakarin, et al., 1994: 314-321; Baddle & Goudas, 1996: 75-78; Moore, et al., 1991:

215). This agrees with the study of Simons-Morton, et al. (1997: 45), which found that higher social support was associated with more physical activity. Nevertheless, the study of Garcia, et al (1995: 217-218), in exercise behaviors revealed that social support for exercise and exercise norms were related indirectly to exercise behavior in this study. This suggested that the proposed model should be tested further and refined to incorporate theoretically consistent but empirically relevant variables.

Hence, the health behavior of each side contributing to CHD correlated with interpersonal influences. This factor will motivate and cause various behaviors under the HPM, models of which are generated from the behavior of friends and parents whose relationship is involved in adolescent CHD risk behaviors. It is an important strategy for behavioral change. Through norms, the way of living concerned with social criteria sets standards for performance. The last component is support from parents and peers that encourages adolescents to behave well providing a beneficial source of individual behavior and pattern sustenance.

Summary

This review of literature about CHD risk factor relationships, supports the position that CHD morbidity and mortality rates in persons, may be linked to adolescent health behaviors. Greater frequency or higher mean level in negative health behavior includes smoking, alcohol/caffeine drinking, high fat and calorie intake and lack of exercise, which indicate a higher health risk contribution to CHD. If perceived self-efficacy and interpersonal influences are significant in highlighting CHD risk behaviors, then individual perception and environmental context may reduce mortality risk by influencing health behaviors. Therefore there is a need for

empirical data and more studies on the correlation between these factors among Thai adolescents, and research should be extensively conducted even though CHD risk behavior may be slight. Consequently, nurses have an important role in the application of nursing science in order to protect health condition problems in primary stages. This also supports health-promoting behavior in good ways among Thai adolescents who should become healthy adults in the near future.

CHAPTER III

MATERIALS AND METHODS

The descriptive study aims to identify relationships among perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors of high school and vocational students in Bangkok Metropolis. The study site, population samples, instruments, data collection, and data analysis will be described in this chapter.

Population and Sample Group

This study population refers to adolescents living with parents and studying in grade 10, 11 or12 of secondary schools in Bangkok Metropolis, under super-division of the Elementary Education Department, and students of Certificate of Vocational Education under super-vision of the Department of Vocational Education, Ministry of Education.

Sample groups were assembled through multistage random sampling by calculating sample group size out of a total population of 130,279 (The Division of Secondary Education and Department of Vocational Education 1999) using as the following formula (Taro Yamane, 1973).

$$n = \frac{N}{1 + Ne^2}$$

when: n = Sample Size

N = Size of population

e = The statistical significance level in this study was set at 0.05

$$n = \frac{130{,}279}{1 + 130{,}279 \ (0.05)^2}$$

$$= \ 398$$

So, a sample size of not less than 398 persons was required

The procedures of random sampling

1. The city plan of Bangkok can be distinguished into 3 zones: inner city zone, central city zone and outer city zone. A zone can be made random for simple random sampling so a zone can be considered by the ratio 2:2:1. The ratio was in accordance with the number of districts in each zone. (Figure4).

2. A random district sample was made by random sampling so as to be one secondary school and one vocational education college from each district. The names of the schools are sampled from all the schools in the same district. There are 10 educational institutes chosen.

3. A classroom sample of secondary schools with grade 10,11 and 12 or vocational certificate students in year 1, 2 and 3 from 10 schools already randomly sampled were made by drawing one classroom from each level. Overall 30 classrooms were obtained.

4. Students were then selected by drawing lots of student I.D. numbers. The ratio of standard secondary students to vocational students was 4:1 in line with the proportion of the total population. The total sample was 450 students (360:90).

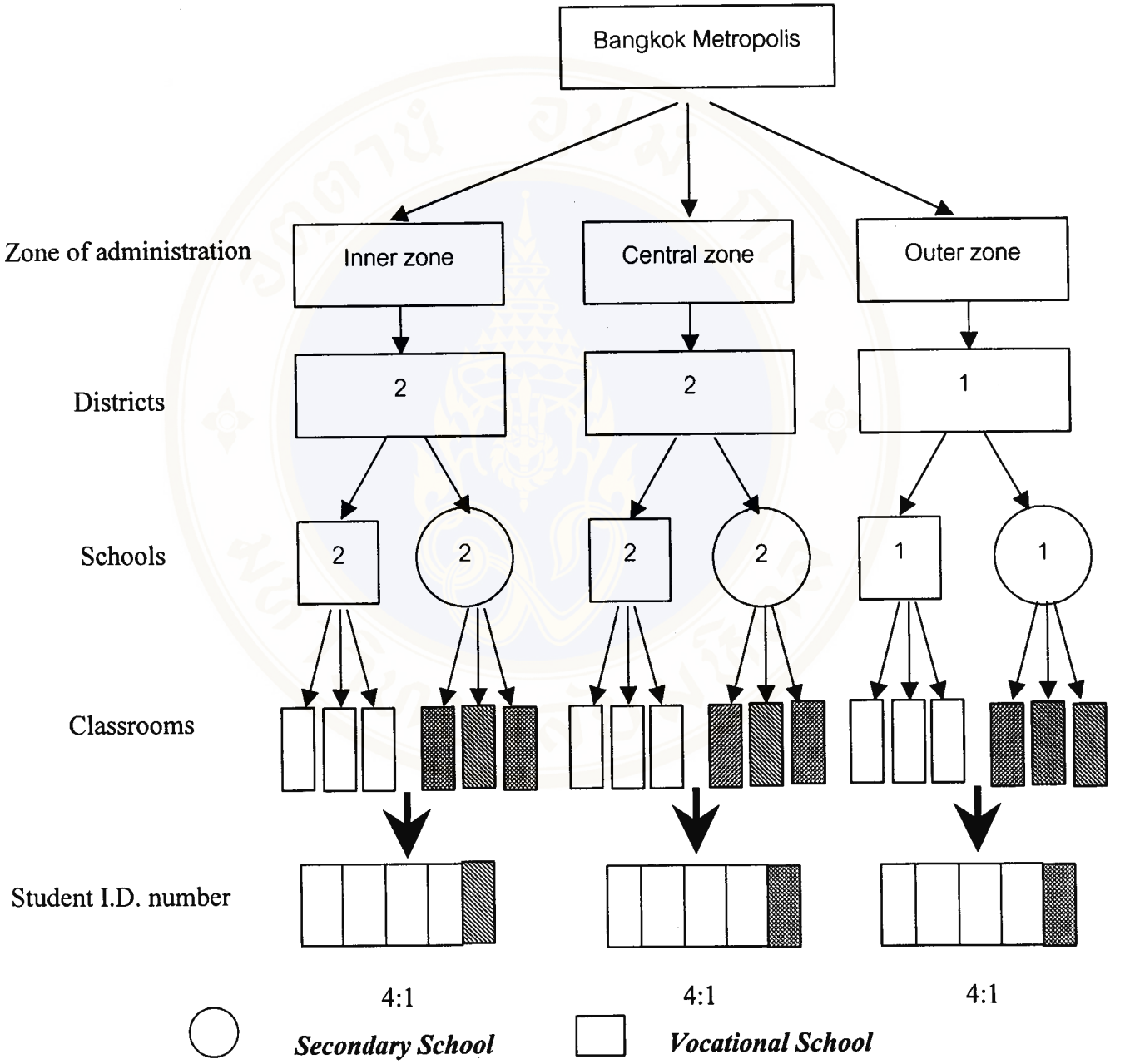

Figure 4: Multistage random sampling in this study

Setting

Data was collected from upper secondary school under the Elementary Education Department and colleges belonging to the Department of Vocational Education in Bangkok on Monday to Friday.

Instruments

The instrument for this study was a questionnaire developed by the researcher according to the literature review. This questionnaire comprised of the following 4 parts (Appendix A):

Part 1: Demographic Data Form

The demographic data form was used to gather information on adolescent's sex, age, education level, body weight, height, health problems, family members' health record, as related to cardiovascular disease, and the number of the adolescent's close friends.

Part 2: The Perceived Self-Efficacy Questionnaire

This questionnaire was developed by the researcher based on Health Promotion Model (Pender, 1996:69), Bandura's self-efficacy (1986: 391 - 439), and literature reviews. This questionnaire was used to measure the degree of adolescents' confidence in their perceived abilities to perform preventive health behavior contributing to risk of CHD. It included 17 items required in avoiding health risk behavior (such as smoking behavior, alcohol and caffeine drinking, sedentary behavior, high fat and high calorie dietary intake) and adopting health-promoting behavior (such as exercise behavior,

healthy dietary intake). Each item was rated on a 5-point Likert scale. The subjects had to answer all of the items and rate them from 0 (no confidence) to 4 (most confidence) as follows:

No confidence = 0

Little confidence = 1

Moderate confidence = 2

Much confidence = 3

Most confidence = 4

Total scores of the perceived self-efficacy questionnaire ranged from 0 - 68. Higher total scores means that the adolescent has a higher level of perceived self-efficacy for avoiding CHD risk behaviors.

