COMPARISON OF PERSONAL AND REPRODUCTIVE HEALTH BEHAVIOR BETWEEN FEMALE PATIENTS ADMITTED WITH CARDIOVASCULAR DISEASES, FEMALE PATIENTS ADMITTED WITH NON CARDIOVASCULAR DISEASES AND FEMALES WHO HAD NOT BEEN ADMITTED TO HOSPITAL

SUPHANSA WORAMALEE

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Suphansa Woramalee
.....
Miss. Suphansa Woramalee
Candidate

Somsak Suthutvoravut
.....
Assoc.Prof. Somsak Suthutvoravut.,
M.D.,Dip. Thai Board of Ob. & Gyn.
Dip.Field Epidemiology (C.D.C.)
Major -Advisor

V. Singhakajen
.....
Assoc. Prof. Vajira Singhakajen,
B.A.(Stat), LL. B.,
M.A.(Demography)
Co-Advisor

B. Mahaisavariya
.....
Prof. Banchong Mahaisavariya
M.D. Dean
Faculty of Graduate Studies

Somsak Suthutvoravut
.....
Assoc. Prof. Somsak Suthutvoravut.,
M.D.,Dip. Thai Board of Ob. & Gyn.
Dip.Field Epidemiology (C.D.C.)
Chair
Master of Science Programme in
Human Reproduction and Population
Planning
Faculty of Medicine Ramathibodi
Hospital

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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Science (Human Reproduction and Population Planning)
on
August 20, 2008

Suphansa Woramalee
.....
Miss. Suphansa Woramalee
Candidate

Sanya Patrachai
.....
Assist.Prof. Sanya Patrachai,
M.D.,Dip. Thai Board of Ob. & Gyn,
M.P.H.
Chair

Somsak Suthutvoravut
.....
Assoc. Prof. Somsak Suthutvoravut.,
M.D.,Dip. Thai Board of Ob. & Gyn.
Dip.Field Epidemiology (C.D.C.)
Member

Laor Chansuta
.....
Miss. Laor Chansuta
M.Sc, (Human Reproduction and
PopulationPlanning)
Member

V. Singhakajen
.....
Assoc. Prof. Vajira Singhakajen,
B. A.(Stat), LL. B.,
M. A.(Demography)
Member

B. Mahaisavariya
.....
Prof. Banchong Mahaisavariya
M.D. Dean
Faculty of Graduate Studies
Mahidol University

Rajata Rajatanavin
.....
Prof. Rajata Rajatanavin
M.D., F.A.C.E.,
Dean
Faculty of Medicine
Ramathibodi Hospital
Mahidol University

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Suphansa Woramalee

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SUPHANSA WORAMALEE 4837944 RAHP/M

M.Sc. (HUMAN REPRODUCTION AND POPULATION PLANNING)

THESIS ADVISORS: SOMSAK SUTHUTVORAVUT, M.D. (THAI BOARD OF OB. & GYN.), SANYA PATRACHAI, M.D. (THAI BOARD OF OB. & GYN.),
VAJIRA SINGHAKAJEN, B.A. (STAT.), LL.B., M.A.

ABSTRACT

Cardiovascular diseases (CVDs) are a common disease which is a major cause of death and morbidity. Women are less likely to have CVDs due to intrinsic sex hormone factors and lifestyle factors. This study is an analytical research, the objectives of which were to study factors associated with CVDs among women. Cases were 45 women who were admitted due to CVDs in Siriraj Hospital from 1st May 2007 to 31st July 2008 and who were between 15-59 years old .The control consisted of 2 groups; one was a non CVD group who were admitted due to other non-severe diseases at the same time as the CVD case. The other was a non admitted to hospital group who mostly were health personnel in the hospital who reported no chronic diseases. Both control groups were matched by age with the CVDs cases. The questionnaires consisted of 5 parts: demographic factors, physiologic factors, activities of daily life, sexual behavior and contraception and general health. Data was collected by interviewing. Data were analyzed descriptively by frequency, percentage, mean and standard deviation. Odd ratio and multiple logistic regression analysis were applied to test significant association at the level of $p<0.05$ by SPSS statistical program.

The results showed that the significant factors associated with CVD patients when compared with non CVD patients were: no exercise (OR=6.52, 95%CI 1.70-25.03), use of hormonal contraception (OR=5.83, 95% CI 1.20-28.36), high calorie intake (>2,000 Kcal/day) (OR=5.09, 95% CI 2.02-12.62), height<160cms (OR=4.12, 95% CI 1.69-10.04), systolic blood pressure >130 mmHg (OR=2.34, 95% CI 1.15-3.78) , weight >60 kg. (OR=1.89, 95% CI 1.39-2.57), body mass index 25.1-30 kg/m^2 (OR=1.71, 95% CI 1.00-2.92). Similar results were obtained when comparing CVD patients with the non admitted group but more factors were found to be significantly associated with CVD. They were education (less than secondary school) (OR=9.28, 95% CI 3.31-25.97), infrequent sexual intercourse (OR=4.85, 95%CI 1.60-14.70), diastolic blood pressure>85 mmHg. (OR=4.75, 95% CI 1.67-13.48).

In conclusion, factors associated with CVD in women were associated with lifestyle i.e. no exercise or high calorie intake. Regarding reproductive health, use of hormonal contraception is a contributing factor. This knowledge should be disseminated for women to change their lifestyles and realize the risk of developing CVD when hormonal contraception is used.

KEY WORDS: CARDIOVASCULAR DISEASE

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เปรียบเทียบพฤติกรรมส่วนบุคคลและอนามัยเจริญพันธุ์ระหว่างผู้ป่วยหญิงที่รับไว้ในโรงพยาบาลด้วยโรคหัวใจหลอดเลือด, ผู้ที่ไม่ได้เป็นโรคหัวใจหลอดเลือดและผู้หญิงที่ไม่ได้รับไว้ในโรงพยาบาล (COMPARISON OF PERSONAL AND REPRODUCTIVE HEALTH BEHAVIOR BETWEEN FEMALE PATIENTS ADMITTED WITH CARDIOVASCULAR DISEASES, FEMALE PATIENTS ADMITTED WITH NON CARDIOVASCULAR DISEASES AND FEMALES WHO HAD NOT BEEN ADMITTED TO HOSPITAL)

สุพรรษา วรมาลี 4837944 RAHP/M

วท.ม. (การเจริญพันธุ์และวางแผนประชากร)

คณะกรรมการควบคุมวิทยานิพนธ์: สมศักดิ์ สุทัศน์วรวุฒิ, พ.บ.ว.ว. (สูตินรีเวช), สัญญา ภัทราชัย, พ.บ.ว.ว. (สูตินรีเวช), วชิระ สิงหะคเชนทร์, สคม. (ประชากรศาสตร์)

บทคัดย่อ

โรคหัวใจหลอดเลือดเป็นโรคที่พบได้บ่อย มีความเสี่ยงต่อการเสียชีวิตและทุพพลภาพสูง ปกติสตรีจะมีโอกาสเป็นโรคน้อยกว่าบุรุษอาจจะเนื่องจากฮอร์โมนเพศ และการปฏิบัติตัว การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่มีความสัมพันธ์ต่อการเกิดโรคหัวใจหลอดเลือดในสตรีที่รับไว้รักษาในโรงพยาบาลศิริราชจำนวน 45 คน วันที่ 1 พ.ค. 2550 ถึง 31 ก.ค. 2551 มีอายุระหว่าง 15-59 ปีโดยมีกลุ่มควบคุม 2 กลุ่ม คือ กลุ่มที่เป็นโรคระบบอื่นที่รับไว้โรงพยาบาลในระยะเวลาเดียวกันและผู้ไม่เป็นโรคซึ่งเป็นบุคลากรในโรงพยาบาล โดยใช้อายุเป็นตัวแปรควบคุม การเก็บรวบรวมข้อมูลใช้แบบสอบถามแบ่งเป็น 5 ส่วน ได้แก่ข้อมูลทางด้านประชากร,ด้านกายภาพ,การใช้ชีวิตประจำวัน , พฤติกรรมเกี่ยวกับอนามัยเจริญพันธุ์ และสุขภาพทั่วไป วิเคราะห์สถิติโดยใช้ค่าร้อยละ ค่าเฉลี่ยส่วนเบี่ยงเบนมาตรฐาน ใช้ค่า Odd ratio และการวิเคราะห์การถดถอยพหุแบบลอจิสติก ใช้เพื่อทดสอบความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ ที่ระดับความเชื่อมั่น ร้อยละ 95

ผลการศึกษาพบว่าปัจจัยที่มีความสัมพันธ์กับการเกิดโรคหัวใจหลอดเลือดเมื่อเปรียบเทียบสตรีกลุ่มที่เป็นโรคอื่น ได้แก่ การไม่ออกกำลังกาย (OR=6.52, 95%CI 1.70-25.03) ยาคุมกำเนิดชนิดฮอร์โมน (OR=5.83, 95%CI 1.2-28.36) การรับประทานอาหารที่มีแคลอรี่สูง (OR=5.09, 95%CI 2.02-12.62) ส่วนสูงน้อยกว่า 160 เซนติเมตร (OR=4.12, 95%CI 1.69-10.04) ความดันโลหิตซีสโตลิคมากกว่า 130 มิลลิเมตรปรอท (OR=2.34, 95% CI 1.15-3.78) น้ำหนักมากกว่า 60 กิโลกรัม(OR=1.89, 95%CI 1.35-2.57) และดัชนีมวลกาย 25.1-30 กิโลกรัม/เมตร^2 (OR=1.71, 95%CI 1.00-2.92) เมื่อเปรียบเทียบโรคหัวใจหลอดเลือดกับสตรีที่มีสุขภาพดี ได้ผลใกล้เคียงกัน ปัจจัยที่มีความสัมพันธ์เพิ่มเติมได้แก่ การศึกษาต่ำกว่าอุดมศึกษา (OR=9.28, 95%CI 3.31-25.97) การร่วมเพศนานๆ ครั้ง (OR=4.85, 95%CI1.60-14.70) ความดันโลหิตไดแอสโทลิคมากกว่า 85 มิลลิเมตรปรอท (OR= 4.75,95%CI 1.67-13.48) โดยสรุป ปัจจัยที่สตรีมีความเสี่ยงจะเกิดโรคหัวใจหลอดเลือด ส่วนใหญ่เป็นผลจากการปฏิบัติตัว ได้แก่ การไม่ออกกำลังกาย การรับประทานอาหารที่มีแคลอรี่สูง ทางด้านอนามัยเจริญพันธุ์พบว่า การใช้ฮอร์โมนคุมกำเนิดยังคงเป็นปัจจัยที่มีนัยสำคัญ ซึ่งปัจจัยเหล่านี้สามารถแก้ไขได้ ควรเผยแพร่ความรู้เหล่านี้ให้สตรีทราบเพื่อเปลี่ยนแปลงชีวิตประจำวันและตระหนักถึงความเสี่ยงที่จะเกิดโรคหัวใจหลอดเลือด

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CHAPTER I
INTRODUCTION

Significance of Problem

Cardiovascular disease (CVD) is one of the first three leading causes of death among the Thai population. Cardiovascular disease is defined as "the disorder of the heart and the arterial circulation supplying the heart, brain, and peripheral tissues"

Cardiovascular disease included a variety of disease of the heart and blood vessel, coronary heart disease, stroke, hypertension, rheumatic heart disease, congestive heart failure, and peripheral artery disease. Patient with Congestive heart disease, atherosclerotic disease of the aorta or peripheral arteries, or carotid artery disease were at high risk for heart attack and CVD death. About 50 percent of all heart attacks and at least 70 percent of CVD death occur in individuals with prior symptoms of CVD. The risk for heart attack and death among persons with CVD was five to seven times higher than among the general population. (1)

Worldwide, Cardiovascular disease (CVD) is one of the first five leading causes of death. There was agreement as to the importance of vascular disease and its impact on the community. Time move on and clinical emphasis has changed from communicable disease to non-communicable disease. Cardiovascular diseases (CVD) present a major health problem. It claimed 40.6 percent of all deaths or 1 of every 2.5 deaths in the United States (US) in 1998. CVD was about 70 percent of "total mental mortality it" was listed as a primary or contributing case on death certificates. Since 1900, (2)

CVD has been the number one killer in the United States every year. From 1988 to 1998 death rates from 22.0 to 20.4 percent. The problem accounts for more than 10 million deaths each year and is predicted an increase to 20 million by the year 2005. In developed countries, approximately 5.2 million or one-half of all deaths can be contributed to cardiovascular disease, primary coronary heart disease (2.7 million)

and stroke (1.4 million). According to advances in medical care and primary prevention factors such as life-style changes to modify risk factors. During the past several decades, Thailand has experienced rapid economic growth and an epidemiologic transition. Economic development, social change and intensive preventive measure have led to major progress in controlling infectious disease. On the other hand, changes in lifestyle and diet, along with an increase in life expectancy and urbanization, may contribute to the emergence of chronic diseases progressively each year since 1975, and has become one of the first three leading causes of death among Thai population for more than 10 years .(3)

In Thailand, although communicable diseases still dominate morbidity, on communicable morbidity is steadily and cardiovascular diseases are becoming major causes of morbidity. However, treatment of cardiovascular disease is being given higher priority than prevention.

The risk of CVD grows with age. CVD is primarily a disease of aging. About four out of five people who die of coronary heart disease are age 65 or older. Men's heart problem tends to peak earlier. In, women heart disease tends to peak at age 65. It is significantly higher in men over 45 years of age. At older ages, women who have heart attacks more likely than men are to die from them within a few weeks. Increase in life expectancy in many proportions and the growing proportions of these populations attaining advanced age have profound impacts on cardiovascular disease.