Part 3: The Interpersonal Influence Questionnaire

The Interpersonal Influence Questionnaire was developed by the researcher based on Health Promotion Model (Pender, 1996: 70-71) and was in accordance with the literature review. The form of evaluation of interpersonal influence included two sections as follows:

Section 3.1:

Norm : standard for performance which is associated with parents' and peers' expectation and influence on the avoidance of adolescent CHD risk behaviors. This part consisted of 7 items. (No.1, 2, 3, 6,7, 8, 13)

Social support : instrumental and emotional encouragement to avoid CHD risk behaviors from parents and peers. This part consisted of 11 items. (No. 4, 5, 9-12, 14-18)

Each item of norm and social support was rated on a 5-point-Likert scale of perception in which positive items were graded very true = 5, true = 4, not sure = 3, not true =2, not true at all = 1. The score of negative items was reversed.

Section 3.2 :

Modeling avoidance of CHD risk behaviors are the perception of the adolescents about mothers, fathers and peers CHD risk behaviors. This part consisted of 11 items for each person. There was a total of 33 items (No.19-51) items which were rated on a 5-point-Likert scale of perception about influence on avoidance of CHD risk behaviors exerted by mothers, fathers, and close friends in which positive items are graded everyday = 5, usually = 4, sometimes = 3, seldom = 2, never = 1. The score of negative items was reversed.

Total scores of the Interpersonal Influence Questionnaire ranged from 51-255. The higher scores means that adolescents receive awareness of powerful influence from parents and peers in order to prevent health risk contributing to CHD at a high level.

Part 4 : The Adolescent CHD Risk Behaviors Questionnaire

This questionnaire was developed by the researcher according to the literature review. The questionnaire included 7 positive items (items 13, 17, 20, 21, 27, 28, and 29) and 23 negative items. Each item was rated on a 5-point-Likert scale of adolescent CHD risk behaviors. The main behaviors are cigarette smoking / living in cigarette fume area

(active/ passive smoking), alcohol and caffeine drinking, high fat and high calorie dietary intake, and the lack of exercise. Health behavior was measured, and a higher frequency of positive risk factors indicates a higher risk of developing the ailment. This questionnaire measured the frequency of adolescents' behavior, which was done realistically without the perceived self-efficacy such behaviors of which an component but difference aspect was measured so as to be specifically efficient to behavior. However, to prevent from confounding factor. The researcher distributed each set of questionnaire per person per one time.

The score criteria of health behavior are as follows:

Health risk behavior contributing to CHD	**Smoking (active and passive)**	**Alcohol, Caffeine drinking**	**Dietary intake**		**Physical Activities**	
			High fat & calorie	**Low fat & calorie**	**Aerobic Exercise**	**Sedentary**
Routinely or daily	5	5	5	1	1	5
Often	4	4	4	2	2	4
Sometime	3	3	3	3	3	3
A few times	2	2	2	4	4	2
Never	1	1	1	5	5	1

The higher score means adolescents have higher risk health behavior contributing to CHD.

Validity of the instrument

After the instruments had been approved by the advisor professor, four experts were consulted (one cardiac care unit clinical nurse specialist, an expert in behavioral science, and two nursing instructors who were experts in health promotion and public health nursing). They examined the content validity and language suitability of the instruments, perceived self - efficacy questionnaire, interpersonal influence questionnaire and the adolescent CHD risk behaviors questionnaire.

Reliability testing

After the researcher had been given helpful advice from experts and appropriate of Thai language on three questionnaires, the researcher then applied them to 32 students who had the same characteristics as the sample groups and the Cronbach' s alpha calculated. The lowest acceptable alpha value was considered .70 (Polit & Hungler, 1997: 297). Cronbach' s alpha was 0.7 for the Perceived Self-efficacy Questionnaire, 0.74 for the Interpersonal Influence Questionnaire and 0.73 for Adolescents' CHD Risk Behaviors Questionnaire. These results of reliability indicated a satisfaction level internal consistency reliability coefficient. However, the instruments of human behavior and behavioral perceived for instrument testing quality in accuracy of. The test - retest reliabilities for the 3 sets of in instrument over a one week period were r = 0.79, 0.76, and 0.83, $p<.05$ (n=32), respectively.

Data Collection Procedures

The researcher collected the information by using a Faculty of Graduate Studies letter submitted to the Directors of the Vocational Education Department and the Elementary Education Department, Ministry of Education, requesting their permission to collect information. The approximate times to collect data were on official working days. Steps and methods of collecting data included;

1. The researcher met each school director and asked them for permission to collect information

2. The researcher called on academic deputy directors, guidance teachers' classroom advisors or other teachers who were given responsibilities to coordinate in collecting information at the right time.

3. The researcher went to students' classroom and introduced them to the research objectives and explained the protection of human rights (Appendix B).

4. The researcher distributed questionnaires to participants and explained details. Participants were allowed to ask questions. Subjects read and completed the questionnaires in the following order: 1) Demographic Data Form, 2) the Adolescents CHD risk behaviors Questionnaire, 3) the Perceived Self-efficacy Questionnaire, and 4) the Interpersonal Influence Questionnaire. In the meantime, sample groups took 20 minutes to answer questions by themselves having. The researcher then checked the completion of answers. Data would be cancelled if they refused to partly or wholly answer the questionnaires.

5. The researcher then collated the collected information and worked out the statistical analysis.

Analysis of Data

Information was analyzed by using SPSS/FW (Statistical Package for Social Sciences for Windows) using the following analytical procedures

1. Descriptive analysis in terms of frequencies and percentages on characteristics of the sample.

2. Perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors were described by using interval range, mean standard deviation, and skewness.

3. Relationship between perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors were analyzed using Pearson's product moment correlation coefficient.

CHAPTER IV

RESULTS

The result from this study are presented under the following topics:

Part I Demographic data of adolescents

Part II Perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors

Part III The relationship between perceived self-efficacy, interpersonal influence, and adolescent CHD risk behaviors.

Part I: Demographic Data of Adolescents

Data on 22 participants were excluded from data analysis because of missing information some items. The final sample used in analysis comprised 428 adolescents. The about half of adolescents were male (52.6 %). The largest group of subjects had age between 16 to 17 years ($\overline{X}$ = 16.27, S.D. = 1.07). Most of adolescents had grade 10 or 1st year of vocation education, 35.05 %. Two hundred and eighty six (66.8%) of adolescents had Body Mass Index < 20 (kg/m^2) and 75.2 % of them had family members without underlying cardiovascular disease. Sixty-three (14.7%) of adolescents had health problem. In this group, twenty-one (33.33%) of the adolescent had allergy. The majority of the adolescents (44.4%) had number of close friends ranging from 1 to 5 persons. The details are shown in Table 7.

Table 7 Distribution of adolescents' demographic characteristics (n = 428)

Demographic data	Number	Percent
Sex		
Male	225	52.57
Female	203	47.43
Age		
14 - 15	111	25.93
16 - 17	262	61.21
18 - 19	55	12.85
$\bar{X}$ = 16.27, S.D. = 1.07, Min = 14, Max = 19		
Education		
Grade 10 or 1st year	150	35.05
Grade 11 or 2nd year	140	32.71
Grade 12 or 3rd year	138	32.24
Body Mass Index		
< 20	286	66.82
20 - 24.9	125	29.21
> 24.9	17	3.97
$\bar{X}$ = 19.37, S.D. = 3.12, Min = 12.95, Max = 38.27		

Table 7 Distribution of adolescents' demographic characteristics (n = 428) (continued).

Demographic data	Number	Percent
Family members with underlying cardiovascular disease		
Without underlying disease	322	75.23
With underlying disease	103	24.77
Health Problems		
No	365	85.28
Yes	63	14.72
If yes ;type of disease		
- Allergy	21	33.33
- Respiratory infection	16	25.40
- Abdominal pain	12	19.05
- Headache	11	17.45
- Hyperthyroid	1	1.59
- Hypotension	1	1.59
- Pulmonary tuberculosis	1	1.59
Number of close friends		
1 - 5	190	44.39
6 - 10	170	39.72
> 10	68	15.89

$\bar{X}$ = 7.95, S.D.=6.90, Min = 1, Max = 50

Remark : Body Mass Index (BMI) = $\frac{Weight\ (kg.)}{Height^2\ (m^2)}$ (Department of Medical Services Ministry of Public health, 1999)

Part II: Adolescent CHD Risk Behaviors, Perceived Self-efficacy, and Interpersonal Influence.