It is the author's interest that reproductive history and lifestyles are significant contributing factors to CVD. Longitudinal or cohort study is very difficult and expensive to do. Case control study is the best way to find these significant association but the results would depend on the control group. In this study, both control of non CVD group and healthy group of women were selected as controls.

Objective of the study

To study the association and relative risk between three groups (CVD, non CVD, non admitted group) the following factors were included:

1. Demographic factors, i.e. age, marital status, no. of children, education, and occupation.

2. Physiologic factors, i.e. weight, height, body mass index, systolic blood pressure, and diastolic blood pressure.

3. Activities of daily life, i.e. calorie intake, exercise, smoking, alcoholic intake.

4. Sexual behavior, i.e. time of menopause, duration of marriage, no. of husband, frequency of sexual intercourse, history of contraception used.

5. General health, i.e. other medical disease, other medical treatment than CVD.

Limitation

The study was done in a University Hospital which is located in the urban area of Bangkok. Most women lived nearly the hospital. The study showed only applied to women who live in the urban area of Thailand. The study of women who marriage or relation with a husband who with cardiovascular disease, non CVD and non admitted to comparison with be risk that make factor is the cardiovascular disease 15-59 years old.

Definitions

Cardiovascular disease group mean women had disease of CVD according to ICD10 and were admitted into Siriraj Hospital for treatment during 1 May 2007 to 31 July 2008.

Non CVD group mean women were sick with other diseases than with cardiovascular disease and were admitted for treatment at the same time as cases. The examples for other diseases were glaucoma, cataract, ears infection, nose infection and urinary tract infection.

Non admitted or healthy group mean women had no chronic disease and had never been and admitted for treatment in any hospitals.

Blood pressure (BP): Blood pressure levels were classified according to 1999 WHO-ISH Guidelines for the Management of Hypertension as follows:

- Optimal blood pressure mean SBP<120mmHg and DBP<80 mmHg
- Normal blood pressure mean SBP<130mmHg and DBP<85 mmHg

- High-normal blood pressure mean SBP<130-139 mmHg and DBP 85-89 mmHg

Cigarette smoking: Cigarette smoking was defined by cigarette smoking habits and number of cigarette smoked per day.

- Non smoker mean a person who never smoked
- Smoker means a person who smoked for more than 12 months.

Alcohol intake: Alcohol intake was defined by drinking alcohol beverage habits and average amounts of glasses of alcohol is beverage consumed per day.

Exercise habit: Exercise habit was defined as follows:

- No exercise means person who habitually never exercises at all.
- Moderate exercise means a person who performs any types of exercise less than 3 times per week and/or less than 30 minutes per day.
- Regular exercise or adequate exercise means a person who performs an aerobic activity such as walking, running, biking, or swimming for at least 30 minutes per day at least three times per week.

Eating habit: Eating habit was defined by frequency of eating selected foods categorized as high or low calories intake. Intake more than 2,000 calories per day was categorized as high intake. The samples were asked about their kinds regular diets on their average days of life. From the information type of eating habit were classified.

Expected Outcome and Benefits

1. Results of this study will be useful for personal medical and publish health for health promotion and prevent cardiovascular diseases.
2. Recommendation about contraception and CVD.

Conceptual Framework

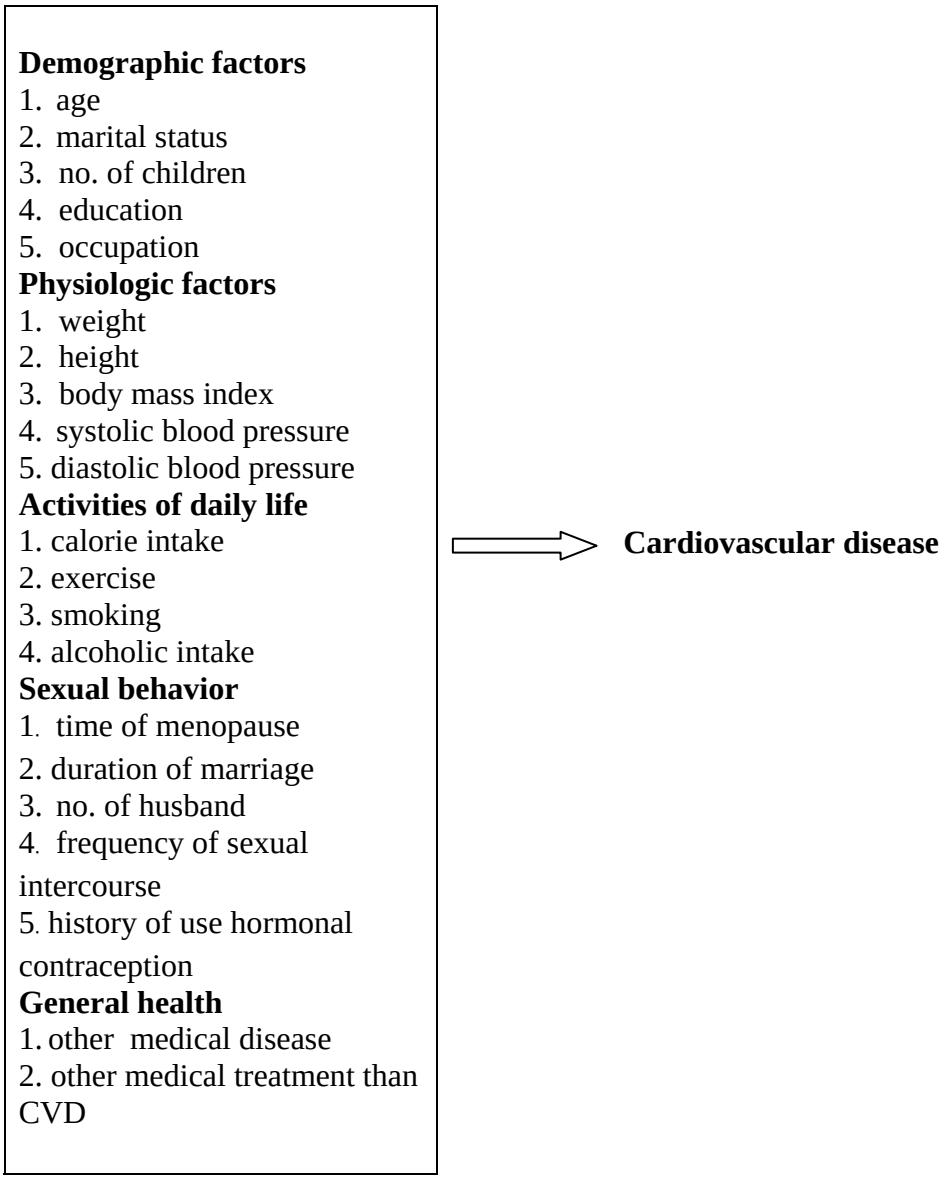

Figure 1 The factors associated with CVD

CHAPTER II
LETERATURE REVIEW

The literature review will be focus on the following topics.

1. Cardiovascular disease
2. Risk factors of CVD
3. Reproductive health and CVD
4. Related literature

1. Cardiovascular disease

Cardiovascular disease (CVD) or circulatory disease comprises the major disorder of the heart and the arterial circulation supplying the heart, brain, and peripheral tissues. The scope of CVD is given in a classification of circulatory system diseases published by the World Health Organization in its International Statistical Classifications of Diseases and Related Health Problems 10th revision (ICD 10), which is the authoritative source of such a classification throughout the world. The ICD10 present classifies of diseases of the circulatory system as follows: (4)

Diseases of circulatory System (I00-I99)

I00-I02	Acute rheumatic fever
I05-I09	Chronic rheumatic heart disease
I10-I15	Hypertensive disease
I20-I25	Ischemic heart disease
I26-I28	Pulmonary heart disease and disease of pulmonary circulation
I30-I52	Other forms of heart disease
I60-I69	Cerebrovascular disease
I70-I79	Disease of arteries, arterioles and capillaries
I80-I89	Disease of veins, lymphatic vessels and lymph nodes, not elsewhere classified
I95-I99	Other and unspecified diseases of the circulatory system

2. Risk factor of cardiovascular disease (CVD)

"Risk factors" mean factors that are related to the cause of disease, compared with people who do not have those factors. Heart failure may be the final and most severe manifestation of nearly every form of cardiac disease, including coronary atherosclerosis, myocardial infarction, valvular disease, hypertension, congenital heart disease, and the cardiomyopathies. More than 400,000 new case of heart failure develop in the United States each year, and approximately 5 million people currently have this condition. It accounts for more than 12 million yearly medical office visits and is the most common diagnosis of hospitalized patients age 65 and older. The incidence of heart failure is actually increasing, in part because the population is aging, and also because of interventions that prolong survival after cardiac insults such as myocardial infarction.

It is anticipated that CVD will increase and turn to be the leading cause of death in developing countries in the future. Four factors are determined the increase in death and disability from these diseases. Firstly, there is the increase in the middle and older are groups that are likely to develop CVD. Secondly, older age groups are more exposed to risk factors. Thirdly; lifestyles tend to change along with industrialization and urbanization. And fourthly, CVD may shift from high to low socioeconomic groups as happened in developed countries. (6)

2.1 Age and Sex

The differences in risk factors of CVD according to sex are recognized in the first month of life but become clearer with adolescence and the many changes associated with puberty. Age specific mean values for systolic and diastolic blood pressure and for multiple component of the blood lipid profile differ by sex from various ages in puberty onward depending on their distinct time patterns of development. Smoking behavior progresses rapidly in this period and tend to less prevalent among females than males at successive ages. Through early and middle adulthood, women tend to have lower age-specific mean values for blood pressure and total cholesterol concentration but greater prevalence of physical inactivity and being overweight. In middle age, the rates for coronary heart disease events increase for women more gradually than for men, while the rates of strokes for women parallel

those of men closely. In later life, both total cholesterol concentration and blood pressure increase to values greater than those for men of the same age. Rates of coronary heart disease and stroke both increase sharply among women and men with further increase in age. As for differences by sex in age specific rates of coronary heart disease, there is a lag of 10-15 years in rates for women versus those for men. Recognition of the differences that occur in periods throughout the life span may contribute to understanding their causes. (5)

2.2 Body mass index

Weight can be altered by dietary change, but this appears to be difficult. Trials are often of very short duration and suffer from high drop-out rates, limiting their validity. Several good Quality systematic reviews offer insights. A behavioral component improves weight loss in dietary and exercise programs, as do written meal plans, weekly shopping lists and group therapy. Weight maintenance strategies should be integral parts of all weight loss programs. There is little strong evidence that the proportion of dietary fat has an effect on body weight. In terms of managing cardiovascular risk, people with hyperlipidemia should receive dietary lipid lowering advice in addition to weight management advice. Obesity is a risk factor for cardiovascular disease. However, there is still no consensus whether it is an independent factor. One prospective epidemiological study conducted in the United States concluded that physical activities are associated with cardiovascular disease mortality and reduced risk of CVD among men with diabetes.(7)

Gross obesity is a burden on cardiovascular function, limits mobility, and is a risk factor for hypertension and premature death. For those reasons an attempt should be made to reduce the weight of patient to the national standard for sex and height. It is, however, often difficult to induce a change in diet. Body Mass Index (BMI), which described relative weight for height, was significantly correlated with total body fat content. The BMI should be used to assess overweight and obesity and to monitor changes in body weight.

2.3 Smoking

Smoking is associated with many diseases. Cigarette smoking contributes significantly to cardiovascular morbidity and mortality by promoting vascular beds. Epidemiologic studies conducted in diverse populations are supportive of a causal association between environmental tobacco smoke, exposure from spouses and coronary heart disease mortality in nonsmokers. The smoke inhaled by smokers and by non-smokers contains the same toxic substances. The degree of damage from toxins generated by cigarette smoking varies from individual to individual because of the difference reaction of endogenous defense system that varies among individual with difference genetic backgrounds. One prospective study in US female nurses suggested that regular exposure to passive smoking at home or work place increases the risk of coronary heart disease among nonsmoking women.(8)

Cigarette smoking causes substantially increased risk of mortality from heart disease and stroke in both men and women. It is the most important coronary heart disease risk factor for both young men and women. It produces a greater relative risk in persons less than 50 years of age than those over 50 years old. It causes about 30 percent of cardiovascular disease death worldwide. Among industrialized countries where smoking has been common, smoking is estimated to cause 22 percent for cardiovascular disease and accounts for 4.5 million cardiovascular disease deaths. The increase in smoking in developing countries contrasts sharply with the overall decline in many industrialized countries. Recent projections from the WHO suggest that, by the year 2020, tobacco will become the largest single cause of death, accounting for 12.3 percent of global deaths. India, China, and countries in the Middle Eastern Crescent will by then have tobacco contributing to more than 12 percent of all deaths. Breathing environmental tobacco smoke, including side stream and exhaled smoke from cigarettes, cigar and pipes; also causes serious health problem. Exposure to environmental tobacco smoke may also increase the risk of cardiovascular disease among non-smoker.