Adolescent CHD Risk Behaviors :

Lack of exercise behavior was the highest risk behavior toward adolescent CHD risk behavior ($\bar{X}$ = 2.99, S.D.= .71), when mean scores was considered. The lowest mean score of adolescent CHD risk behavior was smoking behavior ($\bar{X}$=1.77, S.D.=.63) as shows in Table 8.

Table 8 Mean and standard deviation of adolescent CHD risk behaviors by each behavior category.

CHD risk behavior	Mean	S.D.
Lack of exercise.	2.99	.71
High fat and calories dietary intake	2.76	.27
Alcohol and caffeine drinking	1.77	.63
Smoking.	1.69	.50
Total	**2.52**	**.63**

Table 9 : Mean, standard deviation, and frequency, and percentage on the lack of exercise behavior by each item from highest mean to lowest. (n=428)

Lack of exercise	Mean	SD.	Usually or Everyday n (%)	Seldom or Sometime n (%)	Never n (%)
I sit and lie for long hours continuously such as watching TV, reading novels or cartoons, playing computer games, etc.	4.04	1.01	295 (68.93)	129 (30.14)	4 (0.93)
I exercise, e.g. walking, jogging, aerobic dance, cycling which takes 15-45 minutes continuously each time.	2.65	1.18	189 (44.16)	223 (52.10)	16 (3.74)
I exercise until I sweat, my heart beats faster and my respiration rate increases.	2.64	1.22	194 (45.33)	212 (49.53)	22 (5.14)
I play, at least one kind of sports such as football,basketball,volleyball, badminton, handball,which takes more than 20 minutes continuously.	2.61	1.20	197 (46.03)	212 (49.53)	19 (4.44)
Total	**2.99**	**0.71**			

Table 9 shows that the items in the lack of exercise behavior, which received the lowest scores, were received the lowest scores were related to sit and lie for long hours continuously such as watching television, reading novels or cartoons, playing computer games, etc. From the case of 68.93% adolescents who answer "Usually or Everyday "

Table10 Mean, standard deviation, and frequency, and percentage on High fat and calorie dietary intake by each item from highest mean to lowest. (n=428)

High fat calorie dietary intake	Mean	SD.	Usually or Everyday n (%)	Seldom or Sometime n (%)	Never n (%)
I eat more than one egg per day.	3.24	1.01	167 (39.02)	250 (58.41)	11 (2.57)
I eat seafood, e.g. squids, shrimps oysters, crabs.	3.12	.81	117 (27.34)	308 (71.96)	3 (0.70)
I eat ice cream or milkshake.	3.05	.90	116 (27.10)	309 (72.20)	3 (0.70)
I eat doughnuts, jamrolls, muffins, cakes, and other bakery.	2.93	.93	105 (24.53)	314 (73.37)	9 (2.10)
I eat coconut cream curry, e.g. green sweet coconut cream curry, parched curry	2.93	.88	107 (25)	313 (73.13)	8 (1.87)
I eat cooked in food lard, palm oil, or coconut oil.	2.89	1.32	145 (33.88)	223 (52.10)	60 (14.02
I eat chicken oiled rice, pork leg in paste with rice, red pork in paste with steamed rice.	2.86	.81	74 (17.29)	344 (80.37)	10 (2.34)
I eat cereal food or dried grain e.g. boiled soybean water, soybean milk.	2.86	.96	128 (29.90)	293 (68.46)	7 (1.64)
I eat fatty meat e.g. three – layered pork, bacon, sweet pork sausage, viscera, fried pork skin.	2.85	1.05	103 (24.07)	293 (68.46)	32 (7.47)
I eat fried sweets or desserts containing coconut cream e.g. fried bananas Chinese doughnut, steamed sticky rice in coconut cream.	2.74	.83	70 (16.36)	352 (82.24)	6 (1.40)

Table10 Mean, standard deviation, and frequency, and percentage on High fat and calorie dietary intake.(n=428) (continued)

High fat calorie dietary intake	Mean	SD.	Usually or Everyday n (%)	Seldom or Sometime n (%)	Never n (%)
I eat fried Thai noodle with egg, fried noodle in black sauce.	2.69	.76	50 (11.68)	371 (86.68)	7 (1.64)
I eat fruits two times a day	2.65	1.08	184 (42.99)	232 (54.21)	12 (2.80)
I eat fast food, e.g. pizza in different topping, fried chicken, sandwiches, …	2.61	.79	57 (13.32)	358 (83.64)	13 (3.04)
I eat viscera like liver, heart, hard bowel.	2.56	.93	62 (14.49)	308 (71.96)	58 (13.55)
I eat vegetable three meals a day.	2.50	1.13	224 (52.33)	186 (43.46)	18 (4.21)
I eat desserts added with egg yolk, e.g. Tong Yip, Tong Yod, Foi Tong.	2.49	.74	35 (8.18)	376 (87.85)	17 (3.97)
I eat animal skin e.g. pork skin, chicken skin, duck skin.	2.38	.86	43 (10.05)	337 (78.74)	48 (11.21)
I eat plain meat, fish, chicken.	2.27	.92	260 (60.75)	164 (38.32)	4 (0.93)
Total	**2.76**	**.27**			

Table 10 shows the overall mean of high fat and calorie dietary intake behavior was 2.75 (S.D.=.27). The means in each item were mostly less than 3.00. Only 3 items had mean risk scores more than including eating egg more than one egg per day, eating seafood, and eating ice cream or milk shake.

Table11 Mean, standard deviation, and frequency, and percentage on smoking behavior by each item from highest mean to lowest. (n=428)

Smoking	Mean	SD.	Usually or Everyday n (%)	Seldom or Sometime n (%)	Never n (%)
I stay among smokers in smoke filled excess more than an hour.	2.25	1.11	56 (13.08)	254 (59.35)	118 (27.57)
I go to discos, bar, pubs or snooker clubs more than one hour.	1.54	.81	10 (2.34)	152 (35.51)	266 (62.15)
I smoke more than one cigarette.	1.29	.92	26 (6.08)	24 (5.60)	378 (88.32)
Total	**1.69**	**.50**			

Table 11 shows that passive and active smoking behaviors have a mean of 1.69 (S.D.=.50). The highest mean score is in a items "I stay among smokers in smoke filled excess more than an hour".($\overline{X}$ =2.25, S.D.=1.11) and the lowest mean score is in a items "I smoke more than one cigarette" ($\overline{X}$ =1.29, S.D.=.92). From the case of 378 (88.32%) adolescent who answer "Never".

Table12 Mean, standard deviation, and frequency, and percentage on alcohol an caffeine drinking by each item from highest mean to lowest. (n=428)

Alcohol and caffeine drinking	Mean	SD.	Usually or Everyday n (%)	Seldom or Sometime n (%)	Never n (%)
I drink tea chocolate, cocoa, or soft drinks in cola or energizing drinks more than two cups of coffee in total per day. (one cup = 150 cc)	2.84	1.22	118 (27.57)	248 (57.94)	62 (14.49)
I drink more than one cup of coffee per day (one cup =150 cc.)	1.82	.89	19 (4.44)	227 (53.04)	182 (42.52)
I drink the amount of more than three glasses of wine cooler, white wine, red wine per day. (one glass = 120 cc)	1.52	.65	3 (0.70)	186 (43.46)	239 (55.84)
I drink more than 60 cc alcoholic drinks of the amount 60 cc (1/6 flat shaped bottle) of alcoholic spirits	1.38	.66	5 (1.17)	123 (28.73)	300 (70.10)
I drink fresh beer or light beer more than three glasses per day. (one glass = 360 cc)	1.30	.60	3 (0.70)	99 (23.13)	326 (76.17)
Total	**.77**	**.63**			

Table 12 shows caffeine drinking behavior has higher average mean than alcohol drinking behavior. The highest mean score is drinking tea chocolate, cocoa, or soft drinks in cola or energizing drinks more than two cups of coffee in total per day. (one cup = 150 cc) and item, which lowest mean is drinking fresh beer or light beer more than three glasses per day.(one glass = 360 cc). The result from questionnaire shows that adolescent never has alcohol drinking behavior as 76.17%.

Perceived self-efficacy:

Table 13 Mean and standard deviation of adolescents' perceived self-efficacy by each behavior category.

Perceived Self-efficacy	Mean	S.D.
- avoidance smoking	3.25	.58
- abstinence from consuming alcoholic and caffeine	3.01	.65
- exercise	2.63	.08
- avoidance high fat and calories dietary intake	2.38	.40
Total	**2.70**	**.57**

The mean of avoidance smoking self-efficacy was 3.25, more than adolescents' perceived self-efficacy in other avoidance CHD risk behaviors. While, adolescent participants reported mean of perceived self- efficacy toward avoidance high fat and calories dietary intake behavior merely 2.38 as presented in table 13.

Interpersonal influence:

Table 14 Mean and Standard deviation of interpersonal influence each sub-scale.

Interpersonal influence	Mean	S.D.
Norm	3.52	.68
Modeling	3.50	.62
Mother	3.60	.82
Father	3.34	.57
Friend	3.57	.44
Social support	3.47	.68

When considering a mean score by each dimension, it was apparent the highest mean score was norm($\bar{X}$ = 3.52). The lowest mean score was social support ($\bar{X}$ = 3.47). As shows in table 14. Besides this, it is found that mother was crucial influential source on preventive CHD risk behaviors more than father and friend

Table 15 Mean, standard deviation, minimum, maximum and skewness of perceived self-efficacy, interpersonal, and CHD risks behaviors.

Variable	Min - Max		$\bar{X}$	S.D.	Skewness
	Possible Range	Actual Range			
Perceived self-efficacy	0-68	20-63	45.83	8.73	-.35
Interpersonal influence	51-255	134-223	178.49	15.71	-.06
Adolescent CHD risk behavior	30-150	57-103	75.51	8.48	.50

Table 15 is a summary of the major variables of the study. It shows that perceived self-efficacy had a mean of 45.83 (S.D. = 8.73, skewness = -.35), interpersonal influence had a mean of 178.49 (S.D.= 15.71, skewness = -.06). This indicates that the adolescent had a trend toward a high perceived self-efficacy and high interpersonal influent. By contrast, adolescent CHD risk behaviors had a mean of 75.51 (S.D. = 8.48, skewness = .50), it indicating that the adolescent potentially has low CHD risk behavior.

Part III. Relationship between Perceived Self-Efficacy, Interpersonal Influence and Adolescent CHD Risk Behaviors

Table 16 Pearson' s product moment correlation between perceived self-efficacy, interpersonal influence and adolescent CHD risk behaviors (n = 428)

Variables	Adolescent CHD risk behaviors
	r
Perceived self-efficacy	-.55 **
Interpersonal influence	-.39 **
Norm	-.27 **
Social support	-.33 **
Modeling	-.32 **

** $p < .01$

Table 16 shows that perceived self-efficacy and interpersonal influence were negative correlated with adolescent CHD risk behaviors at a statistically significant level ($P < 0.01$). The strongest negative relationship was perceived self-efficacy ($r = -.55$), followed by interpersonal influences ($r = -.39$). Interpersonal influence consists of norm, social support, and modeling which each one has negative correlation with statistical significant at level .01 as shown in table 16.

CHAPTER V

DISCUSSION

In this chapter adolescent CHD risk behaviors are initially presented and discussed, followed by a discussion of perceived self-efficacy, interpersonal influence, and testing of the hypothesis.

Adolescent CHD Risk Behaviors

The mean score on adolescent CHD risks behaviors is 75.51 (S.D. = 8.48, skewness = .50) which means that the majority of the sample had low level CHD risks behaviors. When comparing each behavior, it is found that the lack of exercise behavior had the highest mean score of adolescent CHD risk behavior. Considering each item by mean score (Table 9), it was found that the behavior which had the highest score was "I sit and lie for long hours continuously watching TV, reading a novel or cartoons, playing computer games, etc." ($\overline{X}$ = 4.04, S.D. = 1.01). Almost 70% of the subjects answered "usually or every day". Meanwhile, over half of them (55.84%) answered "sometimes, seldom or never" to the item "I exercise, e.g. walking, jogging, aerobic dancing, cycling which takes 15-45 minutes continuously each time" as well as to other exercise activities from other items such as sports exercise.

One possible inference is that the majority of adolescents had more sedentary behavior than exercise behavior. This is in accordance with several studies (Anukoolwuthipong, M., 1997: 92; Visuthikul, K., 1997: 79) which found that the lack

of exercise is at the highest level in adolescents when compared with other health risk behaviors.

The second highest risk behavior for adolescent CHD is high fat and calorie dietary intake behavior. Considering each item in table 10 the highest mean was "I eat more than one egg per day" ($\bar{X}$ = 3.24, S.D. = 1.01). It was found that 39.02% of subjects answered "usually or every day" and merely 2.57% of adolescents who answered "never". This can lead to the risk of eating behavior since the body needs cholesterol of its amount less than 300 mg per day (Pruitt, 1994: 18). Moreover, the study found that 100 mg. of yolk can generate more than 1,480 mg of cholesterol. However, from the nutrition proportion an adolescent requires one egg a day. Some adolescents stated that they had knowledge about eating one egg a day but did not know how many eggs would result in CHD. At present many Thai dishes and sweets have eggs as an ingredient. Egg is a common food item to find and to cook, which is another reason for adolescents eating them regularly.

From the study it is remarkable to notice that 281 subjects (66.82%) had a Body Mass Index < 20 kg/m^2 (Table 1). Whereas 15 out of 18 questionnaire items on eating high fat and high calorie food were answered and these were related to a minimal degree of CHD risk behavior, the three remaining items were about eating more than one egg in a day, eating seafood and eating ice cream, all of which have a high risk behavior score (Table 9). It is possible that adolescents even have the behavior of eating low fat food but they had inappropriate nutritional knowledge concerning high cholesterol content so they should be guided on eating nutritious food and sweets as well.

The lowest mean score of adolescents CHD risk behavior was smoking behavior in table 8. When considering each item, it was found that the lowest mean was "I smoke more than one cigarette" ($\overline{X}$ = 1.29, S.D. = 0.92). Although more than 88.32 % of the subjects answered "never" to that question, it was found that 50 (11.68%) of the subjects are often or usually smoking. This can be an origin of risk behavior, drug addiction, and bad modeling which reverses the expectation of all educational institutes desire to have 100% of the student not smoking. Furthermore, 13.08 % of the subjects answered "usually or everyday" in the item "Staying among smokers or in smoke filled excess more than one hour" and thus are considered to be passive smokers. According to the literature review, staying in a heavily smoke polluted area can increase the risk of CHD equal to being involved in active smoking (Muscat, et al., 1991:141).

The next lowest mean score was alcohol and caffeine drinking behavior. The result showed caffeine-drinking behavior has a higher average mean than alcohol drinking behavior (Table 12). From the case of 118 (27.57%) adolescent who answer "Usually or Everyday" to drinking tea, chocolate, cocoa, or soft drinks in cola or energizing drinks of more than two cups of coffee in total per day (one cup = 150 cc). The previously mentioned beverages are popular and are consumed a lot by adolescents which is consistent with other studies. The amount of 150 cc of the previously mentioned beverages has an amount of caffeine equal to 100 mg/day which has a direct effect on the heart, which includes increased blood pressure and blood sugar. These increased risks for CHD should be prevented and avoided as already mentioned. The results were similar for alcoholic beverages drinking. Even though it had the lowest mean, each question had mean scores lower than 2.00such as" I drink fresh beer or light beer more than three glasses in a day (one glass = 360 cm^3) ($\overline{X}$ = 1.30, S.D. = .60) or " I

drink more than 60cm^3 (1/6 flat shaped bottle) of alcoholic spirits ($\overline{X}$ = 1.38,S.D.=.66). Although behavioral performances have been sporadically conducted, alcohol content added in several beverages is in high volume, which is hazardous to health. Thus, some adolescents should be given better guidance regarding safer behavior.

In summary, the issues of high cholesteral dietary intake behavior and sedentary behavior are common. Beside, there should be consideration on the risk behavior of its harmful effects from smoking and drinking alcohol. They are the most important empirical problems regarding CHD risk behavior in adolescents. Nurses, therefore, should be aware and plan interventions to prevent these adolescent CHD risk behaviors.

Perceived Self-Efficacy of and Interpersonal Influences on Adolescent

Perceived self-efficacy had a mean of 45.83 (S.D. = 8.73, skewness = -.35) which means that the majority of subjects had rather good perceived self-efficacy. While, the highest mean was perceived self-efficacy regarding avoidance of smoking behavior (Table 13).