Cigarette smoking is harmful at any age and biggest risk factor for sudden cardiac death; smokers have two to four times the risk of nonsmokers. Attempts should be made to persuade patient who still smokes to give up the habit. There was overwhelming evidence for an adverse effect of smoking on the risk of CVD and other

atherosclerotic disease including the occurrence of superimposed thrombotic phenomena. (8)

Cigarette smoking is a major risk factor for all manifestations of CVD, stroke, and peripheral artery disease. In ten major cohort studies in several countries, each found a higher incidence of myocardial infarction and death from coronary heart disease among smokers, average 70 percent higher in cigarette smokers versus non-smoker. Pooled data from five large studies demonstrated that middle aged men who smoked 20 or more cigarettes per day have two to three times the risk of developing major coronary events as compared with nonsmokers. An analysis of the 30-year Framingham data found that the relative risk for CVD was almost three times as greater in male smokers aged 30-44 than nonsmokers, though the relative CVD risk for smokers declined for each succeeding age group. The higher relative risk for CVD among younger smokers is likely due to the rather low risk for CVD among nonsmokers this age group. (8)

2.4 Alcohol

In the Framingham Study, moderate alcohol consumption produced a beneficial effect in men with respect to mortality from CVD, but the findings for women wear inconclusive. The results also revealed that different types of alcohol beverages have different cardio protective effects. For nonsmokers, consumption of beer or wine provided a greater reduction in CVD risk than spirits. The influence of moderate beer consumption on blood coagulation was examined in 28 patients with CVD. Group while six represented the control group. Subjects showed a statistically significant decrease in thrombogenic activity in the experimental group. In the nurses' Health Study, with a large cohort of over 87,000 female nurses in middle-age who consumed one alcoholic drink per day, the result showed an approximately 50 percent lower risk nonfatal myocardial infarction or death resulting from CVD than nondrinkers, after other coronary risk factors were adjusted for. Although moderate alcohol intake was shown to decrease the risk of CVD and ischemic stroke, longer-term follow-up in the Nurses' Health Study validates the decreased risk of death from CVD for women with light to moderate alcohol intake. Drinking too much alcohol can lead to high blood pressure and heart disease. One study conducted in Kuopio city of

Finland among 1641 middle age men who were beer drinkers, suggested that beer binging is associated with fetal myocardial infarctions.(9)

Studies regarding the cardio protection effect of alcohol have focused predominantly on the amount of alcohol consumed. Few studies have investigated the effect of frequency, type, and past history of alcohol consumption. One study investigated the influence of beer, wine, and spirits on the rate of CVD in 21 countries. Intake of all three types of alcohol revealed a significant negative correlation with CVD, although the relationship was strong for wine ethanol. The cardio protective effects of moderate alcohol consumption on CVD have been well supported by large studies across diverse populations. In addition, all three types of alcohol, wine beer and spirits have been found to reduce CVD. (9)

2.5 Exercise

The most useful exercising for the heart is aerobic exercise which is the exercise using oxygen for moving every part of body at the regular speed, the motivates the operation of the lung and the heart very efficiently .The rate of the heart beating which can be calculated from the formulary of the target rate of heart beating equalized to 220 age year. Aerobic exercise must be practiced continually in the long period of 20-40 minutes, regularly or at least 3-4 times a week.

Patients who are used to exercise should be encouraged to continue it as long as possible. Even for the sedentary, there is evidence that active exercise taken up late in life can be beneficed though its actual effect on heart disease has not been demonstrated. It has, however, been proved that even a limited amount of vigorous exercise can have a beneficial effect on a middle-aged patient with coronary heart disease .Lack of exercise is risk factor of CVD. Women who exercised more lost weight and had a smaller drop in HDL-C levels than more sedentary women. Exercise regimens have been postulated to show disease progression and delay the onset of morbid events. Such as myocardial infarction and angina.(10)

2.6 Hypertension

Blood pressure is a critical measure of the adequacy of circulator function. A great many mechanisms operate continuously to maintain blood pressure at a level sufficient for the perfusion of body tissues. Along with high blood pressure come the related risks of atherosclerotic and hypertensive diseases. Population difference in rates of coronary heart disease and stroke are explained to a significant degree by differences in the prevalence of high blood pressure. Blood pressure is also a substantial factor in differential risks of these events, especially stroke, within populations.

More than 50 million Americans have hypertension-blood pressure high enough to be a danger to their well – being. Hypertension can be implicated in as many as 800,000 deaths per year as well as no lethal myocardial infarctions, strokes, and permanent damage to the retina and kidney .Nonetheless, nearly one-third of hypertensive individuals are unaware that they have this condition. Because elevated blood pressure is usually asymptomatic until an acute cardiovascular event strikes, screening for hypertension is critical aspect of preventive medicine. Hypertension is also a scientific problem of unexpected complexity. In almost 95% of affected patients, the cause of the blood pressure elevation is unknown, a condition termed primary or essential hypertension. Evidence suggests that there are multiple, diverse causes for essential hypertension and considerable insight into these factors can be achieved by studying the normal physiology of blood pressure control, as will be examined.(11,12)

Hypertension was the most common cardiovascular disease, affecting about 20% of the adult population. It was considered both as a disease category and as one of the major risk factors for heart disease, stroke and kidney disease. It was particularly common in elderly men and women. Blood pressures of 140/90 mmHg or above were considered high, while blood pressures in the range of 130-139/85-89mm/Hg were high normal and less than 130/85 mmHg was normal. High blood pressure was a potent risk factor the heart.

2.7 Diet and Heart Failure

The incidence of chronic heart failure, the common end-result of most cardiac diseases, is increasing steadily in many countries despite considerable improvement in the acute and chronic treatment of CVD, which is currently the main cause of CVD in most countries. In recent years, most CVD research effort has focused on drug treatment, and little attention has been paid to nonpharmacogical management. Some unidebentified factors may indeed contribute to the risk in the prevalence of CVD and should be recognized and corrected if possible. For instance, CVD is now seen also as a metabolic problem with endocrine and immunological disturbances potentially contributing to its progression. Only recently has it been also recognized that increased oxidative stress may contribute to the pathogenesis of CVD. The intimate link between diet and oxidative stress is obvious: the major antioxidant defenses of the body are derived from essential nutrients.

Cardiovascular disease is the greatest cause of mortality in developed countries and diet plays an important role in contributing to the development and progression of ischemic heart disease. The influences of general nutrition and micronutrients such as vitamins and minerals on the progression of CVD are poorly understood and recent studies have done little to clarify the situation. A micronutrient can be regarded as any essential dietary component present in trace amounts. Micronutrients have multiple roles both as participants in many important metabolic processes throughout the body and to counter the oxidative stress resulting from normal metabolism and daily exposure to environmental agents. They can also serve to facilitate communications, aid muscle contraction, and maintain stable tissue environments.

High intake of saturated fat and cholesterol, together with caloric imbalance and consequent obesity, as well as fiber intakes, lead to high mean levels of total serum cholesterol and its atherogenic subfractions, and to high prevalence and incidence rate of hypercholesterolemia from childhood and youth on wards.(13,14)

3. Reproductive health and CVD

Oral contraceptives

The first field trial of oral contraceptive was carried out in San Juan, Puerto Rico in 1956. Oral contraceptive was first approved by USFDA in 1959.Over the past

30 years, the pill has remained the most widely used contraceptive and has been extensively studied. Besides their many benefits, various undesirable side effects have been reported, resulting in further development toward more ideal oral contraceptives. Some reported adverse reactions influencing the current development of oral contraceptive will be briefly discussed.

Cardiovascular effects

Thromboembolic disorders

An increased risk of venous thromboembolic disorders was among the first observed cardiovascular effects in western women. It was considered that estrogen increase this risk through its effect on the blood vessel wall and change in coagulation factors. The incidence of such disorders in Asian women is much lower than in western woman. Comparison of the incidence of postpartum thrombotic events among 41,056 deliveries at Chulalongkorn and Siriraj Hospitals and 28,869 deliveries at the Mayo Clinic, showed that the total events rate in Thai patients was only 1.7 per 100,000 deliveries, while that in women at the Mayo ?Clinic was 137.9 per 100,000 deliveries.

Ischemic heart disease

A number of studies in western women have reported an increased risk of ischemic heart disease among oral contraceptive use. The increased risk tends to concentrate among pill users age 35 years or over who are smokers. There has been no published work showing and increased risk of ischemic heart disease in oriental pill users. A WHO multicenter case-control study on the effect or oral contraceptives on cardiovascular disease which includes Asian women in the study is underway.

In the recent decades, the practice of contraceptive method has changed dramatically in most regions of the world. The proportion of couples using contraceptives has increased steadily, and the mix of methods is now dominated by modern methods that have become a available since the 1960.(15)

In comparison with economic trends or national crises, specific contraceptive measures have probably contributed little to population trends. Events such as the Depression of the 1920s and 1930s, followed by World War II in the

1940s have had much more profound effects on populations than the advent of the oral contraceptive pill or intrauterine devices. However, for the individual couple, the ability to control and space their family using one or several current methods as appropriate is very important to the well-being and happiness of parents and other children.

Advantages of the method are its efficacy and that it is not coitally related, but there may be others, such as reduced menstrual loss or diminished dysmenorrheal. Disadvantages are the need to take tablets daily, an increased vaginal discharge due either to increased cervical mucus or a tendency to candida infections, weight gain and headaches in some users. There are also wide-ranging metabolic effects which have been extensively investigated during the past 20 years. The estrogen component acting via hepatic estrogen receptors alters protein synthesis. This manifests through the changes in enzymes, binding and transport proteins, and proteins involved in the coagulation mechanism. The pill causes increased risk of thrombosis, possibly through raised coagulation factors and fibrinogen and increased platelet adhesiveness. This may cause venous thromboembolism in susceptible individuals, namely those with a previous history of deep venous thrombosis or those with varicose veins and thrombophlebitis. In women with a family history of venous thromboembolic disease, antithrombin III deficiency in plasma should be excluded. There are alterations in lipids, such as increased triglyceride levels as well as a reduction in the high (HDL) and an increase in the low density (LDL) lipoprotein fractions of cholesterol, the latter being caused by the progestogen component. Arterial thrombosis may result in susceptible women-those who already have abnormal lipids, obese women, and those who smoke heavily, particularly over the age of 35. It is debatable as to whether or not pill steroids cause impairment of glucose tolerance. Many of the studies were carried out on the higher dose pills used 10 to 20 years ago. The current pills probably have no significant effect on carbohydrate metabolism, except in susceptible women such as latent diabetics. There are various contraindications to the pill, some being more absolute than others. The absolute contraindications include pregnancy, pulmonary embolism, deep vein thrombosis, sickle cell disease, porphyria, liver disease and jaundice particularly where it is associated with a previous pregnancy or carcinoma of the breast. It is necessary to maintain a high level of vigilance in women with varicose

veins, diabetes, hypertension, renal disease, chronic heart failure and oligomenorrhoea, but none of these conditions constitutes an absolute contraindication,and,in some case, the adverse effects of a pregnancy may substantially outweigh any hazard from the pill. Women who smoke and those over the age of 35 years have a significantly increased risk of thromboembolic disease.

The mortality rate from thrombo-embolic disease is 1.3 per 100,000 below 34 years of age and 3.4 per 100,000 above 35 years. Cardiovascular problems are increased levels of low-density lipoproteins or reduced levels of high-density lipoproteins. Prolonged amenorrhea may occur in women coming off the pill, but the direct relationship remains unclear. Smoking increases the risk of thrombo-embolic disease two to threefold.(15)

4. Related literature

4.1 Age and Sex

Sui X. and colleague(16)studied Cardio respiratory fitness as a predictor of nonfatal cardiovascular events in asymptomatic women and men. Found that hazard ratios were 1.00 (referent), 0.82 (95 %CI 0.72-0.94), and 0.61 (95 % CI 0.53-0.71) in men. After adjustment for other CVD predictors, the association remained significant in men but not in women.

Blauwet LA. and colleague (17) found that there are important sex differences in terms of prevention, diagnosis, treatment, and outcomes in patients with CVD. Women are being included in clinical trials in increasing numbers; lack of knowledge about sex differences persists because sex-specific analysis and reporting of sex-specific results remains limited. This knowledge gap limits the ability of health care professionals to provide optimal care for both women and men. Ongoing support and encouragement is needed for both the inclusion of sufficient numbers of women in clinical trials and for the reporting of sex-specific results of CVD trials.

Oyama N. and colleague (18) found that differential impact of age, sex, and hypertension on aortic atherosclerosis. Hypertension was associated with increased aortic plaque burden. Among no-hypertension subjects, women had greater plaque

burden than men. These data suggest that subclinical atherosclerosis is more common in no-hypertension women and emphasize the importance of focusing on preventive measures in both sexes.

Idris I.(19) found that age is a strong independent predictor of CHD risk. Transition from low to moderate-risk category for men and women with diabetes occurred at ages 37 and 50 years, respectively. Sensitivity for fulfilling this CHD risk criteria are 98.7% for men and 87.1% for women. Stains should be routinely prescribed to all Asian Indian men and women with diabetes above the ages of 37 and 50 years, respectively. For patients below these age thresholds, decision to initiate stains should be based on patient's individual cardiovascular risk factors.

4.2 Body mass index

Kaur P. and colleague(22) found that prevalence of major cardiovascular risk factors was: current smokers (20.2%), body mass index ≥ 23 kg/m^2 (66.8%), central obesity (70.2%), hypertension (27.2%), diabetes mellitus (16.3%) and total cholesterol ≥ 200mg/dl (30.3%).

Abell JE. and colleague (7) found that the younger white women, the relative risk for CVD mortality was significant in obese women (BMI > 30 kg/m^2) than women of normal weight (BMI 18.5-24.9 kg/m^2) OR=1.59(95%CI 1.20-2.09). Similarly, in older white women, the relative risk for CVD mortality in obese women than women of normal weight was significant OR=1.21(95%CI 104-1.41).

Perez PA. and colleague (20) who found that obesity to be recognized was cardiovascular disease (CVD). Obesity, particularly abdominal obesity, predisposes a person to a number of other cardiovascular risk factors, and is an independent predictor of clinical CVD including coronary death, coronary heart disease, heart failure and stroke.

Chen JL. and colleague (21) who found that the Chinese American children (2008) a low level of physical activity and high BMI are associated with increased risk

of CVD. The development of culturally appropriate programs that promote an active lifestyle and reduce weight is critical in CVD prevention.