However, when considering the mean score item-by-item, it was apparent that the highest mean score was " I can stop smoking cigarette or I won't smoke from now on" ($\overline{X}$ = 3.66, S.D. = .86). The results showed that 91.12% of the adolescents had most or much confidence to avoid smoking behavior. Bandura (1986:71) believed that the stronger people perceived self - efficacy is, the more vigorous and persistent their efforts are. Thus, the majority of subjects tend to "don't smoke". Moreover, it may be due to the fact that the general public is aware of the risk of smoking behavior. Consequently, there has been a campaign of "No Smoking" by television, newspaper,

radio and health care providers. Besides, a goal of the National Strategic Policy and Target of NCD Prevention & Control (1993: 20), is to spread the information regarding the danger of smoking to youths and students aged over 10 years, who number more than 80% in 1996 and over 95% in 2000. This has yielded good results for adolescents since they have been well informed and have received good will from their society. Behaving in accordance with self- knowledge about one's efficacy whether accurate or faulty, is based on the source of information by which people partly judge their capability such as vicarious experiences of observing the performances of others; verbal persuasion and allied types of social influence that one possesses certain capabilities (Bandura, 1986: 399).

The lowest mean score was "I can avoid eating sweets, fried food or coconut milk filled food such as ice-cream and fried flour" ($\overline{X}$ = 1.96, S.D. = 1.04). Further more, the next three lowest mean scores were in high fat and high calories behavior as well. These were "No matter how hard it is, I can avoid eating high fatty food such as chicken oiled rice, rice with red pork, coconut curry" ($\overline{X}$ = 2.04, S.D. = 1.14), "I can avoid eating high cholesterol food such as, animal viscera, chicken skin, or yolk" ($\overline{X}$ = 2.09 S.D. = 11.03), and "I can avoid eating fast food such as pizza, hamburger, and French fries" ($\overline{X}$ = 2.11, S.D. = 1.15).

Interpersonal Influence had a mean of 178.49 (S.D. = 15.71, skewness = -.06) When considering each dimension, this study showed the highest mean score was norms ($\overline{X}$ =3.52,S.D.=.68)(Table14). This was a study on social norms of parents and peers from the adolescent's perception. It was found that parents had significant influence on adolescent for not smoking. This has the highest mean scores

(Appendix D). The majority of adolescents (78.98%) answered "True or Very true ". This was the same with the item on peer influence for smoking where 62.62% answered "Not true or Not true at all". . This showed that parents and peer were a significant person and provided a good social norm for avoiding smoking behavior. On the contrary adolescent had low interpersonal influence with regard to avoiding fat and calorie dietary intake behavior. The majority of adolescents agreed with the item "Most of your friends like eating fast food e.g. pizza, hamburger, doughnut, fried chicken, etc." and the item "Your parents like eating high fatty food e.g. coconut cream curry, roasted pork with steamed rice, fatty meat, fried food or oil fried food." Moreover, from the observation data on social support it was found that the lowest mean scores with regard to avoiding high fat and calorie dietary intake behavior were the same.

The lowest mean score was the item "when having an outing with friends at a shopping center, they always ask you to eat fast foods such as fried chicken, pizzas, hamburger" ($\bar{X}$ = 2.03, S.D. = .97), for which 74.30% answered "very true" or "true". This means that peer group had an influence on CHD risk behavior, which was more than avoiding CHD risk behavior and was consistent with close friend modeling. Thus, these groups should be given attention since they influence on adolescent behavior.

In fact, from the study, adolescent's development and adaptation involve close friends as one part of their group (Whaley & Wongs, 1993) 44.39% of the sample groups had 1-5 close friends while the rest had more than 5 close friends. Thus friends are an important social network which would influence school age student's behavior. Also, the finding of a recent study by Lhimsoonthon, B.(2000:51) showed external support and resources from one's family members or a significant person was a crucial

factor that protects adolescents from involvement with cigarettes and alcohol. Whereas, this study showed that the social support, parental support and peer support, had the lowest mean of interpersonal influence (Table15). Thus, the social support was considered to below which increased the important problem of risk behaviors.

However, when considering the mean score of interpersonal influence by each influential source from modeling, the scores were compared among mother, father, and friend. It is showed that adolescents received significant influence from mother on avoiding CHD risk behaviors. When considering each item (Appendix D)., it was seen that the highest mean score was "Mother's smoking" ($\bar{X}$ = 4.80, S.D. = .79) , for which 92.29% answered "never" The next highest mean score was "mothers drink alcohol, beer and wine" ($\bar{X}$= 4.42, S.D. = .83), of which 96.96% answered "never", "seldom", or "sometimes". Therefore mother's behavior was a good model for adolescent health behavior. It can be inferred that mothers plays a significant role as a primary source of interpersonal influence on avoiding having CHD risk behavior in real Thai society. While, the father had the lowest influence as a model in the behavior especially, exercise behavior. It was found that adolescent had the lowest interpersonal influence from parents in exercise behavior.

Hypothesis of the Research: There is a negative relationship between perceived self-efficacy and adolescent CHD risk behaviors.

The study result showed that perceived self-efficacy had a significant negative correlation with adolescent CHD risk behavior ($r = -0.55$, $p < .01$). This means that the adolescents with high perceived self-efficacy would have good CHD risk avoiding behavior. On the contrary, those with low perceived self-efficacy would have

poor CHD risk avoiding behavior. So the results of the research supported the hypothesis of the study and agreed with Pender's Health Promotion Model (Pender, 1996: 67-81). Pender indicated that perceived self-efficacy was factor in behavior–specfic cognitions and effects which had direct influence on behavioral outcome. The adolescents with high perceived self-efficacy have lower CHD risk, and have important motivation towards positive health behavior by themselves. This is in accordance with the study by Gremboski (1993: 89), who found that the elderly with high self-efficacy had lower health risk in all risk behaviors and with the study of Loveland–Cherry (1996: 497-511), who found that self–efficacy was negatively correlated with alcohol use.

In addition there are numerous studies supporting the finding that perceived self-efficacy had a positive correlation with health-promoting lifestyles (Kwan-ngen, S., 1994: 72; Pender, et al., 1990: 329; Waller, et al, 1998: 17-32; Yamchanchai, W., 1995: 44-46), and that there was a possitive relationship with health-promotion behavior (Chanchanakit, C. 1995: 93; Phurut, 1996:64). Especially, the perceived self-efficacy was positively correlated with healthy eating behavior (Gracey, et al, 1996: 187-204; Heatey & Thombs, 1997: 172-177), with stoping smoking (Kawalski, 1997: 128-42), and with healthy exercise behavior (Charoenkitarn, v., 2000:62).

Therefore, perceived self–efficacy is an important factor that influences the adoption of positive health behavior and avoidance of negative behavior. Nurses could play a significant role in primary prevention to increase adolescent' perceived self-efficacy in order to promote healthy behavior and reduce health risk.

Hypothesis of the Research: There is a negative relationship between interpersonal influence and adolescent CHD risk behaviors.

Interpersonal influence had a significant negative correlation with adolescent CHD risk behaviors ($r = -.39$, $p < .01$). This means that the adolescents with high interpersonal influence would have lower CHD risk behaviors. On the contrary, those with low interpersonal influence would have high CHD risk behaviors.

The significant negative relationship between interpersonal influence and CHD risk behaviors supports the concept of the Health Promotion Model (Pender, 1996). CHD risk behaviors are opposite to health promoting behaviors, and are negatively related and this is congruent with the Health Promotion Model. Also, this research finding was consistent with the results of previous studies that interpersonal influence had a statistically significant positive correlation with health–promoting behavior of the elderly with osteoathritis ($r = .3487$, $p < .001$) (Teesakunwatana, K., 1998: 48), the elderly with coronary artery disease ($r = .3403$, $p < .001$) (Inkoom, J., 1998 : 69), and the male elderly with benign prostatic hyperplasia ($r = .617$, $p < .001$) (Kapraedee, J. 1998: 53). Moreover, interpersonal influence had a positive correlation with health promoting–behavior, and specific exercise behavior, in the elderly. ($r = 0.51$, $p< .001$) (Charoenkitkan, V., 2000: 73)

When considering the relationship from each category of interpersonal influence it was found that norms had a negative correlation with adolescent CHD risk behaviors and was ($r = -.27$) statistically significant at the level .01. The similarly with modeling and social support had negative correlation with adolescent CHD risk behaviors ($r = -.32$, $P < .01$ and $r = -.33$, $P<.01$, respectively). This is consistent with previous studies regarding close friend's smoking (Mc Dermott, et al., 1992: 146-50; Headen, et

al.,1991: 7; Geelund, et al.,1997:1346-1347), parents' alcohol drinking and friends' alcohol drinking (Lau., et al.1990: 240), the support of decreasingly eating fast food by parents and peers (Hongchoowej,Y.,1997), and social support for exercise and exercise norms (Garcia, et al .,1995: 217-218).