Sodjinou R. and colleague(14) who found that the Canada (2008) the most prevalent CVD risk factors were overall obesity (18%), abdominal obesity (32%), hypertension (23%), and low HDL-cholesterol (13%). Diabetes and hypertriglyceridemia were uncommon. The prevalence of overall obesity was roughly four times higher in women than in men.

4.3 Smoking

Nakamura K. and colleague (23) found that smoking and increased levels of blood pressure (BP) substantially increase the risk of cardiovascular diseases (CVD). If these 2 risk factors have a synergistic impact on cardiovascular events, lowering BP and quitting smoking will contribute more to reducing CVD than would be expected from ignoring their interaction. Smoking exacerbated the impact of SBP on the risk of hemorrhagic stroke. Although quitting smoking and lowering BP are both crucial for prevention of CVD, combining the 2 could be expected to have extra beneficial effect on preventing hemorrhagic stroke.

Allison MA. and colleague (24) found that prevalence of and risk factors for subclinical cardiovascular disease in selected US Hispanic ethnic groups. There were differences in the magnitude and significance of the associations between coronary artery calcium and hypertension, hypercholesterolemia, and cigarette smoking among the different Hispanic subgroups. This finding was also present for the other subclinical CVD measures. These results suggest a differential relationship between risk factors and either prevalence or extent of subclinical disease by Hispanic subgroup.

4.4 Alcohol

Athyros VG. and colleague (25) found that moderate alcohol consumption was associated with a lower trend for the prevalence of the metabolic syndrome (Mets), DM, CHD and overall CVD but not stroke compared with no alcohol use. Heavy drinking was associated with an increase in the prevalence of all of these disease states. Wine consumption was associated with a slightly better effect than beer or

spirits consumption on the prevalence of total CVD, and beer consumption was associated with a better effect than spirits consumption.

Burke V. and colleague (26) found that alcohol intake and incidence of coronary disease in Australian aborigines. To examine risk for coronary heart disease (CHD) and cardiovascular disease (CVD) in relation to alcohol in a cohort of Australian Aborigines.

4.5 Exercise

Froberg K. and colleague (27) found association between CVD risk factors and physical activity/fitness is weak. Found that physical inactivity and low fitness to metabolic disorders including cardiovascular disease (CVD) risk factors and obesity

Noda H and colleague (28) found that walking and sports participation and mortality from coronary heart disease and stroke found that physical activity through walking and sports participation might reduce the risk of mortality from ischemic stroke (IS) and coronary heart disease (CHD)**.**

4.6 Blood pressure

Chen J. and colleague (29) found that a significant and linear relationship was observed between BP level and mortality from CVD and all-causes. The relationship between BP and mortality was slightly stronger for systolic BP compared with diastolic BP or pulse pressure. Lowering BP to a normal level in hypertensive patients could prevent 55.5 % of CVD mortality and 31.2 % of all-cause mortality among individuals with a history of CVD.

Gu D. and colleague (11) found that increases in systolic BP were associated with a greater risk of CVD compared to corresponding increases in diastolic BP. The linear trend for increased CVD risk being related to higher BP levels was observed in all subgroups of gender; age, body weight, and cigarette smoking. Systolic BP is a stronger predictor of CVD risk compared to diastolic BP.

Eisenmann JC. and colleague (40) found that CVD risk factors included blood pressure.

Alexander LM. (41) who found that hypertension remains a significant health issue not only for Americans but for the worldwide population. Elevated BP can not only be controlled but can be prevented, by addressing modifiable risk factors for CVD, including increased body weight, physical inactivity, poor dietary habits, alcohol consumption, and smoking. The challenge for the clinician is to reduce the global risk for CVD by preventing or at least delaying the onset of modifiable CVD risk factors.

Jardim PC. and colleague (12) found that hypertension and other cardiovascular risk factors (particularly overweight/obesity) had high significant associated with CVD, reinforcing the need for objective nationwide measures to fight this disease, in order to reduce CVD morbidity and mortality.

4.7 High calorie intake

Sharma SV. and colleague (13) found that diets high in fat, especially saturated fat, were often linked to obesity, hypertension and hypercholesterolemia, all risk factors for CVD.

Lopez EP. and colleague(30) found that significant associations between dietary patterns and major CVD risk factors . Food and nutrition professionals can use this information to assess unhealthful food choices observed in the dietary patterns to guide nutrition recommendations and help reduce the incidence of CVD risk factors.

4.8 Use of hormonal contraception

Paulus D. and colleague (33) studied oral contraception and cardiovascular risk factors during adolescence found that significant relationships between oral contraceptive (OC) use and cardiovascular risk factors i.e., high total cholesterol and smoking.

Spitzer WO. (34) who found that lower risk of thrombotic morbidity and mortality with third-generation oral contraceptive (OCs) compared with second-

generation OCs. In addition, the transnational study has shown that third-generation OCs has a significantly lower relative risk for acute myocardial infarction (MI) compared with second-generation products.

Azizi F. and colleague (35) found that contraceptive methods and risk factors of cardiovascular diseases in Tehranian women. Combined oral contraceptive (COC) users were reported to be at high risk for vascular thromboembolism and cardiovascular diseases.

Khader YS. and colleague (36) found that current oral contraceptive (OC) users have an overall adjusted odds ratio (OR) of myocardial infarction (MI) of 2.48 (95% CI1.91-3.22) compared to never-users.

Bush TL. and colleague(31)found that prevalence of cardiovascular disease at baseline was slightly higher in estrogen users (12%) than in nonusers (10%); furthermore, the exclusion of all women with prevalent cardiovascular disease at baseline did not alter the apparent protective effect of estrogen use on cardiovascular disease mortality OR=0.42(95% CI 0.13 -1.10).

Monier L. (32) found that myocardial infarct is increased by 3 for combined oral contraceptives users aged 30-39 and by 5 for those aged 40-44. Risks of deep phlebitis and cerebral thromboses are also 5 times greater in oral contraceptives users.

CHAPTER III
MATERIALS AND METHODS

Study Design

Type of study: case-control study

Place: Siriraj Hospital at Bangkok province, Thailand

Inclusion criteria

Female patient age 15-59 years old at Siriraj Hospital during May 2007– July 2008 .They was divided into three groups:

Population and Sample

Target populations in this study were 45 women who admitted into Siriraj hospital with CVD. They were treated as cases. Controls were recruited in 2 groups. The first groups were 45 women who were admitted with non CVD. The other control groups were 45 women who were non admitted to hospital group who mostly were health personnel in the hospital. The following criteria were used for selecting the participants of the study.

Cases or CVD group

1. Cardiovascular diseases group had disease of CVD according to ICD10 and were admitted into Siriraj hospital for treatment during 1 May 2007 to 31 July 2008.

The examples for CVD were myocardial infarction, hemorrhagic stroke, atherosclerosis, cerebro-vascular accident, ischemic heart disease, and hypertension.

2. Female age 15-59 years old at married or relation with a husband,

3. Having completed self-administered questionnaires which compose of general information.

Non Cardiovascular disease group

1. Non CVD group who sick with other diseases than with cardiovascular disease and were admitted for treatment at the same time as cases. The examples for other diseases were glaucoma, cataract, ears infection, nose infection and urinary tract infection.

2. Female age 15-59years old at married or relation with a husband

3. Having completed self-administered questionnaires which compose of general information.

Non admitted

1. Non admitted or healthy group had no chronic disease and had never been and admitted for treatment in any hospitals.

2. Female age more than 15-59 years old at married or relation with a husband

3. Having completed self-administered questionnaires which compose of general information.

Sample Size

Female patients admit cardiovascular disease, non cardiovascular disease and non admitted in Siriraj hospital. Contraception in Thailand 80 percentage in reproductive .

$$n = \frac{\left\{ Z\,\alpha/2 \quad \sqrt{2P(1-P)} + Z\beta \quad \sqrt{P_1(1-P_1)+P_2(1-P_2)^2} \right\}^2}{P_1 - P2}$$

Estimate Non-admit and Non CVD who had using contraception 50 %
And CVD who had using contraception 80 %

n = sample size
Z = the standard estimate under normal curve at 0.05 = 1.96
At α (type I error) = 0.05 thus Z α = 1.96
At B (type II error) = 0.2 thus Z β= 0.842

P_1 = proportion of patient non-admit group and non CVD group who had using contraception= 0.5

P_2 = proportion of patient CVD group who had using contraception = 0.8

$$P = \frac{P1 + P2}{2}$$

$$P = \frac{0.5 + 0.8}{2} = 0.65$$

$$n = \frac{\left\{1.96 \sqrt{2(0.65)(0.35)} + 0.842 \sqrt{0.5(0.5) + 0.8\,(0.2)^2}\right\}^2}{0.5\text{-}0.8}$$

n = 40

The minimal sample size was 40 women in the each group and 10 percent were added for data loss or incomplete records. Total sample size was equal to 45 women and it is adequate for analysis to meet the objective.

CVD group	45 women
Non CVD group	45 women
Non admitted group	45 women
Total sample size	135 women

Method of data collection

The study population is collected from women patient who were admitted at Siriraj hospital from 1 May, 2007 to 31 July ,2008 .Forty five cases of women were CVD group, and other 2 control group were non CVD group and non admitted group(healthy), each had 45 cases. Then the population was collected with systematic random sampling to get the number of sample size of study.

Instrument

The researcher developed an instrument from the review of the related literatures. The questionnaires were validated by three experts and were tried out with a group of 30 subjects who had characteristic similar to those of the subjects in the present study. Questionnaires were test about demographic factors, physiologic factors, activities of daily life , sexual behavior and contraception, general health.

Statistical analysis

After data collection, the data record forms were checked for validity and coded in SPSS (Statistics Program for Social Science) version 13.0 was use for data analysis. Data analysis was performed as following steps.

1. Description the characteristics of study population in number, percent, mean and standard deviation.

2. Test the correlation between dependent and independent variable with calculation for relation risk in odd ratio with 95 percent confidence interval for dichotomous variable using univariate analysis.

3. Calculation for relative risk in odd ratio with 95 percent confidence interval in multiple logistic regression analysis.

CHAPTER IV
RESULTS

The objective of this research was to study into the significant factors associated with CVD. Cases were women who were admitted due to CVD into Siriraj Hospital during 1 May, 2007 to 31 July, 2008 and age between 15-59 years old. Two control groups were selected; one was patients who were admitted into the same hospital during the same period. The other was healthy women who mostly were. Personal in the hospital case and controls were matched by age groups.

The factors under study included:

1. Demographic factors, i.e. age, marital status, no. of children, education, occupation.

2. Physiologic factors, i.e. weight, height, body mass index, systolic blood pressure, and diastolic blood pressure.

3. Activities of daily life, i.e. calorie intake, exercise, smoking, alcoholic intake.

4. Sexual behavior and use of contraception, i.e. time of menopause, duration of marriage, no. of husband, frequency of sexual intercourse and history of use hormonal contraception.

5. General health, i.e. other medical diseases, other medical treatment than CVD

Results of this study were presented in this chapter as follows:

Characteristics of all subjects.

Factors associated with CVD by univariate analysis.

Factors associated with CVD by multiple logistic regression analysis.

Objective 1: Characteristics of all subjected

1.1 Demographic factors

Age

All three groups were matched for age between 15 to 59 years of age. Average age in CVD group was 37.64 ± 13.445 years old compared to 35.80 ± 13.36 years old in non CVD group and 37.38 ± 13.19 years old in non admitted group. (Table 1)

Marital status

Most women in all three groups married (75.6% , 73.3% and 75.6 %)for CVD, non CVD and non admitted group respectively. (Table 1)

No. of children

Most women in all three groups had 1-2 children (62.2% , 40.0% and 42.2 % for CVD, non CVD and non admitted group respectively. (Table 1)

Education

Most women in CVD and non CVD group completed secondary school (48.9% and 53.3% respectively. While most women (60.0%) non admitted group graduated from college or university. (Table 1)

Occupation

In CVD group most women (35.6%) were private employee. In non CVD group most women (35.6%) were in trade or agriculture sector. In non admitted group most women (42.2%) were in government or state enterprise sector. (Table 1)

Table 1 Demographic factors

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Age (years)				
15-19	5(11.1)	6(13.3)	5(11.1)	16(11.9)
20-29	11(24.4)	11(24.4)	9(20.0)	31(23.0)
30-39	8(17.8)	9(20.0)	11(24.4)	28(20.7)
40-49	9(20.0)	9(20.0)	9(20.0)	27(20.0)
>50	12(26.7)	10(22.2)	11(24.4)	33(24.4)
Mean±SD	37.64 ±13.44	35.80±13.36	37.38±13.19	36.94±13.25
Min-Max	18-59	17-59	17-58	17-59
Marital status				
Married	34(75.6)	33(73.3)	34(75.6)	101(74.8)
Widowed	6(13.3)	6(13.3)	5(11.1)	17(12.6)
Divorced or separated	5(11.1)	6(13.3)	6(13.3)	17(22.6)
No. of children				
0	10(22.2)	7(15.6)	11(24.4)	28(20.7)
1-2	28(62.2)	18(40.0)	19(42.2)	65(48.1)
≥3	7(15.6)	20(44.4)	15(33.3)	42(31.1)
Education				
Primary school or less	11(24.4)	13(28.9)	7(15.6)	31(23.0)
Secondary school	22(48.9)	24(53.3)	11(24.4)	57(42.2)
College or University	12(26.7)	8(17.8)	27(60.0)	47(34.8)
Occupation				
No work or student	6(13.3)	7(15.6)	7(15.6)	20(14.8)
Government or State enterprises	13(28.9)	10(22.2)	19(42.2)	42(31.1)
Private employee	16(35.6)	12(26.7)	11(24.4)	39(28.9)
Trade or agriculture	10(22.2)	16(35.6)	8(17.8)	34(25.2)

1.2 Physical factors

Weight

Most women in CVD group (42.2%) had weight 51-60 kgs compared to most women in non CVD and non admitted group who weighed 40-50 kgs (51.1% and 62.2% respectively). (Table 2)

Height

Most women in CVD group(60.0%) had height 150-160 cms compare to most women in non CVD and non admitted group who height >160 cms (60.0% and 51.1% respectively). (Table 2)

Body mass index

Most women in CVD group (37.8%) had BMI >30kg/m^2 compared to most women in non CVD group (35.6%) who had BMI <18.5 kg/m^2 and in non admitted group (62.2%) who had BMI 18.5 -25 kg/m^2. (Table 2)

Systolic blood pressure (SBP)

Most women in CVD group (55.6%) had SBP> 130 mmHg compared to most women in non CVD and non admitted group who had SBP 121-130 mmHg (64.4% and 57.8% respectively). (Table 2)

Diastolic blood pressure (DBP)

Most women in CVD group (42.2%) had DBP> 85 mmHg compared to most women in non CVD and non admitted group who had DBP 81-85 mmHg (46.7% and 44.4% respectively). (Table 2)

Table 2 Physical factors

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Weight (kgs)				
<40	5(11.1)	9(20.0)	6(13.3)	20(14.8)
40-50	7(15.6)	23(51.1)	28(62.2)	58(43.0)
51-60	19(42.2)	7(15.6)	6(13.3)	32(23.7)
>60	14(31.1)	6(13.3)	5(11.1)	25(18.5)
Height (cms)				
<150	6(13.3)	6(13.3)	6(13.3)	18(13.3)
150-160	27(60.0)	12(26.7)	18(35.6)	57(42.2)
>160	12(26.7)	27(60.0)	21(51.1)	60(51.1)
Body mass index (kg/m^2)				
<18.5	7(15.6)	16(35.6)	5(11.1)	28(20.7)
18.5-25	7(15.6)	10(22.2)	28(62.2)	45(33.3)
25.1-30	14(31.1)	6(13.3)	7(15.6)	27(20.0)
>30	17(37.8)	13(28.9)	5(11.1)	35(25.9)
Systolic blood pressure (mmHg)				
≤ 120	6(13.3)	8(17.8)	12(26.7)	26(19.3)
121-130	14(31.1)	29(64.4)	26(57.8)	69(51.1)
>130	25(55.6)	8(17.8)	7(15.6)	40(29.6)
Diastolic blood pressure (mmHg)				
≤80	15(33.3)	15(33.3)	19(42.2)	49(36.3)
81-85	11(24.4)	21(46.7)	20(44.4)	52(38.5)
>85	19(42.2)	9(20.0)	6(13.3)	34(25.2)

1.3 Activities of daily life

Calorie intake

Most women in CVD group (62.2%) responded that they usually had high calorie intake compared to most women in non CVD and in non admitted group who responded that they usually had lower calorie intake (75.6% and 73.3% respectively). (Table 3)

Exercise

Most women in CVD group (64.4%) responds that they usually did not exercise compared to most women in non CVD and in non admitted group who responded that they usually exercise (82.2% and 73.3% respectively. (Table 3)

Smoking

Most women in CVD group (26.7%) smoked compared to most women in non CVD and in non admitted group who were non smoker (86.7% and 82.2% respectively). (Table 3)

Alcoholic intake

Most women in CVD group (31.1%) responded that they ever consumed alcohol is beverages compared to most women in non CVD and in non admitted group who responded that they never have alcoholic beverages (80.0% and 82.2% respectively). (Table 3)

Table 3 Activities of daily life.

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Calorie intake (Kcal/day)				
Low (≤2000)	17(37.8)	34(75.6)	33(73.3)	84(62.2)
High (>2000)	28(62.2)	11(24.4)	12(26.7)	51(37.8)
Exercise				
No	29(64.4)	8(17.8)	12(26.7)	49(36.3)
Yes	16(35.6)	37(82.2)	33(73.3)	86(63.7)
Sometime (<90 min/week)	11(68.8)	28(75.7)	11(33.3)	50(58.1)
Frequent (≥90 min/week)	5(31.2)	9(24.3)	22(66.7)	36(41.9)
Smoking (no./day)				
Never	33(13.3)	39(86.7)	37(82.2)	109(80.7)
Ever	12(26.7)	6(13.3)	8(17.8)	26(19.3)
Low (1-2/day)	10(83.3)	5(83.3)	7(87.5)	22(84.6)
High (>2/day)	2(16.7)	1(16.7)	1(12.5)	4(15.4)
Alcoholic intake (glasses/day)				
Never	31(68.9)	36(80.0)	37(82.2)	104(77.0)
Ever	14(31.1)	9(20.0)	8(17.8)	31(23.0)
Low (≤1 glass/day)	7(50.0)	5(55.6)	4(50.0)	16(51.6)
High (>1glass/day)	7((50.0)	4(44.4)	4(50.0)	15(48.4)

1.4 Sexual behavior and use of contraception

Time of menopause

Most women in all three groups still had menstruation (62.2%, 73.3% and 75.6% respectively. (Table 4)

Duration of marriage

Most women in CVD and non admitted group (37.8% and 40.0% respectively) had duration of marriage >20 years. Most women in non CVD group (40.0%) had duration of marriage 11-20 years. (Table 4)

No. of husband

Most women in all three groups had 1 husband (82.2%, 84.4% and 82.2% respectively). (Table 4)

Frequency of sexual intercourse

Most women in all three groups had frequency of sexual intercourse 2-4 time per month (66.7%, 62.2% and 48.9% respectively). (Table 4)

History of contraception

Most women in CVD group (62.2%) used contraception compare to most women in non CVD and in non admitted group never used contraception (77.8% and 75.6% respectively). (Table 4)

Table 4 Sexual behavior and use of contraception

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Time of menopause (years)				
No	28(62.2)	33(73.3)	34(75.6)	95(70.4)
Yes	17(37.8)	12(26.4)	11(24.4)	40(29.6)

Table 4 Sexual behavior and use of contraception (cont.)

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Duration of marriage (years)				
≥10	16(35.6)	14(31.1)	15(33.3)	45(33.3)
11-20	12(26.6)	18(40.0)	12(26.7)	42(31.1)
>20	17(37.8)	13(28.9)	18(40.0)	48(35.6)
No. of husband				
1	37(82.2)	38(84.4)	37(82.2)	112(83)
≥2	8(17.8)	7(15.6)	8(17.8)	23(17)
Frequency of sexual intercourse				
Seldom (≤1/month)	10(22.2)	5(11.1)	6(13.3)	21(15.6)
Sometime (2-4/month)	30(66.7)	28(62.2)	12(48.9)	80(59.3)
Frequent (≥2-3/week)	5(11.1)	12(26.7)	17(37.8)	34(25.2)
History of contraception used				
Never use	17(37.8)	35(77.8)	34(75.6)	
Use	28(62.2)	10(22.2)	11(24.4)	
Pill	10(66.7)	5(50.0)	5(45.6)	
(< 5 years)	2(13.3)	2(20.0)	3(27.4)	
(≥5 years)	8(53.4)	3(30.0)	2(18.2)	
Injection or Implant	4(26.7)	3(30.0)	7(63.6)	
(< 1 year)	2(13.3)	2(20.0)	4(36.3)	
(≥1years)	2(13.3)	1(10.0)	3(27.3)	

Table 4 Sexual behavior and use of contraception (cont.)

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Intrauterine devices	2(13.3)	3(30.0)	1(9.1)	
(<3 years)	1(6.5)	2(20.0)	1(9.1)	
(≥3years)	1(6.5)	1(10.0)	-	
Voluntary sterilization	6(40.0)	7(70.0)	3(6.7)	
(<3 years)	3(20.0)	5(50.0)	1(2.2)	
(≥3years)	3(20.0)	2(20.0)	2(4.5)	
History of use hormonal contraception				
Never use	25(55.5)	42(93.3)	41(91.1)	
Use	20(44.5)	3(6.6)	4(8.9)	

1.5 General health

Other medical disease

Most women in all three groups had not other medical diseases (80.0%, 84.4% and 82.2% respectively). (Table 5)

Other medical treatment than CVD

Most women in all three groups had not other medical treatment than CVD (80.0%, 84.4% and 82.2% respectively).(Table 5)

Table 5 General health

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Non admitted n(%) N=45	Total n(%) N=135
Other medical diseases				
No	36(80.0)	38(84.4)	37(82.2)	111(82.2)
Yes	9(20.0)	7(15.6)	8(17.8)	24(17.8)
Gastric ulcer	5(55.6)	4(57.1)	2(25.0)	11(45.8)
Migraine	2(22.2)	3(42.9)	3(37.5)	8(33.3)
Asthma	1(11.1)	-	2(25.0)	3(12.5)
Hyperthyroid	1(11.1)	-	1(12.5)	2(8.3)
Other medical treatment than CVD				
No	36(80.0)	38(84.4)	37(82.2)	111(82.2)
Yes	9(20.0)	7(15.6)	8(17.8)	24(17.8)
Herbal	2(22.2)	2(28.6)	1(12.5)	5(20.8)
Antacid	3(33.3)	2(28.6)	1(12.5)	6(25.0)
Analgesic	2 (22.2)	3(42.8)	3(37.5)	8(33.3)
Inhaler	1(11.1)	-	2(25.0)	3(12.5)
Anti thyroid	1(11.1)	-	1(12.5)	2(8.3)

Objective 2 Significant factors associated with CVD.

2.1 When compare with non CVD group by univariate analysis.

Demographic factors

Age

There was no significant association between age and CVD. The group of age 15-19 years was used as referent group. (Table 6)

Marital status

There was no significant association between marital status and CVD. The group of widow or divorced or separated was used as referent group. (Table 6)

No. of children

There was no significant association between no. of children and CVD. The group of ≥1 children was used as referent group. (Table 6)

Education

There was no significant association between education level and CVD. The group of women completed primary or secondary school was used as referent group. (Table 6)

Occupation

There was no significant association between occupation and CVD. The group of women in trade or agricultural sector was used as referent group. (Table 6)

Table 6 Demographic factors

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Age (years)					
15-19	5(45.0)	6(55.0)	Ref.		
20-29	11(50.0)	11(50.0)	1.22	(0.14-2.32)	0.429
30-39	8(47.0)	9(53.0)	1.08	(0.14-2.76)	0.534
40-49	9(50.0)	9(50.0)	1.22	(0.15-2.59)	0.515
≥50	12(54.5)	10(45.5)	1.46	(0.12-2.12)	0.353
Marital status					
Married	34(50.7)	33(49.3)	1.23	(0.35-4.37)	0.748
Widow or divorced or separated	11(47.8)	12(52.2)	Ref.		
No. of children					
0	10(58.8)	7(41.2)	1.55	(0.53-4.52)	0.419
≥1	35(47.9)	38(52.1)	Ref.		

Table 6 Demographic factors (cont.)

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Education					
Primary/secondary school or less	33(47.1)	37(52.9)	Ref.		
College or university	12(60.0)	8(40.0)	1.68	(0.24-1.86)	0.438
Occupation					
No work or student	6(46.2)	7(53.8)	1.37	(0.29-4.12)	0.898
Government or state enterprises	13(56.5)	10(43.5)	2.08	(0.33-3.62)	0.887
Private employee	16(57.1)	12(42.9)	2.13	(0.30-2.50)	0.786
Trade or agriculture	10(38.5)	16(61.5)	Ref.		

Physical factors

Weight

Women who weighed 51-60 kgs were of significantly. Overweight was found to be associated with the risk of CVD higher risk of develop CVD (OR=8.92, 95% CI 2.65-29.94) and women who weighed 60 kgs or were also lead higher risk of CVD (OR=2.76, 95%CI 1.46-5.24).(Table 7)

Height

Women who was 150-160 cms tall had significant higher risk of CVD (OR =2.62, 95%CI 1.04 - 6.63). (Table 7)

Body mass index (BMI)

Women who had BMI 25.1-30 kg/m^2 had significant higher risk of CVD (OR =2.32, 95% 1.20-4.43). (Table 7)

Systolic blood pressure (SBP)

Women who had SBP >130 mmHg had significant risk of CVD. (OR=6.49, 95%CI 2.33 - 17.95). (Table 7)

Diastolic blood pressure (DBP)

There was no significant association between DBP and CVD.DBP of and 80-85 mmHg had lead the least risk of CVD. (Table 7)

Table 7 Physical factors

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Weight (kgs)					
<40	5(35.7)	9(64.3)	1.83	(0.46-7.27)	0.390
40-50	7(23.3)	23(76.7)	Ref.		
51-60	19(73.1)	7(26.9)	8.92	(2.65-29.94)	0.001*
>60	14(70.0)	6(30.0)	2.76	(1.46-5.24)	0.001*
Height (cms)					
<150	6(50.0)	6(50.0)	1.75	(0.46-6.65)	0.409
150-160	27(69.2)	12(30.8)	2.62	(1.04-6.63)	0.039*
>160	12(30.8)	27(69.2)	Ref.		
Body mass index (kg/m2)					
<18.5	7(30.4)	16(69.6)	Ref.		
18.5-25	7(41.2)	10(58.8)	1.60	(0.17-2.32)	0.481
25.1-30	14(70.0)	6(30.0)	2.32	(1.20-4.43)	0.021*
>30	17(56.7)	13(43.3)	1.44	(0.98-2.11)	0.057
Systolic blood pressure (mmHg)					
≤120	6(42.9)	8(57.1)	1.55	(0.45-5.34)	0.483
121-130	14(32.6)	29(67.4)	Ref.		
>130	25(75.8)	8(24.2)	6.49	(2.33-17.95)	0.001*
Diastolic blood pressure (mmHg)					
≤80	15(50.0)	15(50.0)	1.90	(0.69-5.30)	0.213
80-85	11(34.4)	21(65.6)	Ref.		
>85	19(67.9)	9(32.1)	4.03	(1.37-11.83)	0.222

Activity of daily life

Calorie intake

Women who had high calorie intake (>2,000 Kcal/day) had significantly higher risk of CVD (OR =5.09, 95 %CI 2.05 - 12.62). (Table 8)

Exercise

Women who had responded that they usually did not exercise had significantly higher risk of CVD (OR =8.39, 95%CI 3.15 -22.30). (Table 8)

Smoking

There was no significant association between smoking and CVD. The group of no smoking was used as referent group. (Table 8)

Alcoholic intake

There was no significant association between alcohol intake and CVD. The group of no alcohol intake was used as referent group. (Table 8)

Table 8 Activities of daily life

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Calorie intake (Kcal/day)					
Low (≤2000)	17(33.3)	34(66.7)	Ref.		
High (>2000)	28(71.8)	11(28.2)	5.09	(2.05-12.62)	0.009*
Exercise					
No	29(78.4)	8(21.6)	8.39	(3.15-22.30)	0.018*
Yes	16(30.2)	37(69.8)	Ref.		
Sometime (<90 min/week)	11(68.8)	28(75.7)			
Frequent (≥90 min/week)	5(31.2)	9(24.3)			

Table 8 Activities of daily life (cont.)