From the result, the power of correlation between norms and adolescent CHD risk behaviors had a low level ($r = -.27$, $p < .01$). Through adolescents can perceive the norm of society that they live in. However they can adopt or reject having behaviors by following norms (Pender, 1996: 71).

Social support had a negative correlation with adolescent CHD risk behavior. Adolescents received instrument support and emotional support from their parents and peers who encouraged them to intend to maintain the avoidance of CHD risk behaviors. This finding was congruent with Lhimsoonthon' s research (2000:49) that social support was an important protective factor against adolescents' negative behavior. Thus, this is one factor which can be recommended for increasing social support.

This study found that modeling had a negative correlation with adolescent CHD risk behavior. Similarly, a previous qualitative study by Lindenberg, et al. (1994: 611) which indicated that role models had an influence on adolescent's refusal of substance use behavior. The investigator suggests nurses campaign for the avoidance of CHD risk behaviors with parents and with peers' adolescents.

In conclusion, perceived self-efficacy and interpersonal influence including norm modeling and social support had significantly negative relationships with adolescent CHD risk behaviors. The research findings were congruent with the Health Promotion Model and contribute to the advancement of nursing knowledge.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

Conclusion of the Study

This descriptive research aimed to study adolescent CHD risk behaviors, perceived self-efficacy and interpersonal influence. The Health Promotion Model (Pender, 1996) was used as a conceptual framework of the study. Multistage random sampling in this study yielded 428 adolescents living with their parents from 5 upper secondary schools under the Elementary Education Department and 5 colleges belonging to the Department of Vocational Education in Bangkok. Data were collected during June to August 2000. The instruments for data collection were developed by the researcher based on the Health Promotion Model (Pender, 1996). The questionnaires consisted of 4 parts. These were 1) Demographic data form, 2) Adolescent CHD risk behaviors questionnaire, 3) The perceived self-efficacy questionnaire, and 4) The interpersonal influence questionnaire. Parts 2, 3 and 4 of the questionnaire consisted of 30, 17, and 51 Likert scale questions respectively. The questionnaires were tested and their content validated by 4 experts. Reliability of the adolescent CHD risk behaviors questionnaire, the perceived self-efficacy questionnaire, and the interpersonal influence questionnaire was examined using Cronbach's alpha and by test-retesting with a pilot study sample (n = 32). The Cronbach's alpha coefficients for the adolescent CHD risk behavior, the perceived self-efficacy questionnaire, and the interpersonal influence questionnaire were 0.73,

0.70, and 0.74, respectively. Pearson's coefficient for adolescent CHD risk behavior, the perceived self-efficacy questionnaire, and the interpersonal influence questionnaire were 0.83, 0.79, and 0.76, respectively.

The results of this study showed that adolescent CHD risk behavior had a mean of 75.51 (S.D. = 8.48), the perceived self-efficacy had a mean of 45.83 (S.D. = 8.73), and the interpersonal influence had a mean of 178.49 (S.D. = 15.71). Pearson's product moment correlation coefficient showed that perceived self efficacy and interpersonal influence had a significant negative correlation with adolescent CHD risk behavior ($r = .55$ and $.39$, $p < .01$), respectively. The results of this study support the Health Promotion Model by Pender (1996).

Research Limitations

A cross-sectional design was selected for this study, to explain the relationships among variables. This design is limited in assessing changes over times. These study findings are limited to the study population of mid adolescents who are living with parents. This study can not be generalized to populations other than the study poppulation.

Recommendations

The findings of this study provide several important implications for the nursing profession including nursing practice, nursing education, and nursing research.

Implications for nursing practice and suggestion

1. The assessment of health behavior with both positive and negative aspects can be used as an important guideline in reducing fatal disease in the field of health promotion nursing.

2. The results of the study showed the majority of subjects had a high tendency to lack of exercise behavior, so this problem should be resolved and behavior should be adjusted. The important roles of nurses in this situation are to promote healthy behavior and the avoidance of risk behaviors. So, a program should be built that will provide adolescents with the knowledge, behavioral skills and confidence to participate in exercise. The program can promote exercise or physical activity by establishing physical activity policies, increasing sports' equipment, and providing access to safe spaces and facilities for exercise in the school and the community.

School nurses should ensure that adolescents participate in physical education classes, extracurricular exercise programs, and community sports and recreation programs in which the adolescent will experience enjoyment and success. This can be considered as an increase in perceived self-efficacy in exercise behavior in adolescents.

In addition, adolescents need opportunities to observe others performing the skills and to receive encouraging feedback, and repeated opportunities for exercise during physical education class, during recess, and immediately before and after school. Thus, nurses have to enable school personnel and parents to participate in

physical activities and other healthy behaviors which should help them serve as role models for adolescents.

Especially, parents should try to be role models for exercise behavior and should support, plan and participate in family activities. Parents support can encourage their children to be active with their friends. Adolescent 's participation in sedentary activities (e.g., watching television or playing computer games) should be monitored and replaced with exercise activity, and parents or peers should encourage them to play outside in safe places and in supervised playgrounds and parks.

3. Nursing intervention should focus on the increasing adolescents' perceived self-efficacy and the involvement of parents and school. Nurses will have an important role to provide information, transfer knowledge, ensure understanding, and encourage recognition of personal beliefs and values about health and health related behavior which is specific for actual daily activity in order to reduce CHD risk behaviors. Nurse should be concerned with the following:

- Harmful health effects that do not come from smoking alone but also passive smoking is a danger factor.
- Adolescents should not consume more than one egg a day. Nurses should give information on food that has high cholesterol, high fat, and high calorie especially fast food.
- Avoiding alcoholic beverage including frequency and quantity, which will produce harmful health effect.
- Caffeine is not only found in coffee but in other beverages such as, cocoa, chocolate, Coca-Cola, etc.

4. Nursing intervention, besides its focus on adolescents themselves should also recognize the role of parents and peers as factors contributing to CHD risk behaviors and promote good model behavior especially father to have avoiding CHD risk behaviors. Nurses should motivate family members and peer groups as a whole to set norms for healthy behavior, infringement of which brings about disapproval and exert social pressure. Promote good behavior model and important social support for adolescent to maintain good health behaviors.

Implications for nursing education

The result of this research could be used as teaching materials for nursing students with the purpose to make them realize the importance of promoting adolescent health behaviors. This could be done by emphasizing psychosocial competencies, interpersonal influence and perceived self-efficacy, factors, which would have an effect on adolescent health promoting behavior and avoidance of risk behaviors for CHD.

Implications for nursing research

Based on the limitation and findings of this study, several recommendations for future research are presented.

1. An intervention study using action research techniques or experimental research design is recommend especially for avoiding CHD risk behaviors and having good health behavior by increasing perceived self-efficacy and the received good norm, social support, and modeling from parents and peers.

2. Replication of this study with various age groups and population (i.e., early adolescent, school-age children, including school-age children who are not in school) should be conducted in order to increase the generalization of the research findings. Besides, a longitudinal follow up study is needed to assess change over time, of factors associated with CHD risk behaviors.

3. Adjustment this research instrument should be concerned, especially the part of Interpersonal Influence Questionnaire, in order to assess the adolescents who haven't parents but live with other primary caregivers.

4. Other factors, which relate to adolescent health behaviors such as situational influences, cognitive ability and immediate competing preferences should be studied and may contribute to a better understanding of adolescent CHD risk behavior.

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APPENDIX

Appendix A

Questionnaire

Questionnaire Number

.....

Part I Personal data questionnaire

Instruction: Please answers these questions about yourself by putting a cross in the bracket or filling up the statement in the blanks, as appropriate.

1. Sex ( ) male ( ) female.
2. Age _____years.
3. Education

   Matthayomsuksa_____

   Vocational Certificate year _____
4. Weight_____ kg.

   Height_____cm
5. Have you had any illness, or other health problems?

   ( ) no ( ) yes Please state _____
6. Have your direct relatives like father, mother, brothers and sisters experienced of hypertension or CHD such as a chest pain?

   ( ) no ( ) yes
7. Number of your close friends_____
8. You live with

   ( ) parents ( ) father ( ) mother

   ( ) others, please state_____

Part II Perceived Self - Efficacy Questionnaire regarding Prevention of Health Risk Behaviors from CHD in Adolescents

Instruction :

This questionnaire contains 17 questions, each of which inquires about your confidence in preventing your health risk behavior from CHD. Think it over before answering, then fill in the blanks with your confidence scores in carrying out each behavior by putting a cross to indicate the confidence score which must closely reflects your feelings. Your answers are considered neither wrong nor right, instead the best answer is the one that most relevant to your feelings.