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Smoking (no. day)					
Never	33(45.8)	39(54.2)	Ref.		
Ever	12(66.7)	6(33.3)	2.36	(0.80-6.99)	0.136
Low (1-2/day)	10(83.3)	5(83.3)			
High (>2/day)	2(16.7)	1(16.7)			
Alcoholic intake (glasses/day)					
Never	31(42.3)	36(53.7)	Ref.		
Ever	14(60.9)	9(39.1)	1.98	(0.68-4.74)	0.252
Low (≤1 glass/day)	7(50.0)	5(55.6)			
High (>1glass/day)	7(50.0)	4(44.4)			

2.2 Sexual behavior and contraception

Time of menopause

There was no significant association between time of menopause and CVD. The group of women who still had menstruation was used as referent group. (Table 9)

Duration of marriage

There was no significant association between duration of marriage and CVD. The group of women who were married for 11-20 years was used as referent group. (Table 9)

No. of husband

There was no significant association between no. of husband and CVD. The group who had only husband was used as referent group. (Table 9)

Frequency of sexual intercourse

There was no significant association between frequency of sexual intercourse and CVD. The group of women who had frequency of intercourse of 2-3/week was used as referent group. (Table 9)

History of use hormonal contraception

Women who had history use of contraception was significantly associated with CVD (OR=5.76, 95%CI 2.28-14.54). When women who use of hormonal contraception was significant, the association was still significant (OR=11.20, 95%CI 3.02-41.53).(Table 9)

Table 9 Sexual behavior and contraception

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Time of menopause (years)					
No	28(62.2)	33(73.3)	Ref.		
Yes	17(37.8)	12(26.4)	1.12	(0.43-2.97)	0.805
Duration of marriage (years)					
≥10	16(53.3)	14(46.7)	1.71	(0.61-4.77)	0.301
11-20	12(40.0)	18(60.0)	Ref.		
>20	17(56.67)	13(43.37)	1.06	(0.64-1.77)	0.811
No. of husband					
1	37(49.3)	38(50.7)	Ref.		
≥2	8(53.3)	7(46.7)	1.17	(0.38-3.56)	0.788
Frequency of sexual intercourse					
Seldom (≥1/month)	10(66.7)	5(33.3)	4.80	(1.07-21.44)	0.100
Sometime (2-4/month)	30(51.7)	28(48.3)	2.57	(0.80-8.23)	0.105
Frequent (2-3/week)	5(29.4)	12(70.6)	Ref.		

Table 9 Sexual behavior and contraception (cont.)

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
History of hormone contraception					
Never used	17(32.7)	35(67.3)	Ref.		
Used	28(73.7)	10(26.3)	5.76	(2.28-14.54)	0.015*
Pill	10(66.7)	5(50.0)	5(45.6)		
(< 5 years)	2(13.3)	2(20.0)	3(27.4)		
(≥5 years)	8(53.4)	3(30.0)	2(18.2)		
Injection or implant	4(26.7)	3(30.0)	7(63.6)		
(< 1 year)	2(13.3)	2(20.0)	4(36.3)		
(≥1years)	2(13.3)	1(10.0)	3(27.3)		
Intrauterine devices	2(13.3)	3(30.0)	1(9.1)		
(<3 years)	1(6.5)	2(20.0)	1(9.1)		
(≥3years)	1(6.5)	1(10.0)	-		
Voluntary sterilization	6(40.0)	7(70.0)	3(6.7)		
(<3 years)	3(20.0)	5(50.0)	1(2.2)		
(≥3years)	3(20.0)	2(20.0)	2(4.5)		
History of use hormonal contraception					
Never use	25(55.5)	42(93.3)	Ref.		
Use	20(44.5)	3(6.6)	11.20	(3.02-41.53)	0.040*

General health

Other medical diseases

Other medical concomitance disease was found to have no significant association with CVD. (Table 10)

Other medical treatment than CVD

Other medical treatment than CVD diseases found to have no significant association with CVD. (Table 10)

Table 10 General health

Variable	CVD n(%) N=45	Non CVD n(%) N=45	Odd-ratio	95%CI	p-value
Other medical diseases					
No	36(48.7)	38(51.3)	Ref.		
Yes	9(56.3)	7(43.7)	1.36	(0.45-4.02)	0.600
Gastric ulcer	5(55.6)	4(57.1)			
Migraine	2(22.2)	3(42.9)			
Asthma	1(11.1)	-			
Hyperthyroid	1(11.1)	-			
Other medical treatment than CVD					
No	36(48.7)	38(51.3)	Ref.		
Yes	9(56.3)	7(43.7)	1.36	(0.45-4.02)	0.581
Herbal	2(22.2)	2(28.6)			
Antacid	3(33.3)	2(28.6)			
Analgesic	2 (22.2)	3(42.8)			
Inhaler	1(11.1)	-			
Anti thyroid	1(11.1)	-			

Summary of all statistically significant factors associated with CVD when compared to non CVD group of women was shown in Table 11. The factors of high risk OR were use of hormonal contraception (OR=11.20 95%CI 3.02-41.53) weight 51-60 kgs(OR=8.92 ,95% CI 2.65-29.94), No exercise (OR=8.39, 95%CI 3.15-22.30)and SBP >130 mmHg (OR=6.49 95%CI 2.33-17.95). High calorie intake were the fifth significant factors. (Table 11)

Table 11 Summary of significant factors associated with CVD (when compared to non CVD group)

Factor	OR	95%CI	p-value
Use of hormone contraception	11.20	3.02-41.53	0.040
Weight 51-60 kgs	8.92	2.65-29.94	0.001
No exercise	8.39	3.15-22.30	0.018
SBP >130 mmHg	6.49	2.33-17.95	0.001
High calorie intake	5.09	2.05-12.62	0.009
Weight >60 kgs	2.76	1.46-5.24	0.001
Height 150-160 cms	2.62	1.04-6.63	0.039
Body mass index 25.1-30 kg/m^2	2.32	1.20-4.43	0.021

2.3 When compare with non admitted group by univariate analysis

Demographic factors

Age

There was no significant associated between age and CVD. The group of age 30-39 years was used as referent group. (Table 12)

Marital status

There was no significant association between marital status and CVD. The group of couple was used as referent group. (Table 12)

No. of children

There was no significant association between no. of children and CVD. The group of ≥1 children was used as referent group. (Table 12)

Education

There was no significant association between education level and CVD. The group of women complete primary or secondary school was used as referent group. (Table 12)

Occupation

Women who were trade or agriculture occupation had significantly higher risk of CVD (OR 2.00, 95%CI 1.13-3.54). (Table 12)

Table 12 Demographic factors

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Age(years)					
15-19	5(50.0)	5(50.0)	1.25	(0.27-5.89)	0.778
20-29	11(55.0)	9(45.0)	1.38	(0.39-4.87)	0.621
30-39	8(42.1)	11(57.9)	Ref.		
40-49	9(50.0)	9(50.0)	1.38	(0.38-5.06)	0.606
≥50	12(52.2)	11(47.8)	1.11	(0.59-2.08)	0.679
Marital status					
Couple	34(50.0)	34(50.0)	Ref.		
Widow/ divorce /separate	11(50.0)	11(50.0)	1.23	(0.35-4.37)	0.748
No. of children					
0	10(47.6)	11(52.4)	Ref.		
≥1	35(50.7)	34(49.3)	1.13	(0.42-3.01)	0.827

Table 12 Demographic factors (cont.)

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Education					
Primary/secondary school or less	33(64.7)	18(35.3)	4.12	(1.69-10.04)	0.001*
College or university	12 (30.8)	27(69.2)	Ref.		
Occupation					
No work or student	6(46.2)	7(53.8)	1.90	(0.52-6.96)	0.329
Government or state enterprises	13(40.6)	19(59.4)	Ref.		
Private employee	16(59.3)	11(40.7)	1.90	(0.61-5.90)	0.184
Trade or agriculture	10(55.6)	8(44.4)	2.00	(1.13-3.54)	0.022*

Physical factors

Weight

Women who weighed 51-60 kgs were of significantly. Overweight was found to be associated with the risk of CVD higher risk of develop CVD (OR=12.67, 95% CI 3.67-43.60) and women who weighed 60 kgs or were also lead higher risk of CVD (OR=3.34, 95%CI 1.73-6.45).(Table 13)

Height

Women who was 150-160 cms tall had significantly higher risk of CVD (OR=5.06, 95 %CI 1.93 -13.24).(Table 13)

Body mass index (BMI)

Women who had BMI 25.1-30 kg/m^2 had significant higher risk of CVD (OR =8.00, 95% 2.34-27.32) and women who had BMI >30 kg/m^2 were also lead higher risk of CVD (OR =3.68, 95% 1.92-7.05). (Table 13)

Systolic blood pressure (SBP)

Women who had SBP >130 mmHg had significant risk of CVD. (OR=2.67, 95%CI 1.40-5.09). (Table 13)

Diastolic blood pressure (DBP)

Women who had DBP >85 mmHg had significant risk of CVD. (OR=5.75, 95%CI 1.77-18.66). (Table 13)

Table 13 Physical factors

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Weight (kgs)					
<40	5(45.5)	6(55.5)	3.33	(0.78-14.17)	0.094
40-50	7(20.0)	28(80.0)	Ref.		
51-60	19(76.0)	6(24.0)	12.67	(3.67-43.60)	0.001*
>60	14(73.7)	5(26.3)	3.34	(1.73-6.45)	0.001*
Height (cms)					
<150	6(50.0)	6(50.0)	2.25	(0.60-8.42)	0.223
150-160	27(60.0)	18(40.0)	5.06	(1.93-13.24)	0.001*
>160	12(36.4)	21(63.6)	Ref.		
Body mass index (kg/m2)					
<18.5	7(58.3)	5(41.7)	5.60	(1.36-23.05)	0.098.
18.5-25	7(20.0)	28(80.0)	Ref.		
25.1-30	14(66.7)	7(33.3)	8.00	(2.34-27.32)	0.001*
>30	17(77.3)	5(22.7)	3.68	(1.92-7.05)	0.001*
Systolic blood pressure (mmHg)					
≤ 120	6(33.3)	12(66.7)	Ref.		
121-130	14(35.0)	26(65.0)	1.07	(0.33-3.49)	0.466
>130	25(78.1)	7(21.8)	2.67	(1.40-5.09)	0.026*

Table 13 Physical factors (cont.)

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Diastolic blood pressure (mmHg)					
≤80	15(44.1)	19(55.9)	1.44	(0.52-3.90)	0.478
81-85	11(35.5)	20(64.5)	Ref.		
>85	19(76.0)	6(24.0)	5.75	(1.77-18.66)	0.004*

Activity of daily life

Calorie intake

High calorie intake was a significant risk factor of CVD.(OR=4.53, 95%CI 1.85-11.07).(Table 14)

Exercise

Women who had responded that they usually did not exercise had significantly higher risk of CVD (OR =4.98, 95%CI 2.02-12.25). (Table 14)

Smoking

Smoking was found to have no significant association with CVD. The group of no smoking was used as referent group. (Table 14)

Alcoholic intake

Alcohol intake was found to have no significant association with CVD. The group of no alcohol intake was used as referent group. (Table 14)

Table 14 Activities of daily life

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Calorie intake (Kcal/day)					
Low calorie (≤2000)	17(34.0)	33(66.0)	Ref.		
High calorie (>2000)	28(70.0)	12(30.0)	4.53	(1.85-11.07)	0.002*
Exercise					
No	29(70.7)	12(29.3)	4.98	(2.02-12.25)	0.000*
Yes	16(32.7)	33(67.3)	Ref.		
Sometime (<90 min/week)	11(68.8)	11(33.3)			
Frequent (≥90 min/week)	5(31.2)	22(66.7)			
Smoking (no./day)					
Never	33(47.1)	37(52.9)	Ref.		
Ever	12(60.0)	8(40.0)	1.61	(0.51-4.61)	0.338
Low (1-2/day)	10(83.3)	7(87.5)			
High (>2/day)	2(16.7)	1(12.5)			
Alcoholic intake (glasses/day)					
Never	31(45.6)	37(54.4)	Ref.		
Ever	14(63.6)	8(36.4)	2.09	(0.77-5.62)	0.141
Low(≤1)	7(50.0)	4(50.0)			
High (>1)	7((50.0)	4(50.0)			

Sexual behavior and contraception

Time of menopause

Menopause had no significant association with CVD. The group of women who still had menstruation was used as referent group. (Table 15)

Duration of marriage

Duration of marriage had no significant association with CVD. The group of women who were married for >20 years was used as referent group. (Table 15)

No. of husband

No. of husband had no significant association with CVD. The group who had only husband was used as referent group. (Table 15)

Frequency of sexual intercourse

Women who had frequency of intercourse of ≤1/month had significant association with CVD (OR=5.67, 95%CI1.36-23.46).And women who had frequency of intercourse of 2-4/month had significant association with CVD. (OR=4.63, 95%CI 1.48-14.48). (Table 15)

History of use hormone contraception

Women who had history use of contraception was significantly associated with CVD. (OR=5.09, 95%CI 2.05-12.62). When women who use of hormonal contraception was significant, the association was still significant (OR=8.20, 95%CI 2.51-26.76).(Table 15)

Table 15 Sexual behavior and contraception

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Time of menopause (years)					
No	28(62.2)	34(75.6)	Ref.		
Yes	17(37.8)	11(24.4)	2.02	(0.65-6.25)	0.216
Duration of marriage (year)					
≥10	16(51.6)	15(48.4)	1.12	(0.43-2.97)	0.805
11-20	12(50.0)	12(50.0)	1.05	(0.37-2.99)	0.914
>20	17(48.6)	18(51.4)	Ref.		
No. of husband					
1	37(50.0)	37(50.0)	Ref.		
>1	8(50.0)	8(50.0)	1.00	(0.33-2.94)	1.000
Frequency of sexual intercourse					
Seldom (1/month)	10(62.5)	6(37.5)	5.67	(1.36-23.46)	0.016*
Sometime (2-4/month)	30(71.4)	12(28.6)	4.63	(1.48-14.48)	0.016*
Frequent (2-3/week)	5(22.7)	17(77.3)	Ref.		
History of contraception used					
Never used	17(33.3)	34(66.7)	Ref.		
Used	28(71.8)	11(28.2)	5.09	(2.09-12.62)	0.020*
Pill	10(66.7)	5(50.0)	5(45.6)		
(< 5 years)	2(13.3)	2(20.0)	3(27.4)		
(≥5 years)	8(53.4)	3(30.0)	2(18.2)		

Table 15 Sexual behavior and contraception (cont.)

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Injection or implant	4(26.7)	3(30.0)	7(63.6)		
(< 1 year)	2(13.3)	2(20.0)	4(36.3)		
(≥1years)	2(13.3)	1(10.0)	3(27.3)		
Intrauterine devices	2(13.3)	3(30.0)	1(9.1)		
(<3 years)	1(6.5)	2(20.0)	1(9.1)		
(≥3years)	1(6.5)	1(10.0)	-		
Voluntary sterilization	6(40.0)	7(70.0)	3(6.7)		
(<3 years)	3(20.0)	5(50.0)	1(2.2)		
(≥3years)	3(20.0)	2(20.0)	2(4.5)		
History of use hormonal contraception					
Never use	25(55.5)	41(91.1)	Ref.		
Use	20(44.5)	4(8.9)	8.20	(2.51-26.76)	0.050*

General health

Other medical diseases

Other medical concomitant disease was found to have no significant association with CVD. (Table 16)

Other medical treatment than CVD

Other medical treatment than CVD diseases found to have no significant association with CVD. (Table 16)

Table 16 General health

Variable	CVD n(%) N=45	Non admitted n(%) N=45	Odd-ratio	95%CI	p-value
Other medical diseases					
No	36(49.3)	37(50.7)	Ref.		
Yes	9(52.9)	8(47.1)	1.15	(0.40-3.32)	0.798
Gastric ulcer	5(55.6)	2(25.0)			
Migraine	2(22.2)	3(37.5)			
Asthma	1(11.1)	2(25.0)			
Hyperthyroid	1(11.1)	1(12.5)			
Other medical treatmnt than admission					
No	36(49.3)	37(50.7)	Ref.		
Yes	9(52.9)	8(47.1)	1.15	(0.40-3.32)	
Herbal	2(22.2)	1(12.5)			
Antacid	3(33.3)	1(12.5)			
Analgesic	2 (22.2)	3(37.5)			
Inhaler	1(11.1)	2(25.0)			
Anti thyroid	1(11.1)	1(12.5)			

Summary of all statistically significant factors associated with CVD when compare to non admitted group of women was shown in Table 17.

Table 17 Summary of significant factors associated with CVD (when compare non admitted group)

Factor	**OR**	**95%CI**	**p-value**
Weight 51-60 kgs	12.67	3.67-43.60	0.001
Use of hormone contraception	8.20	2.51-26.76	0.050
Body mass index 25.1-30 kg/m2	8.00	2.34-27.32	0.001
*DBP >85 mmHg	5.75	1.77-18.66	0.004
*Seldom sexual intercourse	5.67	1.36-23.46	0.016
Height 150-160 cms	5.06	1.93-13.24	0.001
No exercise	4.98	2.02-12.25	0.000
*Some time sexual intercourse	4.63	1.48-14.48	0.016
High calorie intake	4.53	1.85-11.07	0.002
Use of hormone contraception	4.37	0.99-19.16	0.050
*Primary or secondary School	4.12	1.69-10.04	0.001

Table 17 Summary of significant factors associated with CVD (when compare non admitted group) (cont.)

Factor	OR	95%CI	p-value
*Body mass index >30 kg/m2	3.68	1.92-7.05	0.001
Weight >60 kgs	3.34	1.73-6.45	0.001
SBP >130 mmHg	2.67	1.40-5.09	0.026
*Trade or agriculture	2.00	1.13-3.54	0.022

*addition significant factors compare table 11.

Objective 3: Logistic regression analysis of factor associated with CVD.

3.1 When compare to non CVD group.

When logistic regression analysis was applied by entering eight factors from univariat analysis into the seven were found to be significantly associated with CVD. They were listed according to the odd ratios shown in table 11. No exercise the top there were (OR=6.52, 95%1.70-25.03), Use of hormonal contraception (OR=5.83, 95%1.20-28.36) which involved activities of daily life and sexual behavior. The rest were factors of weight, height , BMI and SBP.(Table 18)

Table 18 Statistically factors associated with CVD by logistic regression analysis when Compare to non CVD group.

Factors	B	S.E	Wald	Df	R	Exp.(B)	95%CI
No exercise	2.15	0.64	11.06	1	0.001	6.52	1.70-25.03
Use of hormone contraception	0.13	0.51	5.96	1	0.029	5.83	1.20-28.36
High calorie intake (>2,000) Kcal/day	2.32	0.69	11.22	1	0.001	5.09	2.02-12.62
Height <160 cms	2.02	0.68	8.82	1	0.003	4.12	1.69-10.04
SBP >130mmHg	1.46	0.46	9.87	1	0.002	2.34	1.15-3.78
Weight >60 kgs	1.61	0.46	12.14	1	0.000	1.89	1.39-2.57
BMI 25.1-30 kg/m^2	0.76	0.43	3.10	1	0.048	1.71	1.00-2.92

3.2 When compare to non admitted group.

When logistic regression analysis was applied by entering 14 factors were significantly associated with CVD by univariate analysis, 10 factors were found to be significantly associated with CVD. All seven factors which were significant associated with CVD when compare with non CVD still showed significant associated at high level of significant. There addition factors from the analysis. They were:

1. Primary/secondary school or less education (OR=9.28, 95%3.31-25.97)
2. Infrequent of sexual intercourse (OR=4.85, 95%1.60-14.70)
3. DBP>85 mmHg (OR=4.75, 95%1.67-13.48) (Table 19)

Table 19 Significant factors in logistic regression model ($\alpha < 0.05$) between CVD and non admitted

Factors	B	S.E	Wald	Df	R	Exp.(B)	95%CI
*Primary/secondary school or less education	0.81	0.34	5.46	1	0.019	9.28	3.31-25.97
Use of hormone contraception	0.13	0.51	5.44	1	0.050	4.37	0.99-19.16
No exercise	0.72	0.30	5.64	1	0.017	4.98	2.02-12.25
*Infrequent of sexual intercourse	1.22	0.50	5.78	1	0.016	4.85	1.60-14.70
*DBP >85mmHg	3.52	1.20	8.52	1	0.003	4.75	1.67-13.48
High calorie intake (>2,000) Kcal/day	2.17	0.69	9.93	1	0.002	4.52	1.85-11.07
Height 150-160cms	1.47	0.67	4.70	1	0.029	2.71	1.15-6.38
SBP >130mmHg	1.59	0.46	11.76	1	0.001	2.60	1.58-4.29
BMI >25.1kg/m^2	2.49	0.71	12.32	1	0.000	2.34	1.49-3.68
Weight >60 kgs	1.75	0.46	14.39	1	0.000	2.04	1.48-2.79

CHAPTER V
DISCUSSION

In this chapter, the discussion of the research results are divided into 2 part:

Part I: Discussion of research methodology

Part II: Discussion of research results

1. Discussion of research methodology

1.1 Research design

This research design is a case control study which is appropriated for study of risk factors of CVD. The advantages of cases-control study were that it permits the study of rare diseases, or with long latency between exposure and manifestation. The study can be launched and conducted over relatively short time periods, relatively inexpensive as compared to cohort studies. Study of multiple potential causes of disease is also possible. For disadvantages of case-control study were information on exposure and past history is primarily based on interview and may be subject to recall bias. Validation of information on exposure is difficult, or incomplete, or even impossible. The case control study concerned with one disease only, generally incomplete control of extraneous variables and choice of appropriate control group may be difficult.

1.2 Sample size

Target populations in this study were 45 women who admitted due to CVDs at Siriraj Hospital during 1 May 2007 to 31 July 2008**.** The control consisted of 2 groups; one was a non CVD group who were admitted due to non CVD. The other was a non admitted to hospital. The minimal sample size was 40 women in the each group and 10 percent were added for data loss or incomplete records. Total sample size was equal to 45 women and it is adequate for analysis to meet the objective.

1.3 Research instrument

The researcher developed an instrument from the review of the related literatures. The questionnaires were validated by three experts and were tried out with a group of 30 subjects who had characteristic similar to those of the subjects in the present study. Questionnaires were test about demographic factors, physiologic factors, activities of daily life, sexual behavior and contraception, general health.

1.4 Data collection

The research used the interview method for data collection. This method was a good data collection method as some women don't understand each question but the interview helped them understand were clearly the questions in the questionnaire with the help of coordinators, the researcher had an appropriate amount of time to collect data in each subject (20-30 minutes). Thus the results the data collections were correct and complete in this research.

2. Discussion of research results

2.1 Factors significantly associated with CVD (when compare to non CVD group)

The significant factors listed according to Odd ratio were:

1. No exercise
2. Use of hormonal contraception
3. High calorie intake
4. High body mass index
5. High blood pressure

1. No exercise

The study showed that the risk factors which had the highest OR were no exercise (OR= 6.52 (95%CI 1.70-25.03)). The result of this study was in accordance with the study of Noda H. and colleague(28)who studied walking and sports participation and mortality from coronary heart disease and stroke found that walking and sports participation and mortality from coronary heart disease and stroke, and

found that physical activity through walking and sports participation might reduce the risk of mortality from ischemic stroke (IS) and coronary heart disease(CHD)**.**

This finding contradicted to the study of Froberg K and colleague (27) who studied physical activity and fitness and its relations to cardiovascular disease risk factors in children found that association between CVD risk factors and physical activity/fitness is weak. They also found that physical inactivity and low fitness are risk to metabolic disorders including cardiovascular disease (CVD) risk factors and obesity

2. Use of hormonal contraception

The study confirmed the association between cardiovascular disease and use of hormonal contraception. After controlling other factors, the result showed that use of hormonal contraception is an important risk factor for cardiovascular disease with adjusted odds ratio 5.83(95%CI 1.20-28.36).

Paulus D. and colleague (33) who studied oral contraception and cardiovascular risk factors during adolescence found that significant relationships between oral contraceptive (OC) use and cardiovascular risk factors i.e., high total cholesterol and smoking.

Spitzer WO. (34)who studied oral contraception and cardiovascular outcomes found that the lower risk of thrombotic morbidity and mortality with third-generation oral contraceptive (OCs) compared with second-generation OCs. In addition, the transnational study has shown that third-generation OCs has a significantly lower relative risk for acute myocardial infarction (MI) compared with second-generation products.

On the contrary Azizi F. and colleague (35) who studied contraceptive methods and risk factors of cardiovascular diseases in Tehranian women found that contraceptive methods and risk factors of cardiovascular diseases in Tehranian women. Combined oral contraceptive (COC) users were reported to be at high risk for vascular thromboembolism and cardiovascular diseases.

Khader YS. and colleague (36) found that the current oral contraceptive (OC) users have an overall adjusted odds ratio (OR) of myocardial infarction (MI) of 2.48 (95% CI 1.91-3.22) compared to never-users.

3. High calorie intake

In this study, high calorie intake was significantly associated with cardiovascular disease OR= 5.09 (95%CI 2.02-12.62). This finding confirmed the finding of Sharma SV.and colleague(13) found that diets high in fat, especially saturated fat, were often linked to obesity, hypertension and hypercholesterolemia, all risk factors for CVD.

Lopez EP. and colleague (30) found significant associations between dietary patterns and major CVD risk factors. Food and nutrition professionals can use this information to assess unhealthful food choices observed in the dietary patterns to guide nutrition recommendations and help reduce the incidence of CVD risk factors.

4. High body mass index

In this study, high body mass index was significantly associated with cardiovascular disease OR=1.71 (95 %CI 1.00-2.92)

Kaur P. and colleague (39) who studied prevalence and distribution of cardiovascular risk found that prevalence of major cardiovascular risk factors were current smokers (20.2 %), body mass index ≥ 23 kg/m^2(66.8%), central obesity(70.2 %), hypertension(27.2%), diabetes mellitus(16.3 %) and total cholesterol ≥ 200mg/dl(30.3 %).