Each answer means as following

0 = ***No confidence*** means that you have no confidence (0%) in performing or possessing the behavior

1 = ***little confidence*** means that you have little confidence (less than 50%) in performing or possessing the behavior

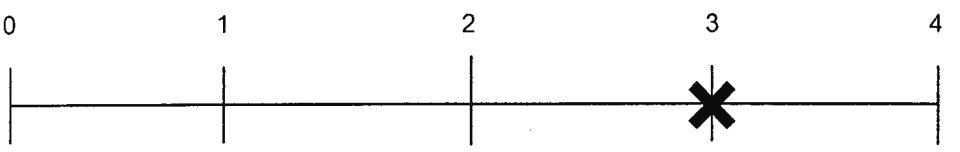
2 = ***moderate confidence*** means that you have average confidence (50%) in performing or possessing the behavior

3 = ***much confidence*** means that you have much confidence (more than 50% but less than 100%) in performing or possessing the behavior

4 = ***most confidence*** means that you have the most confidence in performing or possessing the behavior (100%)

Examples:

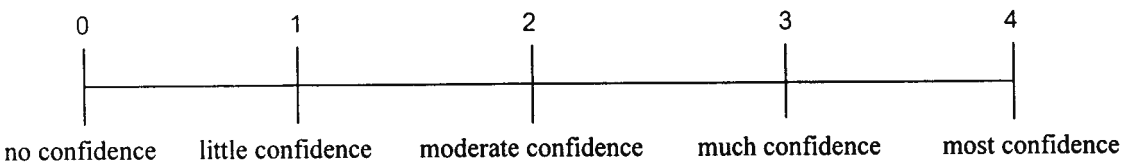
I can avoid eating half-cooled food.



no confidence little confidenc moderate confiden much confidenc most confidence

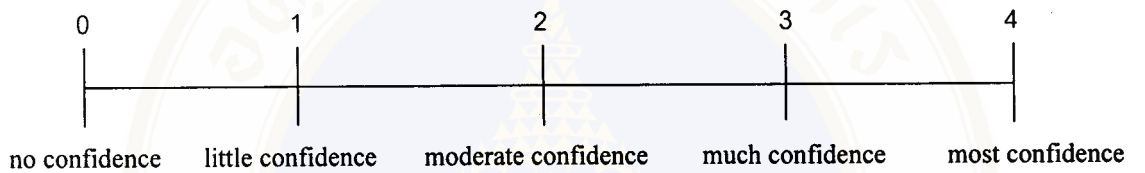
Note You have much confidence (more then 50% but less than 100% in avoiding eating half-cooked food.)

1. I can stop cigarette smoking or I won' t smoke from now on

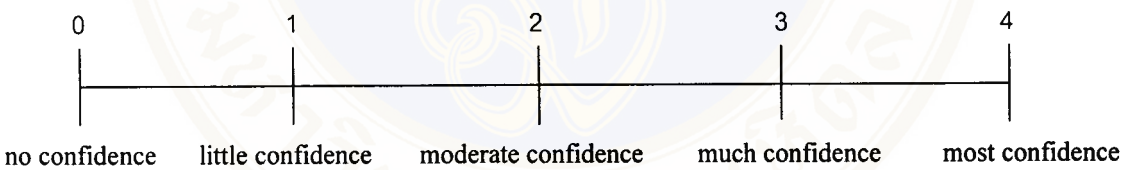


2. I can avoid entering in smoking room or being among heavy smokers,

e.g. snooker clubs, pubs, discos, even though insisted by peers.



3. I can exercise at least three times a week, each time for 20-30 minutes.



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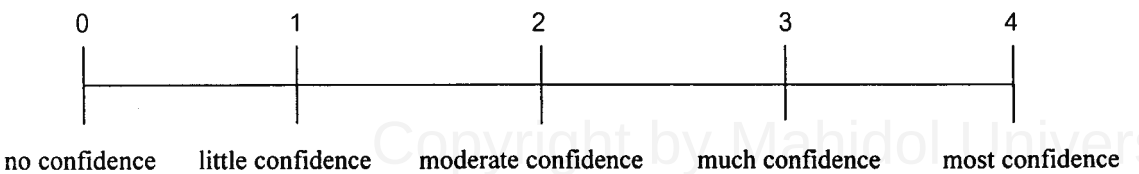
17. I can avoid drinking energizing drinks



Part III Interpersonal Influence Questionnaire Health Risk Behavior from CHD in adolescents.

Instructions:

This questionnaire is aimed to study norms, social support and modeling examples from both parents and peers regarding various kinds of behavior in daily life in your opinion. Each answer is neither right nor wrong, in fact the best answer is which most closely reflacts your own experience of is interchange between you and the people around you. Make a tick on the choice you want. Please answer all items. There are two sections; section 3.1 has 18 items and section 3.2 has 11 items.

Section 3.1

very true means you feel that statement is the most true.

true means you feel that statement is quite true.

not sure means you feel that statement is half true.

not true means you feel that statement is least true.

not true at all means you feel that statement is not true at all

Example

statement	very true	true	not sure	not true	not true at all
your friends agree that you spend your free time on sport		√			

It means your friends agree that you spend your free time on sport. This is true, in your feeling.

Statement	very true	true	not sure	not true	not true at all
1. Parents influence you on your not smoking					
2. Peers have an effect on your smoking.					
3. Parents influence you not to drink alcoholic drinks like whisky on beer.					
.					
.					
.					
.					
.					
.					
.					
.					
.					
17. Your parents and you usually go to public parks or health centers in order to play sports in your free time or on holidays.					
18. Your friends blame you for drinking tea, coffee or other energizing drinks.					

Section 3.2

Instructions: Please tick (✔) on the appropriate frequency of individual functioning behavior for mother, father, and close friends.

Example.

	MOTHER					FATHER					CLOSE FRIENDS				
	Never	seldom	some time	usually	every day	never	seldom	some time	usually	every day	never	seldom	some time	usually	every day
Drinking milk	✔									✔				✔	

It means Your mother never drinks milk. Your father drinks milk every day. Your friends usually drink milk.

Section 3.2

	Mother					Father					Close friends				
	never	seldom	some times	usually	every day	never	seldom	some times	usually	every day	never	seldom	some times	usually	every day
❁ Smoke cigarettes															
❁ Stay in smoking areas or among heavy smokers.															
❁ Drink whisky, beer, wine.															
❁ Drink plain water instead of soft drinks.															
.															
.															
.															
. . .															
❁ Eat plain meat like fish, chicken, pork.															
❁ Eat vegetable and fruits.															
❁ Eat food containing coconut cream, lard.															

Part IV Adolescent CHD Risk Behaviors Questionnaire

Instructions: This questionnaire is designed to assess your prior behavior in all four cases smoking and staying in smoke filled areas, exercising, food taking and drinking alcoholic and caffeine beverages. Each answer is neither right nor wrong, in fact the most correct answer which is most appropriate to your prior behavior. Please answer with a tick in the following choices.

Everyday means that you routinely have the behavior or perform the activity everyday.

Usually means that you have the behavior or perform the activity nearly everyday, i.e. 4-6 days/week.

Sometimes means that you sometimes have the behavior or perform the activity, i.e. 1-3 days per week.

Seldom means that you seldom have the behavior or perform the activity i.e. 1-3 times a month.

Never means that you rarely or never have the behavior or perform the activity i.e. less time , once a month

Example

Behavior	Everyday	Usually	Sometime	Seldom	Never
You eat boiled rice with pork, chicken in boiled rice, shrimp in boiled rice.		✔			

It means that you eat pork boiled rice or chicken boiled rice or shrimp boiled rice, one or all kinds, between four and six times a week.

Behavior	Everyday	Usually	Sometime	Seldom	Never
1. I smoke more than one cigarette a day. 2. I stay among smokers in smoke filled excess more than an hour. . . . . 29. I exercise until I sweat, my heart beats faster and my respiration rate increases 30. I sit and lie for long hours continuously such as watching TV, reading novels or cartoons, playing computer games, etc.					

APPENDIX B

Consent to Participate in Research Study

I, Khanidtha Teewaree, am a graduate nursing student, Nursing Department, Faculty of Medicine, Ramathibodi Hospital, Mahidol University. I am currently conducting research about "The Relationships between Perceived Self - efficacy, Interpersonal influence and Coronary heart disease risk behaviors in Adolescents. You are a member of the target population. I request that you complete this questionnaire. Your answer will be beneficial for understanding adolescent's perceived self efficacy, interpersonal influence and CHD risk behaviors.

All data which you provide in this questionnaire will be kept secret and will be used only to present an overall picture. I have received permission to conduct this study from the teacher in accordance with regulation.

Thank you for your kind cooperation.

Khanidtha Teewaree

Researcher

Appendix C

Data of perceived self – efficacy

Table18 Mean standard deviation and frequency of perceived self–efficacy by each item from highest mean to lowest. (n = 428)

Statement	X	S.D.	No & little Confidence	Moderate Confidence	Much & most Confidence
I can stop smoking cigarette …	3.66	.86	21 (4.91)	17 (3.97)	390 (91.12)
I can avoid drinking …	3.57	.82	16 (3.74)	25 (5.84)	387 (90.42)
Wherever I am, I can avoid...	3.44	.95	25 (5.84)	41 (9.58)	362 (84.58)
I can avoid drinking beer, …	3.44	.96	27 (6.31)	34 (7.94)	367 (85.75)
I can eat vegetable and fruits every…	2.98	1.05	42 (9.81)	85 (19.86)	301 (70.33)
I can use plant oil e.g. soybean oil, …	2.95	1.15	53 (12.38)	79 (18.46)	296 (69.16)
I can avoid being in smoking gone or in among heavy smokers …	2.84	1.07	45 (10.51)	107 (25)	276 (64.49)
I sweat and my heart rates faster when …	2.69	1.10	66 (15.42)	111 (25.93)	251 (58.65)
I can exercise at least three times a week…	2.57	1.22	86 (20.09)	129 (27.81)	223 (52.10)
I can drink fresh water not sweet or soft drinks.	2.46	1.24	109 (25.47)	93 (21.73)	226 (52.80)
I can eat cereal food ….	2.46	1.12	83 (19.39)	143 (33.41)	202 (47.20)
I can eat an egg a day.	2.41	1.20	93 (21.73)	134 (31.31)	201 (46.96)
I can avoid drink coffee, tea, chocolate, co - co.	2.17	1.22	120 (28.04)	129 (30.14)	179 (41.82)

Statement	X	SD.	Usually & Everyday (%)	Seldom & Sometime (%)	Never (%)
I can avoid eating fast food, such as Pizza …	2.11	1.15	124 (28.98)	152 (35.51)	152 (35.51)
I can avoid eating high cholesterol food …	2.09	1.03	115 (26.87)	168 (39.25)	145 (33.88)
No matter how hard it is, I can to avoid …	2.04	1.14	133 (31.08)	154 (35.98)	141 (32.94)
I can avoid eating sweet friend food …	1.96	1.04	131 (30.61)	168 (39.25)	129 (30.14)

Appendix D

Part 3.1 Data of interpersonal influence.

Table18 Mean and stand deviation and frequency of interpersonal influence (n = 428)

Statement	X	S.D.	True Very true	Not sure	Not true Not true at all
NORM	4.18	1.31	338	30	60
1 Parents influence you on your no smoking.			(78.98)	(7.01)	(14.01)
2 Peers have an effect on yours smoking.	3.78	1.40	104 (24.30)	56 (13.08)	268 (62.62)
3 Parents influence you not to drink...	3.82	1.35	280 (65.42)	69 (16.12)	79 (18.46)
6 Your most friends are fond of playing...	(3.86)	(1.07)	280 (65.42)	99 (23.13)	49 (11.45)
7 Your parents like eating high fatty...	(2.71)	(1.01)	179 (41.82)	165 (38.55)	84 (19.63)
8 Most of your friends like eating fast...	(2.39)	(.98)	241 (56.31)	132 (30.84)	55 (12.85)
13 You friends are gathering around...	(3.90)	(1.20)	66 (15.42)	79 (18.45)	283 (66.13)
SOCIAL SUPPORT					
4 Your friends persuade you to drink...	3.56)	1.33	123 (28.73)	68 (15.89)	237 (55.38)
5 Your parents encourage you to spend...	(4.09)	(.99)	318 (74.30)	81 (18.92)	29 (6.78)
9 Your parents encourage you to eat...	(4.10)	(.95)	334 (78.04)	61 (14.25)	33 (7.71)
10 When having outing at shopping ...	(2.03)	(.97)	318 (74.30)	71 (16.58)	39 (9.12)
11 On social meeting, friends always...	(3.56)	(1.36)	119 (27.80)	71 (16.59)	238 (55.61)
12 When being in frustration; you are...	(3.99)	(1.26)	311 (72.66)	55 (12.85)	62 (14.49)
14 At home, your parents prepare soft...	(3.20)	(1.27)	141 (32.94)	91 (21.26)	196 (45.80)
15 Your parents are preparing desserts...	(3.86)	(1.00)	293 (68.46)	96 (22.43)	39 (9.11)
16 Your parents advise you not to drink ...	(4.11)	(1.24)	329 (76.86)	41 (9.59)	58 (13.55)
17 Your parents and you usually go to...	(2.89)	(1.19)	133 (31.07)	131 (30.61)	164 (38.32)
18 Your friends blame you on drinking...	(2.79)	(1.23)	121 (28.27)	125 (29.20)	182 (42.53)

Part 3.2
Modeling

	Mother					Father					Close friends				
	$\bar{X}$	S.D.	■ (%)	▲ (%)	● (%)	$\bar{X}$	S.D.	■ (%)	▲ (%)	● (%)	$\bar{X}$	S.D.	■ (%)	▲ (%)	● (%)
❀ Smoke cigarettes	4.80	0.79	395 (92.29)	15 (3.50)	18 (4.21)	3.61	1.72	236 (55.14)	58 (13.55)	134 (31.31)	4.38	1.23	319 (74.53)	61 (14.25)	48 (11.22)
❀ Stay in smoking …	3.88	1.17	158 (36.92)	207 (48.36)	63 (14.72)	3.22	1.45	95 (22.20)	196 (45.79)	137 (32.01)	3.85	1.16	152 (35.51)	214 (50)	62 (14.49)
❀ Drink whisky, beer, and wine.	4.42	0.83	251 (58.64)	164 (38.32)	13 (3.04)	3.63	1.24	125 (29.21)	219 (51.16)	84 (19.63)	4.28	0.95	227 (53.04)	179 (41.82)	22 (5.14)
❀ Drink plain water instead of soft drinks.	3.83	1.26	24 (5.61)	122 (28.50)	282 (65.89)	3.76	1.28	27 (6.31)	132 (30.84)	269 (62.85)	3.29	1.20	32 (7.48)	208 (48.60)	188 (42.92)
❀ Exercise or play sports …	2.38	1.18	106 (24.77)	248 57.94)	74 (17.29)	2.60	1.26	94 (21.96)	235 (54.91)	99 (23.13)	3.43	1.31	38 (8.88)	181 (42.29)	209 (48.83)
❀ Exercise or play sport continually …	2.11	1.13	152 (35.52)	226 (52.80)	50 (11.68)	2.30	1.22	130 (30.37)	227 (53.04)	71 (16.59)	3.26	1.32	44 (10.28)	202 (47.20)	182 (42.52)
❀ Eat fast food e.g. Pizza, …	4.07	0.81	130 (30.37)	285 (66.59)	13 (3.04)	4.12	0.83	149 (34.81)	261 (60.98)	18 (4.21)	3.16	0.94	23 (5.37)	314 (73.37)	91 (21.26)
❀ Drink tea, coffee, CoCo, …	3.35	1.46	127 (29.67)	172 (40.19)	129 (30.14)	2..91	1.42	73 (17.06)	176 (41.12)	179 (41.82)	3.46	1.07	79 (18.46)	279 (65.18)	70 (16.36)
❀ Eat plain meat like fish, chicken, pork.	3.39	1.14	24 (5.61)	203 (47.43)	201 (46.96)	3.35	1.12	22 (5.14)	206 (48.13)	200 (46.73)	3.28	1.06	20 (4.67)	228 (53.27)	180 (42.06)
❀ Eat vegetable and fruits.	4.11	1.03	11 (2.57)	79 (18.46)	338 (78.97)	4.02	1.02	12 (2.80)	94 (21.96)	322 (75.24)	3.76	1.03	11 (2.57)	142 (33.18)	275 64.25)
❀ Eat food seasoned with coconut cream, lard.	3.25	0.99	44 (10.28)	299 (69.86)	85 (19.86)	3.24	0.97	40 (9.35)	302 (70.56)	86 (20.09)	3.14	0.98	29 (6.78)	295 (68.92)	104 (24.30)

Comment:

■ = *never*

▲ = *seldom and sometime*

● = *usually and everyday*

LIST OF EXPERTS

The content validity of all questionnaires were determined by four experts include:

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