Abell JE. and colleague (7) who studied age and race impact the association between BMI and CVD mortality in women found that in younger white women, the relative risk for CVD mortality was significant in obese women (BMI > 30 kg/m^2) than women of normal weight (BMI 18.5-24.9 kg/m^2) OR=1.59(95 %CI 1.20-2.09). Similarly, in older white women, the relative risk for CVD mortality in obese women was less but still significantly than women of normal weight OR=1.21(95 %CI 104-1.41).

Perez PA. and colleague (20) found obesity to be recognized was cardiovascular disease (CVD). Obesity, particularly abdominal obesity, predisposes a person to a number of other cardiovascular risk factors, and is an independent predictor of clinical CVD including coronary death, coronary heart disease, heart failure and stroke.

Chen JL. and colleague (21) sdudied Chinese American children found that a low level of physical activity and high BMI are associated with increased risk of CVD. The development of culturally appropriate programs that promote an active lifestyle and reduce weight is critical in CVD prevention.

Sodjinou R. and colleague (14) found that the most prevalent CVD risk factors were overall obesity (18%), abdominal obesity (32%), hypertension (23%), and low HDL-cholesterol (13%). Diabetes and hypertriglyceridemia were uncommon. The prevalence of overall obesity was roughly four times higher in women than in men.

5. High blood pressure

In this study, high blood pressure was significantly associated with cardiovascular disease OR= 2.34 (95 %CI 1.15-3.78)

Chen J. and colleague (29) found that a significant and linear relationship was observed between BP level and mortality from CVD and all-causes. The relationship between BP and mortality was slightly stronger for systolic BP compared with diastolic BP or pulse pressure. Lowering BP to a normal level in hypertensive patients could prevent 55.5 % of CVD mortality and 31.2 % of all-cause mortality among individuals with a history of CVD.

Eisenmann JC. and colleague (40) found that CVD risk factors included blood pressure. This study is also in accordance with the study of Gu D. (11) who studied population in China found that increases in systolic BP were associated with a greater risk of CVD compared to corresponding increases in diastolic BP. The linear trend for increased CVD risk being related to higher BP levels was observed in all subgroups of

gender; age, body weight, and cigarette smoking. Systolic BP is a stronger predictor of CVD risk compared to diastolic BP

Alexander LM. (41) found that hypertension remains a significant health issue not only for Americans but for the worldwide population. Elevated BP can not only be controlled but can be prevented, by addressing modifiable risk factors for CVD, including increased body weight, physical inactivity, poor dietary habits, alcohol consumption, and smoking. The challenge for the clinician is to reduce the global risk for CVD by preventing or at least delaying the onset of modifiable CVD risk factors.

Jardim PC. and colleague (12) found that hypertension and other cardiovascular risk factors (particularly overweight/obesity) had high significant associated with CVD, reinforcing the need for objective nationwide measures to fight this disease, in order to reduce CVD morbidity and mortality.

2.2 Factors significantly associated with CVD (when compare to non admitted group)

Similar results were obtained when comparing CVD patients with the non admitted group but more factors were found to be significantly associated with CVD. They were:

1. Low education
2. Infrequent sexual intercourse

1. Low Education

The study, low educational level was significantly association with prevalence of CVD adjust odds ratio 9.28(95%CI=3.31-25.97)

Panagiotakos DB. and colleague (37) who studied population in Greece found that people in the lower educated group had significantly higher prevalence of hypertension, diabetes, and dyslipidemias, were more likely to be sedentary and smokers, compared to higher educated group. Moreover, people in lower educated group had less healthy dietary habits, as assessed using the diet score. Multi-adjusted

analysis revealed that low education was positively associated with 5-year incidence of CVD.

2. Infrequent sexual intercourse

This study, infrequent sexual intercourse was significantly associated with prevalence of CVD with adjusted odds ratio 4.85(95%CI=1.60-14.70)

Barrett-Connor E.(5) found close correlation between erectile dysfunction (ED) and CVD. It is a signal to evaluate the sexual histories of all men who present for cardiovascular evaluation and, perhaps, of all men in general. Early detection of ED may allow for early diagnosis and management of CVD and diabetes.

Billups KL.(39) found that the erectile dysfunction (ED) is another prevalent vascular disorder that is now thought to be caused by endothelial dysfunction. In fact, a burgeoning literature is now available that suggests that ED may be an early marker for atherosclerosis and cardiovascular disease (CVD).

Billups KL.(42) found that the relation between erectile dysfunction (ED) and cardiovascular disease (CVD) is relevant and important to all fields of medicine. ED is often not considered in the same context as traditional cardiovascular conditions, such as hypertension, dyslipidemia, ischemic heart disease, diabetes mellitus, or the insulin resistance/metabolic syndrome complex. The diagnosis of ED and the subsequent evaluation of underlying cardiovascular risk factors could become a powerful clinical tool to help with early detection of atherosclerotic disease and enhance overall preventive vascular health in men.

Archer SL. and colleague (38) found that dysfunction (ED) occur in 60% of CVD patients by 40 years of age. Male ED and female sexual dysfunction (FSD) diminish quality of life and often is a warn in sign of occult CVD.

CHAPTER VI
CONCLUSION

Cardiovascular diseases (CVDs) are a common disease which is a major cause of death and morbidity. Women are less likely to have CVDs due to intrinsic sex hormone factors and lifestyle factors. This study is an analytical research, the objectives of which were to study factors associated with CVDs among women. Cases were 45 women who were admitted due to CVDs in Siriraj Hospital from 1st May 2007 to 31stJuly 2008 and who were between 15-59 years old .The control consisted of 2 groups; one was a non CVD group who were admitted due to other non-severe diseases at the same time as the CVD case. The other was a non admitted to hospital group who mostly were health personnel in the hospital who reported no chronic diseases. Both control groups were matched by age with the CVDs cases. The questionnaires consisted of 5 parts: demographic factors, physiologic factors, activities of daily life, sexual behavior and contraception, and general health. Data was collected by interviewing. Data were analyzed descriptively by frequency, percentage, mean and standard deviation. Odd ratio and multiple logistic regression analysis were applied to test significant association at the level of $p<0.05$ by SPSS statistical program.

The results showed that the significant factors associated with CVD patients when compared with non CVD patients were: no exercise (OR=6.52, 95% CI 1.70-25.03), use of hormonal contraception (OR=5.83, 95% CI 1.20-28.36), high calorie intake (>2,000 Kcal/day) (OR=5.09, 95% CI 2.05-12.62), height<160cms (OR=4.12, 95% CI 1.69-10.04), systolic blood pressure >130 mmHg (OR=2.34, 95% CI 1.15-3.78) , weight >60 kg. (OR=1.89, 95% CI 1.39-2.57), body mass index 25.1-30 kg/m^2 (OR=1.71, 95% CI 1.00-2.92). Similar results were obtained when comparing CVD patients with the non admitted group but more factors were found to be significantly associated with CVD. They were education (less than secondary school) (OR=9.28, 95% CI 3.31-25.97), infrequent sexual intercourse (OR=4.85, 95%CI 1.60-14.70), diastolic blood pressure>85 mmHg. (OR=4.75, 95% CI 1.67-13.48).

In conclusion, factors associated with CVD in women were associated with lifestyle i.e. no exercise or high calorie intake. Regarding reproductive health, use of hormonal contraception is a contributing factor. This knowledge should be disseminated for women to change their lifestyles and realize the risk of developing CVD when hormonal contraception is used.

Recommendation for Application

1. Use of hormones contraception should be recommended to women use be careful because factor CVD.
2. Women should be informed about advantage and side effect in use hormones contraception.

Recommendation for further research

1. Effect in use hormones contraception
2. To study improvement hormones contraception effect decrease CVD.

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APPENDIX

ตอนที่ 1

แบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคล

1.โรค(สำหรับผู้วิจัย)

1._____ วินิจฉัยปี พ.ศ._____

2._____วินิจฉัยปี พ.ศ._____

3._____วินิจฉัยปี พ.ศ._____

4._____วินิจฉัยปี พ.ศ._____

5._____วินิจฉัยปี พ.ศ._____

2.ประวัติการเป็นโรค เจ็บป่วยอื่นๆ

1. _____

2._____

3._____

4._____

5._____

3.การใช้ยาประจำนอกจากยาแพทย์สั่ง

❑ ไม่เคย

❑ เคย ยา_____

เพื่อรักษาหรือดูแลโรค_____

ระยะเวลาในการใช้_____

ช่วงอายุที่ใช้_____

4.อายุ _____ ปีเต็ม(เศษของปีถ้าเกิน 6 เดือนให้นับเป็น 1 ปี)

5.จบการศึกษา

❑ ไม่ได้ศึกษา หรือ ประถมศึกษา

❑ มัธยมศึกษา หรือ ปวช.

❑ อนุปริญญา หรือ ปวส.

❑ ปริญญาตรีขึ้นไป

❑ อื่นๆระบุ_____

6.อาชีพ_____

7.สถานภาพปัจจุบัน

❑ อยู่ด้วยกัน ❑ แยกกันอยู่

❑ หม้าย ❑ หย่าร้าง

❑ อื่นๆระบุ_____

8.จำนวนบุตร

❑ ไม่มี ❑ 1 คน

❑ 2 คน ❑ 3 คน

❑ มากกว่า 3 คนขึ้นไประบุ_____

แบบสอบถามเกี่ยวกับข้อมูลทางสรีระวิทยา

9.ดัชนีมวลกาย

น้ำหนัก_____กิโลกรัม ส่วนสูง_____เซนติเมตร

10.ความดันโลหิต

ความดันโลหิต_____/_____มิลลิเมตรปรอท

แบบสอบถามเกี่ยวกับข้อมูลทางพฤติกรรมสุขภาพ

11. การรับประทานอาหารใน 3 วันที่ผ่านมา

วันแรก	**วันที่2**	**วันที่ 3**
รายการ จำนวน	**รายการ จำนวน**	**รายการ จำนวน**
1.	**1.**	**1.**
2.	**2.**	**2.**
3.	**3.**	**3.**
4.	**4.**	**4.**
5.	**5.**	**5.**
6.	**6.**	**6.**
7.	**7.**	**7.**
8.	**8.**	**8.**
9.	**9.**	**9.**
10.	**10.**	**10.**
11.	**11.**	**11.**
12.	**12.**	**12.**
13.	**13.**	**13.**
14.	**14.**	**14.**
15.	**15.**	**15.**
16.	**16.**	**16.**
17.	**17.**	**17.**
18.	**18.**	**18.**
19.	**19.**	**19.**
20.	**20.**	**20.**

12.ภายใน 6 เดือนที่ผ่านมา ท่านออกกำลังกายบ่อยครั้งแค่ไหน

❑ ไม่เคย

❑ เคย

ออกกำลังกายแบบใด_____

เดือนละ_____ครั้ง ครั้งละ_____ชั่วโมง_____นาที

13.ประวัติการสูบบุหรี่

❑ ไม่เคย

❑ เคย จำนวนการสูบ_____มวน/วัน

❑ เคย แต่ปัจจุบันเลิกแล้ว

❑ ระยะเวลาที่สูบ_____ปี

❑ เคย และปัจจุบันยังสูบอยู่

❑ ระยะเวลาที่สูบ_____ปี

14.ประวัติการดื่มสุรา

❑ ไม่เคย

❑ เคย ปริมาณที่ดื่ม_____แก้ว/วัน

❑ เคย แต่ปัจจุบันเลิกแล้ว

❑ ระยะเวลาที่ดื่ม_____ปี

❑ เคย และปัจจุบันยังดื่มอยู่

❑ ระยะเวลาที่ดื่ม_____ปี

ตอนที่ 2

แบบสอบถามเกี่ยวกับอนามัยเจริญพันธุ์

15. ประวัติการใช้ยาคุมกำเนิด

❑ ไม่เคยใช้

❑ เคยใช้

❑ ยาเม็ดคุมกำเนิด ระยะเวลาในการใช้_____

❑ ยาฉีดคุมกำเนิด ระยะเวลาในการใช้_____

❑ ยาฝังคุมกำเนิด ระยะเวลาในการใช้_____

❑ ห่วงอนามัย ระยะเวลาในการใช้_____

❑ คุมกำเนิดชนิดขวางกั้น ระยะเวลาในการใช้_____

❑ การทำหมัน ระยะเวลาทำหมัน_____

❑ อื่นๆระบุ_____

16.ระยะเวลาในการหมดประจำเดือน

❑ ยังไม่หมดประจำเดือน ❑ น้อยกว่า 5 ปี

❑ ตั้งแต่ 5- 10 ปี ❑ อื่นๆระบุ_____

17.ความถี่ของการมีเพศสัมพันธุ์

❑ นานๆครั้ง (1 ครั้ง / 3เดือนหรือมากกว่า 3 เดือน)

❑ เป็นบางครั้ง (1 ครั้ง / เดือน – 3 เดือน)

❑ บ่อยครั้ง (1 ครั้ง / สัปดาห์ หรือ 2-3 ครั้ง / เดือน)

❑ บ่อยๆครั้ง (1-3 ครั้ง / สัปดาห์)

❑ อื่นๆระบุ_____

15. ระยะเวลาในการแต่งงาน_____

17.จำนวนสามี_____คน

BIOGRAPHY

NAME	Miss Suphansa woramalee
DATE OF BIRTH	26 August 1980
PLACE OF BIRTH	Khornkaen,Thailand
INSTITUTIONS ATTENDED	Mahidol University, 1999-2003 Bachelor of Nursing Science Mahidol University, 2005-2008 Master of Science (Human Reproduction and Population Planning)
POSITION & OFFICE	2 Siriraj Hospital Bangkok, Thailand
HOME ADDRESS	35 M.24 Maepern Nakorn Savan , Thailand